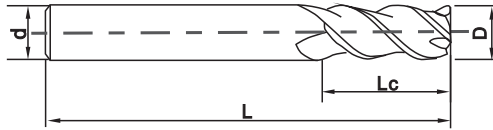


# Square End Mill (HRC48)



## 2 FLUTES SQUARE



2 Flutes	Cobalt 12%	HRC 48	AlCrSiN Coating	UMG 0.5µm	Materials Carbide	
● 1st Recommendation		○ 2nd Recommendation				
Carbon Steel Cast Iron	Alloy Steel	Hardened Steel	Hardened Steel	Stainless Steel	Cast Iron	Titanium Alloys
<HRC35	<HRC48	HRC48-55	HRC55-60			
●	●			○	●	

Order No.	D(mm)	d(mm)	Lc(mm)	L(mm)	Flutes	Stock
TOTIME48-005S-50-2F	0.5	4	1	50	2	▲
TOTIME48-008S-50-2F	0.8	4	2	50	2	▲
TOTIME48-010S-50-2F	1.0	4	3	50	2	▲
TOTIME48-015S-50-2F	1.5	4	5	50	2	▲
TOTIME48-020S-50-1-2F	2.0	4	3	50	2	▲
TOTIME48-020S-50-2-2F	2.0	4	6	50	2	▲
TOTIME48-020S-75-2F	2.0	4	15	75	2	▲
TOTIME48-025S-50-1-2F	2.5	4	6	50	2	▲
TOTIME48-025S-50-2-2F	2.5	4	8	50	2	▲
TOTIME48-030S-04-50-2F	3.0	4	9	50	2	▲
TOTIME48-030S-06-50-2F	3.0	6	9	50	2	▲
TOTIME48-030S-06-75-2F	3.0	6	12	75	2	▲
TOTIME48-040S-04-50-2F	4.0	4	11	50	2	▲
TOTIME48-040S-06-50-2F	4.0	6	11	50	2	▲
TOTIME48-045S-50-1-2F	4.5	6	11	50	2	▲
TOTIME48-045S-50-2-2F	4.5	6	13	50	2	△
TOTIME48-050S-50-2F	5.0	6	13	50	2	▲
TOTIME48-055S-50-2F	5.5	6	16	50	2	▲
TOTIME48-060S-50-2F	6.0	6	16	50	2	▲
TOTIME48-060S-100-2F	6.0	6	20	100	2	▲
TOTIME48-065S-60-2F	6.5	8	16	60	2	▲
TOTIME48-070S-60-2F	7.0	8	20	60	2	▲
TOTIME48-075S-60-2F	7.5	8	20	60	2	△
TOTIME48-080S-60-2F	8.0	8	20	60	2	▲
TOTIME48-080S-100-2F	8.0	8	25	100	2	△
TOTIME48-085S-75-2F	8.5	10	23	75	2	△
TOTIME48-090S-75-2F	9.0	10	23	75	2	▲
TOTIME48-100S-75-2F	10.0	10	25	75	2	▲
TOTIME48-100S-100-2F	10.0	10	30	100	2	▲
TOTIME48-120S-75-2F	12.0	12	30	75	2	▲
TOTIME48-120S-100-2F	12.0	12	35	100	2	▲
TOTIME48-160S-150-2F	16.0	16	36	150	2	▲
TOTIME48-200S-150-2F	20.0	20	45	150	2	△

Tolerance: D ≤ 12 -0.02-0 D > 12 -0.03-0

▲ Stock △ Non-Stock  
Recommended Cutting Conditions P.81

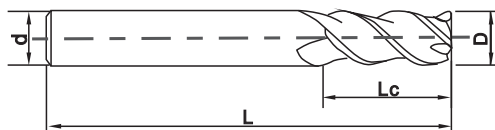
Carbide End Mill Cutter  
For Steels, Cast Iron



# Square End Mill (HRC48)



## 4 FLUTES SQUARE



	4Flutes	Cobalt 12%	HRC 48	AICrSiN Coating	UMG 0.5µm	Materials Carbide
● 1st Recommendation		○ 2nd Recommendation				
Carbon Steel Cast Iron	Alloy Steel	Hardened Steel	Hardened Steel	Stainless Steel	Cast Iron	Titanium Alloys
<HRC35	<HRC48	HRC48-55	HRC55-60			
●	●			○	●	

Order No.	D(mm)	d(mm)	Lc(mm)	L(mm)	Flutes	Stock
TOTIME48-010S-50-4F	1.0	4	3	50	4	▲
TOTIME48-015S-04-50-4F	1.5	4	5	50	4	▲
TOTIME48-015S-06-50-4F	1.5	6	5	50	4	▲
TOTIME48-020S-04-50-4F	2.0	4	6	50	4	▲
TOTIME48-020S-06-50-4F	2.0	6	6	50	4	▲
TOTIME48-025S-04-50-4F	2.5	4	8	50	4	▲
TOTIME48-025S-06-50-4F	2.5	6	8	50	4	▲
TOTIME48-030S-03-50-4F	3.0	3	9	50	4	▲
TOTIME48-030S-04-50-4F	3.0	4	9	50	4	▲
TOTIME48-030S-06-50-1-4F	3.0	6	6	50	4	▲
TOTIME48-030S-06-50-2-4F	3.0	6	9	50	4	▲
TOTIME48-030S-75-4F	3.0	4	12	75	4	▲
TOTIME48-031S-50-4F	3.1	4	9	50	4	▲
TOTIME48-035S-50-4F	3.5	4	11	50	4	▲
TOTIME48-040S-04-50-4F	4.0	4	11	50	4	▲
TOTIME48-040S-06-50-4F	4.0	6	11	50	4	▲
TOTIME48-040S-75-4F	4.0	4	15	75	4	▲
TOTIME48-045S-50-4F	4.5	6	11	50	4	▲
TOTIME48-050S-05-50-4F	5.0	5	13	50	4	▲
TOTIME48-050S-06-50-1-4F	5.0	6	8	50	4	▲
TOTIME48-050S-06-50-2-4F	5.0	6	13	50	4	▲
TOTIME48-050S-75-4F	5.0	6	20	75	4	▲
TOTIME48-055S-50-4F	5.5	6	16	50	4	▲
TOTIME48-060S-50-1-4F	6.0	6	16	50	4	▲
TOTIME48-060S-50-2-4F	6.0	6	18	50	4	▲
TOTIME48-060S-75-4F	6.0	6	20	75	4	▲
TOTIME48-060S-75-2-4F	6.0	6	30	75	4	▲
TOTIME48-065S-60-4F	6.5	8	16	60	4	△
TOTIME48-070S-60-4F	7.0	8	20	60	4	▲
TOTIME48-075S-60-4F	7.5	8	20	60	4	△
TOTIME48-080S-60-1-4F	8.0	8	20	60	4	▲
TOTIME48-080S-60-2-4F	8.0	8	24	60	4	△
TOTIME48-080S-100-4F	8.0	8	25	100	4	▲

Tolerance: D ≤ 12 -0.02-0 D > 12 -0.03-0

▲ Stock △ Non-Stock

Recommended Cutting Conditions P.82

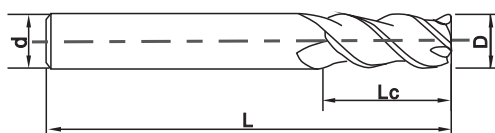
Carbide End Mill Cutter  
For Steels, Cast Iron



# Square End Mill (HRC48)



## 4/6 FLUTES SQUARE



	4 Flutes 6 Flutes	Cobalt 12%	HRC 48	AICrSiN Coating	UMG 0.5µm	Materials Carbide
● 1st Recommendation		○ 2nd Recommendation				
Carbon Steel Cast Iron	Alloy Steel	Hardened Steel	Hardened Steel	Stainless Steel	Cast Iron	Titanium Alloys
<HRC35	<HRC48	HRC48-55	HRC55-60			
●	●			○	●	

Order No.	D(mm)	d(mm)	Lc(mm)	L(mm)	Flutes	Stock
TOTIME48-085S-75-4F	8.5	10	23	75	4	▲
TOTIME48-090S-75-4F	9.0	10	23	75	4	▲
TOTIME48-095S-75-4F	9.5	10	25	75	4	▲
TOTIME48-100S-75-4F	10.0	10	25	75	4	▲
TOTIME48-100S-100-4F	10.0	10	30	100	4	▲
TOTIME48-110S-75-4F	11.0	12	28	75	4	▲
TOTIME48-120S-75-4F	12.0	12	30	75	4	▲
TOTIME48-120S-100-4F	12.0	12	35	100	4	▲
TOTIME48-130S-100-4F	13.0	14	32	100	4	△
TOTIME48-140S-75-4F	14.0	14	32	75	4	▲
TOTIME48-140S-100-4F	14.0	14	34	100	4	△
TOTIME48-150S-100-4F	15.0	16	36	100	4	▲
TOTIME48-160S-100-4F	16.0	16	36	100	4	▲
TOTIME48-180S-100-4F	18.0	18	45	100	4	▲
TOTIME48-180S-150-4F	18.0	18	70	150	4	▲
TOTIME48-200S-100-4F	20.0	20	45	100	4	▲
TOTIME48-200S-150-4F	20.0	20	70	150	4	△
TOTIME48-060S-50-6F	6.0	6	15	50	6	▲
TOTIME48-080S-60-6F	8.0	8	20	60	6	▲
TOTIME48-100S-75-6F	10.0	10	25	75	6	▲
TOTIME48-120S-75-6F	12.0	12	30	75	6	▲
TOTIME48-160S-100-6F	16.0	16	36	100	6	▲
TOTIME48-200S-100-6F	20.0	20	45	100	6	▲

Tolerance: D ≤ 12 -0.02~0 D > 12 -0.03~0

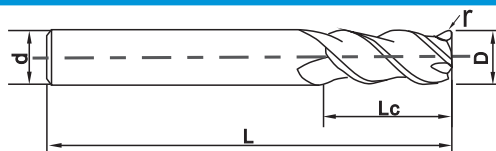
▲ Stock △ Non-Stock

Recommended Cutting Conditions P.82

# Corner Radius End Mill (HRC48)



## 2 FLUTES CORNER RADIUS



	2Flutes	Cobalt 12%	HRC 48	AlCrSiN Coating	UMG 0.5µm	Materials Carbide
● 1st Recommendation		○ 2nd Recommendation				
Carbon Steel Cast Iron	Alloy Steel	Hardened Steel	Hardened Steel	Stainless Steel	Cast Iron	Titanium Alloys
<HRC35	<HRC48	HRC48-55	HRC55-60			
●	●			○	●	

Order No.	D(mm)	r(mm)	d(mm)	Lc(mm)	L(mm)	Stock
TOTIME48-010CR002-50-2F	1.0	0.2	4	3	50	▲
TOTIME48-015CR002-50-2F	1.5	0.2	4	5	50	▲
TOTIME48-020CR002-50-2F	2.0	0.2	4	6	50	▲
TOTIME48-030CR002-04-50-2F	3.0	0.2	4	9	50	△
TOTIME48-030CR002-06-50-2F	3.0	0.2	6	9	50	▲
TOTIME48-030CR003-04-50-2F	3.0	0.3	4	9	50	△
TOTIME48-030CR003-06-50-2F	3.0	0.3	6	9	50	▲
TOTIME48-030CR005-04-50-2F	3.0	0.5	4	9	50	△
TOTIME48-030CR005-06-50-2F	3.0	0.5	6	9	50	△
TOTIME48-040CR002-04-50-2F	4.0	0.2	4	11	50	△
TOTIME48-040CR002-06-50-2F	4.0	0.2	6	11	50	▲
TOTIME48-040CR003-04-50-2F	4.0	0.3	4	11	50	△
TOTIME48-040CR003-06-50-2F	4.0	0.3	6	11	50	▲
TOTIME48-040CR005-04-50-2F	4.0	0.5	4	11	50	△
TOTIME48-040CR005-06-50-2F	4.0	0.5	6	11	50	▲
TOTIME48-040CR010-50-2F	4.0	1.0	4	11	50	▲
TOTIME48-050CR002-50-2F	5.0	0.2	6	13	50	▲
TOTIME48-050CR003-50-2F	5.0	0.3	6	13	50	△
TOTIME48-050CR005-50-2F	5.0	0.5	6	13	50	△
TOTIME48-050CR010-50-2F	5.0	1.0	6	13	50	▲
TOTIME48-060CR005-50-2F	6.0	0.5	6	16	50	▲
TOTIME48-060CR010-50-2F	6.0	1.0	6	16	50	△
TOTIME48-060CR015-50-2F	6.0	1.5	6	16	50	△
TOTIME48-060CR020-50-2F	6.0	2.0	6	16	50	△
TOTIME48-060CR010-75-2F	6.0	1.0	6	16	75	▲
TOTIME48-060CR015-75-2F	6.0	1.5	6	16	75	△
TOTIME48-080CR003-60-2F	8.0	0.3	8	20	60	△
TOTIME48-080CR010-60-2F	8.0	1.0	8	20	60	▲
TOTIME48-080CR015-60-2F	8.0	1.5	8	20	60	△
TOTIME48-080CR020-60-2F	8.0	2.0	8	20	60	△
TOTIME48-080CR005-75-2F	8.0	0.5	8	20	75	▲
TOTIME48-080CR010-75-2F	8.0	1.0	8	20	75	▲
TOTIME48-080CR002-100-2F	8.0	0.2	8	20	100	▲
TOTIME48-080CR005-100-2F	8.0	0.5	8	20	100	△
TOTIME48-100CR003-75-2F	10.0	0.3	10	25	75	▲

Tolerance: D ≤ 12 -0.02-0 D > 12 -0.03-0

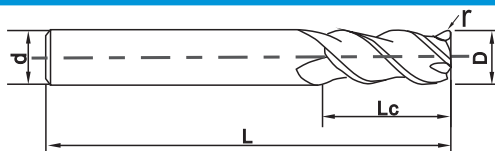
▲ Stock △ Non-Stock  
Recommended Cutting Conditions P.81



# Corner Radius End Mill (HRC48)



## 2 FLUTES CORNER RADIUS



	2Flutes	Cobalt 12%	HRC 48	AlCrSiN Coating	UMG 0.5µm	Materials Carbide
● 1st Recommendation		○ 2nd Recommendation				
Carbon Steel Cast Iron	Alloy Steel	Hardened Steel	Hardened Steel	Stainless Steel	Cast Iron	Titanium Alloys
<HRC35	<HRC48	HRC48-55	HRC55-60			
●	●			○	●	

Order No.	D(mm)	r(mm)	d(mm)	Lc(mm)	L(mm)	Stock
TOTIME48-100CR005-75-2F	10	0.5	10	25	75	△
TOTIME48-100CR010-75-2F	10	1.0	10	25	75	▲
TOTIME48-100CR015-75-2F	10	1.5	10	25	75	△
TOTIME48-100CR020-75-2F	10	2.0	10	25	75	△
TOTIME48-100CR030-75-2F	10	3.0	10	25	75	△
TOTIME48-100CR010-100-2F	10	1.0	10	25	100	▲
TOTIME48-120CR005-75-2F	12	0.5	12	30	75	▲
TOTIME48-120CR010-75-2F	12	1.0	12	30	75	△
TOTIME48-120CR015-75-2F	12	1.5	12	30	75	△
TOTIME48-120CR020-75-2F	12	2.0	12	30	75	▲
TOTIME48-120CR030-75-2F	12	3.0	12	30	75	▲
TOTIME48-160CR005-100-2F	16	0.5	16	36	100	△
TOTIME48-160CR010-100-2F	16	1.0	16	36	100	▲
TOTIME48-160CR020-100-2F	16	2.0	16	36	100	△
TOTIME48-160CR030-100-2F	16	3.0	16	36	100	△
TOTIME48-160CR020-150-2F	16	2.0	16	36	150	△

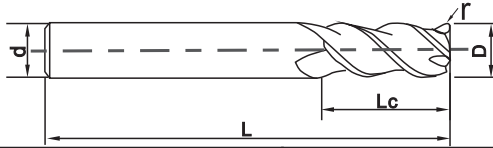
Tolerance: D ≤ 12 -0.02~0 D > 12 -0.03~0

▲ Stock △ Non-Stock  
Recommended Cutting Conditions P.81

# Corner Radius End Mill (HRC48)



## 4 FLUTES CORNER RADIUS



4Flutes		Cobalt 12%	HRC 48	AlCrSiN Coating	UMG 0.5µm	Materials Carbide	
● 1st Recommendation		○ 2nd Recommendation					
Carbon Steel Cast Iron	Alloy Steel	Hardened Steel	Hardened Steel	Stainless Steel	Cast Iron	Titanium Alloys	
<HRC35	<HRC48	HRC48-55	HRC55-60			○	●
●	●						
Order No.	D(mm)	r(mm)	d(mm)	Lc(mm)	L(mm)	Stock	
TOTIME48-010CR002-50-4F	1.0	0.2	4	3	50	▲	
TOTIME48-015CR002-50-4F	1.5	0.2	4	5	50	▲	
TOTIME48-020CR002-50-4F	2.0	0.2	4	6	50	▲	
TOTIME48-030CR002-50-1-4F	3.0	0.2	4	6	50	▲	
TOTIME48-030CR002-50-2-4F	3.0	0.2	4	9	50	△	
TOTIME48-030CR003-50-4F	3.0	0.3	4	9	50	△	
TOTIME48-030CR005-50-4F	3.0	0.5	4	9	50	▲	
TOTIME48-030CR005-75-4F	3.0	0.5	4	9	75	▲	
TOTIME48-040CR002-50-1-4F	4.0	0.2	4	6	50	▲	
TOTIME48-040CR002-50-2-4F	4.0	0.2	4	11	50	▲	
TOTIME48-040CR003-50-4F	4.0	0.3	4	11	50	▲	
TOTIME48-040CR005-50-4F	4.0	0.5	4	11	50	▲	
TOTIME48-040CR005-75-4F	4.0	0.5	4	11	75	▲	
TOTIME48-040CR010-50-4F	4.0	1.0	4	11	50	△	
TOTIME48-045CR010-50-4F	4.5	1.0	6	12	50	▲	
TOTIME48-050CR002-06-50-4F	5.0	0.2	6	13	50	▲	
TOTIME48-050CR005-05-50-4F	5.0	0.5	5	13	50	▲	
TOTIME48-050CR005-06-50-4F	5.0	0.5	6	13	50	△	
TOTIME48-050CR010-05-50-4F	5.0	1.0	5	13	50	△	
TOTIME48-050CR010-06-50-4F	5.0	1.0	6	13	50	△	
TOTIME48-050CR015-50-4F	5.0	1.5	6	13	50	△	
TOTIME48-060CR002-50-4F	6.0	0.2	6	16	50	▲	
TOTIME48-060CR005-50-1-4F	6.0	0.5	6	9	50	▲	
TOTIME48-060CR005-50-2-4F	6.0	0.5	6	16	50	▲	
TOTIME48-060CR010-50-4F	6.0	1.0	6	16	50	▲	
TOTIME48-060CR015-50-4F	6.0	1.5	6	16	50	△	
TOTIME48-060CR005-75-4F	6.0	0.5	6	16	75	▲	
TOTIME48-060CR010-75-4F	6.0	1.0	6	16	75	▲	
TOTIME48-060CR015-75-4F	6.0	1.5	6	16	75	△	
TOTIME48-080CR003-60-4F	8.0	0.3	8	20	60	▲	
TOTIME48-080CR005-60-4F	8.0	0.5	8	20	60	△	
TOTIME48-080CR010-60-4F	8.0	1.0	8	20	60	▲	
TOTIME48-080CR015-60-4F	8.0	1.5	8	20	60	△	
TOTIME48-080CR020-60-4F	8.0	2.0	8	20	60	▲	
TOTIME48-080CR005-75-4F	8.0	0.5	8	20	75	△	

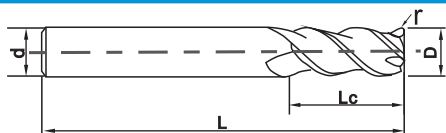
Tolerance: D ≤ 12 -0.02-0 D > 12 -0.03-0

▲ Stock △ Non-Stock  
Recommended Cutting Conditions P.82

# Corner Radius End Mill (HRC48)



## 4 FLUTES CORNER RADIUS



	4Flutes	Cobalt 12%	HRC 48	AlCrSiN Coating	UMG 0.5µm	Materials Carbide
● 1st Recommendation		○ 2nd Recommendation				
Carbon Steel Cast Iron	Alloy Steel	Hardened Steel	Hardened Steel	Stainless Steel	Cast Iron	Titanium Alloys
<HRC35	<HRC48	HRC48-55	HRC55-60			
●	●			○	●	

Order No.	D(mm)	r(mm)	d(mm)	Lc(mm)	L(mm)	Stock
TOTIME48-080CR010-75-4F	8	1.0	8	20	75	▲
TOTIME48-080CR005-100-4F	8	0.5	8	20	100	▲
TOTIME48-080CR010-100-4F	8	1.0	8	20	100	△
TOTIME48-080CR015-100-4F	8	1.5	8	20	100	△
TOTIME48-080CR020-100-4F	8	2.0	8	20	100	△
TOTIME48-100CR002-75-4F	10	0.2	10	25	75	△
TOTIME48-100CR003-75-4F	10	0.3	10	25	75	△
TOTIME48-100CR005-75-4F	10	0.5	10	25	75	▲
TOTIME48-100CR010-75-4F	10	1.0	10	25	75	▲
TOTIME48-100CR015-75-4F	10	1.5	10	25	75	△
TOTIME48-100CR020-75-4F	10	2.0	10	25	75	▲
TOTIME48-100CR025-75-4F	10	2.5	10	25	75	▲
TOTIME48-100CR030-75-4F	10	3.0	10	25	75	△
TOTIME48-100CR005-100-4F	10	0.5	10	25	100	▲
TOTIME48-100CR010-100-4F	10	1.0	10	25	100	▲
TOTIME48-100CR015-100-4F	10	1.5	10	25	100	△
TOTIME48-100CR020-100-4F	10	2.0	10	25	100	△
TOTIME48-120CR005-75-4F	12	0.5	12	30	75	▲
TOTIME48-120CR010-75-4F	12	1.0	12	30	75	▲
TOTIME48-120CR015-75-4F	12	1.5	12	30	75	▲
TOTIME48-120CR020-75-4F	12	2.0	12	30	75	▲
TOTIME48-120CR025-75-4F	12	2.5	12	30	75	▲
TOTIME48-120CR030-75-4F	12	3.0	12	30	75	▲
TOTIME48-120CR005-100-4F	12	0.5	12	30	100	△
TOTIME48-120CR010-100-4F	12	1.0	12	30	100	▲
TOTIME48-120CR015-100-4F	12	1.5	12	30	100	△
TOTIME48-120CR020-100-4F	12	2.0	12	30	100	▲
TOTIME48-120CR030-100-4F	12	3.0	12	30	100	△
TOTIME48-160CR005-100-4F	16	0.5	16	36	100	△
TOTIME48-160CR010-100-4F	16	1.0	16	36	100	▲
TOTIME48-160CR020-100-4F	16	2.0	16	36	100	△
TOTIME48-160CR030-100-4F	16	3.0	16	36	100	△
TOTIME48-160CR005-150-4F	16	0.5	16	36	150	△
TOTIME48-160CR010-150-4F	16	1.0	16	36	150	▲
TOTIME48-160CR015-150-4F	16	1.5	16	36	150	△
TOTIME48-160CR020-150-4F	16	2.0	16	36	150	△
TOTIME48-160CR030-150-4F	16	3.0	16	36	150	△

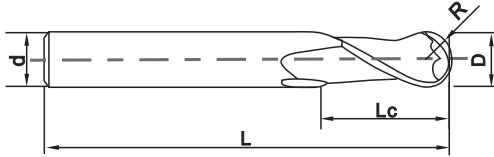
Tolerance: D≤12 -0.02~0 D>12 -0.03~0

▲ Stock △ Non-Stock  
Recommended Cutting Conditions P.82

# Ball Nose End Mill (HRC48)



## 2 FLUTES BALL NOSE



	2Flutes	Cobalt 12%	HRC 48	AlCrSiN Coating	UMG 0.5μm	Materials Carbide
● 1st Recommendation		○ 2nd Recommendation				
Carbon Steel Cast Iron	Alloy Steel	Hardened Steel	Hardened Steel	Stainless Steel	Cast Iron	Titanium Alloys
<HRC35	<HRC48	HRC48-55	HRC55-60			
●	●			○	●	

Order No.	D(mm)	R(mm)	d(mm)	Lc(mm)	L(mm)	Stock
TOTIME48-008B-50-2F	0.8	0.40	4	1.6	50	▲
TOTIME48-009B-50-2F	0.9	0.45	4	1.8	50	▲
TOTIME48-010B-50-2F	1.0	0.50	4	2.0	50	▲
TOTIME48-015B-50-2F	1.5	0.75	4	3.0	50	▲
TOTIME48-020B-04-50-2F	2.0	1.00	4	4.0	50	▲
TOTIME48-020B-06-50-2F	2.0	1.00	6	4.0	50	△
TOTIME48-020B-04-75-2F	2.0	1.00	4	4.0	75	▲
TOTIME48-020B-06-75-2F	2.0	1.00	6	4.0	75	▲
TOTIME48-025B-50-2F	2.5	1.25	4	5.0	50	△
TOTIME48-030B-04-50-2F	3.0	1.50	4	6.0	50	▲
TOTIME48-030B-06-50-2F	3.0	1.50	6	6.0	50	▲
TOTIME48-030B-04-75-2F	3.0	1.50	4	6.0	75	▲
TOTIME48-030B-06-75-2F	3.0	1.50	6	6.0	75	▲
TOTIME48-040B-04-50-2F	4.0	2.00	4	8.0	50	▲
TOTIME48-040B-06-50-2F	4.0	2.00	6	8.0	50	▲
TOTIME48-040B-04-75-2F	4.0	2.00	4	8.0	75	▲
TOTIME48-040B-06-75-2F	4.0	2.00	6	8.0	75	▲
TOTIME48-050B-50-2F	5.0	2.50	6	10.0	50	▲
TOTIME48-050B-75-2F	5.0	2.50	6	10.0	75	▲
TOTIME48-060B-50-2F	6.0	3.00	6	12.0	50	▲
TOTIME48-060B-75-2F	6.0	3.00	6	12.0	75	▲
TOTIME48-070B-60-2F	7.0	3.50	8	14.0	60	▲
TOTIME48-070B-100-2F	7.0	3.50	8	14.0	100	▲

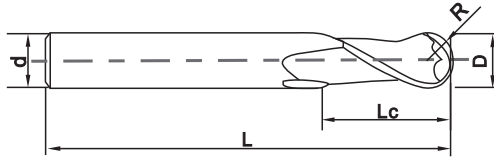
Tolerance: R≤1.5 -0.01~0 1.5<R<3 -0.015~0 R≥3 -0.02~0

▲ Stock △ Non-Stock  
Recommended Cutting Conditions P.83

# Ball Nose End Mill (HRC48)



## 2 FLUTES BALL NOSE



	2Flutes	Cobalt 12%	HRC 48	AlCrSiN Coating	UMG 0.5µm	Materials Carbide
● 1st Recommendation		○ 2nd Recommendation				
Carbon Steel Cast Iron	Alloy Steel	Hardened Steel	Hardened Steel	Stainless Steel	Cast Iron	Titanium Alloys
<HRC35	<HRC48	HRC48-55	HRC55-60			
●	●			○	●	

Order No.	D(mm)	R(mm)	d(mm)	Lc(mm)	L(mm)	Stock
TOTIME48-080B-60-2F	8	4.0	8	14	60	▲
TOTIME48-080B-75-2F	8	4.0	8	14	75	▲
TOTIME48-080B-100-2F	8	4.0	8	14	100	▲
TOTIME48-090B-75-2F	9	4.5	10	16	75	▲
TOTIME48-090B-100-2F	9	4.5	10	16	100	▲
TOTIME48-100B-75-2F	10	5.0	10	18	75	▲
TOTIME48-100B-100-2F	10	5.0	10	18	100	▲
TOTIME48-110B-75-2F	11	5.5	12	20	75	▲
TOTIME48-110B-100-2F	11	5.5	12	20	100	▲
TOTIME48-120B-75-2F	12	6.0	12	22	75	▲
TOTIME48-120B-100-2F	12	6.0	12	22	100	▲
TOTIME48-130B-100-2F	13	6.5	14	26	100	▲
TOTIME48-140B-100-2F	14	7.0	14	26	100	▲
TOTIME48-150B-100-2F	15	7.5	16	30	100	▲
TOTIME48-160B-100-2F	16	8.0	16	30	100	▲
TOTIME48-200B-100-2F	20	10.0	20	38	100	▲

Tolerance: R≤1.5 -0.01~0 1.5<R<3 -0.015~0 R≥3 -0.02~0

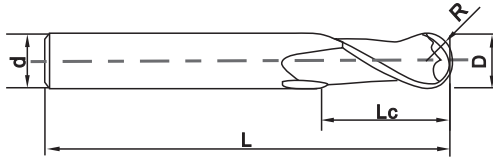
▲ Stock △ Non-Stock  
Recommended Cutting Conditions P.83



# Ball Nose End Mill (HRC48)



## 4 FLUTES BALL NOSE



	4Flutes	Cobalt 12%	HRC 48	AlCrSiN Coating	UMG 0.5µm	Materials Carbide
● 1st Recommendation		○ 2nd Recommendation				
Carbon Steel Cast Iron	Alloy Steel	Hardened Steel	Hardened Steel	Stainless Steel	Cast Iron	Titanium Alloys
<HRC35	<HRC48	HRC48-55	HRC55-60			
●	●			○	●	

Order No.	D(mm)	R(mm)	d(mm)	Lc(mm)	L(mm)	Stock
TOTIME48-020B-04-50-4F	2.0	1.00	4	4	50	▲
TOTIME48-025B-50-4F	2.5	1.25	4	5	50	▲
TOTIME48-030B-03-50-4F	3.0	1.50	3	6	50	▲
TOTIME48-030B-04-50-4F	3.0	1.50	4	6	50	△
TOTIME48-030B-06-50-4F	3.0	1.50	6	6	50	▲
TOTIME48-040B-04-50-4F	4.0	2.00	4	8	50	▲
TOTIME48-040B-06-50-4F	4.0	2.00	6	8	50	▲
TOTIME48-050B-05-50-4F	5.0	2.50	5	10	50	△
TOTIME48-050B-06-50-4F	5.0	2.50	6	10	50	▲
TOTIME48-060B-50-4F	6.0	3.00	6	12	50	▲
TOTIME48-060B-100-4F	6.0	3.00	6	12	100	▲
TOTIME48-060B-150-4F	6.0	3.00	6	12	150	▲
TOTIME48-070B-60-4F	7.0	3.50	8	14	60	▲
TOTIME48-080B-60-4F	8.0	4.00	8	14	60	▲
TOTIME48-080B-100-4F	8.0	4.00	8	14	100	▲
TOTIME48-090B-75-4F	9.0	4.50	10	16	75	▲
TOTIME48-100B-75-4F	10.0	5.00	10	18	75	▲
TOTIME48-110B-75-4F	11.0	5.50	12	20	75	▲
TOTIME48-120B-75-4F	12.0	6.00	12	22	75	▲
TOTIME48-120B-100-4F	12.0	6.00	12	22	100	▲
TOTIME48-120B-150-4F	12.0	6.00	12	22	150	▲
TOTIME48-140B-75-4F	14.0	7.00	14	24	75	▲
TOTIME48-160B-100-4F	16.0	8.00	16	30	100	▲
TOTIME48-200B-100-4F	20.0	10.00	20	38	100	▲

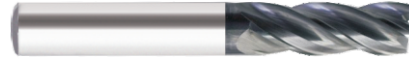
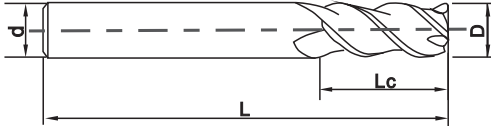
Tolerance: R ≤ 1.5 -0.01~0 1.5 < R < 3 -0.015~0 R ≥ 3 -0.02~0

▲ Stock △ Non-Stock  
Recommended Cutting Conditions P.83

# Variable Helix Square End Mill(HRC48)



## 4 FLUTES SQUARE



	4Flutes	Cobalt 12%	HRC 48	AlCrSiN Coating	UMG 0.5µm	Materials Carbide
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● 1st Recommendation ○2nd Recommendation

Carbon Steel Cast Iron	Alloy Steel	Hardened Steel	Hardened Steel	Stainless Steel	Cast Iron	Titanium Alloys
<HRC35	<HRC48	HRC48-55	HRC55-60			
●	●				○	

Order No.	D (mm)	d (mm)	Lc (mm)	L (mm)	Flutes	Stock
TOTIME3538-020S-50-4F	2.0	4	6	50	4	▲
TOTIME3538-030S-50-4F	3.0	4	9	50	4	▲
TOTIME3538-040S-50-4F	4.0	4	11	50	4	▲
TOTIME3538-040S-06-50-4F	4.0	6	11	50	4	▲
TOTIME3538-040S-75-4F	4.0	6	15	75	4	▲
TOTIME3538-050S-50-4F	5.0	6	13	50	4	▲
TOTIME3538-050S-75-4F	5.0	6	20	75	4	▲
TOTIME3538-055S-50-4F	5.5	6	16	50	4	▲
TOTIME3538-060S-50-4F	6.0	6	16	50	4	▲
TOTIME3538-060S-75-4F	6.0	6	20	75	4	▲
TOTIME3538-070S-60-4F	7.0	8	20	60	4	▲
TOTIME3538-080S-60-4F	8.0	8	16	60	4	▲
TOTIME3538-080S-60-1-4F	8.0	8	20	60	4	▲
TOTIME3538-080S-60-2-4F	8.0	8	25	60	4	▲
TOTIME3538-080S-75-4F	8.0	8	25	75	4	▲
TOTIME3538-080S-100-4F	8.0	8	25	100	4	▲
TOTIME3538-100S-75-4F	10.0	10	25	75	4	▲
TOTIME3538-100S-75-1-4F	10.0	10	20	75	4	▲
TOTIME3538-100S-75-2-4F	10.0	10	30	75	4	▲
TOTIME3538-100S-100-4F	10.0	10	30	100	4	▲
TOTIME3538-120S-75-4F	12.0	12	30	75	4	▲
TOTIME3538-120S-75-1-4F	12.0	12	24	75	4	▲
TOTIME3538-120S-100-4F	12.0	12	35	100	4	▲
TOTIME3538-140S-75-4F	14.0	14	32	75	4	▲
TOTIME3538-140S-100-4F	14.0	14	40	100	4	▲
TOTIME3538-160S-100-4F	16.0	16	36	100	4	▲
TOTIME3538-160S-150-4F	16.0	16	50	150	4	▲
TOTIME3538-180S-100-4F	18.0	18	45	100	4	▲
TOTIME3538-180S-150-4F	18.0	18	50	150	4	▲
TOTIME3538-200S-100-4F	20.0	20	45	100	4	▲
TOTIME3538-200S-150-4F	20.0	20	50	150	4	▲

Tolerance: D≤12 -0.02-0 D>12 -0.03-0

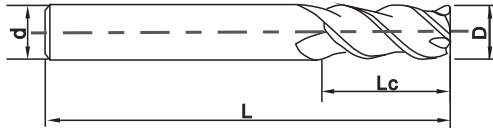
▲ Stock △ Non-Stock  
Recommended Cutting Conditions P.84



# Variable Helix Square End Mill(HRC48)



## 4 FLUTES SQUARE



	4Flutes	Cobalt 12%	HRC 48	TiSiAlN Coating	UMG 0.5µm	Materials Carbide
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● 1st Recommendation		○ 2nd Recommendation				
Carbon Steel Cast Iron	Alloy Steel	Hardened Steel	Hardened Steel	Stainless Steel	Cast Iron	Titanium Alloys
<HRC35	<HRC48	HRC48-55	HRC55-60			
				●		

Order No.	D (mm)	d (mm)	Lc (mm)	L (mm)	Flutes	Stock
TOTIME3638-020S-50-4F	2.0	4	6	50	4	▲
TOTIME3638-030S-50-4F	3.0	4	9	50	4	▲
TOTIME3638-040S-50-4F	4.0	4	12	50	4	▲
TOTIME3638-040S-06-50-4F	4.0	6	12	50	4	▲
TOTIME3638-040S-75-4F	4.0	6	12	75	4	▲
TOTIME3638-050S-50-4F	5.0	6	13	50	4	▲
TOTIME3638-050S-75-4F	5.0	6	20	75	4	▲
TOTIME3638-055S-50-4F	5.5	6	16	50	4	▲
TOTIME3638-060S-50-4F	6.0	6	18	50	4	▲
TOTIME3638-060S-75-4F	6.0	6	18	75	4	▲
TOTIME3638-070S-60-4F	7.0	8	20	60	4	▲
TOTIME3638-080S-60-4F	8.0	8	16	60	4	▲
TOTIME3638-080S-60-1-4F	8.0	8	20	60	4	▲
TOTIME3638-080S-60-2-4F	8.0	8	24	60	4	▲
TOTIME3638-080S-75-4F	8.0	8	24	75	4	▲
TOTIME3638-080S-100-4F	8.0	8	32	100	4	▲
TOTIME3638-100S-75-4F	10.0	10	25	75	4	▲
TOTIME3638-100S-75-1-4F	10.0	10	20	75	4	▲
TOTIME3638-100S-75-2-4F	10.0	10	30	75	4	▲
TOTIME3638-100S-100-4F	10.0	10	40	100	4	▲
TOTIME3638-120S-75-4F	12.0	12	35	75	4	▲
TOTIME3638-120S-75-1-4F	12.0	12	24	75	4	▲
TOTIME3638-120S-100-4F	12.0	12	40	100	4	▲
TOTIME3638-140S-75-4F	14.0	14	32	75	4	▲
TOTIME3638-140S-100-4F	14.0	14	40	100	4	▲
TOTIME3638-160S-100-4F	16.0	16	36	100	4	▲
TOTIME3638-160S-150-4F	16.0	16	50	150	4	▲
TOTIME3638-180S-100-4F	18.0	18	45	100	4	▲
TOTIME3638-180S-150-4F	18.0	18	50	150	4	▲
TOTIME3638-200S-100-4F	20.0	20	45	100	4	▲
TOTIME3638-200S-150-4F	20.0	20	50	150	4	▲

Tolerance: D ≤ 12 -0.02~0 D > 12 -0.03~0

▲ Stock △ Non-Stock  
Recommended Cutting Conditions P.96

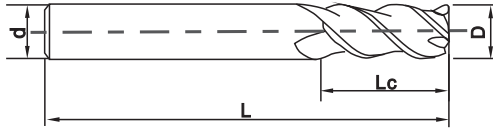




# Variable Lead Square End Mill(HRC48)



2 FLUTES SQUARE [1.5D]



2 Flutes	Cobalt 10%	HRC 48	GS Coating	UMG 0.5μm	Materials Carbide	
● 1st Recommendation		○ 2nd Recommendation				
Carbon Steel Cast Iron	Alloy Steel	Hardened Steel	Hardened Steel	Stainless Steel	Heat Resistant Material	Titanium Alloys
<HRC35	<HRC48	HRC48-55	HRC55-60			
				●	●	●

Order No.	D(mm)	d(mm)	Lc(mm)	L(mm)	Flutes	Stock
TOTIME3538-MS010S-50-2F-1.5D	1.0	4	1.5	50	2	△
TOTIME3538-MS015S-50-2F-1.5D	1.5	4	2.3	50	2	△
TOTIME3538-MS020S-50-2F-1.5D	2.0	4	3.0	50	2	▲
TOTIME3538-MS030S-50-2F-1.5D	3.0	4	4.5	50	2	▲
TOTIME3538-MS040S-50-2F-1.5D	4.0	4	6.0	50	2	△
TOTIME3538-MS040S-75-2F-1.5D	4.0	4	6.0	75	2	▲
TOTIME3538-MS050S-50-2F-1.5D	5.0	6	7.5	50	2	△
TOTIME3538-MS060S-50-2F-1.5D	6.0	6	9.0	50	2	△
TOTIME3538-MS060S-75-2F-1.5D	6.0	6	9.0	75	2	▲
TOTIME3538-MS060S-100-2F-1.5D	6.0	6	9.0	100	2	△
TOTIME3538-MS080S-60-2F-1.5D	8.0	8	12.0	60	2	△
TOTIME3538-MS080S-75-2F-1.5D	8.0	8	12.0	75	2	△
TOTIME3538-MS080S-100-2F-1.5D	8.0	8	12.0	100	2	▲
TOTIME3538-MS100S-75-2F-1.5D	10.0	10	15.0	75	2	△
TOTIME3538-MS100S-100-2F-1.5D	10.0	10	15.0	100	2	▲
TOTIME3538-MS120S-75-2F-1.5D	12.0	12	18.0	75	2	△
TOTIME3538-MS120S-100-2F-1.5D	12.0	12	18.0	100	2	▲
TOTIME3538-MS160S-100-2F-1.5D	16.0	16	24.0	100	2	△
TOTIME3538-MS160S-150-2F-1.5D	16.0	16	24.0	150	2	△
TOTIME3538-MS200S-100-2F-1.5D	20.0	20	30.0	100	2	△
TOTIME3538-MS200S-150-2F-1.5D	20.0	20	30.0	150	2	△

Tolerance: D ≤ 12 -0.02~0 D > 12 -0.03~0

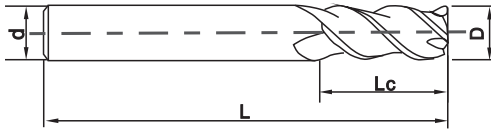
▲ Stock △ Non-Stock  
Recommended Cutting Conditions P.85~P.86



# Variable Lead Square End Mill(HRC48)



2 FLUTES SQUARE [3D]



2 Flutes	Cobalt 10%	HRC 48	GS Coating	UMG 0.5μm	Materials Carbide	
● 1st Recommendation		○ 2nd Recommendation				
Carbon Steel Cast Iron	Alloy Steel	Hardened Steel	Hardened Steel	Stainless Steel	Heat Resistant Material	Titanium Alloys
<HRC35	<HRC48	HRC48-55	HRC55-60			
				●	●	●

Order No.	D(mm)	d(mm)	Lc(mm)	L(mm)	Flutes	Stock
TOTIME3538-MS010S-50-2F-3D	1.0	4	3.0	50	2	△
TOTIME3538-MS015S-50-2F-3D	1.5	4	4.5	50	2	△
TOTIME3538-MS020S-50-2F-3D	2.0	4	6.0	50	2	△
TOTIME3538-MS030S-50-2F-3D	3.0	4	9.0	50	2	△
TOTIME3538-MS040S-50-2F-3D	4.0	4	12.0	50	2	△
TOTIME3538-MS040S-75-2F-3D	4.0	4	12.0	75	2	▲
TOTIME3538-MS050S-50-2F-3D	5.0	6	15.0	50	2	△
TOTIME3538-MS060S-50-2F-3D	6.0	6	18.0	50	2	△
TOTIME3538-MS060S-75-2F-3D	6.0	6	18.0	75	2	▲
TOTIME3538-MS060S-100-2F-3D	6.0	6	18.0	100	2	△
TOTIME3538-MS080S-60-2F-3D	8.0	8	24.0	60	2	△
TOTIME3538-MS080S-75-2F-3D	8.0	8	24.0	75	2	△
TOTIME3538-MS080S-100-2F-3D	8.0	8	24.0	100	2	▲
TOTIME3538-MS100S-75-2F-3D	10.0	10	30.0	75	2	△
TOTIME3538-MS100S-100-2F-3D	10.0	10	30.0	100	2	▲
TOTIME3538-MS120S-75-2F-3D	12.0	12	36.0	75	2	△
TOTIME3538-MS120S-100-2F-3D	12.0	12	36.0	100	2	▲
TOTIME3538-MS160S-100-2F-3D	16.0	16	48.0	100	2	▲
TOTIME3538-MS160S-150-2F-3D	16.0	16	48.0	150	2	△
TOTIME3538-MS200S-100-2F-3D	20.0	20	60.0	100	2	△
TOTIME3538-MS200S-150-2F-3D	20.0	20	60.0	150	2	△

Tolerance: D ≤ 12 -0.02~0 D > 12 -0.03~0

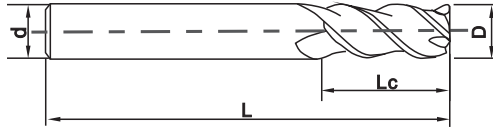
▲ Stock △ Non-Stock  
Recommended Cutting Conditions P.85~P86



# Variable Lead Square End Mill(HRC48)



## 4 FLUTES SQUARE [2.5D]



	4Flutes	Cobalt 10%	HRC 48	GS Coating	UMG 0.5μm	Materials Carbide
● 1st Recommendation		○ 2nd Recommendation				
Carbon Steel Cast Iron	Alloy Steel	Hardened Steel	Hardened Steel	Stainless Steel	Heat Resistant Material	Titanium Alloys
<HRC35	<HRC48	HRC48-55	HRC55-60			
				●	●	●

Order No.	D(mm)	d(mm)	Lc(mm)	L(mm)	Flutes	Stock
TOTIME3538-MS010S-50-4F-2.5D	1.0	4	2.5	50	4	▲
TOTIME3538-MS015S-50-4F-2.5D	1.5	4	3.8	50	4	▲
TOTIME3538-MS020S-50-4F-2.5D	2.0	4	5.0	50	4	▲
TOTIME3538-MS030S-50-4F-2.5D	3.0	4	8.0	50	4	▲
TOTIME3538-MS040S-50-4F-2.5D	4.0	4	10.0	50	4	▲
TOTIME3538-MS040S-75-4F-2.5D	4.0	4	10.0	75	4	△
TOTIME3538-MS050S-50-4F-2.5D	5.0	6	12.0	50	4	▲
TOTIME3538-MS060S-50-4F-2.5D	6.0	6	15.0	50	4	▲
TOTIME3538-MS060S-75-4F-2.5D	6.0	6	15.0	75	4	▲
TOTIME3538-MS060S-100-4F-2.5D	6.0	6	15.0	100	4	△
TOTIME3538-MS080S-60-4F-2.5D	8.0	8	20.0	60	4	▲
TOTIME3538-MS080S-75-4F-2.5D	8.0	8	20.0	75	4	△
TOTIME3538-MS080S-100-4F-2.5D	8.0	8	20.0	100	4	△
TOTIME3538-MS100S-75-4F-2.5D	10.0	10	25.0	75	4	▲
TOTIME3538-MS100S-100-4F-2.5D	10.0	10	25.0	100	4	△
TOTIME3538-MS120S-75-4F-2.5D	12.0	12	30.0	75	4	▲
TOTIME3538-MS120S-100-4F-2.5D	12.0	12	30.0	100	4	△
TOTIME3538-MS160S-100-4F-2.5D	16.0	16	40.0	100	4	▲
TOTIME3538-MS160S-150-4F-2.5D	16.0	16	40.0	150	4	△
TOTIME3538-MS200S-100-4F-2.5D	20.0	20	50.0	100	4	△
TOTIME3538-MS200S-150-4F-2.5D	20.0	20	50.0	150	4	△

Tolerance: D≤12 -0.02~0 D>12 -0.03~0

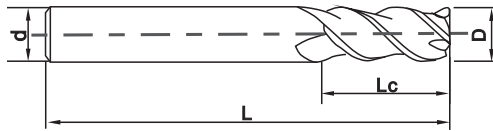
▲ Stock △ Non-Stock  
Recommended Cutting Conditions P.85



# Variable Lead Square End Mill(HRC48)



4 FLUTES SQUARE [3D]



4Flutes	Cobalt 10%	HRC 48	GS Coating	UMG 0.5µm	Materials Carbide	
● 1st Recommendation		○ 2nd Recommendation				
Carbon Steel Cast Iron	Alloy Steel	Hardened Steel	Hardened Steel	Stainless Steel	Heat Resistant Material	Titanium Alloys
<HRC35	<HRC48	HRC48-55	HRC55-60			
				●	●	●

Order No.	D(mm)	d(mm)	Lc(mm)	L(mm)	Flutes	Stock
TOTIME3538-MS010S-50-4F-3D	1.0	4	3.0	50	4	▲
TOTIME3538-MS015S-50-4F-3D	1.5	4	4.5	50	4	△
TOTIME3538-MS020S-50-4F-3D	2.0	4	6.0	50	4	△
TOTIME3538-MS030S-50-4F-3D	3.0	4	9.0	50	4	▲
TOTIME3538-MS040S-50-4F-3D	4.0	4	12.0	50	4	△
TOTIME3538-MS040S-75-4F-3D	4.0	4	12.0	75	4	△
TOTIME3538-MS050S-50-4F-3D	5.0	6	15.0	50	4	▲
TOTIME3538-MS060S-50-4F-3D	6.0	6	18.0	50	4	△
TOTIME3538-MS060S-75-4F-3D	6.0	6	18.0	75	4	△
TOTIME3538-MS060S-100-4F-3D	6.0	6	18.0	100	4	△
TOTIME3538-MS080S-60-4F-3D	8.0	8	24.0	60	4	△
TOTIME3538-MS080S-75-4F-3D	8.0	8	24.0	75	4	▲
TOTIME3538-MS080S-100-4F-3D	8.0	8	24.0	100	4	△
TOTIME3538-MS100S-75-4F-3D	10.0	10	30.0	75	4	△
TOTIME3538-MS100S-100-4F-3D	10.0	10	30.0	100	4	▲
TOTIME3538-MS120S-75-4F-3D	12.0	12	36.0	75	4	△
TOTIME3538-MS120S-100-4F-3D	12.0	12	36.0	100	4	▲
TOTIME3538-MS160S-100-4F-3D	16.0	16	48.0	100	4	△
TOTIME3538-MS160S-150-4F-3D	16.0	16	48.0	150	4	△
TOTIME3538-MS200S-100-4F-3D	20.0	20	60.0	100	4	△
TOTIME3538-MS200S-150-4F-3D	20.0	20	60.0	150	4	△

Tolerance: D ≤ 12 -0.02~0 D > 12 -0.03~0

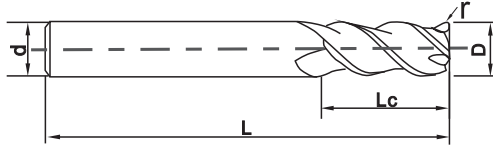
▲ Stock △ Non-Stock  
Recommended Cutting Conditions P.85



# Variable Lead Corner Radius End Mill(HRC48)



## 4 FLUTES CORNER RADIUS [2.5D]



	4Flutes	Cobalt 10%	HRC 48	GS Coating	UMG 0.5µm	Materials Carbide
● 1st Recommendation		○ 2nd Recommendation				
Carbon Steel Cast Iron	Alloy Steel	Hardened Steel	Hardened Steel	Stainless Steel	Heat Resistant Material	Titanium Alloys
<HRC35	<HRC48	HRC48-55	HRC55-60			
				●	●	●

Order No.	D(mm)	r(mm)	d(mm)	Lc(mm)	L(mm)	Flutes	Stock
TOTIME3538-MS010CR001-50-4F-2.5D	1.0	0.1	4	2.5	50	4	△
TOTIME3538-MS010CR002-50-4F-2.5D	1.0	0.2	4	2.5	50	4	▲
TOTIME3538-MS015CR001-50-4F-2.5D	1.5	0.1	4	3.8	50	4	▲
TOTIME3538-MS015CR002-50-4F-2.5D	1.5	0.2	4	3.8	50	4	▲
TOTIME3538-MS020CR001-50-4F-2.5D	2.0	0.1	4	5.0	50	4	▲
TOTIME3538-MS020CR002-50-4F-2.5D	2.0	0.2	4	5.0	50	4	▲
TOTIME3538-MS020CR005-50-4F-2.5D	2.0	0.5	4	5.0	50	4	△
TOTIME3538-MS030CR001-50-4F-2.5D	3.0	0.1	4	8.0	50	4	▲
TOTIME3538-MS030CR002-50-4F-2.5D	3.0	0.2	4	8.0	50	4	△
TOTIME3538-MS030CR003-50-4F-2.5D	3.0	0.3	4	8.0	50	4	△
TOTIME3538-MS030CR005-50-4F-2.5D	3.0	0.5	4	8.0	50	4	△
TOTIME3538-MS040CR002-50-4F-2.5D	4.0	0.2	4	10.0	50	4	△
TOTIME3538-MS040CR003-50-4F-2.5D	4.0	0.3	4	10.0	50	4	△
TOTIME3538-MS040CR005-50-4F-2.5D	4.0	0.5	4	10.0	50	4	▲
TOTIME3538-MS040CR010-50-4F-2.5D	4.0	1.0	4	10.0	50	4	△
TOTIME3538-MS050CR002-50-4F-2.5D	5.0	0.2	6	12.0	50	4	▲
TOTIME3538-MS050CR003-50-4F-2.5D	5.0	0.3	6	12.0	50	4	△
TOTIME3538-MS050CR005-50-4F-2.5D	5.0	0.5	6	12.0	50	4	△
TOTIME3538-MS050CR010-50-4F-2.5D	5.0	1.0	6	12.0	50	4	△
TOTIME3538-MS060CR002-50-4F-2.5D	6.0	0.2	6	15.0	50	4	▲
TOTIME3538-MS060CR003-50-4F-2.5D	6.0	0.3	6	15.0	50	4	△
TOTIME3538-MS060CR005-50-4F-2.5D	6.0	0.5	6	15.0	50	4	▲
TOTIME3538-MS060CR010-50-4F-2.5D	6.0	1.0	6	15.0	50	4	▲
TOTIME3538-MS060CR015-50-4F-2.5D	6.0	1.5	6	15.0	50	4	△
TOTIME3538-MS060CR002-75-4F-2.5D	6.0	0.2	6	15.0	75	4	△
TOTIME3538-MS060CR003-75-4F-2.5D	6.0	0.3	6	15.0	75	4	△
TOTIME3538-MS060CR005-75-4F-2.5D	6.0	0.5	6	15.0	75	4	▲
TOTIME3538-MS060CR010-75-4F-2.5D	6.0	1.0	6	15.0	75	4	△
TOTIME3538-MS060CR015-75-4F-2.5D	6.0	1.5	6	15.0	75	4	△

Tolerance: D ≤ 12 -0.02~0 D > 12 -0.03~0

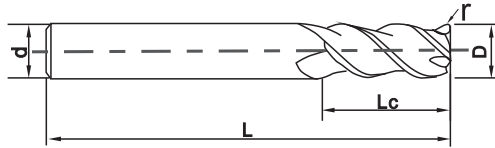
▲ Stock △ Non-Stock  
Recommended Cutting Conditions P.85



# Variable Lead Corner Radius End Mill(HRC48)



## 4 FLUTES CORNER RADIUS [2.5D]



	4Flutes	Cobalt 10%	HRC 48	GS Coating	UMG 0.5µm	Materials Carbide	
● 1st Recommendation		○ 2nd Recommendation					
Carbon Steel Cast Iron	Alloy Steel	Hardened Steel	Hardened Steel	Stainless Steel	Heat Resistant Material	Titanium Alloys	
<HRC35	<HRC48	HRC48-55	HRC55-60				●

Order No.	D(mm)	r(mm)	d(mm)	Lc(mm)	L(mm)	Flutes	Stock
TOTIME3538-MS080CR003-60-4F-2.5D	8	0.3	8	20	60	4	△
TOTIME3538-MS080CR005-60-4F-2.5D	8	0.5	8	20	60	4	▲
TOTIME3538-MS080CR010-60-4F-2.5D	8	1.0	8	20	60	4	▲
TOTIME3538-MS080CR015-60-4F-2.5D	8	1.5	8	20	60	4	△
TOTIME3538-MS080CR020-60-4F-2.5D	8	2.0	8	20	60	4	▲
TOTIME3538-MS080CR003-75-4F-2.5D	8	0.3	8	20	75	4	△
TOTIME3538-MS080CR005-75-4F-2.5D	8	0.5	8	20	75	4	△
TOTIME3538-MS080CR010-75-4F-2.5D	8	1.0	8	20	75	4	△
TOTIME3538-MS080CR015-75-4F-2.5D	8	1.5	8	20	75	4	△
TOTIME3538-MS080CR020-75-4F-2.5D	8	2.0	8	20	75	4	△
TOTIME3538-MS100CR002-75-4F-2.5D	10	0.2	10	25	75	4	△
TOTIME3538-MS100CR003-75-4F-2.5D	10	0.3	10	25	75	4	△
TOTIME3538-MS100CR005-75-4F-2.5D	10	0.5	10	25	75	4	▲
TOTIME3538-MS100CR010-75-4F-2.5D	10	1.0	10	25	75	4	▲
TOTIME3538-MS100CR015-75-4F-2.5D	10	1.5	10	25	75	4	▲
TOTIME3538-MS100CR020-75-4F-2.5D	10	2.0	10	25	75	4	▲
TOTIME3538-MS100CR025-75-4F-2.5D	10	2.5	10	25	75	4	△
TOTIME3538-MS100CR030-75-4F-2.5D	10	3.0	10	25	75	4	▲
TOTIME3538-MS100CR002-100-4F-2.5D	10	0.2	10	25	100	4	△
TOTIME3538-MS100CR003-100-4F-2.5D	10	0.3	10	25	100	4	△
TOTIME3538-MS100CR005-100-4F-2.5D	10	0.5	10	25	100	4	△
TOTIME3538-MS100CR010-100-4F-2.5D	10	1.0	10	25	100	4	△
TOTIME3538-MS100CR015-100-4F-2.5D	10	1.5	10	25	100	4	△
TOTIME3538-MS100CR020-100-4F-2.5D	10	2.0	10	25	100	4	△
TOTIME3538-MS100CR025-100-4F-2.5D	10	2.5	10	25	100	4	△
TOTIME3538-MS100CR030-100-4F-2.5D	10	3.0	10	25	100	4	△
TOTIME3538-MS120CR005-75-4F-2.5D	12	0.5	12	30	75	4	▲
TOTIME3538-MS120CR010-75-4F-2.5D	12	1.0	12	30	75	4	▲
TOTIME3538-MS120CR015-75-4F-2.5D	12	1.5	12	30	75	4	▲
TOTIME3538-MS120CR020-75-4F-2.5D	12	2.0	12	30	75	4	▲
TOTIME3538-MS120CR025-75-4F-2.5D	12	2.5	12	30	75	4	△

Tolerance: D≤12 -0.02~0 D>12 -0.03~0

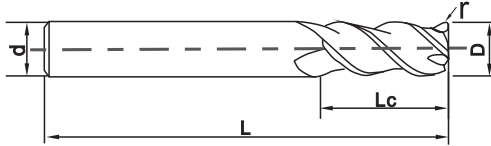
▲ Stock △ Non-Stock  
Recommended Cutting Conditions P.85



# Variable Lead Corner Radius End Mill(HRC48)



## 4 FLUTES CORNER RADIUS [2.5D]



	4Flutes	Cobalt 10%	HRC 48	GS Coating	UMG 0.5μm	Materials Carbide
● 1st Recommendation		○ 2nd Recommendation				
Carbon Steel Cast Iron	Alloy Steel	Hardened Steel	Hardened Steel	Stainless Steel	Heat Resistant Material	Titanium Alloys
<HRC35	<HRC48	HRC48-55	HRC55-60			
				●	●	●

Order No.	D(mm)	r(mm)	d(mm)	Lc(mm)	L(mm)	Flutes	Stock
TOTIME3538-MS120CR030-75-4F-2.5D	12	3.0	12	30	75	4	▲
TOTIME3538-MS120CR005-100-4F-2.5D	12	0.5	12	30	100	4	△
TOTIME3538-MS120CR010-100-4F-2.5D	12	1.0	12	30	100	4	△
TOTIME3538-MS120CR015-100-4F-2.5D	12	1.5	12	30	100	4	△
TOTIME3538-MS120CR020-100-4F-2.5D	12	2.0	12	30	100	4	△
TOTIME3538-MS120CR025-100-4F-2.5D	12	2.5	12	30	100	4	△
TOTIME3538-MS120CR030-100-4F-2.5D	12	3.0	12	30	100	4	△
TOTIME3538-MS160CR005-100-4F-2.5D	16	0.5	16	40	100	4	△
TOTIME3538-MS160CR010-100-4F-2.5D	16	1.0	16	40	100	4	▲
TOTIME3538-MS160CR015-100-4F-2.5D	16	1.5	16	40	100	4	△
TOTIME3538-MS160CR020-100-4F-2.5D	16	2.0	16	40	100	4	△
TOTIME3538-MS160CR025-100-4F-2.5D	16	2.5	16	40	100	4	△
TOTIME3538-MS160CR030-100-4F-2.5D	16	3.0	16	40	100	4	△
TOTIME3538-MS160CR005-150-4F-2.5D	16	0.5	16	40	150	4	△
TOTIME3538-MS160CR010-150-4F-2.5D	16	1.0	16	40	150	4	△
TOTIME3538-MS160CR015-150-4F-2.5D	16	1.5	16	40	150	4	△
TOTIME3538-MS160CR020-150-4F-2.5D	16	2.0	16	40	150	4	△
TOTIME3538-MS160CR025-150-4F-2.5D	16	2.5	16	40	150	4	△
TOTIME3538-MS160CR030-150-4F-2.5D	16	3.0	16	40	150	4	△

Tolerance: D ≤ 12 -0.02~0 D > 12 -0.03~0

▲ Stock △ Non-Stock  
Recommended Cutting Conditions P.85

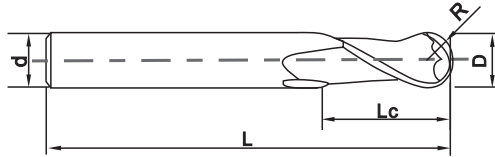
Carbide End Mill Cutter  
For Stainless Steels, Heat Resistant Material, Titanium Alloys



# Variable Lead Ball Nose End Mill(HRC48)



2 FLUTES BALL NOSE [2D]



	2Flutes	Cobalt 10%	HRC 48	GS Coating	UMG 0.5µm	Materials Carbide
● 1st Recommendation		○ 2nd Recommendation				
Carbon Steel Cast Iron	Alloy Steel	Hardened Steel	Hardened Steel	Stainless Steel	Heat Resistant Material	Titanium Alloys
<HRC35	<HRC48	HRC48-55	HRC55-60			
				●	●	●

Order No.	D(mm)	R(mm)	d(mm)	Lc(mm)	L(mm)	Flutes	Stock
TOTIME3538-MS020B-50-2F-2D	2	1.0	4	4	50	2	▲
TOTIME3538-MS020B-75-2F-2D	2	1.0	4	4	75	2	△
TOTIME3538-MS030B-50-2F-2D	3	1.5	4	6	50	2	▲
TOTIME3538-MS030B-75-2F-2D	3	1.5	4	6	75	2	△
TOTIME3538-MS040B-50-2F-2D	4	2.0	4	8	50	2	▲
TOTIME3538-MS040B-75-2F-2D	4	2.0	4	8	75	2	△
TOTIME3538-MS050B-50-2F-2D	5	2.5	6	10	50	2	▲
TOTIME3538-MS050B-75-2F-2D	5	2.5	6	10	75	2	△
TOTIME3538-MS050B-100-2F-2D	5	2.5	6	10	100	2	△
TOTIME3538-MS060B-50-2F-2D	6	3.0	6	12	50	2	▲
TOTIME3538-MS060B-75-2F-2D	6	3.0	6	12	75	2	▲
TOTIME3538-MS060B-100-2F-2D	6	3.0	6	12	100	2	△
TOTIME3538-MS080B-60-2F-2D	8	4.0	8	16	60	2	▲
TOTIME3538-MS080B-75-2F-2D	8	4.0	8	16	75	2	△
TOTIME3538-MS080B-100-2F-2D	8	4.0	8	16	100	2	▲
TOTIME3538-MS100B-75-2F-2D	10	5.0	10	20	75	2	▲
TOTIME3538-MS100B-100-2F-2D	10	5.0	10	20	100	2	▲
TOTIME3538-MS120B-75-2F-2D	12	6.0	12	24	75	2	▲
TOTIME3538-MS120B-100-2F-2D	12	6.0	12	24	100	2	△
TOTIME3538-MS160B-100-2F-2D	16	8.0	16	32	100	2	△
TOTIME3538-MS160B-150-2F-2D	16	8.0	16	32	150	2	△
TOTIME3538-MS200B-100-2F-2D	20	10.0	20	40	100	2	△
TOTIME3538-MS200B-150-2F-2D	20	10.0	20	40	150	2	△

Tolerance: R ≤ 1.5 -0.01-0 1.5 < R < 3 -0.015-0 R ≥ 3 -0.02-0

▲ Stock △ Non-Stock  
Recommended Cutting Conditions P.86



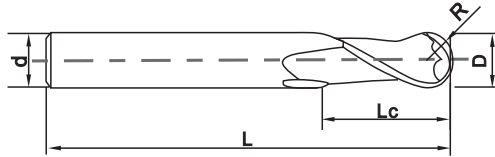
Carbide End Mill Cutter  
For Stainless Steels, Heat Resistant Material, Titanium Alloys



# Variable Lead Ball Nose End Mill(HRC48)



4 FLUTES BALL NOSE [1.5D]



	4Flutes	Cobalt 10%	HRC 48	GS Coating	UMG 0.5μm	Materials Carbide
● 1st Recommendation		○ 2nd Recommendation				
Carbon Steel Cast Iron	Alloy Steel	Hardened Steel	Hardened Steel	Stainless Steel	Heat Resistant Material	Titanium Alloys
<HRC35	<HRC48	HRC48-55	HRC55-60			
				●	●	●

Order No.	D(mm)	R(mm)	d(mm)	Lc(mm)	L(mm)	Flutes	Stock
TOTIME3538-MS040B-50-4F-1.5D	4	2.0	4	6.0	50	4	▲
TOTIME3538-MS040B-75-4F-1.5D	4	2.0	4	6.0	75	4	△
TOTIME3538-MS050B-50-4F-1.5D	5	2.5	6	7.5	50	4	▲
TOTIME3538-MS050B-75-4F-1.5D	5	2.5	6	7.5	75	4	△
TOTIME3538-MS050B-100-4F-1.5D	5	2.5	6	7.5	100	4	△
TOTIME3538-MS060B-50-4F-1.5D	6	3.0	6	9.0	50	4	▲
TOTIME3538-MS060B-75-4F-1.5D	6	3.0	6	9.0	75	4	△
TOTIME3538-MS060B-100-4F-1.5D	6	3.0	6	9.0	100	4	△
TOTIME3538-MS080B-60-4F-1.5D	8	4.0	8	12.0	60	4	▲
TOTIME3538-MS080B-75-4F-1.5D	8	4.0	8	12.0	75	4	△
TOTIME3538-MS080B-100-4F-1.5D	8	4.0	8	12.0	100	4	△
TOTIME3538-MS100B-75-4F-1.5D	10	5.0	10	15.0	75	4	▲
TOTIME3538-MS100B-100-4F-1.5D	10	5.0	10	15.0	100	4	△
TOTIME3538-MS120B-75-4F-1.5D	12	6.0	12	18.0	75	4	▲
TOTIME3538-MS120B-100-4F-1.5D	12	6.0	12	18.0	100	4	△
TOTIME3538-MS160B-100-4F-1.5D	16	8.0	16	24.0	100	4	△
TOTIME3538-MS160B-150-4F-1.5D	16	8.0	16	24.0	150	4	△
TOTIME3538-MS200B-100-4F-1.5D	20	10.0	20	30.0	100	4	△
TOTIME3538-MS200B-150-4F-1.5D	20	10.0	20	30.0	150	4	△

Tolerance: R ≤ 1.5 -0.01~0 1.5 < R < 3 -0.015~0 R ≥ 3 -0.02~0

▲ Stock △ Non-Stock  
Recommended Cutting Conditions P.87

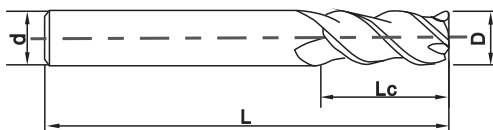
Carbide End Mill Cutter  
For Carbon Steel, Alloy Steel, Cast Iron



# Variable Lead U-shaped Groove Square End Mill(HRC48)



## 4 FLUTES SQUARE



4Flutes	Cobalt 10%	HRC 48	TiSiN Coating	UMG 0.5μm	Materials Carbide	
● 1st Recommendation		○ 2nd Recommendation				
Carbon Steel Cast Iron	Alloy Steel	Hardened Steel	Hardened Steel	Stainless Steel	Cast Iron	Titanium Alloys
<HRC35	<HRC48	HRC48-55	HRC55-60			
●	●			○	●	

Order No.	D (mm)	d (mm)	Lc (mm)	L (mm)	Flutes	Stock
TU45-010S-50-4F	1.0	4	3.0	50	4	▲
TU45-015S-50-4F	1.5	4	4.5	50	4	▲
TU45-020S-50-4F	2.0	4	6.0	50	4	▲
TU45-025S-50-4F	2.5	4	7.5	50	4	▲
TU45-030S-03-50-4F	3.0	3	9.0	50	4	▲
TU45-030S-04-50-4F	3.0	4	9.0	50	4	▲
TU45-030S-06-50-4F	3.0	6	9.0	50	4	▲
TU45-035S-50-4F	3.5	4	10.5	50	4	▲
TU45-040S-04-50-4F	4.0	4	12.0	50	4	▲
TU45-040S-06-50-4F	4.0	6	12.0	50	4	▲
TU45-040S-75-4F	4.0	4	12.0	75	4	▲
TU45-040S-100-4F	4.0	4	12.0	100	4	▲
TU45-050S-50-4F	5.0	6	15.0	50	4	▲
TU45-060S-50-4F	6.0	6	18.0	50	4	▲
TU45-060S-75-4F	6.0	6	18.0	75	4	▲
TU45-060S-100-4F	6.0	6	18.0	100	4	▲
TU45-080S-60-4F	8.0	8	24.0	60	4	▲
TU45-080S-75-4F	8.0	8	24.0	75	4	▲
TU45-080S-100-4F	8.0	8	24.0	100	4	▲
TU45-080S-150-4F	8.0	8	24.0	150	4	▲
TU45-100S-75-4F	10.0	10	30.0	75	4	▲
TU45-100S-100-4F	10.0	10	30.0	100	4	▲
TU45-100S-150-4F	10.0	10	30.0	150	4	▲
TU45-120S-75-4F	12.0	12	30.0	75	4	▲
TU45-120S-100-4F	12.0	12	30.0	100	4	▲
TU45-120S-150-4F	12.0	12	30.0	150	4	▲
TU45-160S-100-4F	16.0	16	48.0	100	4	▲

Tolerance: D ≤ 12 -0.02~0 D > 12 -0.03~0

▲ Stock △ Non-Stock  
Recommended Cutting Conditions P.96

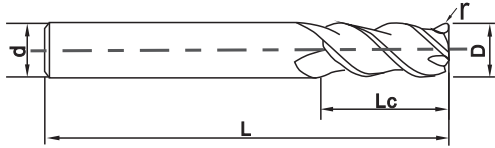
Carbide End Mill Cutter  
For Carbon Steel, Alloy Steel, Cast Iron



# Variable Lead Double-core End Mill(HRC48)



## 4 FLUTES CORNER RADIUS



4Flutes	Cobalt 10%	HRC 48	AlTiN Coating	UMG 0.5μm	Materials Carbide	
● 1st Recommendation		○ 2nd Recommendation				
Carbon Steel Cast Iron	Alloy Steel	Hardened Steel	Hardened Steel	Stainless Steel	Cast Iron	Titanium Alloys
<HRC35	<HRC48	HRC48-55	HRC55-60			
●	●			○	●	

Order No.	D (mm)	r (mm)	d (mm)	Lc (mm)	L (mm)	Flutes	Stock
TD3941-040CR002-50-4F	4	0.2	4	10	50	4	▲
TD3941-060CR002-50-4F	6	0.2	6	15	50	4	▲
TD3941-080CR002-60-4F	8	0.2	8	20	60	4	▲
TD3941-100CR002-75-4F	10	0.2	10	25	75	4	▲
TD3941-120CR002-75-4F	12	0.2	12	30	75	4	▲

Tolerance: D ≤ 12 -0.02~0 D > 12 -0.03~0

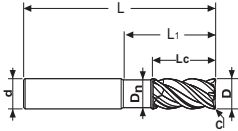
▲ Stock △ Non-Stock  
Recommended Cutting Conditions P.99



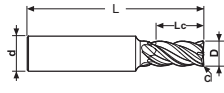
# Variable Lead Square End Mill(HRC48)



## 4 FLUTES SQUARE



Type E



Type F



Form HB



Form HA

	4Flutes	Cobalt 10%	HRC 48	AlCrN Coating	UMG 0.5µm	Materials Carbide
● 1st Recommendation		○ 2nd Recommendation				
Carbon Steel Cast Iron	Alloy Steel	Hardened Steel	Hardened Steel	Stainless Steel	Cast Iron	Titanium Alloys
<HRC35	<HRC48	HRC48-55	HRC55-60			
●	●			○	●	

Order No.	DIN6535 HA/HB	D(mm)	d(mm)	Dn(mm)	Lc(mm)	L1(mm)	L(mm)	CX45° (mm)	Flutes	Type
TOTIME48S-010SC-40-4F-HA	HA	1	4	-	1.5	-	40	0.025	4	F
TOTIME48L-010SC-40-4F-HA	HA	1	4	-	2.5	-	40	0.025	4	F
TOTIME48S-020SC-04-40-4F-HA	HA	2	4	-	3	-	40	0.050	4	F
TOTIME48L-020SC-04-40-4F-HA	HA	2	4	-	4	-	40	0.050	4	F
TOTIME48L-020SC-06-50-4F-HA	HA	2	6	-	4	-	50	0.050	4	F
TOTIME48S-030SC-04-40-4F-HA	HA	3	4	2.8	4	6	40	0.075	4	E
TOTIME48L-030SC-04-40-4F-HA	HA	3	4	2.8	6	9	40	0.075	4	E
TOTIME48L-030SC-06-50-4F-HA	HA	3	6	2.8	6	9	50	0.075	4	E
TOTIME48S-040SC-50-4F-HA/HB	HA/HB	4	6	3.8	5	8	50	0.100	4	E
TOTIME48L-040SC-50-4F-HA/HB	HA/HB	4	6	-	8	-	50	0.100	4	F
TOTIME48L-040SC-54-4F-HA/HB	HA/HB	4	6	3.8	8	12	54	0.100	4	E
TOTIME48S-050SC-50-4F-HA/HB	HA/HB	5	6	4.8	6	10	50	0.150	4	E
TOTIME48L-050SC-54-4F-HA/HB	HA/HB	5	6	4.8	10	15	54	0.150	4	E
TOTIME48S-060SC-54-4F-HA/HB	HA/HB	6	6	5.7	7	16	54	0.200	4	E
TOTIME48L-060SC-54-4F-HA/HB	HA/HB	6	6	5.7	13	19	54	0.200	4	E
TOTIME48S-080SC-58-4F-HA/HB	HA/HB	8	8	7.7	9	20	58	0.200	4	E
TOTIME48L-080SC-63-4F-HA/HB	HA/HB	8	8	7.7	19	27	63	0.200	4	E
TOTIME48S-100SC-65-4F-HA/HB	HA/HB	10	10	9.7	11	24	65	0.200	4	E
TOTIME48L-100SC-72-4F-HA/HB	HA/HB	10	10	9.7	22	32	72	0.200	4	E
TOTIME48S-120SC-73-4F-HA/HB	HA/HB	12	12	11.7	12	26	73	0.200	4	E
TOTIME48L-120SC-82-4F-HA/HB	HA/HB	12	12	11.7	26	38	82	0.200	4	E
TOTIME48S-140SC-75-4F-HA/HB	HA/HB	14	14	13.7	14	28	75	0.300	4	E
TOTIME48L-140SC-82-4F-HA/HB	HA/HB	14	14	13.7	26	38	82	0.300	4	E
TOTIME48S-160SC-82-4F-HA/HB	HA/HB	16	16	15.7	16	32	82	0.300	4	E
TOTIME48L-160SC-92-4F-HA/HB	HA/HB	16	16	15.7	32	44	92	0.300	4	E
TOTIME48S-180SC-82-4F-HA/HB	HA/HB	18	18	17.7	18	32	82	0.300	4	E
TOTIME48L-180SC-92-4F-HA/HB	HA/HB	18	18	17.7	32	44	92	0.300	4	E
TOTIME48S-200SC-92-4F-HA/HB	HA/HB	20	20	19.7	20	40	92	0.300	4	E
TOTIME48L-200SC-104-4F-HA/HB	HA/HB	20	20	19.7	38	50	104	0.300	4	E

Tolerance: D ≤ 12 -0.02~0 D > 12 -0.03~0  
Customized Non-standard End Mill Size is Available.

Recommended Cutting Conditions P.97

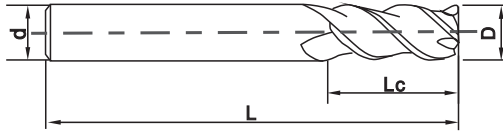
Efficient and Powerful Variable Lead End Mill  
For Steel, Alloy Steel, Cast Iron



# Variable Lead Square End Mill(HRC48)



4 FLUTES SQUARE [Inch]



	4Flutes	Cobalt 10%	HRC 48	AlCrN Coating	UMG 0.5µm	Materials Carbide
● 1st Recommendation		○ 2nd Recommendation				
Carbon Steel Cast Iron	Alloy Steel	Hardened Steel	Hardened Steel	Stainless Steel	Cast Iron	Titanium Alloys
<HRC35	<HRC48	HRC48-55	HRC55-60			
●	●			○	●	

Order No.	D(in)		d(in)	Lc(in)	L(in)	Flutes	Stock
TOTIME48-E0125S-015-4F	1/8	0.125	0.125	0.313	1.500	4	▲
TOTIME48-E0187S-020-4F	3/16	0.187	0.187	0.469	2.000	4	▲
TOTIME48-E0250S-025-4F	1/4	0.250	0.250	0.531	2.500	4	▲
TOTIME48-E0375S-030-4F	3/8	0.375	0.375	0.844	3.000	4	▲
TOTIME48-E0500S-035-4F	1/2	0.500	0.500	1.094	3.500	4	▲
TOTIME48-E0625S-040-4F	5/8	0.625	0.625	1.313	4.000	4	▲
TOTIME48-E0750S-040-4F	3/4	0.750	0.750	1.563	4.000	4	▲
TOTIME48-E1000S-050-4F	1	1.000	1.000	2.094	5.000	4	▲

Tolerance: D ≤ 12 -0.02~0 D > 12 -0.03~0  
Customized Non-standard End Mill Size is Available.

▲ Stock △ Non-Stock  
Recommended Cutting Conditions P.97

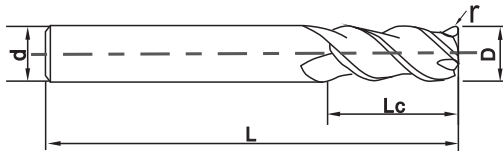
Efficient and Powerful Variable Lead End Mill  
For Steel, Alloy Steel, Cast Iron



# Variable Lead Corner Radius End Mill(HRC48)



4 FLUTES CORNER RADIUS [Inch]



	4 Flutes	Cobalt 10%	HRC 48	AlCrN Coating	UMG 0.5μm	Materials Carbide	
● 1st Recommendation		○ 2nd Recommendation					
Carbon Steel Cast Iron	Alloy Steel	Hardened Steel	Hardened Steel	Stainless Steel	Cast Iron	Titanium Alloys	
<HRC35	<HRC48	HRC48-55	HRC55-60				
●	●			○	●		

Order No.	D(in)		r(in)	d(in)	Lc(in)	L(in)	Flutes	Stock
TOTIME48-E0125CR015-015-4F	1/8	0.125	0.015	0.125	0.313	1.500	4	▲
TOTIME48-E0187CR015-020-4F	3/16	0.187	0.015	0.187	0.438	2.000	4	▲
TOTIME48-E0250CR015-025-4F	1/4	0.250	0.015	0.250	0.625	2.500	4	▲
TOTIME48-E0250CR030-025-4F	1/4	0.250	0.030	0.250	0.625	2.500	4	▲
TOTIME48-E0375CR015-025-4F	3/8	0.375	0.015	0.375	0.875	2.500	4	▲
TOTIME48-E0375CR030-025-4F	3/8	0.375	0.030	0.375	0.875	2.500	4	▲
TOTIME48-E0500CR015-030-4F	1/2	0.500	0.015	0.500	1.125	3.000	4	▲
TOTIME48-E0500CR030-030-4F	1/2	0.500	0.030	0.500	1.125	3.000	4	▲
TOTIME48-E0500CR060-030-4F	1/2	0.500	0.060	0.500	1.125	3.000	4	▲
TOTIME48-E0625CR030-035-4F	5/8	0.625	0.030	0.625	1.313	3.500	4	▲
TOTIME48-E0625CR060-035-4F	5/8	0.625	0.060	0.625	1.313	3.500	4	▲
TOTIME48-E0750CR030-040-4F	3/4	0.750	0.030	0.750	1.625	4.000	4	▲
TOTIME48-E0750CR060-040-4F	3/4	0.750	0.060	0.750	1.625	4.000	4	▲

Tolerance: D ≤ 12 -0.02~0 D > 12 -0.03~0  
Customized Non-standard End Mill Size is Available.

▲ Stock △ Non-Stock  
Recommended Cutting Conditions P.97

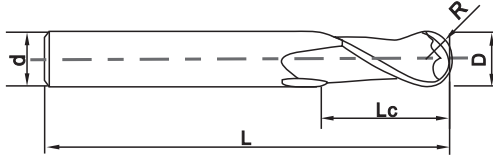
Efficient and Powerful End Mill  
For Steel, Alloy Steel, Cast Iron



# Ball Nose End Mill(HRC48)



2 FLUTES BALL NOSE [Inch]



2 Flutes	Cobalt 10%	HRC 48	AlCrN Coating	UMG 0.5µm	Materials Carbide	
● 1st Recommendation		○ 2nd Recommendation				
Carbon Steel Cast Iron	Alloy Steel	Hardened Steel	Hardened Steel	Stainless Steel	Cast Iron	Titanium Alloys
<HRC35	<HRC48	HRC48-55	HRC55-60			
●	●			○	●	

Order No.	D(in)		r(in)	d(in)	Lc(in)	L(in)	Flutes	Stock
TOTIME48-E0063B-020-2F	1/16	0.063	0.031	0.250	0.125	2.000	2	▲
TOTIME48-E0094B-020-2F	3/32	0.094	0.047	0.250	0.188	2.000	2	▲
TOTIME48-E0125B-020-2F	1/8	0.125	0.063	0.250	0.250	2.000	2	▲
TOTIME48-E0187B-020-2F	3/16	0.187	0.094	0.250	0.375	2.000	2	▲
TOTIME48-E0250B-020-2F	1/4	0.250	0.125	0.250	0.500	2.000	2	▲
TOTIME48-E0375B-025-2F	3/8	0.375	0.187	0.375	0.750	2.500	2	▲
TOTIME48-E0500B-030-2F	1/2	0.500	0.250	0.500	1.000	3.000	2	▲
TOTIME48-E0625B-035-2F	5/8	0.625	0.313	0.625	1.250	3.500	2	▲
TOTIME48-E0750B-040-2F	3/4	0.750	0.375	0.750	1.500	4.000	2	▲

Tolerance:  $R \leq 1.5$  -0.01~0  $1.5 < R < 3$  -0.015~0  $R \geq 3$  -0.02~0  
Customized Non-standard End Mill Size is Available.

▲ Stock △ Non-Stock  
Recommended Cutting Conditions P.94

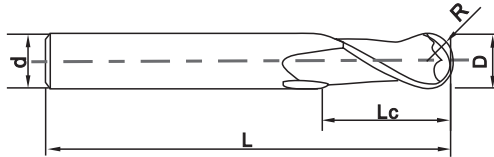
Efficient and Powerful End Mill  
For Steel, Alloy Steel, Cast Iron



# Ball Nose End Mill(HRC48)



4 FLUTES BALL NOSE [Inch]



	4Flutes	Cobalt 10%	HRC 48	AlCrN Coating	UMG 0.5µm	Materials Carbide
● 1st Recommendation		○ 2nd Recommendation				
Carbon Steel Cast Iron	Alloy Steel	Hardened Steel	Hardened Steel	Stainless Steel	Cast Iron	Titanium Alloys
<HRC35	<HRC48	HRC48-55	HRC55-60			
●	●			○	●	

Order No.	D(in)		r(in)	d(in)	Lc(in)	L(in)	Flutes	Stock
TOTIME48-E0063B-020-4F	1/16	0.063	0.031	0.250	0.125	2.000	4	▲
TOTIME48-E0094B-020-4F	3/32	0.094	0.047	0.250	0.188	2.000	4	▲
TOTIME48-E0125B-020-4F	1/8	0.125	0.063	0.250	0.250	2.000	4	▲
TOTIME48-E0187B-020-4F	3/16	0.187	0.094	0.250	0.375	2.000	4	▲
TOTIME48-E0250B-020-4F	1/4	0.250	0.125	0.250	0.500	2.000	4	▲
TOTIME48-E0375B-025-4F	3/8	0.375	0.187	0.375	0.750	2.500	4	▲
TOTIME48-E0500B-030-4F	1/2	0.500	0.250	0.500	1.000	3.000	4	▲
TOTIME48-E0625B-035-4F	5/8	0.625	0.313	0.625	1.250	3.500	4	▲
TOTIME48-E0750B-040-4F	3/4	0.750	0.375	0.750	1.500	4.000	4	▲

Tolerance:  $R \leq 1.5$  -0.01~0  $1.5 < R < 3$  -0.015~0  $R \geq 3$  -0.02~0  
Customized Non-standard End Mill Size is Available.

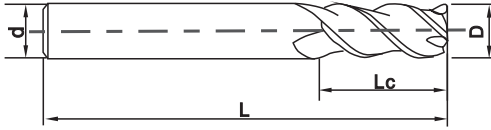
▲ Stock △ Non-Stock  
Recommended Cutting Conditions P.100



# Cermet Square End Mill(HRC48)



## 4 FLUTES SQUARE



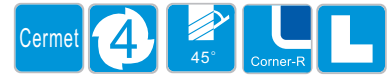
4Flutes	Cobalt 0%	HRC 48	No Coating	UMG —	Materials Cermet	
● 1st Recommendation		○ 2nd Recommendation				
Carbon Steel Cast Iron	Alloy Steel	Hardened Steel	Hardened Steel	Stainless Steel	Cast Iron	Titanium Alloys
<HRC35	<HRC48	HRC48-55	HRC55-60			
●	●				●	

Order No.	D(mm)	d(mm)	Lc(mm)	L(mm)	Flutes	Stock
TCM45-040S-50-4F	4	4	10	50	4	▲
TCM45-040S-75-4F	4	4	12	75	4	▲
TCM45-050S-50-4F	5	5	12.5	50	4	▲
TCM45-060S-50-4F	6	6	15	50	4	▲
TCM45-060S-75-4F	6	6	18	75	4	▲
TCM45-080S-60-4F	8	8	20	60	4	▲
TCM45-080S-75-4F	8	8	24	75	4	▲
TCM45-080S-100-4F	8	8	24	100	4	▲
TCM45-100S-75-4F	10	10	25	75	4	▲
TCM45-100S-100-4F	10	10	30	100	4	▲
TCM45-120S-75-4F	12	12	30	75	4	▲
TCM45-120S-100-4F	12	12	30	100	4	▲
TCM45-160S-100-4F	16	16	50	100	4	▲

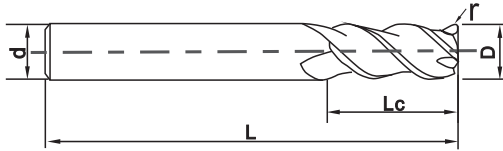
Tolerance: D ≤ 12 -0.02~0 D > 12 -0.03~0

▲ Stock △ Non-Stock  
Recommended Cutting Conditions P.98

# Cermet Corner Radius End Mill(HRC48)



## 4 FLUTES CORNER RADIUS



	4Flutes	Cobalt 0%	HRC 48	No Coating	UMG	Materials Cermet
● 1st Recommendation		○ 2nd Recommendation				
Carbon Steel Cast Iron	Alloy Steel	Hardened Steel	Hardened Steel	Stainless Steel	Cast Iron	Titanium Alloys
<HRC35	<HRC48	HRC48-55	HRC55-60			
●	●				●	

Order No.	D(mm)	r(mm)	d(mm)	Lc(mm)	L(mm)	Flutes	Stock
TCM45-040CR002-50-4F	4	0.2	4	10	50	4	▲
TCM45-040CR005-50-4F	4	0.5	4	10	50	4	▲
TCM45-040CR010-50-4F	4	1.0	4	10	50	4	▲
TCM45-050CR002-50-4F	5	0.2	5	12.5	50	4	▲
TCM45-050CR005-50-4F	5	0.5	5	12.5	50	4	▲
TCM45-060CR002-50-4F	6	0.2	6	15	50	4	▲
TCM45-060CR005-50-4F	6	0.5	6	15	50	4	▲
TCM45-060CR010-50-4F	6	1.0	6	15	50	4	▲
TCM45-060CR002-75-4F	6	0.2	6	18	75	4	▲
TCM45-060CR005-75-4F	6	0.5	6	18	75	4	▲
TCM45-060CR010-75-4F	6	1.0	6	18	75	4	▲
TCM45-080CR002-60-4F	8	0.2	8	20	60	4	▲
TCM45-080CR005-60-4F	8	0.5	8	20	60	4	▲
TCM45-080CR010-60-4F	8	1.0	8	20	60	4	▲
TCM45-080CR002-75-4F	8	0.2	8	24	75	4	▲
TCM45-080CR005-75-4F	8	0.5	8	24	75	4	▲
TCM45-080CR010-75-4F	8	1.0	8	24	75	4	▲
TCM45-080CR002-100-4F	8	0.2	8	24	100	4	▲
TCM45-080CR005-100-4F	8	0.5	8	24	100	4	▲
TCM45-080CR010-100-4F	8	1.0	8	24	100	4	▲
TCM45-100CR002-75-4F	10	0.2	10	25	75	4	▲
TCM45-100CR005-75-4F	10	0.5	10	25	75	4	▲
TCM45-100CR010-75-4F	10	1.0	10	25	75	4	▲
TCM45-100CR005-100-4F	10	0.5	10	30	100	4	▲
TCM45-100CR010-100-4F	10	1.0	10	30	100	4	▲
TCM45-120CR005-75-4F	12	0.5	12	30	75	4	▲
TCM45-120CR010-75-4F	12	1.0	12	30	75	4	▲
TCM45-120CR005-100-4F	12	0.5	12	30	100	4	▲
TCM45-120CR010-100-4F	12	1.0	12	30	100	4	▲

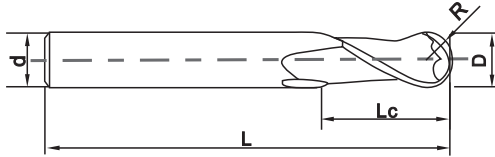
Tolerance: D ≤ 12 -0.02~0 D > 12 -0.03~0

▲ Stock △ Non-Stock  
Recommended Cutting Conditions P.98

# Cermet Ball Nose End Mill(HRC48)



## 2 FLUTES BALL NOSE



	2 Flutes	Cobalt 0%	HRC 48	No Coating	UMG —	Materials Cermet
● 1st Recommendation		○ 2nd Recommendation				
Carbon Steel Cast Iron	Alloy Steel	Hardened Steel	Hardened Steel	Stainless Steel	Cast Iron	Titanium Alloys
<HRC35	<HRC48	HRC48-55	HRC55-60			
●	●				●	

Order No.	D(mm)	R(mm)	d(mm)	Lc(mm)	L(mm)	Flutes	Stock
TCM45-040B-50-2F	4	2.0	4	8	50	2	▲
TCM45-050B-50-2F	5	2.5	5	10	50	2	▲
TCM45-060B-50-2F	6	3.0	6	12	50	2	▲
TCM45-060B-75-2F	6	3.0	6	12	75	2	▲
TCM45-080B-60-2F	8	4.0	8	16	60	2	▲
TCM45-080B-75-2F	8	4.0	8	16	75	2	▲
TCM45-100B-75-2F	10	5.0	10	20	75	2	▲
TCM45-100B-100-2F	10	5.0	10	20	100	2	▲
TCM45-120B-75-2F	12	6.0	12	24	75	2	▲
TCM45-120B-100-2F	12	6.0	12	24	100	2	▲

Tolerance: R ≤ 1.5 -0.01~0 1.5 < R < 3 -0.015~0 R ≥ 3 -0.02~0

▲ Stock △ Non-Stock  
Recommended Cutting Conditions P.99

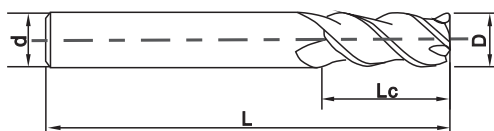
Carbide End Mill Cutter  
For Die Steel, Hardened Steel



# High Speed and High Hardness Square End Mill(HRC65)



4 FLUTES SQUARE [2.5D]



	4Flutes	Cobalt 10%	HRC 65	ALDUA Coating	UMG 0.5μm	Materials Carbide
● 1st Recommendation		○ 2nd Recommendation				
Carbon Steel Cast Iron	Die Steel	Hardened Steel	Hardened Steel	Stainless Steel	Heat Resistant Material	Titanium Alloys
<HRC35	HRC32-48	HRC48-55	HRC55-65			
	●	●	●			

Order No.	D(mm)	d(mm)	Lc(mm)	L(mm)	Flutes	Stock
TOTIME65-H010S-50-4F-2.5D	1.0	4	2.5	50	4	▲
TOTIME65-H015S-50-4F-2.5D	1.5	4	3.8	50	4	▲
TOTIME65-H020S-50-4F-2.5D	2.0	4	5.0	50	4	▲
TOTIME65-H030S-50-4F-2.5D	3.0	4	8.0	50	4	▲
TOTIME65-H040S-50-4F-2.5D	4.0	4	10.0	50	4	▲
TOTIME65-H040S-75-4F-2.5D	4.0	4	10.0	75	4	▲
TOTIME65-H050S-50-4F-2.5D	5.0	6	12.0	50	4	▲
TOTIME65-H060S-50-4F-2.5D	6.0	6	15.0	50	4	▲
TOTIME65-H060S-75-4F-2.5D	6.0	6	15.0	75	4	▲
TOTIME65-H060S-100-4F-2.5D	6.0	6	15.0	100	4	▲
TOTIME65-H080S-60-4F-2.5D	8.0	8	20.0	60	4	▲
TOTIME65-H080S-75-4F-2.5D	8.0	8	20.0	75	4	▲
TOTIME65-H080S-100-4F-2.5D	8.0	8	20.0	100	4	△
TOTIME65-H100S-75-4F-2.5D	10.0	10	25.0	75	4	▲
TOTIME65-H100S-100-4F-2.5D	10.0	10	25.0	100	4	▲
TOTIME65-H120S-75-4F-2.5D	12.0	12	30.0	75	4	▲
TOTIME65-H120S-100-4F-2.5D	12.0	12	30.0	100	4	▲
TOTIME65-H160S-100-4F-2.5D	16.0	16	40.0	100	4	△
TOTIME65-H160S-150-4F-2.5D	16.0	16	40.0	150	4	△
TOTIME65-H200S-100-4F-2.5D	20.0	20	50.0	100	4	△
TOTIME65-H200S-150-4F-2.5D	20.0	20	50.0	150	4	△

Tolerance: D ≤ 12 -0.02~0 D > 12 -0.03~0

▲ Stock △ Non-Stock  
Recommended Cutting Conditions P.90

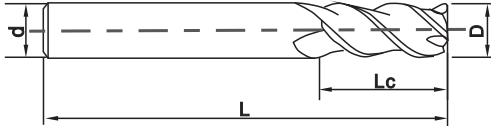
Carbide End Mill Cutter  
For Die Steel, Hardened Steel



# High Speed and High Hardness Square End Mill(HRC65)



4 FLUTES SQUARE [3D]



	4Flutes	Cobalt 10%	HRC 65	ALDUA Coating	UMG 0.5µm	Materials Carbide
● 1st Recommendation		○ 2nd Recommendation				
Carbon Steel Cast Iron	Die Steel	Hardened Steel	Hardened Steel	Stainless Steel	Heat Resistant Material	Titanium Alloys
<HRC35	HRC32-48	HRC48-55	HRC55-65			
	●	●	●			

Order No.	D(mm)	d(mm)	Lc(mm)	L(mm)	Flutes	Stock
TOTIME65-H010S-50-4F-3D	1.0	4	3.0	50	4	△
TOTIME65-H015S-50-4F-3D	1.5	4	4.5	50	4	△
TOTIME65-H020S-50-4F-3D	2.0	4	6.0	50	4	△
TOTIME65-H030S-50-4F-3D	3.0	4	9.0	50	4	△
TOTIME65-H040S-50-4F-3D	4.0	4	12.0	50	4	▲
TOTIME65-H040S-75-4F-3D	4.0	4	12.0	75	4	△
TOTIME65-H050S-50-4F-3D	5.0	6	15.0	50	4	▲
TOTIME65-H060S-50-4F-3D	6.0	6	18.0	50	4	▲
TOTIME65-H060S-75-4F-3D	6.0	6	18.0	75	4	△
TOTIME65-H060S-100-4F-3D	6.0	6	18.0	100	4	△
TOTIME65-H080S-60-4F-3D	8.0	8	24.0	60	4	△
TOTIME65-H080S-75-4F-3D	8.0	8	24.0	75	4	▲
TOTIME65-H080S-100-4F-3D	8.0	8	24.0	100	4	△
TOTIME65-H100S-75-4F-3D	10.0	10	30.0	75	4	▲
TOTIME65-H100S-100-4F-3D	10.0	10	30.0	100	4	△
TOTIME65-H120S-75-4F-3D	12.0	12	36.0	75	4	△
TOTIME65-H120S-100-4F-3D	12.0	12	36.0	100	4	△
TOTIME65-H160S-100-4F-3D	16.0	16	48.0	100	4	△
TOTIME65-H160S-150-4F-3D	16.0	16	48.0	150	4	△
TOTIME65-H200S-100-4F-3D	20.0	20	60.0	100	4	△
TOTIME65-H200S-150-4F-3D	20.0	20	60.0	150	4	△

Tolerance: D ≤ 12 -0.02~0 D > 12 -0.03~0

▲ Stock △ Non-Stock  
Recommended Cutting Conditions P.90

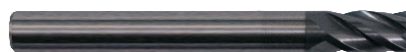
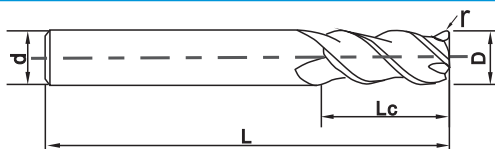
Carbide End Mill Cutter  
For Die Steel, Hardened Steel



# High Speed and High Hardness Corner Radius End Mill(HRC65)



## 4 FLUTES CORNER RADIUS [2D]



	4Flutes	Cobalt 10%	HRC 65	ALDUA Coating	UMG 0.5µm	Materials Carbide
● 1st Recommendation		○ 2nd Recommendation				
Carbon Steel Cast Iron	Die Steel	Hardened Steel	Hardened Steel	Stainless Steel	Heat Resistant Material	Titanium Alloys
<HRC35	HRC32-48	HRC48-55	HRC55-65			
	●	●	●			

Order No.	D(mm)	r(mm)	d(mm)	Lc(mm)	L(mm)	Flutes	Stock
TOTIME65-H010CR001-50-4F-2D	1.0	0.1	4	2	50	4	▲
TOTIME65-H010CR002-50-4F-2D	1.0	0.2	4	2	50	4	▲
TOTIME65-H015CR001-50-4F-2D	1.5	0.1	4	3	50	4	▲
TOTIME65-H015CR002-50-4F-2D	1.5	0.2	4	3	50	4	▲
TOTIME65-H020CR001-50-4F-2D	2.0	0.1	4	4	50	4	▲
TOTIME65-H020CR002-50-4F-2D	2.0	0.2	4	4	50	4	▲
TOTIME65-H020CR005-50-4F-2D	2.0	0.5	4	4	50	4	▲
TOTIME65-H030CR001-50-4F-2D	3.0	0.1	4	6	50	4	△
TOTIME65-H030CR002-50-4F-2D	3.0	0.2	4	6	50	4	▲
TOTIME65-H030CR003-50-4F-2D	3.0	0.3	4	6	50	4	△
TOTIME65-H030CR005-50-4F-2D	3.0	0.5	4	6	50	4	▲
TOTIME65-H040CR002-50-4F-2D	4.0	0.2	4	8	50	4	▲
TOTIME65-H040CR003-50-4F-2D	4.0	0.3	4	8	50	4	▲
TOTIME65-H040CR005-50-4F-2D	4.0	0.5	4	8	50	4	▲
TOTIME65-H040CR010-50-4F-2D	4.0	1.0	4	8	50	4	△
TOTIME65-H050CR002-50-4F-2D	5.0	0.2	6	10	50	4	△
TOTIME65-H050CR003-50-4F-2D	5.0	0.3	6	10	50	4	△
TOTIME65-H050CR005-50-4F-2D	5.0	0.5	6	10	50	4	▲
TOTIME65-H050CR010-50-4F-2D	5.0	1.0	6	10	50	4	△
TOTIME65-H060CR002-50-4F-2D	6.0	0.2	6	12	50	4	▲
TOTIME65-H060CR003-50-4F-2D	6.0	0.3	6	12	50	4	▲
TOTIME65-H060CR005-50-4F-2D	6.0	0.5	6	12	50	4	▲
TOTIME65-H060CR010-50-4F-2D	6.0	1.0	6	12	50	4	▲
TOTIME65-H060CR015-50-4F-2D	6.0	1.5	6	12	50	4	△
TOTIME65-H060CR002-75-4F-2D	6.0	0.2	6	12	75	4	▲
TOTIME65-H060CR003-75-4F-2D	6.0	0.3	6	12	75	4	△
TOTIME65-H060CR005-75-4F-2D	6.0	0.5	6	12	75	4	▲
TOTIME65-H060CR010-75-4F-2D	6.0	1.0	6	12	75	4	▲
TOTIME65-H060CR015-75-4F-2D	6.0	1.5	6	12	75	4	△
TOTIME65-H080CR003-60-4F-2D	8.0	0.3	8	16	60	4	△

Tolerance: D ≤ 12 -0.02~0 D > 12 -0.03~0

▲ Stock △ Non-Stock  
Recommended Cutting Conditions P.90

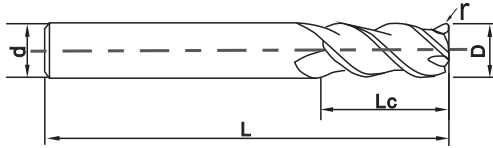
Carbide End Mill Cutter  
For Die Steel, Hardened Steel



# High Speed and High Hardness Corner Radius End Mill(HRC65)



## 4 FLUTES CORNER RADIUS [2D]



	4Flutes	Cobalt 10%	HRC 65	ALDUA Coating	UMG 0.5µm	Materials Carbide
● 1st Recommendation		○ 2nd Recommendation				
Carbon Steel Cast Iron	Die Steel	Hardened Steel	Hardened Steel	Stainless Steel	Heat Resistant Material	Titanium Alloys
<HRC35	HRC32-48	HRC48-55	HRC55-65			
	●	●	●			

Order No.	D(mm)	r(mm)	d(mm)	Lc(mm)	L(mm)	Flutes	Stock
TOTIME65-H080CR005-60-4F-2D	8	0.5	8	16	60	4	▲
TOTIME65-H080CR010-60-4F-2D	8	1.0	8	16	60	4	▲
TOTIME65-H080CR015-60-4F-2D	8	1.5	8	16	60	4	△
TOTIME65-H080CR020-60-4F-2D	8	2.0	8	16	60	4	△
TOTIME65-H080CR003-75-4F-2D	8	0.3	8	16	75	4	△
TOTIME65-H080CR005-75-4F-2D	8	0.5	8	16	75	4	▲
TOTIME65-H080CR010-75-4F-2D	8	1.0	8	16	75	4	▲
TOTIME65-H080CR015-75-4F-2D	8	1.5	8	16	75	4	△
TOTIME65-H080CR020-75-4F-2D	8	2.0	8	16	75	4	△
TOTIME65-H100CR002-75-4F-2D	10	0.2	10	20	75	4	△
TOTIME65-H100CR003-75-4F-2D	10	0.3	10	20	75	4	△
TOTIME65-H100CR005-75-4F-2D	10	0.5	10	20	75	4	▲
TOTIME65-H100CR010-75-4F-2D	10	1.0	10	20	75	4	▲
TOTIME65-H100CR015-75-4F-2D	10	1.5	10	20	75	4	△
TOTIME65-H100CR020-75-4F-2D	10	2.0	10	20	75	4	△
TOTIME65-H100CR025-75-4F-2D	10	2.5	10	20	75	4	△
TOTIME65-H100CR030-75-4F-2D	10	3.0	10	20	75	4	△
TOTIME65-H100CR002-100-4F-2D	10	0.2	10	20	100	4	△
TOTIME65-H100CR003-100-4F-2D	10	0.3	10	20	100	4	△
TOTIME65-H100CR005-100-4F-2D	10	0.5	10	20	100	4	▲
TOTIME65-H100CR010-100-4F-2D	10	1.0	10	20	100	4	▲
TOTIME65-H100CR015-100-4F-2D	10	1.5	10	20	100	4	△
TOTIME65-H100CR020-100-4F-2D	10	2.0	10	20	100	4	△
TOTIME65-H100CR025-100-4F-2D	10	2.5	10	20	100	4	△
TOTIME65-H100CR030-100-4F-2D	10	3.0	10	20	100	4	△
TOTIME65-H120CR005-75-4F-2D	12	0.5	12	24	75	4	▲
TOTIME65-H120CR010-75-4F-2D	12	1.0	12	24	75	4	▲
TOTIME65-H120CR015-75-4F-2D	12	1.5	12	24	75	4	△
TOTIME65-H120CR020-75-4F-2D	12	2.0	12	24	75	4	△
TOTIME65-H120CR025-75-4F-2D	12	2.5	12	24	75	4	△
TOTIME65-H120CR030-75-4F-2D	12	3.0	12	24	75	4	△

Tolerance: D ≤ 12 -0.02~0 D > 12 -0.03~0

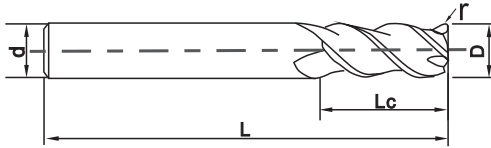
▲ Stock △ Non-Stock  
Recommended Cutting Conditions P.90



# High Speed and High Hardness Corner Radius End Mill(HRC65)



## 4 FLUTES CORNER RADIUS [2D]



	4 Flutes	Cobalt 10%	HRC 65	ALDUA Coating	UMG 0.5μm	Materials Carbide
● 1st Recommendation		○ 2nd Recommendation				
Carbon Steel Cast Iron	Die Steel	Hardened Steel	Hardened Steel	Stainless Steel	Heat Resistant Material	Titanium Alloys
<HRC35	HRC32-48	HRC48-55	HRC55-65			
	●	●	●			

Order No.	D(mm)	r(mm)	d(mm)	Lc(mm)	L(mm)	Flutes	Stock
TOTIME65-H120CR005-100-4F-2D	12	0.5	12	24	100	4	▲
TOTIME65-H120CR010-100-4F-2D	12	1.0	12	24	100	4	▲
TOTIME65-H120CR015-100-4F-2D	12	1.5	12	24	100	4	△
TOTIME65-H120CR020-100-4F-2D	12	2.0	12	24	100	4	△
TOTIME65-H120CR025-100-4F-2D	12	2.5	12	24	100	4	△
TOTIME65-H120CR030-100-4F-2D	12	3.0	12	24	100	4	△
TOTIME65-H160CR005-100-4F-2D	16	0.5	16	32	100	4	△
TOTIME65-H160CR010-100-4F-2D	16	1.0	16	32	100	4	△
TOTIME65-H160CR015-100-4F-2D	16	1.5	16	32	100	4	△
TOTIME65-H160CR020-100-4F-2D	16	2.0	16	32	100	4	△
TOTIME65-H160CR025-100-4F-2D	16	2.5	16	32	100	4	△
TOTIME65-H160CR030-100-4F-2D	16	3.0	16	32	100	4	△
TOTIME65-H160CR005-150-4F-2D	16	0.5	16	32	150	4	△
TOTIME65-H160CR010-150-4F-2D	16	1.0	16	32	150	4	△
TOTIME65-H160CR015-150-4F-2D	16	1.5	16	32	150	4	△
TOTIME65-H160CR020-150-4F-2D	16	2.0	16	32	150	4	△
TOTIME65-H160CR025-150-4F-2D	16	2.5	16	32	150	4	△
TOTIME65-H160CR030-150-4F-2D	16	3.0	16	32	150	4	△

Tolerance: D ≤ 12 -0.02~0 D > 12 -0.03~0

▲ Stock △ Non-Stock  
Recommended Cutting Conditions P.90



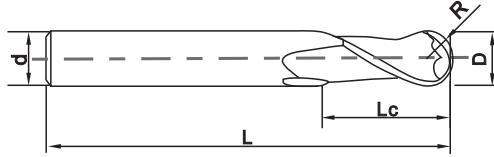
Carbide End Mill Cutter  
For Die Steel, Hardened Steel



# High Speed and High Hardness Ball Nose End Mill(HRC65)



2 FLUTES BALL NOSE [1.5D]



	2Flutes	Cobalt 10%	HRC 65	ALDUA Coating	UMG 0.5μm	Materials Carbide
● 1st Recommendation		○ 2nd Recommendation				
Carbon Steel Cast Iron	Die Steel	Hardened Steel	Hardened Steel	Stainless Steel	Heat Resistant Material	Titanium Alloys
<HRC35	HRC32-48	HRC48-55	HRC55-65			
	●	●	●			

Order No.	D(mm)	R(mm)	d(mm)	Lc(mm)	L(mm)	Flutes	Stock
TOTIME65-H020B-50-2F-1.5D	2	1.0	4	3.0	50	2	▲
TOTIME65-H020B-75-2F-1.5D	2	1.0	4	3.0	75	2	△
TOTIME65-H030B-50-2F-1.5D	3	1.5	4	4.5	50	2	▲
TOTIME65-H030B-75-2F-1.5D	3	1.5	4	4.5	75	2	△
TOTIME65-H040B-50-2F-1.5D	4	2.0	4	6.0	50	2	▲
TOTIME65-H040B-75-2F-1.5D	4	2.0	4	6.0	75	2	△
TOTIME65-H050B-50-2F-1.5D	5	2.5	6	7.5	50	2	▲
TOTIME65-H050B-75-2F-1.5D	5	2.5	6	7.5	75	2	△
TOTIME65-H050B-100-2F-1.5D	5	2.5	6	7.5	100	2	△
TOTIME65-H060B-50-2F-1.5D	6	3.0	6	9.0	50	2	▲
TOTIME65-H060B-75-2F-1.5D	6	3.0	6	9.0	75	2	▲
TOTIME65-H060B-100-2F-1.5D	6	3.0	6	9.0	100	2	△
TOTIME65-H080B-60-2F-1.5D	8	4.0	8	12.0	60	2	▲
TOTIME65-H080B-75-2F-1.5D	8	4.0	8	12.0	75	2	▲
TOTIME65-H080B-100-2F-1.5D	8	4.0	8	12.0	100	2	▲
TOTIME65-H100B-75-2F-1.5D	10	5.0	10	15.0	75	2	▲
TOTIME65-H100B-100-2F-1.5D	10	5.0	10	15.0	100	2	▲
TOTIME65-H120B-75-2F-1.5D	12	6.0	12	18.0	75	2	▲
TOTIME65-H120B-100-2F-1.5D	12	6.0	12	18.0	100	2	▲
TOTIME65-H160B-100-2F-1.5D	16	8.0	16	24.0	100	2	△
TOTIME65-H160B-150-2F-1.5D	16	8.0	16	24.0	150	2	△
TOTIME65-H200B-100-2F-1.5D	20	10.0	20	30.0	100	2	△
TOTIME65-H200B-150-2F-1.5D	20	10.0	20	30.0	150	2	△

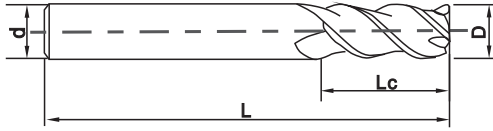
Tolerance: R ≤ 1.5 -0.01~0 1.5 < R < 3 -0.015~0 R ≥ 3 -0.02~0

▲ Stock △ Non-Stock  
Recommended Cutting Conditions P.90

# Square End Mill(HRC48)



## 3 FLUTES SQUARE



	3Flutes	Cobalt 10%	HRC 48	No Coating	MG 0.8μm	Materials Carbide
● 1st Recommendation		○ 2nd Recommendation				
Carbon Steel Cast Iron	Alloy Steel	Hardened Steel	Hardened Steel	Stainless Steel	Aluminium Alloys	Copper Alloys
<HRC35	<HRC48	HRC46-55	HRC55-60			
					●	○

Order No.	D(mm)	d(mm)	Lc(mm)	L(mm)	Flutes	Stock
TOTIME48-020AL-50-3F	2	4	6	50	3	▲
TOTIME48-030AL-50-3F	3	4	9	50	3	▲
TOTIME48-040AL-50-3F	4	4	11	50	3	▲
TOTIME48-050AL-50-3F	5	5	13	50	3	▲
TOTIME48-060AL-50-3F	6	6	16	50	3	▲
TOTIME48-080AL-60-3F	8	8	20	60	3	▲
TOTIME48-100AL-75-3F	10	10	25	75	3	▲
TOTIME48-120AL-75-3F	12	12	30	75	3	▲

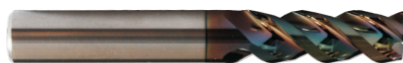
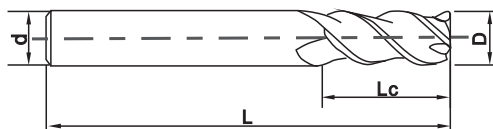
Tolerance: D ≤ 12 -0.02~0 D > 12 -0.03~0

▲ Stock △ Non-Stock  
Recommended Cutting Conditions P.88

# Square End Mill(HRC48)



## 3 FLUTES TAC COATING SQUARE [3D]



	3Flutes	Cobalt 10%	HRC 48	TAC Coating	MG 0.8μm	Materials Carbide
● 1st Recommendation		○ 2nd Recommendation				
Carbon Steel Cast Iron	Alloy Steel	Hardened Steel	Hardened Steel	Stainless Steel	Aluminium Alloys	Copper Alloys
<HRC35	<HRC48	HRC48-55	HRC55-60			
					●	●

Order No.	D(mm)	d(mm)	Lc(mm)	L(mm)	Flutes	Stock
TOTIME48-C010AL-50-3F-3D	1.0	4	3.0	50	3	▲
TOTIME48-C015AL-50-3F-3D	1.5	4	4.5	50	3	▲
TOTIME48-C020AL-50-3F-3D	2.0	4	6.0	50	3	▲
TOTIME48-C030AL-50-3F-3D	3.0	4	9.0	50	3	▲
TOTIME48-C040AL-50-3F-3D	4.0	4	12.0	50	3	▲
TOTIME48-C040AL-75-3F-3D	4.0	4	12.0	75	3	▲
TOTIME48-C050AL-50-3F-3D	5.0	6	15.0	50	3	▲
TOTIME48-C060AL-50-3F-3D	6.0	6	18.0	50	3	▲
TOTIME48-C060AL-75-3F-3D	6.0	6	18.0	75	3	△
TOTIME48-C060AL-100-3F-3D	6.0	6	18.0	100	3	▲
TOTIME48-C080AL-60-3F-3D	8.0	8	24.0	60	3	▲
TOTIME48-C080AL-75-3F-3D	8.0	8	24.0	75	3	△
TOTIME48-C080AL-100-3F-3D	8.0	8	24.0	100	3	△
TOTIME48-C100AL-75-3F-3D	10.0	10	30.0	75	3	▲
TOTIME48-C100AL-100-3F-3D	10.0	10	30.0	100	3	△
TOTIME48-C120AL-75-3F-3D	12.0	12	36.0	75	3	▲
TOTIME48-C120AL-100-3F-3D	12.0	12	36.0	100	3	▲
TOTIME48-C160AL-100-3F-3D	16.0	16	48.0	100	3	△
TOTIME48-C160AL-150-3F-3D	16.0	16	48.0	150	3	△
TOTIME48-C200AL-100-3F-3D	20.0	20	60.0	100	3	△
TOTIME48-C200AL-150-3F-3D	20.0	20	60.0	150	3	△

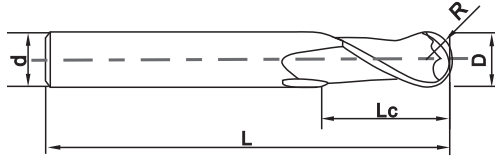
Tolerance: D ≤ 12 -0.02~0 D > 12 -0.03~0

▲ Stock △ Non-Stock  
Recommended Cutting Conditions P.89

# Ball Nose End Mill(HRC48)



2 FLUTES BALL NOSE [1.5D]



	2Flutes	Cobalt 10%	HRC 48	No Coating	UMG 0.5μm	Materials Carbide
● 1st Recommendation		○ 2nd Recommendation				
Carbon Steel Cast Iron	Alloy Steel	Hardened Steel	Hardened Steel	Stainless Steel	Aluminium Alloys	Copper Alloys
<HRC35	<HRC48	HRC48-55	HRC55-60			
					●	●

Order No.	D(mm)	R(mm)	d(mm)	Lc(mm)	L(mm)	Flutes	Stock
TOTIME48-010ALB-50-2F-1.5D	1.0	0.50	4	1.5	50	2	△
TOTIME48-015ALB-50-2F-1.5D	1.5	0.75	4	2.3	50	2	△
TOTIME48-020ALB-50-2F-1.5D	2.0	1.00	4	3.0	50	2	▲
TOTIME48-030ALB-50-2F-1.5D	3.0	1.50	4	4.5	50	2	△
TOTIME48-040ALB-50-2F-1.5D	4.0	2.00	4	6.0	50	2	▲
TOTIME48-060ALB-50-2F-1.5D	6.0	3.00	6	9.0	50	2	△
TOTIME48-060ALB-75-2F-1.5D	6.0	3.00	6	9.0	75	2	▲
TOTIME48-080ALB-60-2F-1.5D	8.0	4.00	8	12.0	60	2	△
TOTIME48-080ALB-75-2F-1.5D	8.0	4.00	8	12.0	75	2	▲
TOTIME48-080ALB-100-2F-1.5D	8.0	4.00	8	12.0	100	2	△
TOTIME48-100ALB-75-2F-1.5D	10.0	5.00	10	15.0	75	2	▲
TOTIME48-100ALB-100-2F-1.5D	10.0	5.00	10	15.0	100	2	△
TOTIME48-120ALB-75-2F-1.5D	12.0	6.00	12	18.0	75	2	△
TOTIME48-120ALB-100-2F-1.5D	12.0	6.00	12	18.0	100	2	▲

Tolerance: R ≤ 3 ± 0.015 R > 3 ± 0.02

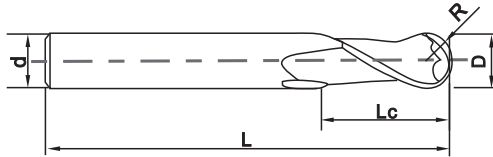
▲ Stock △ Non-Stock  
Recommended Cutting Conditions P.88



# Ball Nose End Mill(HRC48)



2 FLUTES BALL NOSE [2D]



2Flutes	Cobalt 10%	HRC 48	No Coating	UMG 0.5µm	Materials Carbide	
● 1st Recommendation		○ 2nd Recommendation				
Carbon Steel Cast Iron	Alloy Steel	Hardened Steel	Hardened Steel	Stainless Steel	Aluminium Alloys	Copper Alloys
<HRC35	<HRC48	HRC48-55	HRC55-60			
					●	●

Order No.	D(mm)	R(mm)	d(mm)	Lc(mm)	L(mm)	Flutes	Stock
TOTIME48-010ALB-50-2F-2D	1.0	0.50	4	2	50	2	▲
TOTIME48-015ALB-50-2F-2D	1.5	0.75	4	3	50	2	▲
TOTIME48-020ALB-50-2F-2D	2.0	1.00	4	4	50	2	▲
TOTIME48-030ALB-50-2F-2D	3.0	1.50	4	6	50	2	▲
TOTIME48-040ALB-50-2F-2D	4.0	2.00	4	8	50	2	▲
TOTIME48-060ALB-50-2F-2D	6.0	3.00	6	12	50	2	▲
TOTIME48-060ALB-75-2F-2D	6.0	3.00	6	12	75	2	△
TOTIME48-080ALB-60-2F-2D	8.0	4.00	8	16	60	2	▲
TOTIME48-080ALB-75-2F-2D	8.0	4.00	8	16	75	2	△
TOTIME48-080ALB-100-2F-2D	8.0	4.00	8	16	100	2	△
TOTIME48-100ALB-75-2F-2D	10.0	5.00	10	20	75	2	▲
TOTIME48-100ALB-100-2F-2D	10.0	5.00	10	20	100	2	△
TOTIME48-120ALB-75-2F-2D	12.0	6.00	12	24	75	2	▲
TOTIME48-120ALB-100-2F-2D	12.0	6.00	12	24	100	2	△

Tolerance: R ≤ 3 ±0.015 R > 3 ±0.02

▲ Stock △ Non-Stock  
Recommended Cutting Conditions P.88

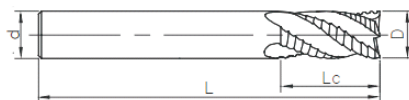
Carbide End Mill Cutter  
For Alloy Steel, Hardened Steel



# Variable Lead Roughing (HRC55)



## 4 FLUTES ROUGHING



	4Flutes	Cobalt 10%	HRC 55	TiAlN Coating	UMG 0.6μm	Carbide Materials	
● 1st Recommendation		○ 2nd Recommendation					
Carbon Steel Cast Iron	Alloy Steel	Hardened Steel	Hardened Steel	Stainless Steel	Heat Resistant Material	Titanium Alloys	
<HRC35	<HRC48	HRC48-55	HRC55-65				
●	●	●					

Order No.	D(mm)	d(mm)	Lc(mm)	L(mm)	Flutes	Stock
TOTIME3839-060R-S-4F	6	6	15	50	4	▲
TOTIME3839-080R-S-4F	8	8	20	60	4	▲
TOTIME3839-100R-S-4F	10	10	30	75	4	▲
TOTIME3839-120R-S-4F	12	12	32	75	4	▲
TOTIME3839-160R-S-4F	16	16	45	100	4	▲
TOTIME3839-200R-S-4F	20	20	50	100	4	▲

Tolerance: D ≤ 8 0~0.01 D > 8 0~0.02

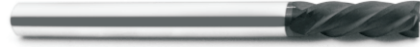
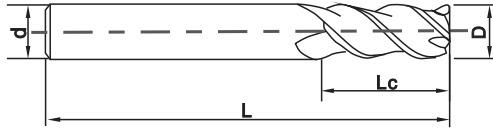
▲ Stock △ Non-Stock  
Recommended Cutting Conditions P.91



# Diamond Coating Square End Mill



## 4 FLUTES SQUARE



	4Flutes	Cobalt 10%	HRC 48	Diamond Coating	UMG 0.5µm	Materials Carbide
● 1st Recommendation		○ 2nd Recommendation				
Carbon Steel Cast Iron	Die Steel	Hardened Steel	Hardened Steel	Stainless Steel	Graphite	Aluminum
<HRC35	HRC32-48	HRC48-55	HRC55-65			
					●	○

Order No.	D(mm)	d(mm)	Lc(mm)	L(mm)	Flutes	Stock
TDIA-010S-50-4F	1	4	3	50	4	▲
TDIA-020S-50-4F	2	4	6	50	4	▲
TDIA-030S-50-4F	3	4	9	50	4	▲
TDIA-040S-50-4F	4	4	12	50	4	▲
TDIA-040S-60-4F	4	4	12	60	4	▲
TDIA-040S-75-4F	4	4	12	75	4	▲
TDIA-040S-100-4F	4	4	20	100	4	▲
TDIA-060S-50-4F	6	6	20	50	4	▲
TDIA-060S-60-4F	6	6	20	60	4	▲
TDIA-060S-75-4F	6	6	25	75	4	▲
TDIA-060S-100-4F	6	6	30	100	4	▲
TDIA-060S-150-4F	6	6	40	150	4	▲
TDIA-080S-50-4F	8	8	20	50	4	▲
TDIA-080S-60-4F	8	8	20	60	4	▲
TDIA-080S-75-4F	8	8	30	75	4	▲
TDIA-080S-100-4F	8	8	30	100	4	▲
TDIA-080S-150-4F	8	8	40	150	4	▲
TDIA-100S-60-4F	10	10	25	60	4	▲
TDIA-100S-75-4F	10	10	30	75	4	▲
TDIA-100S-100-4F	10	10	30	100	4	▲
TDIA-100S-150-4F	10	10	40	150	4	▲
TDIA-120S-100-4F	12	12	40	100	4	▲
TDIA-120S-150-4F	12	12	50	150	4	▲
TDIA-120S-180-4F	12	12	50	180	4	▲

Tolerance: D < 6 -0.02~0 6 ≤ D ≤ 12 -0.03~0

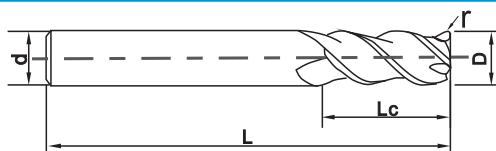
▲ Stock △ Non-Stock  
Recommended Cutting Conditions P.110



# Diamond Coating Corner Radius End Mill



## 4 FLUTES CORNER RADIUS



	4Flutes	Cobalt 10%	HRC 48	Diamond Coating	UMG 0.5μm	Materials Carbide
● 1st Recommendation		○ 2nd Recommendation				
Carbon Steel Cast Iron	Die Steel	Hardened Steel	Hardened Steel	Stainless Steel	Graphite	Aluminum
<HRC35	HRC32-48	HRC48-55	HRC55-65			
					●	○

Order No.	D(mm)	r(mm)	d(mm)	Lc(mm)	L(mm)	Flutes	Stock
TDIA-030CR002-60-4F	3	0.2	3	10	60	4	▲
TDIA-030CR002-75-4F	3	0.2	3	10	75	4	▲
TDIA-030CR002-100-4F	3	0.2	3	10	100	4	▲
TDIA-030CR003-60-4F	3	0.3	3	10	60	4	▲
TDIA-030CR005-60-4F	3	0.5	3	10	60	4	▲
TDIA-030CR005-75-4F	3	0.5	3	10	75	4	▲
TDIA-030CR005-100-4F	3	0.5	3	10	100	4	▲
TDIA-040CR001-40-4F	4	0.1	4	6	40	4	▲
TDIA-040CR002-50-4F	4	0.2	4	6	50	4	▲
TDIA-040CR002-60-4F	4	0.2	4	12	60	4	▲
TDIA-040CR002-75-4F	4	0.2	4	20	75	4	▲
TDIA-040CR002-100-4F	4	0.2	4	20	100	4	▲
TDIA-040CR005-50-4F	4	0.5	4	6	50	4	▲
TDIA-040CR005-60-4F	4	0.5	4	12	60	4	▲
TDIA-040CR005-75-4F	4	0.5	4	12	75	4	▲
TDIA-040CR005-100-4F	4	0.5	4	20	100	4	▲
TDIA-060CR003-75-4F	6	0.3	6	20	75	4	▲
TDIA-060CR003-100-4F	6	0.3	6	30	100	4	▲
TDIA-060CR005-60-4F	6	0.5	6	20	60	4	▲
TDIA-060CR005-75-4F	6	0.5	6	20	75	4	▲
TDIA-060CR005-100-4F	6	0.5	6	25	100	4	▲
TDIA-080CR003-75-4F	8	0.3	8	25	75	4	▲
TDIA-080CR003-100-4F	8	0.3	8	30	100	4	▲

Tolerance: D < 6 -0.02~0 6 ≤ D ≤ 12 -0.03~0

▲ Stock △ Non-Stock  
Recommended Cutting Conditions P.110

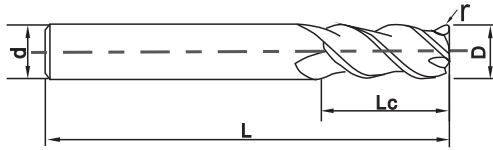




# Diamond Coating Corner Radius End Mill



## 4 FLUTES CORNER RADIUS



	4Flutes	Cobalt 10%	HRC 48	Diamond Coating	UMG 0.5µm	Materials Carbide
● 1st Recommendation		○ 2nd Recommendation				
Carbon Steel Cast Iron	Die Steel	Hardened Steel	Hardened Steel	Stainless Steel	Graphite	Aluminum
<HRC35	HRC32-48	HRC48-55	HRC55-65			
					●	○

Order No.	D(mm)	r(mm)	d(mm)	Lc(mm)	L(mm)	Flutes	Stock
TDIA-080CR005-75-4F	8	0.5	8	30	75	4	▲
TDIA-080CR005-100-4F	8	0.5	8	30	100	4	▲
TDIA-080CR005-150-4F	8	0.5	8	40	150	4	▲
TDIA-100CR005-75-4F	10	0.5	10	25	75	4	▲
TDIA-100CR005-100-4F	10	0.5	10	30	100	4	▲
TDIA-100CR005-150-4F	10	0.5	10	40	150	4	▲
TDIA-120CR005-100-4F	12	0.5	12	30	100	4	▲
TDIA-120CR005-150-4F	12	0.5	12	40	150	4	▲

Tolerance: D<6 -0.02~0 6≤D≤12 -0.03~0

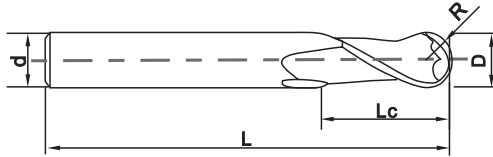
▲ Stock △ Non-Stock  
Recommended Cutting Conditions P.110



# Diamond Coating Ball Nose End Mill



## 2 FLUTES BALL NOSE



2Flutes	Cobalt 10%	HRC 48	Diamond Coating	UMG 0.5μm	Materials Carbide	
● 1st Recommendation		○ 2nd Recommendation				
Carbon Steel Cast Iron	Die Steel	Hardened Steel	Hardened Steel	Stainless Steel	Graphite	Aluminum
<HRC35	HRC32-48	HRC48-55	HRC55-65			
					●	○

Order No.	D(mm)	R(mm)	d(mm)	Lc(mm)	L(mm)	Flutes	Stock
TDIA-030B-50-2F	3	1.5	3	6	50	2	▲
TDIA-030B-60-2F	3	1.5	3	6	60	2	▲
TDIA-030B-75-2F	3	1.5	3	6	75	2	▲
TDIA-030B-100-2F	3	1.5	3	6	100	2	▲
TDIA-040B-50-2F	4	2.0	4	8	50	2	▲
TDIA-040B-60-2F	4	2.0	4	8	60	2	▲
TDIA-040B-75-2F	4	2.0	4	8	75	2	▲
TDIA-040B-100-2F	4	2.0	4	10	100	2	▲
TDIA-060B-60-2F	6	3.0	6	12	60	2	▲
TDIA-060B-75-2F	6	3.0	6	12	75	2	▲
TDIA-060B-100-2F	6	3.0	6	16	100	2	▲
TDIA-060B-150-2F	6	3.0	6	20	150	2	▲
TDIA-080B-75-2F	8	4.0	8	16	75	2	▲
TDIA-080B-100-2F	8	4.0	8	16	100	2	▲
TDIA-080B-150-2F	8	4.0	8	30	150	2	▲
TDIA-100B-100-2F	10	5.0	10	20	100	2	▲
TDIA-100B-150-2F	10	5.0	10	30	150	2	▲
TDIA-120B-100-2F	12	6.0	12	30	100	2	▲
TDIA-120B-150-2F	12	6.0	12	30	150	2	▲

Tolerance: R<3 -0.02~0 3≤R≤6 -0.03~0

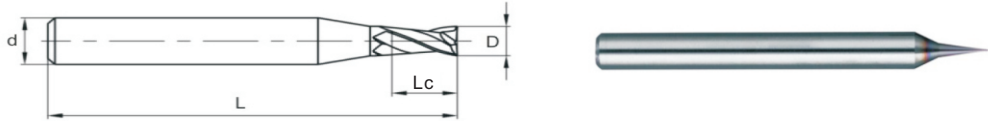
▲ Stock △ Non-Stock  
Recommended Cutting Conditions P.110



# Micro Square End Mill



## 2 FLUTES SQUARE



	2Flutes	Cobalt 10%	HRC 48	X3H Coating	UMG 0.5µm	Materials Carbide
● 1st Recommendation		○ 2nd Recommendation				
Carbon Steel Cast Iron	Alloy Steel	Hardened Steel	Hardened Steel	Stainless Steel	Aluminium Alloys	Copper Alloys
<HRC35	<HRC48	HRC48-55	HRC55-60			
					●	●

Order No.	D(mm)	d(mm)	Lc(mm)	L(mm)	Flutes	Stock
TMALS010-2F	0.10	4	0.2	50	2	▲
TMALS015-2F	0.15	4	0.3	50	2	▲
TMALS020-2F	0.20	4	0.4	50	2	▲
TMALS025-2F	0.25	4	0.5	50	2	▲
TMALS030-2F	0.30	4	0.6	50	2	▲
TMALS035-2F	0.35	4	0.7	50	2	▲
TMALS040-2F	0.40	4	0.8	50	2	▲
TMALS045-2F	0.45	4	0.9	50	2	▲
TMALS050-2F	0.50	4	1.0	50	2	▲
TMALS060-2F	0.60	4	1.2	50	2	▲
TMALS070-2F	0.70	4	1.4	50	2	▲
TMALS080-2F	0.80	4	1.6	50	2	▲
TMALS090-2F	0.90	4	1.8	50	2	▲

Tolerance: D ≤ 12 -0.02~0 D > 12 -0.03~0

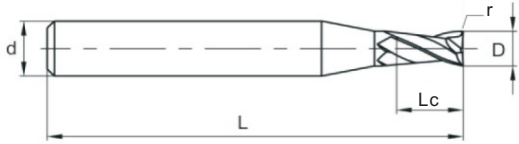
▲ Stock △ Non-Stock  
Recommended Cutting Conditions P.93



# Micro Corner Radius End Mill



## 2 FLUTES CORNER RADIUS



	2Flutes	Cobalt 10%	HRC 48	X3H Coating	UMG 0.5µm	Materials Carbide
● 1st Recommendation		○ 2nd Recommendation				
Carbon Steel Cast Iron	Alloy Steel	Hardened Steel	Hardened Steel	Stainless Steel	Aluminium Alloys	Copper Alloys
<HRC35	<HRC48	HRC48-55	HRC55-60			
					●	●

Order No.	D(mm)	r(mm)	d(mm)	Lc(mm)	L(mm)	Flutes	Stock
TMALCR0202-2F	0.2	0.02	4	0.4	50	2	▲
TMALCR0205-2F	0.2	0.05	4	0.4	50	2	▲
TMALCR0305-2F	0.3	0.05	4	0.6	50	2	▲
TMALCR0310-2F	0.3	0.10	4	0.6	50	2	▲
TMALCR0405-2F	0.4	0.05	4	0.8	50	2	▲
TMALCR0410-2F	0.4	0.10	4	0.8	50	2	▲
TMALCR0505-2F	0.5	0.05	4	1.0	50	2	▲
TMALCR0510-2F	0.5	0.10	4	1.0	50	2	▲
TMALCR0605-2F	0.6	0.05	4	1.2	50	2	▲
TMALCR0610-2F	0.6	0.10	4	1.2	50	2	▲
TMALCR0705-2F	0.7	0.05	4	1.4	50	2	▲
TMALCR0710-2F	0.7	0.10	4	1.4	50	2	▲
TMALCR0805-2F	0.8	0.05	4	1.6	50	2	▲
TMALCR0810-2F	0.8	0.10	4	1.6	50	2	▲

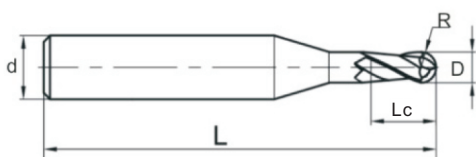
▲ Stock    △ Non-Stock  
Recommended Cutting Conditions P.93



# Micro Ball Nose End Mill



## 2 FLUTES BALL NOSE



	2Flutes	Cobalt 10%	HRC 48	X3H Coating	UMG 0.5µm	Materials Carbide	
● 1st Recommendation		○ 2nd Recommendation					
Carbon Steel Cast Iron	Alloy Steel	Hardened Steel	Hardened Steel	Stainless Steel	Aluminium Alloys	Copper Alloys	
<HRC35	<HRC48	HRC48-55	HRC55-60				●

Order No.	D(mm)	R(mm)	d(mm)	Lc(mm)	L(mm)	Flutes	Stock
TMALB020-2F	0.2	0.10	4	0.4	50	2	▲
TMALB030-2F	0.3	0.15	4	0.6	50	2	▲
TMALB040-2F	0.4	0.20	4	0.8	50	2	▲
TMALB050-2F	0.5	0.25	4	1.0	50	2	▲
TMALB060-2F	0.6	0.30	4	1.2	50	2	▲
TMALB070-2F	0.7	0.35	4	1.4	50	2	▲
TMALB080-2F	0.8	0.40	4	1.6	50	2	▲

▲ Stock    △ Non-Stock  
Recommended Cutting Conditions P.93

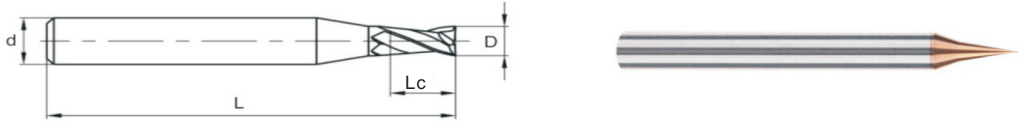
Carbide End Mill Cutter  
For Carbon Steel, Cast Iron, Alloy Steel, Stainless Steel



# Micro Square End Mill



2 FLUTES SQUARE



2Flutes	Cobalt 10%	HRC 48	AP Coating	MG 0.8μm	Materials Carbide	
● 1st Recommendation		○ 2nd Recommendation				
Carbon Steel Cast Iron	Alloy Steel	Hardened Steel	Hardened Steel	Stainless Steel	Aluminium Alloys	Copper Alloys
<HRC35	HRC35-45	HRC45-55	HRC55-60			
●	●			●		

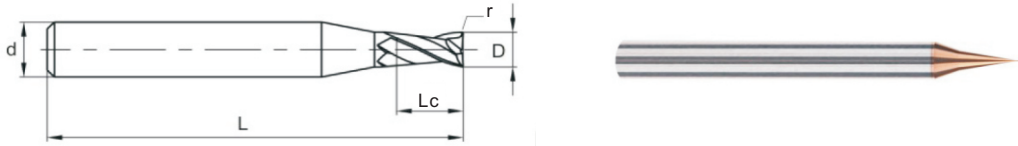
Order No.	D(mm)	d(mm)	Lc(mm)	L(mm)	Flutes	Stock
TMUS010-2F	0.10	4	0.2	50	2	▲
TMUS015-2F	0.15	4	0.3	50	2	▲
TMUS020-2F	0.20	4	0.4	50	2	▲
TMUS025-2F	0.25	4	0.5	50	2	▲
TMUS030-2F	0.30	4	0.6	50	2	▲
TMUS035-2F	0.35	4	0.7	50	2	▲
TMUS040-2F	0.40	4	0.8	50	2	▲
TMUS045-2F	0.45	4	0.9	50	2	▲
TMUS050-2F	0.50	4	1.0	50	2	▲
TMUS060-2F	0.60	4	1.2	50	2	▲
TMUS070-2F	0.70	4	1.4	50	2	▲
TMUS080-2F	0.80	4	1.6	50	2	▲
TMUS090-2F	0.90	4	1.8	50	2	▲

▲ Stock    △ Non-Stock  
Recommended Cutting Conditions P.94

# Micro Corner Radius End Mill



## 2 FLUTES CORNER RADIUS



	2Flutes	Cobalt 10%	HRC 48	AP Coating	MG 0.8μm	Materials Carbide	
● 1st Recommendation		○ 2nd Recommendation					
Carbon Steel Cast Iron	Alloy Steel	Hardened Steel	Hardened Steel	Stainless Steel	Aluminium Alloys	Copper Alloys	
<HRC35	HRC35-45	HRC45-55	HRC55-60				
●	●			●			

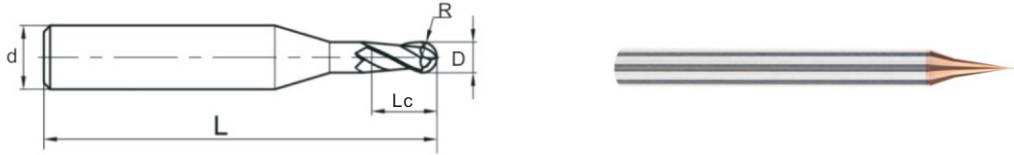
Order No.	D(mm)	r(mm)	d(mm)	Lc(mm)	L(mm)	Flutes	Stock
TMUCR0202-2F	0.2	0.02	4	0.4	50	2	▲
TMUCR0205-2F	0.2	0.05	4	0.4	50	2	▲
TMUCR0305-2F	0.3	0.05	4	0.6	50	2	▲
TMUCR0310-2F	0.3	0.10	4	0.6	50	2	▲
TMUCR0405-2F	0.4	0.05	4	0.8	50	2	▲
TMUCR0410-2F	0.4	0.10	4	0.8	50	2	▲
TMUCR0505-2F	0.5	0.05	4	1.0	50	2	▲
TMUCR0510-2F	0.5	0.10	4	1.0	50	2	▲
TMUCR0605-2F	0.6	0.05	4	1.2	50	2	▲
TMUCR0610-2F	0.6	0.10	4	1.2	50	2	▲
TMUCR0705-2F	0.7	0.05	4	1.4	50	2	▲
TMUCR0710-2F	0.7	0.10	4	1.4	50	2	▲
TMUCR0805-2F	0.8	0.05	4	1.6	50	2	▲
TMUCR0810-2F	0.8	0.10	4	1.6	50	2	▲

▲ Stock    △ Non-Stock  
Recommended Cutting Conditions P.94

# Micro Ball Nose End Mill



## 2 FLUTES BALL NOSE



	2Flutes	Cobalt 10%	HRC 48	AP Coating	MG 0.8µm	Materials Carbide
● 1st Recommendation		○ 2nd Recommendation				
Carbon Steel Cast Iron	Alloy Steel	Hardened Steel	Hardened Steel	Stainless Steel	Aluminium Alloys	Copper Alloys
<HRC35	HRC35-45	HRC45-55	HRC55-60			
●	●			●		

Order No.	D(mm)	R(mm)	d(mm)	Lc(mm)	L(mm)	Flutes	Stock
TMUB020-2F	0.2	0.10	4	0.4	50	2	▲
TMUB030-2F	0.3	0.15	4	0.6	50	2	▲
TMUB040-2F	0.4	0.20	4	0.8	50	2	▲
TMUB050-2F	0.5	0.25	4	1.0	50	2	▲
TMUB060-2F	0.6	0.30	4	1.2	50	2	▲
TMUB070-2F	0.7	0.35	4	1.4	50	2	▲
TMUB080-2F	0.8	0.40	4	1.6	50	2	▲

▲ Stock    △ Non-Stock  
Recommended Cutting Conditions P.94

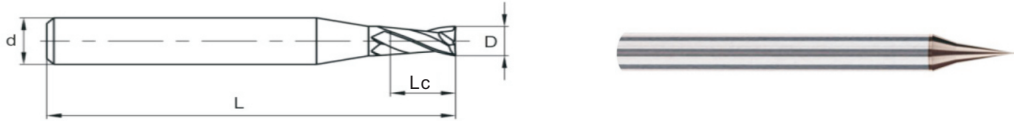




# Micro Square End Mill



## 2 FLUTES SQUARE



	2Flutes	Cobalt 10%	HRC 48	X6H Coating	MG 0.8µm	Materials Carbide
● 1st Recommendation		○ 2nd Recommendation				
Carbon Steel Cast Iron	Alloy Steel	Hardened Steel	Hardened Steel	Stainless Steel	Aluminium Alloys	Copper Alloys
<HRC35	HRC35-45	HRC48-55	HRC55-60			
		●	●			

Order No.	D(mm)	d(mm)	Lc(mm)	L(mm)	Flutes	Stock
TMHS010-2F	0.10	4	0.2	50	2	▲
TMHS015-2F	0.15	4	0.3	50	2	▲
TMHS020-2F	0.20	4	0.4	50	2	▲
TMHS025-2F	0.25	4	0.5	50	2	▲
TMHS030-2F	0.30	4	0.6	50	2	▲
TMHS035-2F	0.35	4	0.7	50	2	▲
TMHS040-2F	0.40	4	0.8	50	2	▲
TMHS045-2F	0.45	4	0.9	50	2	▲
TMHS050-2F	0.50	4	1.0	50	2	▲
TMHS060-2F	0.60	4	1.2	50	2	▲
TMHS070-2F	0.70	4	1.4	50	2	▲
TMHS080-2F	0.80	4	1.6	50	2	▲
TMHS090-2F	0.90	4	1.8	50	2	▲

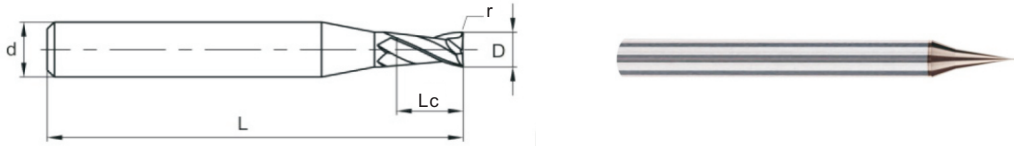
▲ Stock    △ Non-Stock  
Recommended Cutting Conditions P.95



# Micro Corner Radius End Mill



## 2 FLUTES CORNER RADIUS



	2Flutes	Cobalt 10%	HRC 48	X6H Coating	UMG 0.5µm	Materials Carbide	
● 1st Recommendation		○ 2nd Recommendation					
Carbon Steel Cast Iron	Alloy Steel	Hardened Steel	Hardened Steel	Stainless Steel	Aluminium Alloys	Copper Alloys	
<HRC35	HRC35-45	HRC48-55	HRC55-60				
		●	●				

Order No.	D(mm)	r(mm)	d(mm)	Lc(mm)	L(mm)	Flutes	Stock
TMHCR0202-2F	0.2	0.02	4	0.4	50	2	▲
TMHCR0205-2F	0.2	0.05	4	0.4	50	2	▲
TMHCR0305-2F	0.3	0.05	4	0.6	50	2	▲
TMHCR0310-2F	0.3	0.10	4	0.6	50	2	▲
TMHCR0405-2F	0.4	0.05	4	0.8	50	2	▲
TMHCR0410-2F	0.4	0.10	4	0.8	50	2	▲
TMHCR0505-2F	0.5	0.05	4	1.0	50	2	▲
TMHCR0510-2F	0.5	0.10	4	1.0	50	2	▲
TMHCR0605-2F	0.6	0.05	4	1.2	50	2	▲
TMHCR0610-2F	0.6	0.10	4	1.2	50	2	▲
TMHCR0705-2F	0.7	0.05	4	1.4	50	2	▲
TMHCR0710-2F	0.7	0.10	4	1.4	50	2	▲
TMHCR0805-2F	0.8	0.05	4	1.6	50	2	▲
TMHCR0810-2F	0.8	0.10	4	1.6	50	2	▲

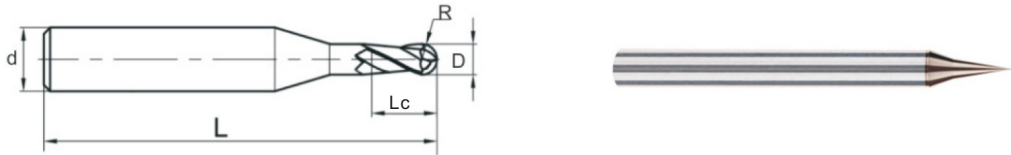
▲ Stock    △ Non-Stock  
Recommended Cutting Conditions P.95



# Micro Ball Nose End Mill



## 2 FLUTES BALL NOSE



	2Flutes	Cobalt 10%	HRC 48	X6H Coating	UMG 0.5µm	Materials Carbide
● 1st Recommendation		○ 2nd Recommendation				
Carbon Steel Cast Iron	Alloy Steel	Hardened Steel	Hardened Steel	Stainless Steel	Aluminium Alloys	Copper Alloys
<HRC35	HRC35-45	HRC48-55	HRC55-60			
		●	●			

Order No.	D(mm)	R(mm)	d(mm)	Lc(mm)	L(mm)	Flutes	Stock
TMHB020-2F	0.2	0.10	4	0.4	50	2	▲
TMHB030-2F	0.3	0.15	4	0.6	50	2	▲
TMHB040-2F	0.4	0.20	4	0.8	50	2	▲
TMHB050-2F	0.5	0.25	4	1.0	50	2	▲
TMHB060-2F	0.6	0.30	4	1.2	50	2	▲
TMHB070-2F	0.7	0.35	4	1.4	50	2	▲
TMHB080-2F	0.8	0.40	4	1.6	50	2	▲

▲ Stock    △ Non-Stock  
Recommended Cutting Conditions P.95

Carbide End Mill Cutter  
For High Hardened Steels( $\leq$ HRC65)

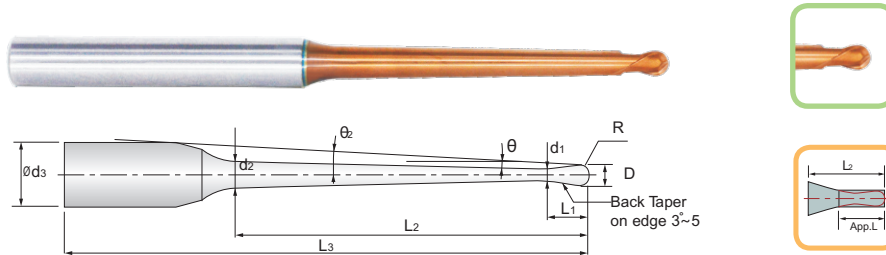


# ZSTNB20... SERIES



## 2 FLUTE, TAPER NECK BACK DRAFT TYPE

The effective neck length shown is not an exact value and to avoid contact with the workpiece, we recommend the user control the precise value of this length.



※R2 or higher is not applied to Back draft type.

Order No.	Dimension(mm)										Effective Neck Length					Stock		
	R	D	L2	θ	L1	d1	d2	L3	d3	App. L	θ2	0.5°	1°	1.5°	2°		3°	
ZSTNB2002-1-04	0.10	0.20	1.0	0.4	0.15	0.17	0.18	50	4	1.35	10.9	1.5	1.7	1.8	2.0	2.3	▲	
ZSTNB2002-1.5-04			1.5	0.4			0.19			1.77	10.4	2.0	2.2	2.4	2.6	2.9	▲	
ZSTNB2002-2-09			2.0	0.9			0.23			1.10	10.1	x	2.8	3.1	3.4	3.9	▲	
ZSTNB2002-2.5-09			2.5	0.9			0.24			1.10	9.6	x	3.3	3.7	4.0	4.5	▲	
ZSTNB2003-2-04	0.15	0.30	2.0	0.4	0.25	0.28	0.29	50	4	2.19	10.0	2.5	2.8	3.0	3.2	3.5	▲	
ZSTNB2003-3-09			3.0	0.9			0.36			1.20	9.3	x	3.8	4.2	4.5	5.1	▲	
ZSTNB2003-4-09			4.0	0.9			0.39			1.20	8.6	x	4.8	5.3	5.7	6.3	▲	
ZSTNB2004-2-04	0.20	0.40	2.0	0.4	0.30	0.37	0.39	50	4	2.20	10.0	2.5	2.8	3.0	3.2	3.5	▲	
ZSTNB2004-3-04			3.0	0.4			0.41			2.44	9.1	3.6	3.9	4.1	4.4	4.8	▲	
ZSTNB2004-4-04			4.0	0.4			0.42			2.44	8.4	4.7	5.2	5.6	5.9	6.5	▲	
ZSTNB2004-4-09			4.0	0.9			0.49			1.25	8.5	x	4.8	5.3	5.7	6.3	▲	
ZSTNB2004-5-04			5.0	0.4			0.44			2.44	7.8	5.7	6.3	6.7	7.1	7.7	▲	
ZSTNB2004-5-09			5.0	0.9			0.52			1.25	7.9	x	5.9	6.4	6.8	7.5	▲	
ZSTNB2005-4-04	0.25	0.50	4.0	0.4	0.35	0.47	0.52	50	4	2.49	8.4	4.6	5.0	5.3	5.5	5.9	▲	
ZSTNB2005-8-09			8.0	0.9			0.71			1.30	6.5	x	8.9	9.6	10.1	10.9	▲	
ZSTNB2005-12-09			12.0	0.9			0.84			1.30	5.3	x	13.0	13.9	14.5	15.4	▲	
ZSTNB20054-2-04	0.27	0.54	2.0	0.4	0.37	0.52	0.54	50	4	1.80	10.0	2.3	2.5	2.7	2.8	3.0	▲	
ZSTNB20054-4-04			4.0				0.57			1.80	8.4	4.5	4.9	5.2	5.5	5.9	▲	
ZSTNB20054-5-04			5.0				0.59			1.80	7.8	5.5	6.0	6.3	6.6	7.1	▲	
ZSTNB20054-6-04			6.0				0.60			1.80	7.2	6.7	7.3	7.8	8.2	8.8	▲	
ZSTNB20054-6.5-04			6.5				0.61			1.80	7.0	7.2	7.9	8.3	8.7	9.4	▲	
ZSTNB20054-7-04			7.0				0.61			1.80	6.8	7.7	8.4	8.9	9.3	10.0	▲	
ZSTNB2006-2-04	0.30	0.60	2.0	0.4	0.40	0.57	0.59	50	4	2.17	10.0	2.4	2.5	2.7	2.8	3.0	▲	
ZSTNB2006-4-04			4.0				0.62			2.54	8.4	4.6	5.0	5.2	5.5	5.9	▲	
ZSTNB2006-6-04			6.0				0.65			2.54	7.2	6.8	7.4	7.8	8.2	8.8	▲	
ZSTNB2006-6-09			6.0				0.75			1.35	7.3	x	6.9	7.5	7.9	8.6	▲	
ZSTNB2006-8-09			8.0				0.81			1.35	6.4	x	8.9	9.6	10.1	10.9	▲	
ZSTNB2006-10-04			10.0				0.70			2.54	5.6	10.8	11.7	12.2	12.7	13.5	▲	
ZSTNB2006-10-09			10.0				0.87			1.35	5.7	x	11.0	11.8	12.3	13.2	▲	
ZSTNB2006-12-09			12.0				0.93			1.35	5.2	x	13.0	13.9	14.5	15.4	▲	
ZSTNB2006-15-04			15.0				0.77			2.54	4.4	15.9	17.0	17.6	18.2	19.2	▲	
ZSTNB2006-15-09			15.0				0.9			1.03	1.35	4.5	x	16.1	17.1	17.7	18.8	▲

X No application  
= No interference

※ These tools are manufactured based on order received. Recommended Cutting Conditions P.101~P.104

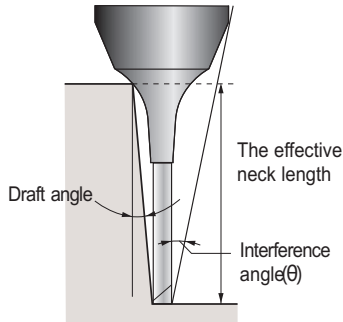
▲ Stock △ Non-Stock



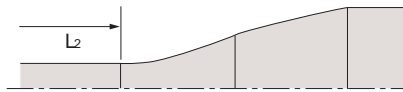
# ZSTNB20...-...-... SERIES



## 2 FLUTE, TAPER NECK BACK DRAFT TYPE



- ▶ If the workpiece has draft angle, the interference length will be longer than the L2.
- ▶ Please refer to the effective neck length for the various draft angles
- ▶ In addition, the angle at which the tool will interfere with the workpiece is shown as the "interference angle  $\theta_2$ ", and should also be referred to



※ The effective neck length shown is not an exact value and to avoid contact with the workpiece, we recommend the user control the precise value of this length.

Order No.	Dimension(mm)										Effective Neck Length					Stock						
	R	D	L2	$\theta$	L1	d1	d2	L3	d3	App. L	$\theta_2$	0.5°	1°	1.5°	2°		3°					
ZSTNB2008-4-04	0.40	0.8	4	0.4	0.50	0.77	0.82	50	4	2.64	8.3	4.6	4.9	5.2	5.5	5.9	▲					
ZSTNB2008-6-04			6				0.85			2.64	7.1	6.6	7.1	7.5	7.7	8.3	▲					
ZSTNB2008-8-09			8	1.01			0.9	1.45		6.3	x	8.9	9.6	10.1	10.9	▲						
ZSTNB2008-12-09			12					1.13		55	1.45	5.0	x	13.0	13.9	14.5	15.4	▲				
ZSTNB2008-16-09			16				1.26	1.45		4.2	x	17.1	18.1	18.8	19.9	▲						
ZSTNB2009-4-04	0.45	0.9	4	0.4	0.60	0.86	0.91	55	4	3.46	8.2	4.5	4.7	4.9	5.1	5.4	▲					
ZSTNB2009-8-04			8				0.96			3.46	6.1	8.7	9.3	9.7	10.0	10.6	▲					
ZSTNB2009-12-04			12				1.02	3.46		4.8	12.9	13.8	14.4	14.9	15.7	▲						
ZSTNB2009-16-04			16					1.08		60	3.46	4.0	17.0	18.0	18.7	19.3	20.5	▲				
ZSTNB2009-18-04			18					1.10		3.46	3.7	19.1	20.1	20.9	21.5	23.1	▲					
ZSTNB2009-20-04			20				1.13	3.46		3.4	21.1	22.2	23.0	23.6	25.6	▲						
ZSTNB2009-22-04			22					1.16		3.46	3.2	23.1	24.3	25.1	25.8	28.2	▲					
ZSTNB2009-24-04			24				1.19	70		3.46	3.0	25.2	26.4	27.2	27.9	-	▲					
ZSTNB2010-6-04	0.50	1	6	0.4	0.80	0.94	1.01	55	6	5.09	8.3	6.8	7.2	7.5	7.8	8.3	▲					
ZSTNB2010-8-04			8				1.04			5.09	7.5	8.8	9.3	9.7	10.0	10.6	▲					
ZSTNB2010-10-04			10				1.07	0.9		5.09	6.8	11.0	11.7	12.3	12.7	13.5	▲					
ZSTNB2010-10-09			10	1.23						2.70	6.9	x	11.2	11.9	12.4	13.2	▲					
ZSTNB2010-15-09			15	1.39			0.4	2.70		5.7	x	16.2	17.1	17.8	18.8	▲						
ZSTNB2010-20-04			20					1.21		65	5.09	4.7	21.2	22.3	23.0	23.6	25.7	▲				
ZSTNB2010-20-09			20	1.54			0.9	2.70		4.8	x	21.3	22.4	23.1	24.6	▲						
ZSTNB2010-25-09			25					1.70		70	2.70	4.2	x	26.4	27.6	28.4	30.8	▲				
ZSTNB2010-30-04			30	1.35			0.4	5.09		3.6	31.3	32.7	33.6	34.8	38.5	▲						
ZSTNB2010-30-09			30					1.86		75	2.70	3.7	x	31.4	32.8	33.7	36.9	▲				
ZSTNB2010-35-09			35	2.02			0.9	2.70		3.3	x	36.5	38.0	39.0	43.1	▲						
ZSTNB2010-40-09			40					2.17		85	2.70	3.0	x	41.6	43.2	44.4	-	▲				
ZSTNB2010-50-09			50	2.49			0.9	2.70		2.5	x	51.7	53.5	55.5	-	▲						
ZSTNB2010-60-09			60					2.80		105	2.70	2.2	x	61.8	63.8	66.6	-	▲				
ZSTNB2010-70-09			70	3.11			115	2.70		1.9	x	71.9	74.0	-	-	▲						
ZSTNB2015-8-04			0.75	1.5			8	0.4		1.35	1.42	1.51	55	6	7.07	7.3	8.9	9.4	9.7	10.0	10.6	▲
ZSTNB2015-10-04							10					1.54			7.07	6.6	10.9	11.5	11.9	12.2	12.9	▲

X No application  
- No interference

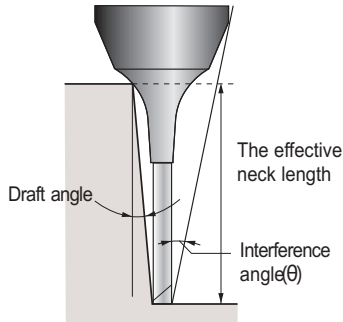
▲ Stock △ Non-Stock  
※ These tools are manufactured based on order received. Recommended Cutting Conditions P.101~P.104



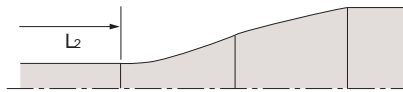
# ZSTNB20...-...-... SERIES



## 2 FLUTE, TAPER NECK BACK DRAFT TYPE



- ▶ If the workpiece has draft angle, the interference length will be longer than the L2.
- ▶ Please refer to the effective neck length for the various draft angles
- ▶ In addition, the angle at which the tool will interfere with the workpiece is shown as the "interference angle  $\theta_2$ ", and should also be referred to



※ The effective neck length shown is not an exact value and to avoid contact with the workpiece, we recommend the user control the precise value of this length.

Order No.	Dimension(mm)										Effective Neck Length					Stock						
	R	D	L2	$\theta$	L1	d1	d2	L3	d3	App. L	$\theta_2$	0.5°	1°	1.5°	2°		3°					
ZSTNB2015-12-04	0.75	1.5	12	0.4	1.35	1.42	1.57	55	6	7.07	6.0	13.0	13.6	14.0	14.4	15.4	▲					
ZSTNB2015-15-09			15	0.9			1.85	60		3.89	5.4	x	16.4	17.2	17.8	18.8	▲					
ZSTNB2015-20-09			20				2.01	65		3.89	4.5	x	21.4	22.4	23.2	24.7	▲					
ZSTNB2015-30-09			30	2.32			75	3.89		3.4	x	31.5	32.9	33.7	37.0	▲						
ZSTNB2018-4-04	0.9	1.8	4	0.4	1.6	1.73	1.76	50	6	4.38	9.2	4.6	4.8	4.9	5.1	5.4	▲					
ZSTNB2018-8-04			8				1.82			6.61	7.1	8.6	9.0	9.2	9.4	10.2	▲					
ZSTNB2018-12-04			12				1.88	6.61		5.8	12.9	13.5	14.0	14.4	15.4	▲						
ZSTNB2018-16-04			16				1.93	6.61		4.9	17.0	17.7	18.3	18.7	20.5	▲						
ZSTNB2018-20-04			20				1.99	6.61		4.3	21.2	22.3	23.0	23.6	25.6	▲						
ZSTNB2018-24-04			24				2.04	6.61		3.8	25.3	26.5	27.3	27.9	30.8	▲						
ZSTNB2018-28-04			28				2.10	6.61		3.4	29.4	30.6	31.5	32.4	35.9	▲						
ZSTNB2018-32-04			32				2.15	6.61		3.0	33.4	34.8	35.7	37.1	-	▲						
ZSTNB2018-36-04			36				2.21	6.61		2.8	37.5	38.9	39.9	41.7	-	▲						
ZSTNB2018-38-04			38				2.24	6.61		2.7	39.5	41.0	42.0	44.0	-	▲						
ZSTNB2018-40-04			40				2.27	6.61		2.6	41.5	43.1	44.2	46.3	-	▲						
ZSTNB2020-8-04			1.0				2.0	8		0.4	1.7	1.92	2.01	50	6	7.42	7.0	8.7	9.0	9.2	9.5	10.2
ZSTNB2020-12-04	12	2.06		55	7.42	5.7		13.0	13.6				14.0	14.4		15.4	▲					
ZSTNB2020-16-04	16	2.12		60	7.42	4.8		17.0	17.7				18.3	18.7		20.5	▲					
ZSTNB2020-20-04	20	2.18		65	7.42	4.1		21.3	22.3				23.0	23.6		25.6	▲					
ZSTNB2020-20-09	20	2.50		4.24	4.2	x		21.4	22.4	23.2			24.6	▲								
ZSTNB2020-25-09	25	2.65		4.24	3.6	x		26.5	27.7	28.5			30.8	▲								
ZSTNB2020-30-04	30	2.32		7.42	3.1	31.4		32.7	33.6	34.8			38.5	▲								
ZSTNB2020-30-09	30	2.81		4.24	3.2	x		31.6	32.9	33.7			36.9	▲								
ZSTNB2020-35-09	35	2.97		4.24	2.8	x		36.6	38.0	39.0			-	▲								
ZSTNB2020-40-04	40	2.46		7.42	2.5	41.5		43.1	44.2	46.3			-	▲								
ZSTNB2020-40-09	40	3.12		4.24	2.6	x		41.7	43.2	44.5			-	▲								
ZSTNB2020-50-09	50	3.44		4.24	2.1	x		51.8	53.5	55.5			-	▲								
ZSTNB2020-60-09	60	3.75		4.24	1.8	x		61.9	63.8	-			-	▲								
ZSTNB2020-70-09	70	4.07		4.24	1.6	x		72.0	74.1	-			-	▲								
ZSTNB2030-8-04	1.5	3.0		8	0.4	2.5		2.86	2.94	50			6	8.50		6.3	8.8	9.1	9.3	9.5	10.3	▲
ZSTNB2030-16-04				16					3.05	55				12.52		4.1	17.2	17.8	18.3	18.7	20.6	▲

X No application  
- No interference

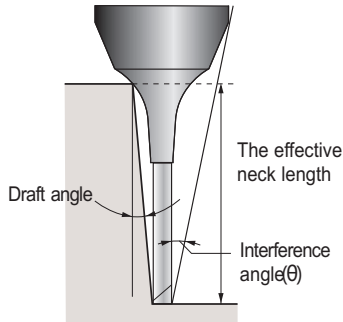
▲ Stock △ Non-Stock  
※ These tools are manufactured based on order received. Recommended Cutting Conditions P.101~P.104



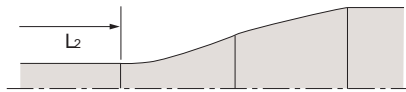
# ZSTNB20...-...-... SERIES



## 2 FLUTE, TAPER NECK BACK DRAFT TYPE



- ▶ If the workpiece has draft angle, the interference length will be longer than the L2.
- ▶ Please refer to the effective neck length for the various draft angles
- ▶ In addition, the angle at which the tool will interfere with the workpiece is shown as the "interference angle θ2", and should also be referred to



※ The effective neck length shown is not an exact value and to avoid contact with the workpiece, we recommend the user control the precise value of this length.

Order No.	Dimension(mm)										Effective Neck Length					Stock																				
	R	D	L2	θ	L1	d1	d2	L3	d3	App. L	θ2	0.5°	1°	1.5°	2°		3°																			
ZSTNB2030-20-04	1.5	3	20	0.4	2.5	2.86	3.10	60	6	12.52	3.4	21.2	22.0	22.6	23.3	25.7	▲																			
ZSTNB2030-30-04			30				3.24										70	12.52	2.5	31.6	32.8	33.7	34.9	-	▲											
ZSTNB2030-30-09			30				3.72											6.95	2.6	x	31.8	33.0	33.8	-	▲											
ZSTNB2030-40-04			40	0.4			3.38	80									12.52	2.0	41.7	43.2	44.3	-	-	-	-	-	-	▲								
ZSTNB2030-40-09			40	0.9			4.04																					6.95	2.0	x	41.9	43.3	-	-	▲	
ZSTNB2030-50-09			50	0.9			4.35																					6.95	1.7	x	52.0	53.6	-	-	▲	
ZSTNB2030-60-09			60	0.9			4.67	6.95																				1.4	x	62.1	-	-	-	-	▲	
ZSTNB2030-70-09			70	0.9			4.98	6.95																				1.2	x	72.1	-	-	-	-	▲	
ZSTNB2040-20-10			2.0	4			20	1.0																				8.0	3.86	4.28	70	8	12.01	5.0	20.5	21.6
ZSTNB2040-30-10	30	4.63			80	12.01	3.51		22.0	31.6	32.5	33.2	34.16	▲																						
ZSTNB2040-40-10	40	4.98			90	12.01	2.7		22.0	42.0	43.4	44.3	-	▲																						
ZSTNB2040-50-10	50	5.33			100	12.01	2.2		22.0	52.0	53.6	54.7	-	▲																						
ZSTNB2040-60-10	60	5.68			110	12.01	1.9		22.0	62.0	63.8	-	-	▲																						
ZSTNB2050-30-10	2.5	5	30	1.0	10.0	4.86	5.56	80	8	14.01	2.8	25.5	31.7	32.6	33.2	-	▲																			
ZSTNB2050-40-10			40				5.91										90	14.01	2.1	25.5	41.7	42.8	43.5	-	▲											
ZSTNB2050-60-10			60				6.61										110	14.01	1.5	25.5	62.1	-	-	-	▲											
ZSTNB2060-30-10	3.0	6	30	1.0	12.0	5.86	6.49	80	8	16.01	1.9	29.0	31.8	32.6	-	-	▲																			
ZSTNB2060-40-10			40				6.84										90	16.01	1.5	29.0	41.8	-	-	-	▲											
ZSTNB2060-50-10			50				7.19										100	16.01	1.2	29.0	51.8	-	-	-	▲											
ZSTNB2060-60-10			60				7.54										110	16.01	1.9	29.0	62.2	63.9	-	-	▲											
ZSTNB2060-70-10			70				7.89										120	16.01	1.7	29.0	72.2	74.1	-	-	▲											
ZSTNB2060-80-10			80				8.23										130	16.01	1.5	29.0	82.2	-	-	-	▲											
ZSTNB2080-50-10	4.0	8	50	1.0	14.0	7.86	9.12	110	10	18.01	1.2	32.0	51.9	-	-	-	▲																			
ZSTNB2080-60-10			60				9.47										120	18.01	1.0	32.0	-	-	-	-	▲											
ZSTNB2080-70-10			70				9.82										130	18.01	0.9	32.0	-	-	-	-	▲											
ZSTNB2080-80-10			80				10.16										140	18.01	1.5	32.0	82.3	-	-	-	▲											
ZSTNB2100-60-10	5.0	10	60	1.0	18.0	9.86	11.33	130	12	22.01	1.1	39.0	62.1	-	-	-	▲																			
ZSTNB2100-75-10			75				11.85										140	22.01	0.9	39.0	-	-	-	-	▲											

X No application  
- No interference

▲ Stock △ Non-Stock  
※ These tools are manufactured based on order received. Recommended Cutting Conditions P.101~P.104

### ■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels (NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500~	Aluminum	Stainless Sheets
			~Hrc55 SKD61	~Hrc55 SKD11					
○	○	○	◎	◎	○				

○: General Application ◎: The most suitable Application

### ■ Tolerance

Diameter	Radius	Shank Dia.
up to 6	±0.005	h6
over 6	±0.01	

※ Items can be changed for quality improvement without notice.

Carbide End Mill Cutter  
For High Hardened Steels(≤HRC65)

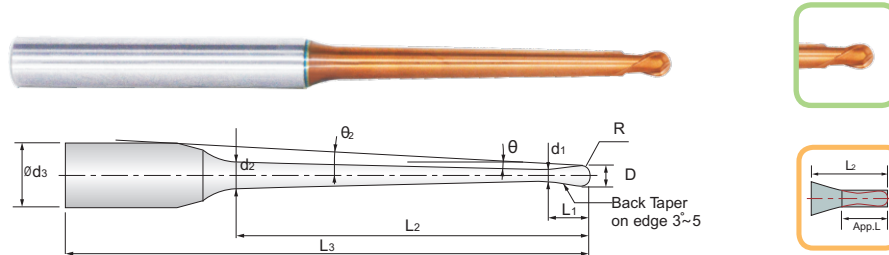


# ZSTNB30... SERIES



## 3 FLUTE, TAPER NECK BACK DRAFT TYPE

The effective neck length shown is not an exact value and to avoid contact with the workpiece, we recommend the user control the precise value of this length.



※R2 or higher is not applied to Back draft type.

Order No.	Dimension(mm)										Effective Neck Length					Stock	
	R	D	L2	θ	L1	d1	d2	L3	d3	App. L	θ2	0.5°	1°	1.5°	2°		3°
ZSTNB3020-8-04	1.0	2	8	0.4	1.7	1.92	2.01	50	6	7.42	7.0	8.7	9.0	9.2	9.5	10.2	▲
ZSTNB3020-12-04			12				2.06	55		7.42	5.7	13.0	13.6	14.0	14.4	15.4	▲
ZSTNB3020-16-04			16				2.12	60		7.42	4.8	17.0	17.7	18.3	18.7	20.5	▲
ZSTNB3020-20-04			20				2.18	65		7.42	4.1	21.3	22.3	23.0	23.6	25.6	▲
ZSTNB3020-20-09			20	2.50			65	0.9		4.24	4.2	x	21.4	22.4	23.2	24.6	▲
ZSTNB3020-25-09			25	2.65			70	0.9		4.24	3.6	x	26.5	27.7	28.5	30.8	▲
ZSTNB3020-30-04			30	2.32			70	0.4		7.42	3.1	31.4	32.7	33.6	34.8	38.5	▲
ZSTNB3020-30-09			30	2.81			75	0.9		4.24	3.2	x	31.6	32.9	33.7	36.9	▲
ZSTNB3020-35-09			35	2.97			80	0.4		4.24	2.8	x	36.6	38.0	39.0	-	▲
ZSTNB3020-40-04			40	2.46			80	0.4		7.42	2.5	41.5	43.1	44.2	46.3	-	▲
ZSTNB3020-40-09			40	3.12			80	0.9		4.24	2.6	x	41.7	43.2	44.5	-	▲
ZSTNB3020-50-09			50	3.44			90	0.9		4.24	2.1	x	51.8	53.5	55.5	-	▲
ZSTNB3020-60-09			60	3.75			100	0.9		4.24	1.8	x	61.9	63.8	-	-	▲
ZSTNB3020-70-09			70	4.07			110	0.9		4.24	1.6	x	72.0	74.1	-	-	▲
ZSTNB3030-8-04	1.5	3	8	0.4	2.5	2.86	2.94	50	6	8.50	6.3	8.8	9.1	9.3	9.5	10.3	▲
ZSTNB3030-16-04			16				3.05	55		12.52	4.1	17.2	17.8	18.3	18.7	20.6	▲
ZSTNB3030-20-04			20				3.10	60		12.52	3.4	21.2	22.0	22.6	23.3	25.7	▲
ZSTNB3030-30-04			30				3.24	70		12.52	2.5	31.6	32.8	33.7	34.9	-	▲
ZSTNB3030-30-09			30	3.72			80	0.9		6.95	2.6	x	31.8	33.0	33.8	-	▲
ZSTNB3030-40-04			40	3.38			80	0.4		12.52	2.0	41.7	43.2	44.3	-	-	▲
ZSTNB3030-40-09			40	4.04			90	0.9		6.95	2.0	x	41.9	43.3	-	-	▲
ZSTNB3030-50-09			50	4.35			90	0.9		6.95	1.7	x	52.0	53.6	-	-	▲
ZSTNB3030-60-09			60	4.67			100	0.9		6.95	1.4	x	62.1	-	-	-	▲
ZSTNB3030-70-09			70	4.98			110	0.9		6.95	1.2	x	72.1	-	-	-	▲
ZSTNB3040-20-10	2.0	4	20	1.0	8.0	3.86	4.28	70	8	12.01	5.0	20.5	21.6	22.3	22.8	23.5	▲
ZSTNB3040-30-10			30				4.63	80		12.01	3.6	22.0	31.6	32.5	33.2	34.1	▲
ZSTNB3040-40-10			40				4.98	90		12.01	2.7	22.0	42.0	43.4	44.3	-	▲
ZSTNB3040-50-10			50				5.33	100		12.01	2.2	22.0	52.0	53.6	54.7	-	▲
ZSTNB3040-60-10			60				5.68	110		12.01	1.9	22.0	62.0	63.8	-	-	▲
ZSTNB3050-30-10	2.5	5	30	1.0	10.0	4.86	5.56	80	8	14.01	2.8	25.5	31.7	32.6	33.2	-	▲
ZSTNB3050-40-10			40				5.91	90		14.01	2.1	25.5	41.7	42.8	43.5	-	▲
ZSTNB3050-60-10			60				6.61	110		12.52	1.5	25.5	62.1	-	-	-	▲

X No application  
- No interference

▲ Stock △ Non-Stock  
※ These tools are manufactured based on order received. Recommended Cutting Conditions P.101~P.104



Carbide End Mill Cutter  
For High Hardened Steels(≤HRC65)

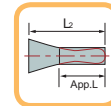
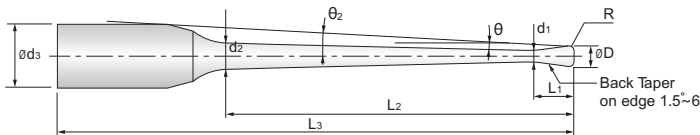


# ZSTNR... SERIES



## 2 FLUTE, TAPER NECK BACK DRAFT TYPE

The effective neck length shown is not an exact value and to avoid contact with the workpiece, we recommend the user control the precise value of this length.



※R2 or higher is not applied to Back draft type.

Order No.	Dimension(mm)										Effective Neck Length					Stock		
	D	R	L2	θ	L1	d1	d2	L3	d3	App. L	θ2	0.5°	1°	1.5°	2°		3°	
ZSTNR2002-2-09005	0.2	0.05	2	0.9	0.15	0.17	0.23	50	4	1.10	10.0	x	2.8	3.1	3.4	3.9	▲	
ZSTNR2004-4-09005	0.4	0.05	4	0.9	0.30	0.37	0.49	50	4	1.25	8.4	x	4.9	5.3	5.7	6.3	▲	
ZSTNR2004-5-09005			5	0.9			0.52			1.25	7.8	x	5.9	6.4	6.8	7.5	▲	
ZSTNR2004-4-0901		0.10	4	0.9			0.49			1.25	8.5	x	4.9	5.3	5.7	6.3	▲	
ZSTNR2004-5-0901			5	0.9			0.52			1.25	7.9	x	5.9	6.4	6.8	7.5	▲	
ZSTNR2005-5-0901	0.5	0.10	5	0.9	0.35	0.47	0.62	50	4	1.30	7.8	x	5.9	6.4	6.8	7.5	▲	
ZSTNR2005-8-0901			8	0.9			0.71			1.30	6.4	x	9.0	9.7	10.2	11.0	▲	
ZSTNR2005-10-0901			10	0.9			0.77			1.30	5.8	x	11.0	11.8	12.4	13.2	▲	
ZSTNR2006-12-0901	0.6	0.10	12	0.9	0.40	0.57	0.93	55	4	1.35	5.1	x	13.0	13.9	14.5	15.5	▲	
ZSTNR2006-15-0901			15	0.9			1.03			1.35	4.5	x	16.1	17.1	17.8	18.8	▲	
ZSTNR2008-6-0402	0.8	0.20	6	0.4	0.50	0.77	0.85	50	4	2.64	7.0	6.6	7.1	7.5	7.8	8.3	▲	
ZSTNR2008-12-0902			12	0.9			1.13			1.45	5.0	x	13.0	13.9	14.5	15.5	▲	
ZSTNR2010-8-0402	1.0	0.20	8	0.4	0.80	0.94	1.04	55	6	5.09	7.4	8.8	9.3	9.7	10.1	10.6	▲	
ZSTNR2010-10-0902			10	0.9			1.23			5.09	6.8	x	11.2	11.9	12.4	13.3	▲	
ZSTNR2010-15-0902			15	0.9			1.39	60		2.70	5.6	x	16.3	17.2	17.8	18.8	▲	
ZSTNR2010-20-0902			20	0.9			1.54	65		2.70	4.8	x	21.3	22.4	23.2	24.7	▲	
ZSTNR2010-25-0902			25	0.9			1.70	70		2.70	4.1	x	26.4	27.6	28.5	30.9	▲	
ZSTNR2010-30-0902			30	0.9			1.86	75		2.70	3.7	x	31.5	32.8	33.7	37.0	▲	
ZSTNR2010-35-0902			35	0.9			2.02	80		2.70	3.3	x	36.5	38.0	39.0	43.2	▲	
ZSTNR2010-8-0403			0.30	8			0.4	1.04		55	2.70	7.4	8.8	9.3	9.7	10.0	10.6	▲
ZSTNR2010-15-0903				15			0.9	1.39		60	2.70	5.6	x	16.3	17.2	17.8	18.8	▲
ZSTNR2010-25-0903				25			0.9	1.70		70	2.70	4.2	x	26.4	27.6	28.5	30.8	▲
ZSTNR2010-30-0903	30	0.9		1.86	75	2.70	3.7	x	31.5	32.8	33.7	37.0	▲					
ZSTNR2015-10-0402	1.5	0.20	10	0.4	1.35	1.42	1.54	55	6	7.07	6.4	11.0	11.5	11.9	12.3	13.0	▲	
ZSTNR2015-15-0902			15	0.9			1.85			60	7.07	5.3	x	16.4	17.3	17.9	18.9	▲
ZSTNR2015-20-0902			20	0.9			2.01			65	3.89	4.5	x	21.5	22.5	23.2	24.9	▲
ZSTNR2015-25-0902			25	0.9			2.16			70	3.89	3.9	x	26.6	27.7	28.5	31.0	▲
ZSTNR2015-30-0902			30	0.9			2.32			75	3.89	3.4	x	31.6	32.9	33.8	37.1	▲
ZSTNR2015-10-0403			0.30	10			0.4			1.54	55	3.89	6.4	11.0	11.5	11.9	12.3	13.0

X No application  
- No interference

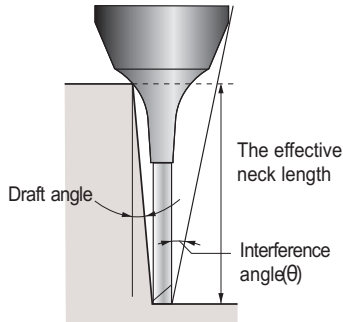
▲ Stock △ Non-Stock  
※ These tools are manufactured based on order received. Recommended Cutting Conditions P.105~P.106



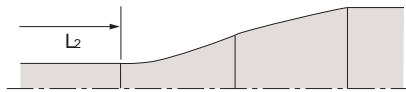
# ZSTNR... SERIES



## 2 FLUTE, TAPER NECK BACK DRAFT TYPE



- ▶ If the workpiece has draft angle, the interference length will be longer than the L2.
- ▶ Please refer to the effective neck length for the various draft angles
- ▶ In addition, the angle at which the tool will interfere with the workpiece is shown as the "interference angle  $\theta_2$ ", and should also be referred to



※ The effective neck length shown is not an exact value and to avoid contact with the workpiece, we recommend the user control the precise value of this length.

Order No.	Dimension(mm)										Effective Neck Length					Stock								
	D	R	L2	$\theta$	L1	d1	d2	L3	d3	App. L	$\theta_2$	0.5°	1°	1.5°	2°		3°							
ZSTNR2015-20-0903	1.5	0.3	20	0.9	1.35	1.42	2.01	65	6	3.89	4.5	x	21.5	22.5	23.2	24.8	▲							
ZSTNR2015-25-0903			25				2.16	70			3.9	x	26.5	27.7	28.5	31.0	▲							
ZSTNR2015-30-0903			30				2.32	75			3.4	x	31.6	32.9	33.8	37.1	▲							
ZSTNR2020-30-0902	2.0	0.2	30	0.9	1.70	1.92	2.81	70	6	7.42	3.1	x	31.6	32.9	33.8	37.2	▲							
ZSTNR2020-40-0902			40				3.12	80			2.5	x	41.8	43.3	44.6	-	▲							
ZSTNR2020-50-0902			50				3.44	90			2.1	x	51.9	53.6	55.7	-	▲							
ZSTNR2020-12-0403		0.3	12	0.4			2.06	55			5.5	13.0	13.6	14.1	14.5	15.6	▲							
ZSTNR2020-20-0903			20	2.50			65	4.1			x	21.5	22.5	23.2	24.9	▲								
ZSTNR2020-30-0903			30	2.81			70	3.1			x	31.6	32.9	33.8	37.1	▲								
ZSTNR2020-40-0903		40	3.12	80			2.5	x			41.7	43.3	44.6	-	▲									
ZSTNR2020-50-0903		50	3.44	90			2.1	x			51.8	53.6	55.7	-	▲									
ZSTNR2020-8-0405		0.5	8	0.9			2.01	50			6.8	8.7	9.0	9.3	9.5	10.4	▲							
ZSTNR2020-12-0405			12				2.06	55			5.6	13.0	13.6	14.1	14.4	15.5	▲							
ZSTNR2020-16-0405			16				2.12	60			4.7	17.0	17.8	18.3	18.7	20.7	▲							
ZSTNR2020-20-0905		0.9	20	0.9			2.50	65			4.2	x	21.5	22.5	23.2	24.8	▲							
ZSTNR2020-25-0905			25				2.65	65			3.6	x	26.6	27.7	28.5	30.9	▲							
ZSTNR2020-30-0905			30				2.81	70			3.1	x	31.6	32.9	33.8	37.1	▲							
ZSTNR2020-40-0905			40				3.12	80			2.5	x	41.7	43.2	44.6	-	▲							
ZSTNR2020-50-0905			50				3.44	90			2.1	x	51.8	53.6	55.6	-	▲							
ZSTNR2030-40-0902			3.0				0.2	40			0.9	2.50	2.86	4.04	80	6	6.95	2.0	x	42.0	43.4	-	-	▲
ZSTNR2030-50-0902								50						4.35	90			1.6	x	52.1	53.7	-	-	▲
ZSTNR2030-60-0902	60	4.67		100	1.4	x		62.2	-	-				-	▲									
ZSTNR2030-40-0903	0.3	40		4.04	80	2.0	x	42.0	43.4	-				-	▲									
ZSTNR2030-50-0903		50		4.35	90	1.7	x	52.1	53.7	-				-	▲									
ZSTNR2030-60-0903		60		4.67	100	1.4	x	62.2	-	-				-	▲									
ZSTNR2030-40-0905	0.5	40		4.04	80	2.0	x	42.0	43.4	-				-	▲									
ZSTNR2030-50-0905		50		4.35	90	1.7	x	52.1	53.7	-				-	▲									
ZSTNR2030-60-0905		60		4.67	100	1.4	x	62.1	-	-				-	▲									

X No application  
- No interference

▲ Stock △ Non-Stock  
※ These tools are manufactured based on order received. Recommended Cutting Conditions P.105~P.106

### ■ Applicable Working Material

Carbon Steels (S45C, S55C...) ~ HB225	Alloy Steels (SCM, SK...) HB225~325	Prehardened Steels (NAK...) HRc30~50	Hardened Steels		Copper	Graphite	Cast Iron FCD400, 500	Aluminum	Stainless Sheets
			~Hrc55 SKD61	~Hrc55 SKD11					
○	○	○	◎	◎	○				

○: General Application ◎: The most suitable Application

### ■ Tolerance

Mill Dia. (mm)	Shank Dia.
0 ~ -0.015	h6

※ Items can be changed for quality improvement without notice.

CBN End Mill(HRC≤70)  
For High-Hardened Steels up to HRC70



# CN2BE SERIES



## CBN 2 FLUTE BALL NOSE

- ▶ Machining high hardness materials HRC50 to HRC70 into finish process for long time.
- ▶ High speed cutting with 20,000rpm and over 20,000rpm of tool and supplying air mist recommended
- ▶ Good cutting ability due to negative rake angle.



Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0~-0.010	h6

(mm)unit:mm

Order No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Stock
	R	D1	D2	L1	L2	L	
CN2BE002000 KKK	R0.10	0.2	4	0.2	-	40	▲
CN2BE002005 KKK	R0.10	0.2	4	0.2	0.5	40	▲
CN2BE002010 KKK	R0.10	0.2	4	0.2	1.0	40	▲
CNSBE003000 KKK	R0.15	0.3	4	0.3	-	40	▲
CN2BE003010 KKK	R0.15	0.3	4	0.3	1.0	40	▲
CN2BE003015 KKK	R0.15	0.3	4	0.3	1.5	40	▲
CN2BE003020 KKK	R0.15	0.3	4	0.3	2.0	40	▲
CN2BE004000 KKK	R0.20	0.4	4	0.4	-	40	▲
CN2BE004010 KKK	R0.20	0.4	4	0.4	1.0	40	▲
CN2BE004015 KKK	R0.20	0.4	4	0.4	1.5	40	▲
CN2BE004020 KKK	R0.20	0.4	4	0.4	2.0	40	▲
CN2BE004030 KKK	R0.20	0.4	4	0.4	3.0	40	▲
CN2BE005000 KKK	R0.25	0.5	4	0.5	-	45	▲
CN2BE005010 KKK	R0.25	0.5	4	0.5	1.0	45	▲
CN2BE005020 KKK	R0.25	0.5	4	0.5	2.0	45	▲
CN2BE005030 KKK	R0.25	0.5	4	0.5	3.0	45	▲
CN2BE005040 KKK	R0.25	0.5	4	0.5	4.0	45	▲
CN2BE006000 KKK	R0.30	0.6	4	0.6	-	45	▲
CN2BE006020 KKK	R0.30	0.6	4	0.6	2.0	45	▲
CN2BE006030 KKK	R0.30	0.6	4	0.6	3.0	45	▲
CN2BE006040 KKK	R0.30	0.6	4	0.6	4.0	45	▲
CN2BE006060 KKK	R0.30	0.6	4	0.6	6.0	45	▲
CN2BE008000 KKK	R0.40	0.8	4	0.8	-	45	▲
CN2BE008020 KKK	R0.40	0.8	4	0.8	2.0	45	▲
CN2BE008040 KKK	R0.40	0.8	4	0.8	4.0	45	▲
CN2BE008060 KKK	R0.40	0.8	4	0.8	6.0	45	▲
CN2BE008080 KKK	R0.40	0.8	4	0.8	8.0	45	▲

▲ Stock △ Non-Stock  
Recommended Cutting Conditions P.107~P.108

● Recommend ○ Suit

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened steels			Cast Iron	Aluminum	Copper Alloy	Stainless Steels	Titanium	Graphite	CFRP
~HB225	HB225~325	HRC30~40	HRC40~45	HRC45~55	HRC55~70							
				●	●							

CBN End Mill(HRC≤70)  
For High-Hardened Steels up to HRC70



# CN2BE SERIES



## CBN 2 FLUTE BALL NOSE

- ▶ Machining high hardness materials HRC50 to HRC70 into finish process for long time.
- ▶ High speed cutting with 20,000rpm and over 20,000rpm of tool and supplying air mist recommended
- ▶ Good cutting ability due to negative rake angle.



Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0~-0.010	h6

(mm)unit:mm

Order No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Stock
	R	D1	D2	L1	L2	L	
CN2BE010000 KKK	R0.50	1.0	4	1.0	-	50	▲
CN2BE010025 KKK	R0.50	1.0	4	1.0	2.5	50	▲
CN2BE010040 KKK	R0.50	1.0	4	1.0	4.0	50	▲
CN2BE010060 KKK	R0.50	1.0	4	1.0	6.0	50	▲
CN2BE010080 KKK	R0.50	1.0	4	1.0	8.0	50	▲
CN2BE012000 KKK	R0.60	1.2	4	1.2	-	50	▲
CN2BE012030 KKK	R0.60	1.2	4	1.2	3.0	50	▲
CN2BE012040 KKK	R0.60	1.2	4	1.2	4.0	50	▲
CN2BE012060 KKK	R0.60	1.2	4	1.2	6.0	50	▲
CN2BE012080 KKK	R0.60	1.2	4	1.2	8.0	50	▲
CN2BE015000 KKK	R0.75	1.5	4	1.5	-	50	▲
CN2BE015040 KKK	R0.75	1.5	4	1.5	4.0	50	▲
CN2BE015060 KKK	R0.75	1.5	4	1.5	6.0	50	▲
CN2BE015080 KKK	R0.75	1.5	4	1.5	8.0	50	▲
CN2BE015100 KKK	R0.75	1.5	4	1.5	10.0	50	▲
CN2BE020000 KKK	R1.00	2.0	4	2.0	-	50	▲
CN2BE020060 KKK	R1.00	2.0	4	2.0	6.0	50	▲
CN2BE020080 KKK	R1.00	2.0	4	2.0	8.0	50	▲
CN2BE020100 KKK	R1.00	2.0	4	2.0	10.0	50	▲
CN2BE030000 KKK	R1.50	3.0	4	2.5	-	50	▲
CN2BE030080 KKK	R1.50	3.0	4	2.5	8.0	50	▲
CN2BE030100 KKK	R1.50	3.0	4	2.5	10.0	50	▲
CN2BE030120 KKK	R1.50	3.0	4	2.5	12.0	50	▲
CN2BE030160 KKK	R1.50	3.0	4	2.5	16.0	60	▲
CN2BE030200 KKK	R1.50	3.0	4	2.5	20.0	60	▲

▲ Stock △ Non-Stock  
Recommended Cutting Conditions P.107~P.108

● Recommend ○ Suit

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened steels			Cast Iron	Aluminum	Copper Alloy	Stainless Steels	Titanium	Graphite	CFRP
~HB225	HB225~325	HRC30~40	HRC40~45	HRC45~55	HRC55~70							
				●	●							

CBN End Mill(HRC≤70)  
For High-Hardened Steels up to HRC70



# CP2BE SERIES



## CBN 2 FLUTE BALL NOSE

- ▶ Machining high hardness materials HRC50 to HRC70 into finish process for long time.
- ▶ High speed cutting with 20,000rpm and over 20,000rpm of tool and supplying air mist recommended
- ▶ Good cutting ability due to negative rake angle.



Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0~-0.010	h6

(mm)unit:mm

Order No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Stock
	R	D1	D2	L1	L2	L	
CP2BE002000 KKK	R0.10	0.2	4	0.2	-	40	▲
CP2BE002005 KKK	R0.10	0.2	4	0.2	0.5	40	▲
CP2BE002010 KKK	R0.01	0.2	4	0.2	1.0	40	▲
CP2BE003000 KKK	R0.15	0.3	4	0.3	-	40	▲
CP2BE003010 KKK	R0.15	0.3	4	0.3	1.0	40	▲
CP2BE003015 KKK	R0.15	0.3	4	0.3	1.5	40	▲
CP2BE003020 KKK	R0.15	0.3	4	0.3	2.0	40	▲
CP2BE004000 KKK	R0.20	0.4	4	0.4	-	40	▲
CP2BE004010 KKK	R0.20	0.4	4	0.4	1.0	40	▲
CP2BE004015 KKK	R0.20	0.4	4	0.4	1.5	40	▲
CP2BE004020 KKK	R0.20	0.4	4	0.4	2.0	40	▲
CP2BE004030 KKK	R0.20	0.4	4	0.4	3.0	40	▲
CP2BE005000 KKK	R0.25	0.5	4	0.5	-	45	▲
CP2BE005010 KKK	R0.25	0.5	4	0.5	1.0	45	▲
CP2BE005020 KKK	R0.25	0.5	4	0.5	2.0	45	▲
CP2BE005030 KKK	R0.25	0.5	4	0.5	3.0	45	▲
CP2BE005040 KKK	R0.25	0.5	4	0.5	4.0	45	▲
CP2BE006000 KKK	R0.30	0.6	4	0.6	-	45	▲
CP2BE006020 KKK	R0.30	0.6	4	0.6	2.0	45	▲
CP2BE006030 KKK	R0.30	0.6	4	0.6	3.0	45	▲
CP2BE006040 KKK	R0.30	0.6	4	0.6	4.0	45	▲
CP2BE006060 KKK	R0.30	0.6	4	0.6	6.0	45	▲
CP2BE008000 KKK	R0.40	0.8	4	0.8	-	45	▲
CP2BE008020 KKK	R0.40	0.8	4	0.8	2.0	45	▲
CP2BE008040 KKK	R0.40	0.8	4	0.8	4.0	45	▲
CP2BE008060 KKK	R0.40	0.8	4	0.8	6.0	45	▲
CP2BE008080 KKK	R0.40	0.8	4	0.8	8.0	45	▲

▲ Stock △ Non-Stock  
Recommended Cutting Conditions P.107~P.108

● Recommend ○ Suit

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened steels			Cast Iron	Aluminum	Copper Alloy	Stainless Steels	Titanium	Graphite	CFRP
~HB225	HB225~325	HRC30~40	HRC40~45	HRC45~55	HRC55~70							
				●	●							

CBN End Mill(HRC≤70)  
For High-Hardened Steels up to HRC70



# CP2BE SERIES



## CBN 2 FLUTE BALL NOSE

- ▶ Machining high hardness materials HRC50 to HRC70 into finish process for long time.
- ▶ High speed cutting with 20,000rpm and over 20,000rpm of tool and supplying air mist recommended
- ▶ Good cutting ability due to negative rake angle.



Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0~-0.010	h6

(mm)unit:mm

Order No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Stock
	R	D1	D2	L1	L2	L	
CP2BE010000 KKK	R0.50	1.0	4	1.2	-	50	▲
CP2BE010025 KKK	R0.50	1.0	4	1.2	2.5	50	▲
CP2BE010040 KKK	R0.50	1.0	4	1.2	4.0	50	▲
CP2BE010060 KKK	R0.50	1.0	4	1.2	6.0	50	▲
CP2BE010080 KKK	R0.05	1.0	4	1.2	8.0	50	▲
CP2BE012000 KKK	R0.60	1.2	4	1.2	-	50	▲
CP2BE012030 KKK	R0.60	1.2	4	1.2	3.0	50	▲
CP2BE012040 KKK	R0.60	1.2	4	1.2	4.0	50	▲
CP2BE012060 KKK	R0.60	1.2	4	1.2	6.0	50	▲
CP2BE012080 KKK	R0.60	1.2	4	1.2	8.0	50	▲
CP2BE015000 KKK	R0.75	1.5	4	1.5	-	50	▲
CP2BE015040 KKK	R0.75	1.5	4	1.5	4.0	50	▲
CP2BE015060 KKK	R0.75	1.5	4	1.5	6.0	50	▲
CP2BE015080 KKK	R0.75	1.5	4	1.5	8.0	50	▲
CP2BE015100 KKK	R0.75	1.5	4	1.5	10.0	50	▲
CP2BE020000 KKK	R1.00	2.0	4	2.0	-	50	▲
CP2BE020060 KKK	R1.00	2.0	4	2.0	6.0	50	▲
CP2BE020080 KKK	R1.00	2.0	4	2.0	8.0	50	▲
CP2BE020100 KKK	R1.00	2.0	4	2.0	10.0	50	▲
CP2BE030000 KKK	R1.50	3.0	4	2.5	-	50	▲
CP2BE030080 KKK	R1.50	3.0	4	2.5	8.0	50	▲
CP2BE030100 KKK	R1.50	3.0	4	2.5	10.0	50	▲
CP2BE030120 KKK	R1.50	3.0	4	2.5	12.0	50	▲
CP2BE030160 KKK	R1.50	3.0	4	2.5	16.0	60	▲
CP2BE030200 KKK	R1.50	3.0	4	2.5	20.0	60	▲

▲ Stock △ Non-Stock

Recommended Cutting Conditions P.107~P.108

● Recommend ○ Suit

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened steels			Cast Iron	Aluminum	Copper Alloy	Stainless Steels	Titanium	Graphite	CFRP
~HB225	HB225~325	HRC30~40	HRC40~45	HRC45~55	HRC55~70							
				●	●							

CBN End Mill(HRC≤70)  
For High-Hardened Steels up to HRC70



# CN2CR<sub>SERIES</sub>



## CBN, 2 FLUTE CORNER RADIUS

- ▶ Machining high hardness materials HRC50 to HRC70 into finish process for long time.
- ▶ High speed cutting with 20,000rpm and over 20,000rpm of tool and supplying air mist recommended
- ▶ Good cutting ability due to negative rake angle.



Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0~-0.010	h6

(mm)unit:mm

Order No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Stock
	R	D1	D2	L1	L2	L	
CN2CR0020002 KKK	R0.02	0.2	4	0.2	-	40	▲
CN2CR0020052 KKK	R0.02	0.2	4	0.2	0.5	40	▲
CN2CR0020102 KKK	R0.02	0.2	4	0.2	1.0	40	▲
CN2CR0020005 KKK	R0.05	0.2	4	0.2	-	40	▲
CN2CR0020055 KKK	R0.05	0.2	4	0.2	0.5	40	▲
CN2CR0020105 KKK	R0.05	0.2	4	0.2	1.0	40	▲
CN2CR0030002 KKK	R0.02	0.3	4	0.3	-	40	▲
CN2CR0030102 KKK	R0.02	0.3	4	0.3	1.0	40	▲
CN2CR0030152 KKK	R0.02	0.3	4	0.3	1.5	40	▲
CN2CR0030202 KKK	R0.02	0.3	4	0.3	2.0	40	▲
CN2CR0030005 KKK	R0.05	0.3	4	0.3	-	40	▲
CN2CR0030105 KKK	R0.05	0.3	4	0.3	1.0	40	▲
CN2CR0030155 KKK	R0.05	0.3	4	0.3	1.5	40	▲
CN2CR0030205 KKK	R0.05	0.3	4	0.3	2.0	40	▲
CN2CR0040002 KKK	R0.02	0.4	4	0.4	-	40	▲
CN2CR0040102 KKK	R0.02	0.4	4	0.4	1.0	40	▲
CN2CR0040152 KKK	R0.02	0.4	4	0.4	1.5	40	▲
CN2CR0040202 KKK	R0.02	0.4	4	0.4	2.0	40	▲
CN2CR0040302 KKK	R0.02	0.4	4	0.4	3.0	40	▲
CN2CR0040005 KKK	R0.05	0.4	4	0.4	-	40	▲
CN2CR0040105 KKK	R0.05	0.4	4	0.4	1.0	40	▲
CN2CR0040155 KKK	R0.05	0.4	4	0.4	1.5	40	▲
CN2CR0040205 KKK	R0.05	0.4	4	0.4	2.0	40	▲
CN2CR0040305 KKK	R0.05	0.4	4	0.4	3.0	40	▲
CN2CR0040001 KKK	R0.10	0.4	4	0.4	-	40	▲
CN2CR0040101 KKK	R0.10	0.4	4	0.4	1.0	40	▲
CN2CR0040151 KKK	R0.10	0.4	4	0.4	1.5	40	▲

▲ Stock △ Non-Stock  
Recommended Cutting Conditions P.109

● Recommend ○ Suit

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened steels			Cast Iron	Aluminum	Copper Alloy	Stainless Steels	Titanium	Graphite	CFRP
~HB225	HB225~325	HRC30~40	HRC40~45	HRC45~55	HRC55~70							
				●	●							

CBN End Mill(HRC≤70)  
For High-Hardened Steels up to HRC70



# CN2CR<sub>SERIES</sub>



## CBN, 2 FLUTE CORNER RADIUS

- ▶ Machining high hardness materials HRC50 to HRC70 into finish process for long time.
- ▶ High speed cutting with 20,000rpm and over 20,000rpm of tool and supplying air mist recommended
- ▶ Good cutting ability due to negative rake angle.



Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0~-0.010	h6

(mm)unit:mm

Order No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Stock
	R	D1	D2	L1	L2	L	
CN2CR0040201 KKK	R0.10	0.4	4	0.4	2	40	▲
CN2CR0040301 KKK	R0.10	0.4	4	0.4	3	40	▲
CN2CR0050002 KKK	R0.02	0.5	4	0.5	-	40	▲
CN2CR0050102 KKK	R0.02	0.5	4	0.5	1	40	▲
CN2CR0050202 KKK	R0.02	0.5	4	0.5	2	40	▲
CN2CR0050302 KKK	R0.02	0.5	4	0.5	3	40	▲
CN2CR0050402 KKK	R0.02	0.5	4	0.5	4	40	▲
CN2CR0050005 KKK	R0.05	0.5	4	0.5	-	40	▲
CN2CR0050105 KKK	R0.05	0.5	4	0.5	1	40	▲
CN2CR0050205 KKK	R0.05	0.5	4	0.5	2	40	▲
CN2CR0050305 KKK	R0.05	0.5	4	0.5	3	40	▲
CN2CR0050405 KKK	R0.05	0.5	4	0.5	4	40	▲
CN2CR0050001 KKK	R0.10	0.5	4	0.5	-	40	▲
CN2CR0050101 KKK	R0.10	0.5	4	0.5	1	40	▲
CN2CR0050201 KKK	R0.10	0.5	4	0.5	2	40	▲
CN2CR0050301 KKK	R0.10	0.5	4	0.5	3	40	▲
CN2CR0050401 KKK	R0.10	0.5	4	0.5	4	40	▲
CN2CR0060002 KKK	R0.02	0.6	4	0.6	-	45	▲
CN2CR0060202 KKK	R0.02	0.6	4	0.6	2	45	▲
CN2CR0060302 KKK	R0.02	0.6	4	0.6	3	45	▲
CN2CR0060402 KKK	R0.02	0.6	4	0.6	4	45	▲
CN2CR0060005 KKK	R0.05	0.6	4	0.6	-	45	▲
CN2CR0060205 KKK	R0.05	0.6	4	0.6	2	45	▲
CN2CR0060305 KKK	R0.05	0.6	4	0.6	3	45	▲
CN2CR0060405 KKK	R0.05	0.6	4	0.6	4	45	▲
CN2CR0060001 KKK	R0.10	0.6	4	0.6	-	45	▲
CN2CR0060201 KKK	R0.10	0.6	4	0.6	2	45	▲

▲ Stock △ Non-Stock  
Recommended Cutting Conditions P.109

● Recommend ○ Suit

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened steels			Cast Iron	Aluminum	Copper Alloy	Stainless Steels	Titanium	Graphite	CFRP
~HB225	HB225~325	HRC30~40	HRC40~45	HRC45~55	HRC55~70							
				●	●							



CBN End Mill(HRC≤70)  
For High-Hardened Steels up to HRC70



# CN2CR<sub>SERIES</sub>



## CBN, 2 FLUTE CORNER RADIUS

- ▶ Machining high hardness materials HRC50 to HRC70 into finish process for long time.
- ▶ High speed cutting with 20,000rpm and over 20,000rpm of tool and supplying air mist recommended
- ▶ Good cutting ability due to negative rake angle.



Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0~-0.010	h6

(mm)unit:mm

Order No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Stock
	R	D1	D2	L1	L2	L	
CN2CR0060301 KKK	R0.10	0.6	4	0.6	3.0	45	▲
CN2CR0060401 KKK	R0.10	0.6	4	0.6	4.0	45	▲
CN2CR0060020 KKK	R0.20	0.6	4	0.6	-	45	▲
CN2CR0060220 KKK	R0.20	0.6	4	0.6	2.0	45	▲
CN2CR0060320 KKK	R0.20	0.6	4	0.6	3.0	45	▲
CN2CR0060420 KKK	R0.20	0.6	4	0.6	4.0	45	▲
CN2CR0080002 KKK	R0.02	0.8	4	0.8	-	45	▲
CN2CR0080202 KKK	R0.02	0.8	4	0.8	2.0	45	▲
CN2CR0080402 KKK	R0.02	0.8	4	0.8	4.0	45	▲
CN2CR0080602 KKK	R0.02	0.8	4	0.8	6.0	45	▲
CN2CR0080005 KKK	R0.05	0.8	4	0.8	-	45	▲
CN2CR0080205 KKK	R0.05	0.8	4	0.8	2.0	45	▲
CN2CR0080405 KKK	R0.05	0.8	4	0.8	4.0	45	▲
CN2CR0080605 KKK	R0.05	0.8	4	0.8	6.0	45	▲
CN2CR0080001 KKK	R0.10	0.8	4	0.8	-	45	▲
CN2CR0080201 KKK	R0.10	0.8	4	0.8	2.0	45	▲
CN2CR0080401 KKK	R0.10	0.8	4	0.8	4.0	45	▲
CN2CR0080601 KKK	R0.10	0.8	4	0.8	6.0	45	▲
CN2CR008000 KKK	R0.20	0.8	4	0.8	-	45	▲
CN2CR008020 KKK	R0.20	0.8	4	0.8	2.0	45	▲
CN2CR008040 KKK	R0.20	0.8	4	0.8	4.0	45	▲
CN2CR008060 KKK	R0.20	0.8	4	0.8	6.0	45	▲
CN2CR0100002 KKK	R0.02	1.0	4	1	-	50	▲
CN2CR0100252 KKK	R0.02	1.0	4	1	2.5	50	▲
CN2CR0100402 KKK	R0.02	1.0	4	1	4.0	50	▲
CN2CR0100602 KKK	R0.02	1.0	4	1	6.0	50	▲
CN2CR0100005 KKK	R0.05	1.0	4	1	-	50	▲

▲ Stock △ Non-Stock  
Recommended Cutting Conditions P.109

● Recommend ○ Suit

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened steels			Cast Iron	Aluminum	Copper Alloy	Stainless Steels	Titanium	Graphite	CFRP
~HB225	HB225-325	HRC30~40	HRC40-45	HRC45-55	HRC55-70							
				●	●							

CBN End Mill(HRC≤70)  
For High-Hardened Steels up to HRC70



# CN2CR<sub>SERIES</sub>



## CBN, 2 FLUTE CORNER RADIUS

- ▶ Machining high hardness materials HRC50 to HRC70 into finish process for long time.
- ▶ High speed cutting with 20,000rpm and over 20,000rpm of tool and supplying air mist recommended
- ▶ Good cutting ability due to negative rake angle.



Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0~-0.010	h6

(mm)unit:mm

Order No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Stock
	R	D1	D2	L1	L2	L	
CN2CR0100255 KKK	R0.05	1.0	4	1.0	2.5	50	▲
CN2CR0100405 KKK	R0.05	1.0	4	1.0	4.0	50	▲
CN2CR0100605 KKK	R0.05	1.0	4	1.0	6.0	50	▲
CN2CR0100001 KKK	R0.10	1.0	4	1.0	-	50	▲
CM2CR0100251 KKK	R0.10	1.0	4	1.0	2.5	50	▲
CN2CR0100401 KKK	R0.10	1.0	4	1.0	4.0	50	▲
CN2CR0100601 KKK	R0.10	1.0	4	1.0	6.0	50	▲
CN2CR01000020 KKK	R0.20	1.0	4	1.0	-	50	▲
CN2CR01002520 KKK	R0.20	1.0	4	1.0	2.5	50	▲
CN2CR01004020 KKK	R0.20	1.0	4	1.0	4.0	50	▲
CN2CR01006020 KKK	R0.20	1.0	4	1.0	6.0	50	▲
CN2CR010000 KKK	R0.30	1.0	4	1.0	-	50	▲
CN2CR010025 KKK	R0.30	1.0	4	1.0	2.5	50	▲
CN2CR010040 KKK	R0.30	1.0	4	1.0	4.0	50	▲
CN2CR010060 KKK	R0.30	1.0	4	1.0	6.0	50	▲
CN2CR0150002 KKK	R0.02	1.5	4	1.5	-	50	▲
CN2CR0150402 KKK	R0.02	1.5	4	1.5	4.0	50	▲
CN2CR0150602 KKK	R0.02	1.5	4	1.5	6.0	50	▲
CN2CR0150802 KKK	R0.02	1.5	4	1.5	8.0	50	▲
CN2CR0151002 KKK	R0.02	1.5	4	1.5	10.0	50	▲
CN2CR0150005 KKK	R0.05	1.5	4	1.5	-	50	▲
CN2CR0150405 KKK	R0.05	1.5	4	1.5	4.0	50	▲
CN2CR0150605 KKK	R0.05	1.5	4	1.5	6.0	50	▲
CN2CR0150805 KKK	R0.05	1.5	4	1.5	8.0	50	▲
CN2CR0151005 KKK	R0.05	1.5	4	1.5	10.0	50	▲
CN2CR0150001 KKK	R0.10	1.5	4	1.5	-	50	▲
CN2CR0150401 KKK	R0.10	1.5	4	1.5	4.0	50	▲

▲ Stock △ Non-Stock  
Recommended Cutting Conditions P.109

● Recommend ○ Suit

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened steels			Cast Iron	Aluminum	Copper Alloy	Stainless Steels	Titanium	Graphite	CFRP
~HB225	HB225~325	HRC30~40	HRC40~45	HRC45~55	HRC55~70							
				●	●							

CBN End Mill(HRC≤70)  
For High-Hardened Steels up to HRC70



# CN2CR<sub>SERIES</sub>



## CBN, 2 FLUTE CORNER RADIUS

- ▶ Machining high hardness materials HRC50 to HRC70 into finish process for long time.
- ▶ High speed cutting with 20,000rpm and over 20,000rpm of tool and supplying air mist recommended
- ▶ Good cutting ability due to negative rake angle.



Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0~-0.010	h6

(mm)unit:mm

Order No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Stock
	R	D1	D2	L1	L2	L	
CN2CR0150601 KKK	R0.10	1.5	4	1.5	6	50	▲
CN2CR0150801 KKK	R0.10	1.5	4	1.5	8	50	▲
CN2CR0151001 KKK	R0.10	1.5	4	1.5	10	50	▲
CN2CR01500020 KKK	R0.20	1.5	4	1.5	-	50	▲
CN2CR01504020 KKK	R0.20	1.5	4	1.5	4	50	▲
CN2CR01506020 KKK	R0.20	1.5	4	1.5	6	50	▲
CN2CR01508020 KKK	R0.20	1.5	4	1.5	8	50	▲
CN2CR01510020 KKK	R0.20	1.5	4	1.5	10	50	▲
CN2CR0150003 KKK	R0.30	1.5	4	1.5	-	50	▲
CN2CR0150403 KKK	R0.30	1.5	4	1.5	4	50	▲
CN2CR0150603 KKK	R0.30	1.5	4	1.5	6	50	▲
CN2CR0150803 KKK	R0.30	1.5	4	1.5	8	50	▲
CN2CR0151003 KKK	R0.30	1.5	4	1.5	10	50	▲
CN2CR015000 KKK	R0.50	1.5	4	1.5	-	50	▲
CN2CR015040 KKK	R0.50	1.5	4	1.5	4	50	▲
CN2CR015060 KKK	R0.50	1.5	4	1.5	6	50	▲
CN2CR015080 KKK	R0.50	1.5	4	1.5	8	50	▲
CN2CR015100 KKK	R0.50	1.5	4	1.5	10	50	▲
CN2CR0200005 KKK	R0.05	2.0	4	2.0	-	50	▲
CN2CR0200605 KKK	R0.05	2.0	4	2.0	6	50	▲
CN2CR0200805 KKK	R0.05	2.0	4	2.0	8	50	▲
CN2CR0201005 KKK	R0.05	2.0	4	2.0	10	50	▲
CN2CR0200001 KKK	R0.10	2.0	4	2.0	-	50	▲
CN2CR0200601 KKK	R0.10	2.0	4	2.0	6	50	▲
CN2CR0200801 KKK	R0.10	2.0	4	2.0	8	50	▲
CN2CA0201001 KKK	R0.10	2.0	4	2.0	10	50	▲
CN2CR0200002 KKK	R0.20	2.0	4	2.0	-	50	▲

▲ Stock △ Non-Stock  
Recommended Cutting Conditions P.109

● Recommend ○ Suit

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened steels			Cast Iron	Aluminum	Copper Alloy	Stainless Steels	Titanium	Graphite	CFRP
~HB225	HB225~325	HRC30~40	HRC40~45	HRC45~55	HRC55~70							
				●	●							

CBN End Mill(HRC≤70)  
For High-Hardened Steels up to HRC70



# CN2CR<sub>SERIES</sub>



## CBN, 2 FLUTE CORNER RADIUS

- ▶ Machining high hardness materials HRC50 to HRC70 into finish process for long time.
- ▶ High speed cutting with 20,000rpm and over 20,000rpm of tool and supplying air mist recommended
- ▶ Good cutting ability due to negative rake angle.



Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0~-0.010	h6

(mm)unit:mm

Order No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Stock
	R	D1	D2	L1	L2	L	
CN2CR0200602 KKK	R0.20	2.0	4	2.0	6	50	▲
CN2CR0200802 KKK	R0.20	2.0	4	2.0	8	50	▲
CN2CR0201002 KKK	R0.20	2.0	4	2.0	10	50	▲
CN2CR0200003 KKK	R0.30	2.0	4	2.0	-	50	▲
CN2CR0200603 KKK	R0.30	2.0	4	2.0	6	50	▲
CN2CR0200803 KKK	R0.30	2.0	4	2.0	8	50	▲
CN2CR0201003 KKK	R0.30	2.0	4	2.0	10	50	▲
CN2CR020000 KKK	R0.50	2.0	4	2.0	-	50	▲
CN2CR020060 KKK	R0.50	2.0	4	2.0	6	50	▲
CN2CR020080 KKK	R0.50	2.0	4	2.0	8	50	▲
CN2CR020100 KKK	R0.50	2.0	4	2.0	10	50	▲
CN2CR0300005 KKK	R0.05	3.0	4	2.5	-	50	▲
CN2CR0300805 KKK	R0.05	3.0	4	2.5	8	50	▲
CN2CR0301005 KKK	R0.05	3.0	4	2.5	10	50	▲
CN2CR0301205 KKK	R0.05	3.0	4	2.5	12	50	▲
CN2CR0301605 KKK	R0.05	3.0	4	2.5	16	60	▲
CN2CR0302005 KKK	R0.05	3.0	4	2.5	20	60	▲
CN2CR0300001 KKK	R0.10	3.0	4	2.5	-	50	▲
CN2CR0300801 KKK	R0.10	3.0	4	2.5	8	50	▲
CN2CR0301001 KKK	R0.10	3.0	4	2.5	10	50	▲
CN2CR0301201 KKK	R0.10	3.0	4	2.5	12	50	▲
CN2CR0301601 KKK	R0.10	3.0	4	2.5	16	60	▲
CN2CR0302001 KKK	R0.10	3.0	4	2.5	20	60	▲
CN2CR0300002 KKK	R0.20	3.0	4	2.5	-	50	▲
CN2CR0300802 KKK	R0.20	3.0	4	2.5	8	50	▲
CN2CR0301002 KKK	R0.20	3.0	4	2.5	10	50	▲
CN2CR0301202 KKK	R0.20	3.0	4	2.5	12	50	▲

▲ Stock △ Non-Stock  
Recommended Cutting Conditions P.109

● Recommend ○ Suit

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened steels			Cast Iron	Aluminum	Copper Alloy	Stainless Steels	Titanium	Graphite	CFRP
~HB225	HB225~325	HRC30~40	HRC40~45	HRC45~55	HRC55~70							
				●	●							



# CN2CR<sub>SERIES</sub>



## CBN, 2 FLUTE CORNER RADIUS

- ▶ Machining high hardness materials HRC50 to HRC70 into finish process for long time.
- ▶ High speed cutting with 20,000rpm and over 20,000rpm of tool and supplying air mist recommended
- ▶ Good cutting ability due to negative rake angle.



Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0~-0.010	h6

(mm)unit:mm

Order No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Stock
	R	D1	D2	L1	L2	L	
CN2CR0301602 KKK	R0.2	3.0	4	2.5	16	60	▲
CN2CR0302002 KKK	R0.2	3.0	4	2.5	20	60	▲
CN2CR0300003 KKK	R0.3	3.0	4	2.5	-	50	▲
CN2CR0300803 KKK	R0.3	3.0	4	2.5	8	50	▲
CN2CR0301003 KKK	R0.3	3.0	4	2.5	10	50	▲
CN2CR0301203 KKK	R0.3	3.0	4	2.5	12	50	▲
CN2CR0301603 KKK	R0.3	3.0	4	2.5	16	60	▲
CN2CR0302003 KKK	R0.3	3.0	4	2.5	20	60	▲
CN2CR0300000 KKK	R0.5	3.0	4	2.5	-	50	▲
CN2CR0300800 KKK	R0.5	3.0	4	2.5	8	50	▲
CN2CR0301000 KKK	R0.5	3.0	4	2.5	10	50	▲
CN2CR0301200 KKK	R0.5	3.0	4	2.5	12	50	▲
CN2CR0301600 KKK	R0.5	3.0	4	2.5	16	60	▲
CN2CR0302000 KKK	R0.5	3.0	4	2.5	20	60	▲

▲ Stock △ Non-Stock  
Recommended Cutting Conditions P.109

● Recommend ○ Suit

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened steels			Cast Iron	Aluminum	Copper Alloy	Stainless Steels	Titanium	Graphite	CFRP
~HB225	HB225~325	HRC30~40	HRC40~45	HRC45~55	HRC55~70							
				●	●							

CBN End Mill(HRC≤70)  
For High-Hardened Steels up to HRC70



# CP2CR<sub>SERIES</sub>



## CBN, 2 FLUTE CORNER RADIUS

- ▶ Machining high hardness materials HRC50 to HRC70 into finish process for long time.
- ▶ High speed cutting with 20,000rpm and over 20,000rpm of tool and supplying air mist recommended
- ▶ Good cutting ability due to negative rake angle.



Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0~-0.010	h6

(mm)unit:mm

Order No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Stock
	R	D1	D2	L1	L2	L	
CP2CR0020002 KKK	R0.02	0.2	4	0.2	-	40	▲
CP2CR0020052 KKK	R0.02	0.2	4	0.2	0.5	40	▲
CP2CR0020102 KKK	R0.02	0.2	4	0.2	1.0	40	▲
CP2CR0020005 KKK	R0.05	0.2	4	0.2	-	40	▲
CP2CR0020055 KKK	R0.05	0.2	4	0.2	0.5	40	▲
CP2CR0020105 KKK	R0.05	0.2	4	0.2	1.0	40	▲
CP2CR0030002 KKK	R0.02	0.3	4	0.3	-	40	▲
CP2CR0030102 KKK	R0.02	0.3	4	0.3	1.0	40	▲
CP2CR0030152 KKK	R0.02	0.3	4	0.3	1.5	40	▲
CP2CR0030202 KKK	R0.02	0.3	4	0.3	2.0	40	▲
CP2CR0030005 KKK	R0.05	0.3	4	0.3	-	40	▲
CP2CR0030105 KKK	R0.05	0.3	4	0.3	1.0	40	▲
CP2CR0030155 KKK	R0.05	0.3	4	0.3	1.5	40	▲
CP2CR0030205 KKK	R0.05	0.3	4	0.3	2.0	40	▲
CP2CR0040002 KKK	R0.02	0.4	4	0.4	-	40	▲
CP2CR0040102 KKK	R0.02	0.4	4	0.4	1.0	40	▲
CP2CR0040152 KKK	R0.02	0.4	4	0.4	1.5	40	▲
CP2CR0040202 KKK	R0.02	0.4	4	0.4	2.0	40	▲
CP2CR0040302 KKK	R0.02	0.4	4	0.4	3.0	40	▲
CP2CR0040005 KKK	R0.05	0.4	4	0.4	-	40	▲
CP2CR0040105 KKK	R0.05	0.4	4	0.4	1.0	40	▲
CP2CR0040155 KKK	R0.05	0.4	4	0.4	1.5	40	▲
CP2CR0040205 KKK	R0.05	0.4	4	0.4	2.0	40	▲
CP2CR0040305 KKK	R0.05	0.4	4	0.4	3.0	40	▲
CP2CR0040001 KKK	R0.10	0.4	4	0.4	-	40	▲
CP2CR0040101 KKK	R0.10	0.4	4	0.4	1.0	40	▲
CP2CR0040151 KKK	R0.1	0.4	4	0.4	1.5	40	▲

▲ Stock △ Non-Stock  
Recommended Cutting Conditions P.109

● Recommend ○ Suit

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened steels			Cast Iron	Aluminum	Copper Alloy	Stainless Steels	Titanium	Graphite	CFRP
~HB225	HB225~325	HRC30~40	HRC40~45	HRC45~55	HRC55~70							
				●	●							

CBN End Mill(HRC≤70)  
For High-Hardened Steels up to HRC70



# CP2CR<sub>SERIES</sub>



## CBN, 2 FLUTE CORNER RADIUS

- ▶ Machining high hardness materials HRC50 to HRC70 into finish process for long time.
- ▶ High speed cutting with 20,000rpm and over 20,000rpm of tool and supplying air mist recommended
- ▶ Good cutting ability due to negative rake angle.



Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0~-0.010	h6

(mm)unit:mm

Order No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Stock
	R	D1	D2	L1	L2	L	
CP2CR0040201 KKK	R0.10	0.4	4	0.4	2	40	▲
CP2CR0040301 KKK	R0.10	0.4	4	0.4	3	40	▲
CP2CR0050002 KKK	R0.02	0.5	4	0.5	-	40	▲
CP2CR0050102 KKK	R0.02	0.5	4	0.5	1	40	▲
CP2CR0050202 KKK	R0.02	0.5	4	0.5	2	40	▲
CP2CR0050302 KKK	R0.02	0.5	4	0.5	3	40	▲
CP2CR0050402 KKK	R0.02	0.5	4	0.5	4	40	▲
CP2CR0050005 KKK	R0.05	0.5	4	0.5	-	40	▲
CP2CR0050105 KKK	R0.05	0.5	4	0.5	1	40	▲
CP2CR0050205 KKK	R0.05	0.5	4	0.5	2	40	▲
CP2CR0050305 KKK	R0.05	0.5	4	0.5	3	40	▲
CP2CR0050405 KKK	R0.05	0.5	4	0.5	4	40	▲
CP2CR0050001 KKK	R0.10	0.5	4	0.5	-	40	▲
CP2CR0050101 KKK	R0.10	0.5	4	0.5	1	40	▲
CP2CR0050201 KKK	R0.10	0.5	4	0.5	2	40	▲
CP2CR0050301 KKK	R0.10	0.5	4	0.5	3	40	▲
CP2CR0050401 KKK	R0.10	0.5	4	0.5	4	40	▲
CP2CR0060002 KKK	R0.02	0.6	4	0.6	-	45	▲
CP2CR0060202 KKK	R0.02	0.6	4	0.6	2	45	▲
CP2CR0060302 KKK	R0.02	0.6	4	0.6	3	45	▲
CP2CR0060402 KKK	R0.02	0.6	4	0.6	4	45	▲
CP2CR0060005 KKK	R0.05	0.6	4	0.6	-	45	▲
CP2CR0060205 KKK	R0.05	0.6	4	0.6	2	45	▲
CP2CR0060305 KKK	R0.05	0.6	4	0.6	3	45	▲
CP2CR0060405 KKK	R0.05	0.6	4	0.6	4	45	▲
CP2CR0060001 KKK	R0.10	0.6	4	0.6	-	45	▲
CP2CR0060201 KKK	R0.10	0.6	4	0.6	2	45	▲

▲ Stock △ Non-Stock  
Recommended Cutting Conditions P.109

● Recommend ○ Suit

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened steels			Cast Iron	Aluminum	Copper Alloy	Stainless Steels	Titanium	Graphite	CFRP
~HB225	HB225~325	HRC30~40	HRC40~45	HRC45~55	HRC55~70							
				●	●							

CBN End Mill(HRC≤70)  
For High-Hardened Steels up to HRC70



# CP2CR<sub>SERIES</sub>



## CBN, 2 FLUTE CORNER RADIUS

- ▶ Machining high hardness materials HRC50 to HRC70 into finish process for long time.
- ▶ High speed cutting with 20,000rpm and over 20,000rpm of tool and supplying air mist recommended
- ▶ Good cutting ability due to negative rake angle.



Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0~-0.010	h6

(mm)unit:mm

Order No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Stock
	R	D1	D2	L1	L2	L	
CP2CR0060301 KKK	R0.10	0.6	4	0.6	3.0	45	▲
CP2CR0060401 KKK	R0.10	0.6	4	0.6	4.0	45	▲
CP2CR0060020 KKK	R0.20	0.6	4	0.6	-	45	▲
CP2CR0060220 KKK	R0.20	0.6	4	0.6	2.0	45	▲
CP2CR0060320 KKK	R0.20	0.6	4	0.6	3.0	45	▲
CP2CR0060420 KKK	R0.20	0.6	4	0.6	4.0	45	▲
CP2CR0080002 KKK	R0.02	0.8	4	0.8	-	45	▲
CP2CR0080202 KKK	R0.02	0.8	4	0.8	2.0	45	▲
CP2CR0C80402 KKK	R0.02	0.8	4	0.8	4.0	45	▲
CP2CR0080602 KKK	R0.02	0.8	4	0.8	6.0	45	▲
CP2CR0080005 KKK	R0.05	0.8	4	0.8	-	45	▲
CP2CR0080205 KKK	R0.05	0.8	4	0.8	2.0	45	▲
CP2CR0080405 KKK	R0.05	0.8	4	0.8	4.0	45	▲
CP2CR0080605 KKK	R0.05	0.8	4	0.8	6.0	45	▲
CP2CR0080001 KKK	R0.10	0.8	4	0.8	-	45	▲
CP2CR0080201 KKK	R0.10	0.8	4	0.8	2.0	45	▲
CP2CR0080401 KKK	R0.10	0.8	4	0.8	4.0	45	▲
CP2CR0080601 KKK	R0.10	0.8	4	0.8	6.0	45	▲
CP2CR008000 KKK	R0.20	0.8	4	0.8	-	45	▲
CP2CR008020 KKK	R0.20	0.8	4	0.8	2.0	45	▲
CP2CR008040 KKK	R0.20	0.8	4	0.8	4.0	45	▲
CP2CR008060 KKK	R0.20	0.8	4	0.8	6.0	45	▲
CP2CR0100002 KKK	R0.02	1.0	4	1.0	-	50	▲
CP2CR0100252 KKK	R0.02	1.0	4	1.0	2.5	50	▲
CP2CR0100402 KKK	R0.02	1.0	4	1.0	4.0	50	▲
CP2CR0100602 KKK	R0.02	1.0	4	1.0	6.0	50	▲
CP2CR0100005 KKK	R0.05	1.0	4	1.0	-	50	▲

▲ Stock △ Non-Stock  
Recommended Cutting Conditions P.109

● Recommend ○ Suit

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened steels			Cast Iron	Aluminum	Copper Alloy	Stainless Steels	Titanium	Graphite	CFRP
~HB225	HB225-325	HRC30~40	HRC40-45	HRC45-55	HRC55-70							
				●	●							



CBN End Mill(HRC≤70)  
For High-Hardened Steels up to HRC70



# CP2CR<sub>SERIES</sub>



## CBN, 2 FLUTE CORNER RADIUS

- ▶ Machining high hardness materials HRC50 to HRC70 into finish process for long time.
- ▶ High speed cutting with 20,000rpm and over 20,000rpm of tool and supplying air mist recommended
- ▶ Good cutting ability due to negative rake angle.



Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0~-0.010	h6

(mm)unit:mm

Order No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Stock
	R	D1	D2	L1	L2	L	
CP2CR0100255 KKK	R0.05	1.0	4	1.0	2.5	50	▲
CP2CR0100405 KKK	R0.05	1.0	4	1.0	4.0	50	▲
CP2CR0100605 KKK	R0.05	1.0	4	1.0	6.0	50	▲
CP2CR0100001 KKK	R0.10	1.0	4	1.0	-	50	▲
CP2CR0100251 KKK	R0.10	1.0	4	1.0	2.5	50	▲
CP2CR0100401 KKK	R0.10	1.0	4	1.0	4.0	50	▲
CP2CR0100601 KKK	R0.10	1.0	4	1.0	6.0	50	▲
CP2CR01000020 KKK	R0.20	1.0	4	1.0	-	50	▲
CP2CR01002520 KKK	R0.20	1.0	4	1.0	2.5	50	▲
CP2CR01004020 KKK	R0.20	1.0	4	1.0	4.0	50	▲
CP2CR01006020 KKK	R0.20	1.0	4	1.0	6.0	50	▲
CP2CR010000 KKK	R0.30	1.0	4	1.0	-	50	▲
CP2CR010025 KKK	R0.30	1.0	4	1.0	2.5	50	▲
CP2CR010040 KKK	R0.30	1.0	4	1.0	4.0	50	▲
CP2CR010060 KKK	R0.30	1.0	4	1.0	6.0	50	▲
CP2CR0150002 KKK	R0.02	1.5	4	1.5	-	50	▲
CP2CR0150402 KKK	R0.02	1.5	4	1.5	4.0	50	▲
CP2CR0150602 KKK	R0.02	1.5	4	1.5	6.0	50	▲
CP2CR0150802 KKK	R0.02	1.5	4	1.5	8.0	50	▲
CP2CR0151002 KKK	R0.02	1.5	4	1.5	10.0	50	▲
CP2CR0150005 KKK	R0.05	1.5	4	1.5	-	50	▲
CP2CR0150405 KKK	R0.05	1.5	4	1.5	4.0	50	▲
CP2CR0150605 KKK	R0.05	1.5	4	1.5	6.0	50	▲
CP2CR0150805 KKK	R0.05	1.5	4	1.5	8.0	50	▲
CP2CR0151005 KKK	R0.05	1.5	4	1.5	10.0	50	▲
CP2CR0150001 KKK	R0.10	1.5	4	1.5	-	50	▲
CP2CR0150401 KKK	R0.10	1.5	4	1.5	4.0	50	▲

▲ Stock △ Non-Stock  
Recommended Cutting Conditions P.109

● Recommend ○ Suit

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened steels			Cast Iron	Aluminum	Copper Alloy	Stainless Steels	Titanium	Graphite	CFRP
~HB225	HB225~325	HRC30~40	HRC40~45	HRC45~55	HRC55~70							
				●	●							

CBN End Mill(HRC≤70)  
For High-Hardened Steels up to HRC70



# CP2CR<sub>SERIES</sub>



## CBN, 2 FLUTE CORNER RADIUS

- ▶ Machining high hardness materials HRC50 to HRC70 into finish process for long time.
- ▶ High speed cutting with 20,000rpm and over 20,000rpm of tool and supplying air mist recommended
- ▶ Good cutting ability due to negative rake angle.



Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0~-0.010	h6

(mm)unit:mm

Order No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Stock
	R	D1	D2	L1	L2	L	
CP2CR0150601 KKK	R0.10	1.5	4	1.5	6	50	▲
CP2CR0150801 KKK	R0.10	1.5	4	1.5	8	50	▲
CP2CR0151001 KKK	R0.10	1.5	4	1.5	10	50	▲
CP2CR01500020 KKK	R0.20	1.5	4	1.5	-	50	▲
CP2CR01504020 KKK	R0.20	1.5	4	1.5	4	50	▲
CP2CR01506020 KKK	R0.20	1.5	4	1.5	6	50	▲
CP2CR01508020 KKK	R0.20	1.5	4	1.5	8	50	▲
CP2CR01510020 KKK	R0.20	1.5	4	1.5	10	50	▲
CP2CR0150003 KKK	R0.30	1.5	4	1.5	-	50	▲
CP2CR0150403 KKK	R0.30	1.5	4	1.5	4	50	▲
CP2CR0150603 KKK	R0.30	1.5	4	1.5	6	50	▲
CP2CR0150803 KKK	R0.30	1.5	4	1.5	8	50	▲
CP2CR0151003 KKK	R0.30	1.5	4	1.5	10	50	▲
CP2CR015000 KKK	R0.50	1.5	4	1.5	-	50	▲
CP2CR015040 KKK	R0.50	1.5	4	1.5	4	50	▲
CP2CR015060 KKK	R0.50	1.5	4	1.5	6	50	▲
CP2CR015080 KKK	R0.50	1.5	4	1.5	8	50	▲
CP2CR015100 KKK	R0.50	1.5	4	1.5	10	50	▲
CP2CR0200005 KKK	R0.05	2.0	4	2.0	-	50	▲
CP2CR0200605 KKK	R0.05	2.0	4	2.0	6	50	▲
CP2CR0200805 KKK	R0.05	2.0	4	2.0	8	50	▲
CP2CR0201005 KKK	R0.05	2.0	4	2.0	10	50	▲
CP2CR0200001 KKK	R0.10	2.0	4	2.0	-	50	▲
CP2CR0200601 KKK	R0.10	2.0	4	2.0	6	50	▲
CP2CR0200801 KKK	R0.10	2.0	4	2.0	8	50	▲
CP2CR0201001 KKK	R0.10	2.0	4	2.0	10	50	▲
CP2CR0200002 KKK	R0.20	2.0	4	2.0	-	50	▲

▲ Stock △ Non-Stock  
Recommended Cutting Conditions P.109

● Recommend ○ Suit

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened steels			Cast Iron	Aluminum	Copper Alloy	Stainless Steels	Titanium	Graphite	CFRP
~HB225	HB225~325	HRC30~40	HRC40~45	HRC45~55	HRC55~70							
				●	●							

CBN End Mill(HRC≤70)  
For High-Hardened Steels up to HRC70



# CP2CR<sub>SERIES</sub>



## CBN, 2 FLUTE CORNER RADIUS

- ▶ Machining high hardness materials HRC50 to HRC70 into finish process for long time.
- ▶ High speed cutting with 20,000rpm and over 20,000rpm of tool and supplying air mist recommended
- ▶ Good cutting ability due to negative rake angle.



Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0~-0.010	h6

Order No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Stock
	R	D1	D2	L1	L2	L	
CP2CR0200602 KKK	R0.20	2.0	4	2.0	6	50	▲
CP2CR0200802 KKK	R0.20	2.0	4	2.0	8	50	▲
CP2CR0201002 KKK	R0.20	2.0	4	2.0	10	50	▲
CP2CR0200003 KKK	R0.30	2.0	4	2.0	-	50	▲
CP2CR0200603 KKK	R0.30	2.0	4	2.0	6	50	▲
CP2CR0200803 KKK	R0.30	2.0	4	2.0	8	50	▲
CP2CR0201003 KKK	R0.30	2.0	4	2.0	10	50	▲
CP2CR020000 KKK	R0.50	2.0	4	2.0	-	50	▲
CP2CR020060 KKK	R0.50	2.0	4	2.0	6	50	▲
CP2CR020080 KKK	R0.50	2.0	4	2.0	8	50	▲
CP2CR020100 KKK	R0.50	2.0	4	2.0	10	50	▲
CP2CR0300005 KKK	R0.05	3.0	4	2.5	-	50	▲
CP2CR0300805 KKK	R0.05	3.0	4	2.5	8	50	▲
CP2CR0301005 KKK	R0.05	3.0	4	2.5	10	50	▲
CP2CR0301205 KKK	R0.05	3.0	4	2.5	12	50	▲
CP2CR0301605 KKK	R0.05	3.0	4	2.5	16	60	▲
CP2CR0302005 KKK	R0.05	3.0	4	2.5	20	60	▲
CP2CR0300001 KKK	R0.10	3.0	4	2.5	-	50	▲
CP2CR0300801 KKK	R0.10	3.0	4	2.5	8	50	▲
CP2CR0301001 KKK	R0.10	3.0	4	2.5	10	50	▲
CP2CR0301201 KKK	R0.10	3.0	4	2.5	12	50	▲
CP2CR0301601 KKK	R0.10	3.0	4	2.5	16	60	▲
CP2CR0302001 KKK	R0.10	3.0	4	2.5	20	60	▲
CP2CR0300002 KKK	R0.20	3.0	4	2.5	-	50	▲
CP2CR0300802 KKK	R0.20	3.0	4	2.5	8	50	▲
CP2CR0301002 KKK	R0.20	3.0	4	2.5	10	50	▲
CP2CR0301202 KKK	R0.20	3.0	4	2.5	12	50	▲

▲ Stock △ Non-Stock  
Recommended Cutting Conditions P.109

● Recommend ○ Suit

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened steels			Cast Iron	Aluminum	Copper Alloy	Stainless Steels	Titanium	Graphite	CFRP
~HB225	HB225~325	HRC30~40	HRC40~45	HRC45~55	HRC55~70							
				●	●							

CBN End Mill(HRC≤70)  
For High-Hardened Steels up to HRC70



# CP2CR<sub>SERIES</sub>



## CBN, 2 FLUTE CORNER RADIUS

- ▶ Machining high hardness materials HRC50 to HRC70 into finish process for long time.
- ▶ High speed cutting with 20,000rpm and over 20,000rpm of tool and supplying air mist recommended
- ▶ Good cutting ability due to negative rake angle.



Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0~-0.010	h6

(mm)unit:mm

Order No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Stock
	R	D1	D2	L1	L2	L	
CP2CR0301602 KKK	R0.2	3.0	4	2.5	16	60	▲
CP2CR0302002 KKK	R0.2	3.0	4	2.5	20	60	▲
CP2CR0300003 KKK	R0.3	3.0	4	2.5	-	50	▲
CP2CR0300803 KKK	R0.3	3.0	4	2.5	8	50	▲
CP2CR0301003 KKK	R0.3	3.0	4	2.5	10	50	▲
CP2CR0301203 KKK	R0.3	3.0	4	2.5	12	50	▲
CP2CR0301603 KKK	R0.3	3.0	4	2.5	16	60	▲
CP2CR0302003 KKK	R0.3	3.0	4	2.5	20	60	▲
CP2CR0300000 KKK	R0.5	3.0	4	2.5	-	50	▲
CP2CR0300800 KKK	R0.5	3.0	4	2.5	8	50	▲
CP2CR0301000 KKK	R0.5	3.0	4	2.5	10	50	▲
CP2CR0301200 KKK	R0.5	3.0	4	2.5	12	50	▲
CP2CR0301600 KKK	R0.5	3.0	4	2.5	16	60	▲
CP2CR0302000 KKK	R0.5	3.0	4	2.5	20	60	▲

▲ Stock △ Non-Stock  
Recommended Cutting Conditions P.109

● Recommend ○ Suit

Carbon Steels	Alloy Steels	Prehardened Steels	Hardened steels			Cast Iron	Aluminum	Copper Alloy	Stainless Steels	Titanium	Graphite	CFRP
~HB225	HB225~325	HRC30~40	HRC40~45	HRC45~55	HRC55~70							
				●	●							

## Carbide End Mill Cutter(HRC 48)



### 2 Flutes Square End Mill / 2 Flutes Corner Radius End Mill For Steels, Cast Iron — Side Milling

Workpiece Material		Cutting Depth (mm)	Vc m/min	Tool Diameter (mm)	3	4	6	8	10	12	16	20
<b>P</b>	Carbon Steels/ Alloy Steels (<35HRC)	$ap \leq 1.5D$	180	Rotation Speed (min-1)	19110	14330	9550	7170	5730	4780	3580	2870
		$ae \leq 0.15D$		Feed Speed (mm/min)	1070	1030	920	930	920	860	860	860
	Alloy Steels (35-48HRC)	$ap \leq 1D$	130	Rotation Speed (min-1)	13800	10350	6900	5180	4140	3450	2590	2070
		$ae \leq 0.12D$		Feed Speed (mm/min)	610	580	550	620	560	500	410	370
<b>M</b>	Stainless Steels	$ap \leq 1.5D$	130	Rotation Speed (min-1)	13800	10350	6900	5180	4140	3450	2590	2070
		$ae \leq 0.15D$		Feed Speed (mm/min)	690	660	590	650	610	590	490	460
<b>K</b>	Grey Cast Irons/ Ductile Cast Irons (<32HRC)	$ap \leq 1.5D$	160	Rotation Speed (min-1)	16990	12740	8490	6370	5100	4250	3190	2550
		$ae \leq 0.15D$		Feed Speed (mm/min)	850	820	820	750	700	680	610	560
	High Alloy Cast Irons (35-45HRC)	$ap \leq 1D$	140	Rotation Speed (min-1)	14860	11150	7430	5570	4460	3720	2790	2230
		$ae \leq 0.12D$		Feed Speed (mm/min)	650	670	670	620	580	560	500	460

## Carbide End Mill Cutter(HRC 48)



### 2 Flutes Square End Mill / 2 Flutes Corner Radius End Mill For Steels, Cast Iron — Slotting

Workpiece Material		Cutting Depth (mm)	Vc m/min	Tool Diameter (mm)	3	4	6	8	10	12	16	20
<b>P</b>	Carbon Steels/ Alloy Steels (<35HRC)	$ap \leq 0.8D$	80	Rotation Speed (min-1)	8490	6370	4250	3190	2550	2120	1590	1270
				Feed Speed (mm/min)	430	540	440	400	370	350	400	410
	Alloy Steels (35-48HRC)	$ap \leq 0.3D$	60	Rotation Speed (min-1)	6370	4780	3190	2390	1910	1590	1190	960
				Feed Speed (mm/min)	260	310	270	230	220	220	230	230
<b>M</b>	Stainless Steels	$ap \leq 0.3D$	55	Rotation Speed (min-1)	5840	4380	2920	2190	1750	1460	1100	880
				Feed Speed (mm/min)	140	160	200	200	200	190	170	160
<b>K</b>	Grey Cast Irons/ Ductile Cast Irons (<32HRC)	$ap \leq 0.5D$	55	Rotation Speed (min-1)	5840	4380	2920	2190	1750	1460	1100	880
				Feed Speed (mm/min)	210	250	250	220	210	200	190	170
	High Alloy Cast Irons (35-45HRC)	$ap \leq 0.3D$	50	Rotation Speed (min-1)	5310	3980	2650	1990	1590	1330	1000	800
				Feed Speed (mm/min)	160	180	210	180	180	170	160	140

## Carbide End Mill Cutter(HRC 48)



### 4 Flutes Square End Mill / 4 Flutes Corner Radius End Mill For Steels, Cast Iron——Side Milling

Workpiece Material		Cutting Depth (mm)	Vc m/min	Tool Diameter (mm)	3	4	6	8	10	12	16	20
<b>P</b>	Carbon Steels/ Alloy Steels (<35HRC)	$ap \leq 1.5D$	180	Rotation Speed (min-1)	19110	14330	9550	7170	5730	4780	3580	2870
		$ae \leq 0.15D$		Feed Speed (mm/min)	2140	2060	1830	1860	1830	1720	1720	1720
	Alloy Steels (35-48HRC)	$ap \leq 1D$	130	Rotation Speed (min-1)	13800	10350	6900	5180	4140	3450	2590	2070
		$ae \leq 0.12D$		Feed Speed (mm/min)	1210	1160	1100	1240	1130	1010	830	750
<b>M</b>	Stainless Steels	$ap \leq 1.5D$	130	Rotation Speed (min-1)	13800	10350	6900	5180	4140	3450	2590	2070
		$ae \leq 0.15D$		Feed Speed (mm/min)	1380	1330	1190	1300	1230	1170	980	910
<b>K</b>	Grey Cast Irons/ Ductile Cast Irons (<32HRC)	$ap \leq 1.5D$	160	Rotation Speed (min-1)	16990	12740	8490	6370	5100	4250	3190	2550
		$ae \leq 0.15D$		Feed Speed (mm/min)	1700	1630	1630	1500	1410	1360	1210	1120
	High Alloy Cast Irons (35-45HRC)	$ap \leq 1D$	140	Rotation Speed (min-1)	14860	11150	7430	5570	4460	3720	2790	2230
		$ae \leq 0.12D$		Feed Speed (mm/min)	1310	1340	1340	1250	1160	1120	1000	910

## Carbide End Mill Cutter(HRC 48)



### 6 Flutes Square End Mill For Steels, Cast Iron——Side Milling

Workpiece Material		Cutting Depth (mm)	Vc m/min	Tool Diameter (mm)	3	4	6	8	10	12	16	20
<b>P</b>	Carbon Steels/ Alloy Steels (<35HRC)	$ap \leq 1.5D$	180	Rotation Speed (min-1)	19110	14330	9550	7170	5730	4780	3580	2870
		$ae \leq 0.15D$		Feed Speed (mm/min)	3210	3100	2750	2800	2750	2580	2580	2580
	Alloy Steels (35-48HRC)	$ap \leq 1D$	130	Rotation Speed (min-1)	13800	10350	6900	5180	4140	3450	2590	2070
		$ae \leq 0.12D$		Feed Speed (mm/min)	1820	1740	1600	1860	1690	1510	1240	1120
<b>M</b>	Stainless Steels	$ap \leq 1.5D$	130	Rotation Speed (min-1)	13800	10350	6900	5180	4140	3450	2590	2070
		$ae \leq 0.15D$		Feed Speed (mm/min)	2070	1990	1780	1960	1840	1760	1480	1370
<b>K</b>	Grey Cast Irons/ Ductile Cast Irons (<32HRC)	$ap \leq 1.5D$	160	Rotation Speed (min-1)	16990	12740	8490	6370	5100	4250	3190	2550
		$ae \leq 0.15D$		Feed Speed (mm/min)	2550	2450	2450	2260	2110	2040	1820	1680
	High Alloy Cast Irons (35-45HRC)	$ap \leq 1D$	140	Rotation Speed (min-1)	14860	11150	7430	5570	4460	3720	2790	2230
		$ae \leq 0.12D$		Feed Speed (mm/min)	1960	2010	2010	1870	1740	1670	1510	1360

## Carbide End Mill Cutter(HRC 48)



### 2 Flutes Ball Nose End Mill For Steels, Cast Iron — Profiling

Workpiece Material		Cutting Depth (mm)	Vc m/min	Tool Diameter (mm)	4	5	6	7	8	9	10	11	12
<b>P</b>	Carbon Steels/ Alloy Steels (<35HRC)	$ap \leq 0.2D$	160	Rotation Speed (min-1)	12740	10190	8490	7280	6370	5660	5100	4630	4250
		$ae \leq 0.3D$		Feed Speed (mm/min)	1020	1020	1020	1020	1020	1020	1020	1020	1020
	Alloy Steels (35-48HRC)	$ap \leq 0.15D$	120	Rotation Speed (min-1)	9550	7640	6370	5460	4780	4250	3820	3470	3190
		$ae \leq 0.15D$		Feed Speed (mm/min)	610	640	660	630	620	610	610	610	610
<b>M</b>	Stainless Steels	$ap \leq 0.2D$	110	Rotation Speed (min-1)	8760	7010	5840	5010	4380	3890	3500	3190	2920
		$ae \leq 0.2D$		Feed Speed (mm/min)	610	630	640	630	63	620	630	640	640
<b>K</b>	Grey Cast Irons/ Ductile Cast Irons (<32HRC)	$ap \leq 0.2D$	140	Rotation Speed (min-1)	11150	8920	7430	6370	5570	4950	4460	4050	3720
		$ae \leq 0.2D$		Feed Speed (mm/min)	780	800	820	800	800	790	800	810	820
	High Alloy Cast Irons (35-45HRC)	$ap \leq 0.1D$	120	Rotation Speed (min-1)	9550	7640	6370	5460	4780	4250	3820	3470	3190
		$ae \leq 0.1D$		Feed Speed (mm/min)	610	640	660	660	670	650	650	660	670

## Carbide End Mill Cutter(HRC 48)



### 4 Flutes Ball Nose End Mill For Steels, Cast Iron — Profiling

Workpiece Material		Cutting Depth (mm)	Vc m/min	Tool Diameter (mm)	4	5	6	7	8	9	10	11	12
<b>P</b>	Carbon Steels/ Alloy Steels (<35HRC)	$ap \leq 0.2D$	160	Rotation Speed (min-1)	12740	10190	8490	7280	6370	5660	5100	4630	4250
		$ae \leq 0.3D$		Feed Speed (mm/min)	2040	2040	2040	2040	2040	2040	2040	2040	2040
	Alloy Steels (35-48HRC)	$ap \leq 0.15D$	120	Rotation Speed (min-1)	9550	7640	6370	5460	4780	4250	3820	3470	3190
		$ae \leq 0.15D$		Feed Speed (mm/min)	1220	1280	1330	1270	1240	1220	1220	1210	1210
<b>M</b>	Stainless Steels	$ap \leq 0.2D$	110	Rotation Speed (min-1)	8760	7010	5840	5010	4380	3890	3500	3190	2920
		$ae \leq 0.2D$		Feed Speed (mm/min)	1220	1260	1290	1260	1260	1250	1260	1270	1290
<b>K</b>	Grey Cast Irons/ Ductile Cast Irons (<32HRC)	$ap \leq 0.2D$	140	Rotation Speed (min-1)	11150	8920	7430	6370	5570	4950	4460	4050	3720
		$ae \leq 0.2D$		Feed Speed (mm/min)	1560	1610	1640	1610	1610	1590	1610	1620	1640
	High Alloy Cast Irons (35-45HRC)	$ap \leq 0.1D$	120	Rotation Speed (min-1)	9550	7640	6370	5460	4780	4250	3820	3470	3190
		$ae \leq 0.1D$		Feed Speed (mm/min)	1220	1280	1330	1310	1340	1310	1300	1320	1340

# Carbide End Mill Cutter(HRC 48)



## 4 Flute Variable Helix Square End Mill For Steels, Cast Iron — Slotting

Workpiece Material		Cutting Depth (mm)	Vc m/min	Tool Diameter (mm)	3	4	6	8	10	12	16	20
<b>P</b>	Carbon Steels/ Alloy Steels (<35HRC)	$ap \leq 1D$	80	Rotation Speed (min-1)	8490	6370	4250	3190	2550	2120	1590	1270
				Feed Speed (mm/min)	1050	1220	970	850	790	760	850	870
	Alloy Steels (35-48HRC)	$ap \leq 0.5D$	60	Rotation Speed (min-1)	6370	4780	3190	2390	1910	1590	1190	960
				Feed Speed (mm/min)	660	730	600	500	470	480	490	500
<b>M</b>	Stainless Steels	$ap \leq 0.3D$	55	Rotation Speed (min-1)	5840	4380	2920	2190	1750	1460	1100	880
				Feed Speed (mm/min)	420	420	470	450	430	430	380	350
<b>K</b>	Grey Cast Irons/ Ductile Cast Irons (<32HRC)	$ap \leq 0.8D$	55	Rotation Speed (min-1)	5840	4380	2920	2190	1750	1460	1100	880
				Feed Speed (mm/min)	560	600	560	480	460	450	410	370
	High Alloy Cast Irons (35-45HRC)	$ap \leq 0.5D$	50	Rotation Speed (min-1)	5310	3980	2650	1990	1590	1330	1000	800
				Feed Speed (mm/min)	450	460	480	400	380	380	350	320



## Carbide End Mill Cutter(HRC 48)



4 Flutes Square End Mill / 4 Flutes Corner Radius End Mill For Stainless Steels, Titanium Alloys  
— Side Milling

Workpiece Material		Cutting Depth (mm)	Vc m/min	Tool Diameter (mm)	1	2	4	6	8	10	12	16	20
<b>M</b>	Stainless Steels	$ap \leq 1.5D$	100	Rotation Speed (min <sup>-1</sup> )	25000	15900	8000	5300	4000	3200	2600	2000	1600
		$ae \leq 0.1D$		Feed Speed (mm-min)	850	850	960	1000	1000	760	720	620	520
<b>S</b>	Titanium Alloys	$ap \leq 1.5D$	80	Rotation Speed (min <sup>-1</sup> )	20000	12720	6400	4240	3200	2560	2080	1600	1280
		$ae \leq 0.1D$		Feed Speed (mm-min)	680	680	768	800	800	608	576	496	416

## Carbide End Mill Cutter(HRC 48)



2 Flutes Square End Mill For Stainless Steels, Titanium Alloys — Side Milling

Workpiece Material		Cutting Depth (mm)	Vc m/min	Tool Diameter (mm)	1	2	4	6	8	10	12	16	20
<b>M</b>	Stainless Steels	$ap \leq 1.5D$	100	Rotation Speed (min <sup>-1</sup> )	25000	15900	8000	5300	4000	3200	2600	2000	1600
		$ae \leq 0.1D$		Feed Speed (mm/min)	425	425	480	500	500	380	360	310	260
<b>S</b>	Titanium Alloys	$ap \leq 1.5D$	80	Rotation Speed (min <sup>-1</sup> )	20000	12720	6400	4240	3200	2560	2080	1600	1280
		$ae \leq 0.1D$		Feed Speed (mm/min)	340	340	384	400	400	304	288	248	208

## Carbide End Mill Cutter(HRC 48)



### 2 Flutes Square End Mill For Stainless Steels, Titanium Alloys — Slotting Milling

Workpiece Material		Cutting Depth (mm)	Vc m/min	Tool Diameter (mm)	1	2	4	6	8	10	12	16	20
<b>M</b>	Stainless Steels	$ap \leq 0.1D$	70	Rotation Speed (min <sup>-1</sup> )	10000	8600	5600	3700	2800	2200	1800	1400	1100
		$ae \leq 1.0D$		Feed Speed (mm/min)	300	300	225	240	240	190	165	150	135
<b>S</b>	Titanium Alloys	$ap \leq 0.1D$	55	Rotation Speed (min <sup>-1</sup> )	8000	6880	4480	2960	2240	1760	1440	1120	880
		$ae \leq 1.0D$		Feed Speed (mm/min)	240	240	180	192	192	152	132	120	108

## Carbide End Mill Cutter(HRC 48)



### 2 Flutes Ball Nose End Mill For Stainless Steels, Titanium Alloys — Profiling Milling

Workpiece Material		Cutting Depth (mm)	Vc m/min	Tool Diameter (mm)	1	2	4	6	8	10	12	16	20
<b>M</b>	Stainless Steels	$ap \leq 0.2D$	100	Rotation Speed (min <sup>-1</sup> )	25000	15900	8000	5300	4000	3200	2600	2000	1600
		$ae \leq 0.2D$		Feed Speed (mm/min)	360	360	408	425	425	323	306	260	221
<b>S</b>	Titanium Alloys	$ap \leq 0.2D$	80	Rotation Speed (min <sup>-1</sup> )	20000	12720	6400	4240	3200	2560	2080	1600	1280
		$ae \leq 0.2D$		Feed Speed (mm/min)	288	288	320	340	340	260	250	208	180

# Carbide End Mill Cutter(HRC 48)



## 4 Flutes Ball Nose End Mill For Stainless Steels, Titanium Alloys — Profiling Milling

Workpiece Material		Cutting Depth (mm)	Vc m/min	Tool Diameter (mm)	1	2	4	6	8	10	12	16	20
<b>M</b>	Stainless Steels	$ap \leq 0.2D$	100	Rotation Speed (min <sup>-1</sup> )	25000	15900	8000	5300	4000	3200	2600	2000	1600
		$ae \leq 0.2D$		Feed Speed (mm/min)	720	720	816	850	850	646	612	520	442
<b>S</b>	Titanium Alloys	$ap \leq 0.2D$	80	Rotation Speed (min <sup>-1</sup> )	20000	12720	6400	4240	3200	2560	2080	1600	1280
		$ae \leq 0.2D$		Feed Speed (mm/min)	576	576	320	680	680	520	490	416	350

## Carbide End Mill Cutter(HRC 48)



### 3 Flutes Square End Mill For Aluminium Alloys——Side Milling

Workpiece Material		Cutting Depth (mm)	Vc m/min	Tool Diameter (mm)	2	4	6	8	10	12
N	Aluminium Alloys (Si<12%)	$ap \leq 1.5D$	150 (60-350)	Rotation Speed (min-1)	16000	12000	10600	10000	9500	9300
		$ae \leq 0.2D$		Feed Speed (mm/min)	1150	1570	1650	1800	2300	3100
	Copper Alloys (<Hb200)	$ap \leq 1.5D$	150 (60-350)	Rotation Speed (min-1)	16000	12000	10600	10000	9500	9300
		$ae \leq 0.2D$		Feed speed (mm/min)	1030	1420	1490	1610	2060	2800

## Carbide End Mill Cutter(HRC 48)



### 3 Flute Square End Mill For Aluminium Alloys——Slotting

Workpiece Material		Cutting Depth (mm)	Vc m/min	Tool Diameter (mm)	2	4	6	8	10	12
N	Aluminium Alloys (Si<12%)	$ap \leq 0.5D$	150 (60-350)	Rotation Speed (min-1)	12800	10000	9300	8750	8000	7450
		$ae = 1D$		Feed Speed (mm/min)	760	1080	1300	1470	1530	1700
	Copper Alloys (<Hb200)	$ap \leq 0.5D$	150 (60-350)	Rotation Speed (min-1)	12800	10000	9300	8750	8000	7450
		$ae = 1D$		Feed Speed (mm/min)	890	970	1160	1320	1380	1530

## Carbide End Mill Cutter(HRC 48)



### 2 Flutes Ball Nose End Mill For Aluminium Alloys, Copper Alloys——Profiling Milling

Workpiece Material		Cutting Depth (mm)	Vc m/min	Tool Diameter (mm)	1	2	4	6	8	10	12
N	Aluminium Alloys	$ap \leq 0.3D$	150 (60-350)	Rotation Speed (min-1)	19000	15900	11900	10600	8000	7950	7950
		$ae \leq 0.3D$		Feed Speed	950	1600	1900	2500	2550	3200	3800
	Copper Alloys	$ap \leq 0.3D$	150 (60-350)	Rotation Speed (min-1)	19000	15900	11900	10600	8000	7950	7950
		$ae \leq 0.3D$		Feed Speed (mm/min)	860	1430	1720	2300	2300	2850	3450

## Carbide End Mill Cutter(HRC 48)



### 3 Flutes Square End Mill For Aluminium Alloys, Copper Alloys — Side Milling

Workpiece Material		Cutting Depth (mm)	Vc m/min	Tool Diameter (mm)	1	2	4	6	8	10	12	16	20
N	Aluminium Alloys	$ap \leq 1.5D$	150 ( 50 - 350 )	Rotation Speed (min-1)	18000	16000	15000	12000	12000	10000	8000	6000	5000
		$ae=0.1mm$		Feed Speed (mm/min)	1000	1000	1000	1000	1000	1000	1000	1000	1000
	Copper Alloys	$ap \leq 1.5D$	150 ( 50 - 350 )	Rotation Speed (min-1)	14400	12800	12000	9600	9600	8000	6400	4800	4000
		$ae=0.1mm$		Feed Speed (mm/min)	900	900	900	900	900	900	900	900	900

## Carbide End Mill Cutter(HRC 48)



### 3 Flutes Square End Mill For Aluminium Alloys, Copper Alloys — Slotting Milling

Workpiece Material		Cutting Depth (mm)	Vc m/min	Tool Diameter (mm)	1	2	4	6	8	10	12	16	20
N	Aluminium Alloys	$ap \leq 1.5D$	150 ( 50 - 350 )	Rotation Speed (min-1)	12600	11200	10500	8400	8400	7000	5600	4200	3500
				Feed Speed (mm/min)	2000	2000	2000	2000	2000	2000	2000	2000	2000
	Copper Alloys	$ap \leq 1.5D$	150 ( 50 - 350 )	Rotation Speed (min-1)	10080	8960	8400	6720	6720	5600	4480	3360	2800
				Feed Speed (mm/min)	1800	1800	1800	1800	1800	1800	1800	1800	1800

## Carbide End Mill Cutter(HRC 65)



4 Flutes Square End Mill / 4 Flutes Corner Radius End Mill For Die Steel, Hardened Steel  
— Side Milling

Workpiece Material		Cutting Depth (mm)	Vc m/min	Tool Diameter (mm)	2	4	6	8	10	12	16	20
<b>H</b>	Die Steels Hardened Steels (HRC ≤ 48)	$ap \leq 1.0D$	150	Rotation Speed (min <sup>-1</sup> )	23000	11750	7800	5800	4700	3900	2900	2350
		$ae \leq 0.04D$		Feed Speed (mm/min)	1150	1350	1500	1300	1100	900	750	600
	Hardened Steels (48 - 55HRC)	$ap \leq 1.0D$	120	Rotation Speed (min <sup>-1</sup> )	18400	9400	6240	4640	3760	3120	2320	1880
		$ae \leq 0.04D$		Feed Speed (mm/min)	920	1080	1200	1040	880	720	600	480
	Hardened Steels (55 - 65HRC)	$ap \leq 1.0D$	100	Rotation Speed (min <sup>-1</sup> )	14720	7520	4992	3712	3008	2496	1856	1504
		$ae \leq 0.04D$		Feed Speed (mm/min)	736	864	960	832	704	576	480	384

## Carbide End Mill Cutter(HRC 65)



2 Flutes Ball Nose End Mill For Die Steel, Hardened Steel — Profiling Milling

Workpiece Material		Cutting Depth (mm)	Vc m/min	Tool Diameter (mm)	2	4	6	8	10	12	16	20
<b>H</b>	Die Steels Hardened Steels (HRC ≤ 48)	$0.05 \leq ap \leq 0.1D$	150	Rotation Speed (min <sup>-1</sup> )	23000	11750	7800	5800	4700	3900	2900	2350
		$ae \leq 0.02D$		Feed Speed (mm/min)	920	1080	1200	1040	880	720	600	480
	Hardened Steels (48 - 55HRC)	$0.05 \leq ap \leq 0.1D$	120	Rotation Speed (min <sup>-1</sup> )	18400	9400	6240	4640	3760	3120	2320	1880
		$ae \leq 0.02D$		Feed Speed (mm/min)	736	864	960	832	704	576	480	384
	Hardened Steels (55 - 65HRC)	$0.05 \leq ap \leq 0.1D$	100	Rotation Speed (min <sup>-1</sup> )	14720	7520	4992	3712	3008	2496	1856	1504
		$ae \leq 0.02D$		Feed Speed (mm/min)	590	690	768	670	560	460	384	300

# Carbide End Mill Cutter(HRC 35-55)



4 Flutes Square End Mill / 4 Flutes Corner Radius End Mill For Carbon Steels, Alloy Steels, Stainless Steels—Side Milling

Workpiece Material		Cutting Depth (mm)	Vc m/min	Tool Diameter (mm)	6	8	10	12	16	20
<b>P</b>	Carbon Steels Alloy Steels (HRC ≤ 35)	$ap \leq 1.5D$	90	Rotation Speed (min <sup>-1</sup> )	4770	3580	2860	2390	1790	1430
		$ae \leq 0.3D$		Feed Speed (mm/min)	400	610	620	560	540	500
	Alloy Steels Hardened Steels (35 - 48HRC)	$ap \leq 1.5D$	80	Rotation Speed (min <sup>-1</sup> )	4240	3180	2550	2120	1590	1270
		$ae \leq 0.3D$		Feed Speed (mm/min)	330	510	510	460	450	420
	Hardened Steels (48 - 55HRC)	$ap \leq 1.5D$	65	Rotation Speed (min <sup>-1</sup> )	3445	2580	2070	1720	1290	1160
		$ae \leq 0.3D$		Feed Speed (mm/min)	264	408	408	368	360	336
<b>M</b>	Stainless Steels	$ap \leq 1.5D$	70	Rotation Speed (min <sup>-1</sup> )	3710	2790	2230	1860	1390	1110
		$ae \leq 0.3D$		Feed Speed (mm/min)	290	450	450	410	390	360

# Carbide End Mill Cutter(HRC 35-55)



4 Flutes Square End Mill / 4 Flutes Corner Radius End Mill For Carbon Steels, Alloy Steels, Stainless Steels——Side Milling

Workpiece Material		Cutting Depth (mm)	Vc m/min	Tool Diameter (mm)	6	8	10	12	16	20
<b>P</b>	Carbon Steels Alloy Steels (HRC ≤ 35)	ap ≤ 1.0D	90	Rotation Speed (min <sup>-1</sup> )	4240	3180	2550	2120	1590	1270
		ap max=12mm		Feed Speed (mm/min)	320	350	380	350	340	330
	Alloy Steels Hardened Steels (35 - 48HRC)	ap ≤ 1.0D	80	Rotation Speed (min <sup>-1</sup> )	3710	2790	2230	1860	1390	1110
		ap max=12mm		Feed Speed (mm/min)	260	290	310	290	280	270
	Hardened Steels (48 - 55HRC)	ap ≤ 1.0D	65	Rotation Speed (min <sup>-1</sup> )	3000	2200	1800	1500	1100	900
		ap max=12mm		Feed Speed (mm/min)	208	232	248	232	224	216
<b>M</b>	Stainless Steels	ap ≤ 1.0D	70	Rotation Speed (min <sup>-1</sup> )	3180	2390	1910	1590	1190	950
		ap max=12mm		Feed Speed (mm/min)	220	250	270	240	240	230



## Carbide End Mill Cutter(HRC 48)



2 Flutes Square End Mill / 2 Flutes Corner Radius End Mill For Aluminium Alloys, Copper Alloys  
— Side Milling / Slotting Milling

Workpiece Material		Cutting Depth (mm)	Vc m/min	Tool Diameter (mm)	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
N	Aluminium Alloys	$ap \leq 0.05D$	65 (30-110)	Rotation Speed (min <sup>-1</sup> )	40000	40000	40000	40000	40000	40000	40000	40000	40000
		$ae \leq 1.0D$		Feed Speed (mm/min)	200	300	500	1400	2000	2800	3150	3500	3750
	Copper Alloys	$ap \leq 0.05D$	65 (30-110)	Rotation Speed (min <sup>-1</sup> )	40000	40000	40000	40000	40000	40000	40000	40000	40000
		$ae \leq 1.0D$		Feed Speed (mm/min)	180	270	450	1260	1800	2520	2835	3150	3375

## Carbide End Mill Cutter(HRC 48)



2 Flutes Ball Nose End Mill For Aluminium Alloys, Copper Alloys — Profiling Milling

Workpiece Material		Cutting Depth (mm)	Vc m/min	Tool Diameter (mm)	0.2	0.3	0.4	0.5	0.6	0.7	0.8
N	Aluminium Alloys	$ap \leq 0.05D$	65 (30-110)	Rotation Speed (min <sup>-1</sup> )	40000	40000	40000	40000	40000	40000	40000
		$ae \leq 1.0D$		Feed Speed (mm-min)	255	425	1190	1700	2380	2700	2975
	Copper Alloys	$ap \leq 0.05D$	65 (30-110)	Rotation Speed (min <sup>-1</sup> )	40000	40000	40000	40000	40000	40000	40000
		$ae \leq 1.0D$		Feed Speed (mm-min)	229.5	380	1070	1530	2142	2400	2680

## Carbide End Mill Cutter(HRC 48)



2 Flutes Square End Mill / 2 Flutes Corner Radius End Mill For Carbon Steels, Alloy Steels, Stainless Steels——Side Milling / Slotting Milling

Workpiece Material		Cutting Depth (mm)	Vc m/min	Tool Diameter (mm)	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
<b>P</b>	Carbon Steels Alloy Steels	$ap \leq 0.05D$	65 (30-110)	Rotation Speed (min <sup>-1</sup> )	40000	40000	40000	40000	40000	40000	40000	40000	40000
		$ae \leq 1.0D$		Feed Speed (mm/min)	180	270	450	1260	1800	2520	2835	3150	3375
<b>M</b>	Stainless Steels	$ap \leq 0.05D$	65 (30-110)	Rotation Speed (min <sup>-1</sup> )	40000	40000	40000	40000	40000	40000	40000	40000	40000
		$ae \leq 1.0D$		Feed Speed (mm/min)	162	243	405	1134	1620	2268	2500	2835	3000

## Carbide End Mill Cutter(HRC 48)



2 Flutes Ball Nose End Mill For Carbon Steels Alloy Steels, Stainless Steels——Profiling Milling

Workpiece Material		Cutting Depth (mm)	Vc m/min	Tool Diameter (mm)	0.2	0.3	0.4	0.5	0.6	0.7	0.8
<b>P</b>	Carbon Steels Alloy Steels	$ap \leq 0.05D$	65 (30-110)	Rotation Speed (min <sup>-1</sup> )	40000	40000	40000	40000	40000	40000	40000
		$ae \leq 1.0D$		Feed Speed (mm/min)	230	380	1100	1530	2142	2430	2700
<b>M</b>	Stainless Steels	$ap \leq 0.05D$	65 (30-110)	Rotation Speed (min <sup>-1</sup> )	40000	40000	40000	40000	40000	40000	40000
		$ae \leq 1.0D$		Feed Speed (mm/min)	207	342	990	1377	1900	2187	2430

## Carbide End Mill Cutter(HRC 48~60)



2 Flutes Square End Mill / 2 Flutes Corner Radius End Mill For Carbon Steels, Alloy Steels, Stainless Steels — Side Milling / Slotting Milling

Workpiece Material		Cutting Depth (mm)	Vc m/min	Tool Diameter (mm)	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
<b>H</b>	Alloy Steels Hardened Steels ( < HRC50)	$ap \leq 0.03D$	65 ( 30-110 )	Rotation Speed (min <sup>-1</sup> )	40000	40000	40000	40000	40000	40000	40000	40000	40000
		$ae \leq 1.0D$		Feed Speed (mm/min)	180	270	450	1260	1800	2520	2835	3150	3375
	Hardened Steels ( 50-60HRC)	$ap \leq 0.03D$	65 ( 30-110 )	Rotation Speed (min <sup>-1</sup> )	40000	40000	40000	40000	40000	40000	40000	40000	40000
		$ae \leq 1.0D$		Feed Speed (mm/min)	162	243	405	1134	1620	2268	2500	2835	3000

## Carbide End Mill Cutter(HRC 48~60)



2 Flutes Ball Nose End Mill For Die Steels, Hardened Steels — Profiling Milling

Workpiece Material		Cutting Depth (mm)	Vc m/min	Tool Diameter (mm)	0.2	0.3	0.4	0.5	0.6	0.7	0.8
<b>H</b>	Alloy Steels Hardened Steels ( < HRC50)	$ap \leq 0.03D$	65 ( 30-110 )	Rotation Speed (min <sup>-1</sup> )	40000	40000	40000	40000	40000	40000	40000
		$ae \leq 1.0D$		Feed Speed (mm/min)	230	380	1100	1530	2142	2430	2700
	Hardened Steels ( 50-60HRC)	$ap \leq 0.03D$	65 ( 30-110 )	Rotation Speed (min <sup>-1</sup> )	40000	40000	40000	40000	40000	40000	40000
		$ae \leq 1.0D$		Feed Speed (mm/min)	207	342	990	1377	1900	2187	2430

## Carbide End Mill Cutter(HRC 48)



### 4 Flutes Square End Mill For Carbon Steels, Alloy Steels, Cast Iron——Slotting Milling

Workpiece Material		Cutting Depth (mm)	Vc m/min	Tool Diameter (mm)	3	4	6	8	10	12	16	20
<b>P</b>	Carbon Steels Alloy Steels (HRC ≤35)	$ap \leq 1.0D$	80	Rotation Speed (min <sup>-1</sup> )	8490	6370	4250	3190	2550	2120	1590	1270
				Feed Speed (mm/min)	1050	1220	970	850	790	760	850	870
	Alloy Steels Hardened Steels (35-48HRC)	$ap \leq 0.5D$	60	Rotation Speed (min <sup>-1</sup> )	6370	4780	3190	2390	1910	1590	1190	960
				Feed Speed (mm/min)	660	730	600	500	470	480	490	500
<b>K</b>	Grey Cast Irons Ductile Cast Irons	$ap \leq 0.8/D$	55	Rotation Speed (min <sup>-1</sup> )	5840	4380	2920	2190	1750	1460	1100	880
				Feed Speed (mm/min)	560	600	560	480	460	450	410	370

## Carbide End Mill Cutter(HRC 48)



### 4 Flutes Square End Mill For Stainless Steels——Side Milling

Workpiece Material		Cutting Depth (mm)	Vc m/min	Tool Diameter (mm)	3	4	6	8	10	12	16	20
<b>M</b>	Stainless Steels	$ap \leq 1.0D$	100	Rotation Speed (min <sup>-1</sup> )	10600	7960	5300	3980	3180	2650	1990	1590
		$ae \leq 0.1D$		Feed Speed (mm/min)	650	700	680	730	660	600	490	460

## Carbide End Mill Cutter(HRC 48)



### 4 Flutes Square End Mill For Stainless Steels——Slotting Milling

Workpiece Material		Cutting Depth (mm)	Vc m/min	Tool Diameter (mm)	3	4	6	8	10	12	16	20
<b>M</b>	Stainless Steels	$ap \leq 0.1D$	45	Rotation Speed (min <sup>-1</sup> )	4770	3580	2390	1790	1430	1195	895	715
		$ae \leq 1D$		Feed Speed (mm/min)	280	240	210	310	310	310	270	240

## Carbide End Mill Cutter(HRC 48)



4 Flutes Square End Mill / 4 Flutes Corner Radius End Mill For Steels, Cast Iron——Side Milling

Workpiece Material		Cutting Depth (mm)	Vc m/min	Tool Diameter (mm)	3	4	6	8	10	12	16	20
<b>P</b>	Carbon Steels Alloy Steels (HRC≤35)	$ap \leq 1.5D$	200	Rotation Speed (min <sup>-1</sup> )	21230	15920	10620	7960	6370	5310	3980	3190
		$ae \leq 0.4D$		Feed Speed (mm/min)	1910	2545	2545	2545	2550	2550	3185	3180
	Alloy Steels Hardened Steels (35-48HRC)	$ap \leq 1.5D$	190	Rotation Speed (min <sup>-1</sup> )	20160	15120	10080	7560	6050	5040	3780	3020
		$ae \leq 0.4D$		Feed Speed (mm/min)	1815	2420	2420	2420	2420	2420	3025	3020
<b>K</b>	Grey Cast Irons Ductile Cast Irons	$ap \leq 1.5D$	180	Rotation Speed (min <sup>-1</sup> )	19100	14320	9550	7160	6730	4770	3580	2860
		$ae \leq 0.4D$		Feed Speed (mm/min)	1375	1835	1835	1835	1835	1835	2290	2290

## Carbide End Mill Cutter(HRC 48)



4 Flutes Square End Mill / 4 Flutes Corner Radius End Mill For Steels, Cast Iron——Slotting Milling

Workpiece Material		Cutting Depth (mm)	Vc m/min	Tool Diameter (mm)	3	4	6	8	10	12	16	20
<b>P</b>	Carbon Steels Alloy Steels (HRC≤35)	$ap \leq 1.5D$	160	Rotation Speed (min <sup>-1</sup> )	16980	12730	10620	7960	6370	5310	3980	3190
				Feed Speed (mm/min)	1225	1630	2545	2545	2550	2550	3185	3180
	Alloy Steels Hardened Steels (35-48HRC)	$ap \leq 1.5D$	140	Rotation Speed (min <sup>-1</sup> )	14850	11140	10080	7560	6050	5040	3780	3020
				Feed Speed (mm/min)	1070	1425	2420	2420	2420	2420	3025	3020
<b>K</b>	Grey Cast Irons Ductile Cast Irons	$ap \leq 1.5D$	160	Rotation Speed (min <sup>-1</sup> )	16980	12730	8490	6370	5090	4240	3180	2550
				Feed Speed (mm/min)	1070	1425	1425	1425	1425	1425	1780	1785

## Carbide End Mill Cutter(HRC 48)



4 Flutes Square End Mill / 4 Flutes Corner Radius End Mill For Carbon Steels, Alloy Steels, Cast Iron — Side Milling

Workpiece Material		Cutting Depth (mm)	Vc m/min	Tool Diameter (mm)	4	5	6	8	10	12	16	20
<b>P</b>	Carbon Steels Alloy Steels (HRC≤35)	$ap \leq 1.0D$	108	Rotation Speed (min <sup>-1</sup> )	8600	6500	5600	4200	3300	2800	2000	1600
		$ae \leq 0.1D$		Feed Speed (mm/min)	516	520	560	588	528	560	528	512
	Alloy Steels Hardened Steels (35-45HRC)	$ap \leq 1.0D$	108	Rotation Speed (min <sup>-1</sup> )	8600	5600	4200	3300	2800	5310	2000	1600
		$ae \leq 0.1D$		Feed Speed (mm/min)	516	520	560	588	528	560	528	512
<b>K</b>	Grey Cast Irons Ductile Cast Irons	$ap \leq 1.0D$	108	Rotation Speed (min <sup>-1</sup> )	8600	5600	4200	3300	2800	5310	2000	1600
		$ae \leq 0.1D$		Feed Speed (mm/min)	516	520	560	588	528	560	528	512

## Carbide End Mill Cutter(HRC 48)



4 Flutes Square End Mill / 4 Flutes Corner Radius End Mill For Carbon Steels, Alloy Steels, Cast Iron — Slotting Milling

Workpiece Material		Cutting Depth (mm)	Vc m/min	Tool Diameter (mm)	4	5	6	8	10	12	16	20
<b>P</b>	Carbon Steels Alloy Steels (HRC ≤35)	$ap \leq 1.0D$	80	Rotation Speed (min <sup>-1</sup> )	6880	5200	4480	3360	2640	2240	1600	1280
		$ae \leq 0.1D$		Feed Speed (mm/min)	310	312	336	353	317	336	317	308
	Alloy Steels Hardened Steels (35-45HRC)	$ap \leq 1.0D$	80	Rotation Speed (min <sup>-1</sup> )	6880	4480	3360	2640	2240	4248	1600	1280
		$ae \leq 0.1D$		Feed Speed (mm/min)	310	312	336	353	317	336	317	308
<b>K</b>	Grey Cast Irons Ductile Cast Irons	$ap \leq 1.0D$	80	Rotation Speed (min <sup>-1</sup> )	6880	4480	3360	2640	2240	4248	1600	1280
		$ae \leq 0.1D$		Feed Speed (mm/min)	310	312	336	353	317	336	317	308

## Carbide End Mill Cutter(HRC 48)



2 Flutes Ball Nose End Mill For Carbon Steels, Alloy Steels,  
Cast Iron——Profiling

Workpiece Material		Cutting Depth (mm)	Vc m/min	Tool Diameter (mm)	4	5	6	8	10	12	16	20
P	Carbon Steels Alloy Steels (HRC ≤35)	$ap \leq 0.2D$	108	Rotation Speed (min-1)	8600	6500	5600	4200	3300	2800	2000	1600
		$ae \leq 0.2D$		Feed Speed (mm/min)	516	520	560	588	528	560	528	512
	Alloy Steels Hardened Steels (35-45HRC)	$ap \leq 0.2D$	108	Rotation Speed (min-1)	8600	5600	4200	3300	2800	5310	2000	1600
		$ae \leq 0.2D$		Feed Speed (mm/min)	516	520	560	588	528	560	528	512
K	Grey Cast Irons Ductile Cast Irons	$ap \leq 0.2D$	108	Rotation Speed (min-1)	8600	5600	4200	3300	2800	5310	2000	1600
		$ae \leq 0.2D$		Feed Speed (mm/min)	516	520	560	588	528	560	528	512

## Carbide End Mill Cutter(HRC 48)



4 Flutes Corner Radius For Carbon Steels, Alloy Steels——Side Milling

Workpiece Material		Cutting Depth (mm)	Tool Diameter (mm)	4	6	8	10	12	16	20
P	Carbon Steels Alloy Steels (HRC≤30)	$ap \leq 1.0D$	Cutting Speed (m/min)	126	160	163	160	160	160	160
		$ae \leq 0.5D$	Feed Speed (mm/min)	1000	890	780	612	516	384	306
	Alloy Steels Hardened Steels (HRC≤30)	$ap \leq 1.0D$	Cutting Speed (m/min)	126	160	163	160	160	160	160
		$ae \leq 0.5D$	Feed Speed (mm/min)	1000	890	780	612	516	384	306

## Carbide End Mill Cutter(HRC 48)



### 4 Flutes Corner Radius For Carbon Steels, Alloy Steels——Slotting Milling

Workpiece Material		Cutting Depth (mm)	Tool Diameter (mm)	4	6	8	10	12	16	20
P	Carbon Steels Alloy Steels (HRC≤30)	ap≤1.0D	Cutting Speed (m/min)	100	150	151	151	151	151	151
			Feed Speed (mm/min)	600	850	700	580	480	360	288
	Alloy Steels Hardened Steels (HRC≤30)	ap≤1.0D	Cutting Speed (m/min)	100	150	151	151	151	151	151
			Feed Speed (mm/min)	600	850	700	580	480	360	288

## Carbide End Mill Cutter(HRC 48)



### 4 Flutes Ball Nose End Mill For Carbon Steels, Alloy Steels, Stainless Steels——Profiling Milling

Workpiece Material		Cutting Depth (mm)	Vc m/min	Tool Diameter (mm)	0.2	0.3	0.4	0.5	0.6	0.7	0.8
P	Carbon Steels Alloy Steels	ap ≤ 0.05D	65 ( 30 - 110 )	Rotation Speed (min <sup>-1</sup> )	40000	40000	40000	40000	40000	40000	40000
		ae ≤ 1.0D		Feed Speed (mm/min)	460	760	2200	3060	4284	4860	5400
M	Stainless Steels	ap ≤ 0.05D	65 ( 30 - 110 )	Rotation Speed (min <sup>-1</sup> )	40000	40000	40000	40000	40000	40000	40000
		ae ≤ 1.0D		Feed Speed (mm/min)	414	684	1980	2754	3800	4374	4860



## ZSTNB series

### 2/3 FLUTES, TAPER NECK BACK DRAFT TYPE

Workpiece Material					Carbon Steels Alloy Steels (180~250HB)*		Pre-harden Steels (35~45HRC)		Hardened Steels (45~55HRC)		Hardened Steels (55~65HRC)	
Ratio to standard depth of cut					Depth of Cut X 100%		Depth of Cut X 80%		Depth of Cut X 65%		Depth of Cut X 60%	
R (mm)	Mill Dia (mm)	Neck Length (mm)	Neck Angle (mm)	Depth of Cut (mm)	n (min <sup>-1</sup> )	Vf (mm/min)	n (min <sup>-1</sup> )	Vf (mm/min)	n (min <sup>-1</sup> )	Vf (mm/min)	n (min <sup>-1</sup> )	Vf (mm/min)
0.10	0.20	1.0	0.4	0.017	40000	800	28000	504	26000	416	26000	364
		1.5	0.4	0.009	40000	800	28000	504	26000	416	26000	364
		2.0	0.9	0.007	32000	461	22400	323	20800	266	20800	233
		2.5	0.9	0.004	26000	333	18200	204	16900	189	16900	162
0.15	0.30	2.0	0.4	0.025	40000	1200	28000	756	26000	624	26000	546
		3.0	0.9	0.013	32000	691	22400	484	20800	399	20800	349
		4.0	0.9	0.010	26000	499	18200	306	16900	284	16900	243
0.20	0.40	2.0	0.4	0.035	40000	1600	28000	1008	26000	832	26000	728
		3.0	0.4	0.020	40000	1600	28000	1008	26000	832	26000	728
		4.0	0.4	0.007	32000	922	22400	645	20800	532	20800	466
		4.0	0.9	0.009	32000	922	22400	645	20800	532	20800	466
		5.0	0.4	0.006	26000	666	18200	408	16900	379	16900	324
		5.0	0.9	0.007	26000	666	18200	408	16900	379	16900	324
0.25	0.50	4.0	0.4	0.040	40000	2000	28000	1260	26000	1040	26000	910
		8.0	0.9	0.010	26000	728	18200	446	16900	414	16900	355
		12.0	0.9	0.005	22400	627	15680	384	14560	357	14560	306
0.27	0.54	2.0	0.4	0.050	40000	2160	28000	1361	26000	1123	26000	983
		4.0	0.4	0.037	40000	2160	28000	1361	26000	1123	26000	983
		5.0	0.4	0.031	40000	1512	28000	1176	26000	1040	26000	832
		6.0	0.4	0.025	26000	1244	18200	871	16900	676	16900	629
		6.5	0.4	0.020	26000	1011	18200	619	16900	575	16900	493
		7.0	0.4	0.015	26000	899	18200	585	16900	543	16900	465
0.30	0.60	2.0	0.4	0.055	40000	2400	28000	1512	26000	1248	26000	1092
		4.0	0.4	0.035	40000	2400	28000	1512	26000	1248	26000	1092
		6.0	0.4	0.018	32000	1382	22400	968	20800	799	20800	699
		6.0	0.9	0.020	32000	1382	22400	968	20800	799	20800	699
		8.0	0.9	0.020	26000	998	18200	612	16900	568	16900	487
		10.0	0.4	0.013	26000	874	18200	535	16900	497	16900	426
		10.0	0.9	0.015	26000	874	18200	535	16900	497	16900	426
		12.0	0.9	0.010	26000	874	18200	535	16900	497	16900	426
		15.0	0.4	0.005	22400	753	15680	461	14560	367	14560	367
		15.0	0.9	0.006	22400	753	15680	461	14560	367	14560	367

# ZSTNB series

## 2/3 FLUTES, TAPER NECK BACK DRAFT TYPE

Workpiece Material					Carbon Steels Alloy Steels (180~250HB)*		Pre-harden Steels (35~45HRC)		Hardened Steels (45~55HRC)		Hardened Steels (55~65HRC)	
Ratio to standard depth of cut					Depth of Cut X 100%		Depth of Cut X 80%		Depth of Cut X 65%		Depth of Cut X 60%	
R (mm)	Mill Dia (mm)	Neck Length (mm)	Neck Angle (mm)	Depth of Cut (mm)	n (min <sup>-1</sup> )	Vf (mm/min)	n (min <sup>-1</sup> )	Vf (mm/min)	n (min <sup>-1</sup> )	Vf (mm/min)	n (min <sup>-1</sup> )	Vf (mm/min)
0.4	0.8	4	0.4	0.062	32000	2560	22400	1613	20800	1331	20800	1165
		6	0.4	0.045	32000	2560	22400	1613	20800	1331	20800	1165
		8	0.9	0.026	25600	1475	17920	1032	16640	852	16640	745
		12	0.9	0.020	20800	1065	14560	699	13520	606	13520	519
		16	0.9	0.018	20800	932	14560	612	13520	530	13520	454
0.45	0.9	4	0.4	0.063	28300	2547	19810	1605	18395	1324	18395	1159
		8	0.4	0.050	28300	2547	19810	1605	18395	1324	18395	1159
		12	0.4	0.037	18400	1325	12880	811	11960	753	11960	646
		16	0.4	0.024	18400	1325	12880	811	11960	753	11960	646
		18	0.4	0.018	18400	1325	12880	811	11960	753	11960	646
		20	0.4	0.015	15850	1141	11095	699	10303	649	10303	556
		22	0.4	0.012	15850	1141	11095	699	10303	649	10303	556
		24	0.4	0.009	14150	1019	9905	624	9198	579	9198	497
0.50	1.0	6	0.4	0.055	25600	2560	17920	1613	16640	1331	16640	1165
		8	0.4	0.055	25600	2560	17920	1613	16640	1331	16640	1165
		10	0.4	0.032	20800	1872	14560	1310	13520	1082	13520	946
		10	0.9	0.035	20800	1872	14560	1310	13520	1082	13520	946
		15	0.9	0.028	16640	1331	11648	874	10816	757	10816	649
		20	0.4	0.018	16640	1331	11648	874	10816	757	10816	649
		20	0.9	0.020	16640	1331	11648	874	10816	757	10816	649
		25	0.9	0.017	14560	1165	10192	764	9464	662	9464	568
		30	0.4	0.015	12480	874	8736	568	8112	487	8112	406
		30	0.9	0.017	12480	874	8736	568	8112	487	8112	406
		35	0.9	0.010	10400	728	7280	473	6760	406	6760	338
		40	0.9	0.009	10000	700	7000	455	6500	390	6500	325
		50	0.9	0.007	9500	665	6650	432	6175	371	6175	309
		60	0.9	0.005	9000	630	6300	410	5850	351	5850	293
70	0.9	0.003	8500	595	5950	387	5525	332	5525	276		
0.75	1.5	8	0.4	0.070	16960	2544	11872	1603	11024	1323	11024	1158
		10	0.4	0.070	16960	2544	11872	1603	11024	1323	11024	1158
		12	0.4	0.070	16960	2544	11872	1603	11024	1323	11024	1158
		15	0.9	0.045	13568	1832	9498	1282	8819	1058	8819	926
		20	0.9	0.040	11024	1323	7717	810	7166	752	7166	645
		30	0.9	0.028	11024	1323	7717	810	7166	752	7166	645

# ZSTNB series

## 2/3 FLUTES, TAPER NECK BACK DRAFT TYPE

Workpiece Material					Carbon Steels Alloy Steels (180~250HB)*		Pre-harden Steels (35~45HRC)		Hardened Steels (45~55HRC)		Hardened Steels (55~65HRC)	
Ratio to standard depth of cut					Depth of Cut X 100%		Depth of Cut X 80%		Depth of Cut X 65%		Depth of Cut X 60%	
R (mm)	Mill Dia (mm)	Neck Length (mm)	Neck Angle (mm)	Depth of Cut (mm)	n (min <sup>-1</sup> )	Vf (mm/min)	n (min <sup>-1</sup> )	Vf (mm/min)	n (min <sup>-1</sup> )	Vf (mm/min)	n (min <sup>-1</sup> )	Vf (mm/min)
0.9	1.8	4	0.4	0.120	14200	2556	9940	1610	9230	1329	9230	1163
		8	0.4	0.100	14200	2556	9940	1610	9230	1329	9230	1163
		12	0.4	0.080	14200	2556	9940	1610	9230	1329	9230	1163
		16	0.4	0.070	14200	2556	9940	1610	9230	1329	9230	1163
		20	0.4	0.060	9230	1329	6461	814	6000	756	6000	648
		24	0.4	0.050	9230	1329	6461	814	6000	756	6000	648
		28	0.4	0.040	9230	1329	6461	814	6000	756	6000	648
		32	0.4	0.040	9230	1329	6461	814	6000	756	6000	648
		36	0.4	0.030	9230	1329	6461	814	6000	756	6000	648
		38	0.4	0.020	8000	1152	5600	706	5200	655	5200	562
40	0.4	0.020	8000	1152	5600	706	5200	655	5200	562		
1.0	2.0	8	0.4	0.150	15200	3040	10640	1915	9880	1581	9880	1383
		12	0.4	0.090	15200	3040	10640	1915	9880	1581	9880	1383
		16	0.4	0.090	15200	3040	10640	1915	9880	1581	9880	1383
		20	0.4	0.060	12160	2189	8512	1532	7904	1265	7904	1107
		20	0.9	0.070	12160	2189	8512	1532	7904	1265	7904	1107
		25	0.9	0.070	9880	1581	6916	968	6442	899	6422	771
		30	0.4	0.040	9880	1581	6916	968	6442	899	6422	771
		30	0.9	0.050	9880	1581	6916	968	6442	899	6422	771
		35	0.9	0.050	9880	1581	6916	968	6442	899	6422	771
		40	0.4	0.030	9880	1581	6916	968	6442	899	6422	771
		40	0.9	0.040	9880	1581	6916	968	6442	899	6422	771
		50	0.9	0.170	8512	1192	5958	775	5533	664	5533	553
		60	0.9	0.010	7235	1013	5065	658	4703	564	4703	470
		70	0.9	0.010	6150	861	4305	560	3997	480	3997	400
1.5	3.0	8	0.4	0.320	12720	3816	8904	2404	8268	1984	8268	1736
		16	0.4	0.220	12720	3816	8904	2404	8268	1984	8268	1736
		20	0.4	0.150	12720	3434	8904	2137	8268	1736	8268	1488
		30	0.4	0.080	10176	2748	7123	1496	6614	1389	6614	1191
		30	0.9	0.090	10176	2748	7123	1496	6614	1389	6614	1191
		40	0.4	0.060	8268	1984	5788	1215	5374	1129	5374	967
		40	0.9	0.070	8268	1984	5788	1215	5374	1129	5374	967
		50	0.9	0.050	8268	1984	5788	1215	5374	1129	5374	967
		60	0.9	0.030	7123	1710	4986	1047	4630	972	4630	833
		70	0.9	0.020	6233	1496	4363	916	4051	851	4051	729

## ZSTNB series

### 2/3 FLUTES, TAPER NECK BACK DRAFT TYPE

Workpiece Material					Carbon Steels Alloy Steels (180~250HB)*		Pre-harden Steels (35~45HRC)		Hardened Steels (45~55HRC)		Hardened Steels (55~65HRC)	
Ratio to standard depth of cut					Depth of Cut X 100%		Depth of Cut X 80%		Depth of Cut X 65%		Depth of Cut X 60%	
R (mm)	Mill Dia (mm)	Neck Length (mm)	Neck Angle (mm)	Depth of Cut (mm)	n (min <sup>-1</sup> )	Vf (mm/min)	n (min <sup>-1</sup> )	Vf (mm/min)	n (min <sup>-1</sup> )	Vf (mm/min)	n (min <sup>-1</sup> )	Vf (mm/min)
2.0	4	20	1	0.32	11900	2860	9000	2050	7800	1680	7800	1590
		30	1	0.23	11900	2570	9000	1850	7800	1520	7800	1430
		40	1	0.14	9500	1940	7200	1400	6200	1140	6200	1080
		50	1	0.11	7800	1590	5800	1120	5000	920	5000	870
		60	1	0.07	7800	1590	5800	1120	5000	920	5000	870
2.5	5	30	1	0.34	9500	2140	7200	1540	6200	1260	6200	1190
		40	1	0.25	9500	2140	7200	1540	6200	1260	6200	1190
		60	1	0.15	6200	1320	4700	950	4000	770	4000	720
3.0	6	30	1	0.45	8000	2000	6000	1430	5200	1170	5200	1110
		40	1	0.40	8000	1800	6000	1280	5200	1050	5200	990
		50	1	0.32	8000	1800	6000	1280	5200	1050	5200	990
		60	1	0.22	6400	1360	4800	970	4100	780	4100	740
		70	1	0.18	5200	1110	3900	790	3400	650	3400	610
		80	1	0.14	5200	1110	3900	790	3400	650	3400	610
4.0	8	50	1	0.50	6000	1460	4500	1040	3900	850	3900	810
		60	1	0.43	6000	1460	4500	1040	3900	850	3900	810
		70	1	0.33	6000	1460	4500	1040	3900	850	3900	810
		80	1	0.25	4800	1100	3600	780	3100	640	3100	600
5.0	10	60	1	0.70	4800	1300	3600	920	3100	750	3100	710
		75	1	0.50	4800	1300	3600	920	3100	750	3100	710

- Please adjust the cutting depth index according to the cutting depth factors of above table.
- For Rib or Slotting machining process which are not easy for chip ejection, please reduce the cutting depth by 20~30% from the above cutting condition.  
ex) ZSTNB2040-20-10, HRC 55, Rib processing  
Cutting depth : 0.32(standard cutting depth) X 0.65 X 0.8 = 0.17mm
- In actual machining, the condition should be adjusted according to the machining shape, purpose and the machine type.
- If RPM of the machine is low, the feed rate should be low in the same ratio as RPM.

## ZSTNR series

### 2 FLUTES, TAPER NECK BACK DRAFT TYPE

Workpiece Material				Carbon Steels Alloy Steels (180~250HB)		Pre-hardened Steels (35~45HRC)		Hardened Steels (45~55HRC)		Hardened Steels (55~65HRC)	
Ratio to standard depth of cut				Depth of Cut X 100%		Depth of Cut X 80%		Depth of Cut X 65%		Depth of Cut X 60%	
Mill Dia (mm)	R (mm)	Neck Length (mm)	Depth of Cut (mm)	n (min <sup>-1</sup> )	Vf (mm/min)	n (min <sup>-1</sup> )	Vf (mm/min)	n (min <sup>-1</sup> )	Vf (mm/min)	n (min <sup>-1</sup> )	Vf (mm/min)
0.2	0.05	2	0.007	39660	887	33660	754	29700	591	27720	483
0.4	0.05	4	0.009	30096	899	25582	764	22572	599	21067	489
		5	0.007	26752	710	22739	528	20064	466	18726	373
	0.10	4	0.009	31680	946	26928	804	23760	631	22176	515
		5	0.007	28160	747	23936	556	21120	490	19712	392
0.5	0.10	5	0.013	30413	1090	25851	753	22810	562	21289	453
		8	0.008	24330	678	20681	468	18248	350	17031	282
		10	0.007	18248	509	15511	351	13686	262	12773	211
0.6	0.10	12	0.010	20377	791	17320	546	15282	408	14264	329
		15	0.006	16727	649	14218	448	12545	335	11709	270
0.8	0.20	6	0.045	31680	1084	26928	921	23760	723	22176	590
		12	0.020	28160	943	23936	695	21120	613	19712	490
1.0	0.20	8	0.040	28512	1463	24235	1244	21384	976	19958	797
		10	0.035	28512	1596	24235	1357	21384	1064	19958	869
		15	0.028	25344	1261	21542	938	19008	828	17741	662
		20	0.020	19008	828	16157	653	14256	532	13306	414
		25	0.017	15840	690	13464	544	11880	443	11088	345
		30	0.017	15840	690	13464	544	11880	443	11088	345
	0.30	8	0.040	28512	1463	24235	1244	21384	976	19958	797
		15	0.028	25344	1261	21542	938	19008	828	17741	662
		25	0.017	15840	690	13464	544	11880	443	11088	345
		30	0.017	15840	690	13464	544	11880	443	11088	345
		10	0.050	21683	1079	18431	803	16262	708	15178	567
		15	0.045	19712	981	16755	730	14784	644	13798	515
1.5	0.20	20	0.042	17347	863	14745	642	13010	567	12143	453
		25	0.032	14784	644	12566	508	11088	414	10349	322
		30	0.028	12320	536	10472	423	9240	345	8624	268
		10	0.050	21683	1079	18431	803	16262	708	15178	567
	0.30	20	0.042	17347	863	14745	642	13010	567	12143	453
		25	0.032	14784	644	12566	508	11088	414	10349	322
		30	0.028	12320	536	10472	423	9240	345	8624	268
		10	0.050	21683	1079	18431	803	16262	708	15178	567

## ZSTNR series

### 2 FLUTES, TAPER NECK BACK DRAFT TYPE

Workpiece Material				Carbon Steels Alloy Steels (180~250HB)		Pre-harden Steels (35~45HRC)		Hardened Steels (45~55HRC)		Hardened Steels (55~65HRC)		
Ratio to standard depth of cut				Depth of Cut X 100%		Depth of Cut X 80%		Depth of Cut X 65%		Depth of Cut X 60%		
Mill Dia (mm)	R (mm)	Neck Length (mm)	Depth of Cut (mm)	n (min <sup>-1</sup> )	Vf (mm/min)	n (min <sup>-1</sup> )	Vf (mm/min)	n (min <sup>-1</sup> )	Vf (mm/min)	n (min <sup>-1</sup> )	Vf (mm/min)	
2	0.2	30	0.045	13440	1254	11424	933	10080	823	9408	658	
		40	0.035	10080	823	8568	650	7560	529	7056	412	
		50	0.017	8400	686	7140	541	6300	441	5880	343	
	0.3	12	0.088	22680	1814	19278	1427	17010	1191	15876	1048	
		20	0.054	18144	1452	15422	1141	13608	953	12701	838	
		30	0.045	13440	1393	11424	1036	10080	914	9408	732	
		40	0.035	10080	914	8568	722	7560	588	7056	457	
		50	0.017	8400	762	7140	601	6300	490	5880	381	
	0.5	8	0.170	22680	1814	19278	1427	17010	1191	15876	1048	
		12	0.088	22680	1814	19278	1427	17010	1191	15876	1048	
		16	0.088	19278	1542	16386	1213	14459	1012	13495	891	
		20	0.054	18114	1452	15422	1141	13608	953	12701	838	
		25	0.054	15876	1270	13495	999	11907	833	11113	733	
		30	0.045	13440	1393	11424	1036	10080	914	9408	732	
		40	0.035	10080	914	8568	722	7560	588	7056	457	
	50	0.017	8400	762	7140	601	6300	490	5880	381		
	3	0.2	40	0.070	10240	956	8704	711	7680	627	7168	502
			50	0.050	7680	627	6528	495	5760	403	5376	314
60			0.030	6400	523	5440	412	4800	336	4480	261	
0.3		40	0.070	10240	1062	8704	790	7680	697	7168	557	
		50	0.050	7680	697	6528	550	5760	448	5376	348	
		60	0.030	6400	581	5440	458	4800	373	4480	290	
0.5		40	0.070	10240	1062	8704	790	7680	697	7168	557	
		50	0.050	7680	697	6528	550	5760	448	5376	348	
		60	0.030	6400	581	5440	458	4800	373	4480	290	

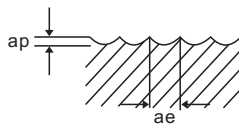
- Please adjust the cutting depth index according to the cutting depth factors of above table.
- In actual machining, the condition should be adjusted according to the machining shape, purpose and machine type.
- If RPM of the machine is low, the feed rate should be low in the same ratio as RPM.

CBN End Mill(HRC≤70)  
Recommended Cutting Conditions

**CN2BE**  
**CP2BE** SERIES

**CBN 2 FLUTE BALL NOSE**

Workpiece Material			Hardened Steels							
STRENGTH			HRC50~HRC60				HRC60~HRC70			
Radius of Ball Nose	DIA.	LBS	RPM	FEED	ap (mm)	ae (mm)	RPM	FEED	ap (mm)	ae (mm)
R0.10	0.2	-	50000	500	0.003	0.003	50000	500	0.003	0.003
R0.10	0.2	0.5	50000	500	0.003	0.003	50000	500	0.003	0.003
R0.10	0.2	1.0	50000	300	0.003	0.003	50000	300	0.003	0.003
R0.15	0.3	-	50000	1000	0.005	0.005	50000	1000	0.005	0.005
R0.15	0.3	1.0	50000	600	0.005	0.005	50000	600	0.005	0.005
R0.15	0.3	1.5	50000	600	0.005	0.005	50000	600	0.005	0.005
R0.15	0.3	2.0	37500	300	0.005	0.003	37500	300	0.005	0.003
R0.20	0.4	-	50000	1200	0.005	0.005	50000	1200	0.005	0.005
R0.20	0.4	1.0	50000	1200	0.005	0.005	50000	1200	0.005	0.005
R0.20	0.4	1.5	50000	720	0.005	0.005	50000	720	0.005	0.005
R0.20	0.4	2.0	50000	720	0.005	0.005	50000	720	0.005	0.005
R0.20	0.4	3.0	37500	360	0.005	0.003	37500	360	0.005	0.003
R0.25	0.5	-	50000	1500	0.005	0.005	50000	1500	0.005	0.005
R0.25	0.5	1.0	50000	1500	0.005	0.005	50000	1500	0.005	0.005
R0.25	0.5	2.0	50000	900	0.005	0.005	50000	900	0.005	0.005
R0.25	0.5	3.0	37500	450	0.005	0.003	37500	450	0.005	0.003
R0.25	0.5	4.0	37500	450	0.005	0.003	37500	450	0.005	0.003
R0.30	0.6	-	50000	2000	0.005	0.005	50000	2000	0.005	0.005
R0.30	0.6	2.0	50000	1200	0.005	0.005	50000	1200	0.005	0.005
R0.30	0.6	3.0	50000	1200	0.005	0.005	50000	1200	0.005	0.005
R0.30	0.6	4.0	37500	600	0.005	0.003	37500	600	0.005	0.003
R0.30	0.6	6.0	37500	450	0.005	0.003	37500	450	0.005	0.003
R0.40	0.8	-	50000	2000	0.005	0.005	50000	2000	0.005	0.005
R0.40	0.8	2.0	50000	2000	0.005	0.005	50000	2000	0.005	0.005
R0.40	0.8	4.0	50000	1200	0.005	0.005	50000	1200	0.005	0.005
R0.40	0.8	6.0	37500	600	0.005	0.003	37500	600	0.005	0.003
R0.40	0.8	8.0	37500	450	0.005	0.003	37500	450	0.005	0.003
R0.50	1.0	-	50000	3000	0.010	0.01	50000	3000	0.01	0.01
R0.50	1.0	2.5	50000	3000	0.010	0.01	50000	3000	0.01	0.01
R0.50	1.0	4.0	40000	2400	0.006	0.01	40000	2400	0.006	0.01
R0.50	1.0	6.0	30000	1800	0.004	0.006	30000	1800	0.004	0.006
R0.50	1.0	8.0	20000	1200	0.004	0.006	20000	1200	0.004	0.006
R0.60	1.2	-	50000	3000	0.010	0.01	50000	3000	0.01	0.01
R0.60	1.2	3.0	50000	3000	0.010	0.01	50000	3000	0.01	0.01
R0.60	1.2	4.0	40000	2400	0.006	0.01	40000	2400	0.006	0.01
R0.60	1.2	6.0	40000	2400	0.006	0.01	40000	2400	0.006	0.01
R0.60	1.2	8.0	20000	1200	0.004	0.006	20000	1200	0.004	0.006
R0.75	1.5	-	50000	3000	0.010	0.01	50000	3000	0.01	0.01
R0.75	1.5	4.0	50000	3000	0.010	0.01	50000	3000	0.01	0.01
R0.75	1.5	6.0	40000	2400	0.006	0.01	40000	2400	0.006	0.01



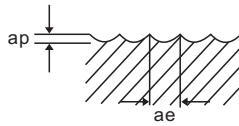
RPM = rev./min.  
FEED = mm/min.  
Vc = m/min.  
fz = mm/t

CBN End Mill(HRC≤70)  
Recommended Cutting Conditions

**CN2BE**  
**CP2BE** SERIES

**CBN 2 FLUTE BALL NOSE**

Workpiece Material			Hardened Steels							
STRENGTH			HRC50~HRC60				HRC60~HRC70			
Radius of Ball Nose	DIA.	LBS	RPM	FEED	ap (mm)	ae (mm)	RPM	FEED	ap (mm)	ae (mm)
R0.75	1.5	8	30000	1800	0.004	0.006	30000	1800	0.004	0.006
R0.75	1.5	10	20000	1200	0.004	0.006	20000	1200	0.004	0.006
R1.00	2.0	-	40000	3200	0.010	0.010	32000	2500	0.010	0.010
R1.00	2.0	6	40000	3200	0.010	0.010	32000	2500	0.010	0.010
R1.00	2.0	8	32000	2560	0.006	0.010	25600	2000	0.006	0.010
R1.00	2.0	10	32000	2560	0.006	0.010	25600	2000	0.006	0.010
R1.50	3.0	-	26500	2100	0.010	0.010	21500	1700	0.010	0.010
R1.50	3.0	8	26500	2100	0.010	0.010	21500	1700	0.010	0.010
R1.50	3.0	10	21200	1680	0.006	0.010	17200	1360	0.006	0.010
R1.50	3.0	12	21200	1680	0.006	0.010	17200	1360	0.006	0.010
R1.50	3.0	16	15900	1260	0.004	0.006	12900	1020	0.004	0.006
R1.50	3.0	20	10600	840	0.004	0.006	8600	680	0.004	0.006



RPM = rev./min.  
FEED = mm/min.  
Vc = m/min.  
fz =

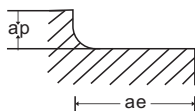


CBN End Mill(HRC≤70)  
Recommended Cutting Conditions

**CN2CR  
CP2CR** SERIES

**CBN 2 FLUTE BALL NOSE**

Workpiece Material		Hardened Steels							
STRENGTH		HRC50~HRC60				HRC60~HRC70			
Radius of Ball Nose	DIA.	RPM	FEED	ap (mm)	ae (mm)	RPM	FEED	ap (mm)	ae (mm)
0.2	-	50000	220	0.020	0.003	50000	200	0.010	0.002
0.2	0.5	50000	220	0.020	0.003	50000	200	0.010	0.002
0.2	1.0	50000	130	0.020	0.003	50000	120	0.010	0.002
0.3	-	50000	500	0.030	0.003	50000	400	0.020	0.002
0.3	1.0	50000	300	0.030	0.003	50000	240	0.020	0.002
0.3	1.5	50000	300	0.030	0.003	50000	240	0.020	0.002
0.3	2.0	37500	150	0.015	0.003	37500	120	0.010	0.002
0.4	-	50000	600	0.050	0.005	50000	480	0.030	0.003
0.4	1.0	50000	600	0.050	0.005	50000	480	0.030	0.003
0.4	1.5	50000	360	0.050	0.005	50000	290	0.030	0.003
0.4	2.0	50000	360	0.050	0.005	50000	290	0.030	0.003
0.4	3.0	37500	180	0.025	0.005	37500	145	0.015	0.003
0.5	-	50000	700	0.100	0.010	50000	550	0.060	0.005
0.5	1.0	50000	700	0.100	0.010	50000	550	0.060	0.005
0.5	2.0	50000	420	0.100	0.010	50000	330	0.060	0.005
0.5	3.0	37500	210	0.050	0.010	37500	165	0.030	0.005
0.5	4.0	37500	210	0.050	0.010	37500	165	0.030	0.005
0.6	-	50000	800	0.100	0.010	50000	600	0.060	0.005
0.6	2.0	50000	480	0.100	0.010	50000	360	0.060	0.005
0.6	3.0	50000	480	0.100	0.010	50000	360	0.060	0.005
0.6	4.0	37500	240	0.050	0.010	37500	180	0.030	0.005
0.8	-	50000	800	0.100	0.010	39000	600	0.060	0.005
0.8	2.0	50000	800	0.100	0.010	39000	600	0.060	0.005
0.8	4.0	50000	480	0.100	0.010	39000	360	0.060	0.005
0.8	6.0	37500	240	0.050	0.010	29250	180	0.030	0.005
1.0	-	43000	1000	0.200	0.010	30000	700	0.100	0.010
1.0	2.5	43000	1000	0.200	0.010	30000	700	0.100	0.010
1.0	4.0	34400	800	0.200	0.006	24000	560	0.100	0.006
1.0	6.0	25800	600	0.120	0.004	18000	420	0.060	0.004
1.5	-	30000	1000	0.400	0.020	19000	700	0.200	0.020
1.5	4.0	30000	1000	0.400	0.020	19000	700	0.200	0.020
1.5	6.0	24000	800	0.400	0.012	15200	560	0.200	0.012
1.5	8.0	18000	600	0.240	0.008	11400	420	0.120	0.008
1.5	10.0	12000	400	0.240	0.008	7600	280	0.120	0.008
2.0	-	22000	900	0.600	0.030	14000	800	0.300	0.030
2.0	6.0	22000	900	0.600	0.030	14000	800	0.300	0.030
2.0	8.0	17600	720	0.600	0.018	11200	640	0.300	0.018
2.0	10.0	17600	720	0.600	0.018	11200	640	0.300	0.018
3.0	-	15000	700	0.800	0.030	10000	550	0.400	0.030
3.0	8.0	15000	700	0.800	0.030	10000	550	0.400	0.030
3.0	10.0	12000	560	0.800	0.018	8000	440	0.400	0.018
3.0	12.0	12000	560	0.800	0.018	8000	440	0.400	0.018
3.0	16.0	9000	420	0.480	0.012	6000	330	0.240	0.012
3.0	20.0	6000	280	0.480	0.012	4000	220	0.240	0.012

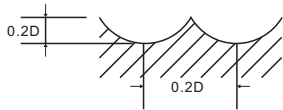


RPM = rev./min.  
FEED = mm/min.  
Vc = m/min.  
fz = mm/t

## TDIA2B<sup>SERIES</sup>

### DIAMOND, 2 FLUTE BALL NOSE

Workpiece Material	Graphite	
DIA.	RPM	FEED
3.0	16000	1450
4.0	16000	2100
6.0	15000	2950
8.0	13000	3000
10.0	11500	3050
12.0	10500	3150

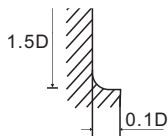


RPM = rev./min.  
FEED = mm/min.

## TDIA4S<sup>SERIES</sup>

### DIAMOND, 4 FLUTE SQUARE, CORNER RADIUS

Workpiece Material	Graphite	
DIA.	RPM	FEED
1.0	24000	960
2.0	22000	1320
3.0	20000	1600
4.0	18000	1900
6.0	11000	2400
8.0	8000	2800
10.0	6500	2400
12.0	5500	2400

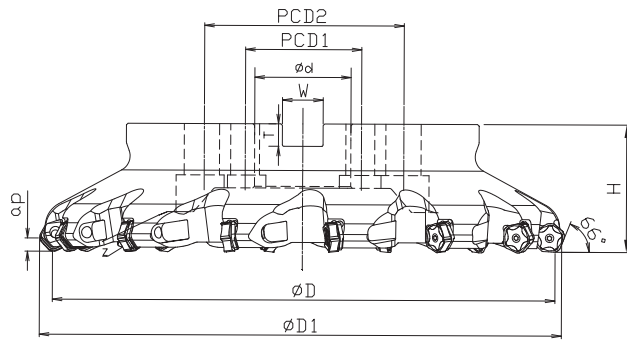


RPM = rev./min.  
FEED = mm/min.

# MFPN66 SERIES

66° Face Mill with High Economical and 10 Cutting Edge Insert for Higher Productivity

- ★ Stability and cost efficiency with 10-edge pentagonal inserts.
- ★ Low cutting forces and reduced chattering with a helical cutting-edge design.
- ★ Tough and reliable dual cutting edge design.



Designation	Size(mm)										Clamping Screw	Wrench
	D	D1	d	H	W	T	Z	PCD 1	PCD 2	Max.ap		
MFPN66050R-4T-M	50	58	22	40	10.4	6.3	4	-	-	5	SB4090	DTPM-15
MFPN66063R-5T-M	63	71	22	40	10.4	6.3	5	-	-	5		
MFPN66080R-6T-M	80	88	27	50	12.4	7.0	6	-	-	5		
MFPN66100R-7T-M	100	108	32	50	12.4	8.0	7	-	-	5		
MFPN66125R-9T-M	125	133	40	63	16.4	9.0	9	-	-	5		
MFPN66160R-11T-M	160	168	40	63	16.4	9.0	11	-	-	5		
MFPN66200R-13T-M	200	208	60	63	25.7	14.0	13	101.6	-	5		
MFPN66250R-15T-M	250	258	60	63	25.7	14.0	15	101.6	-	5		
MFPN66315R-17T-M	315	323	60	63	25.7	14.0	17	101.6	177.8	5		


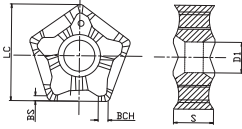

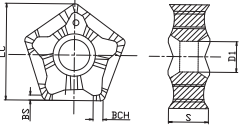
# MFPN66 SERIES

66° Face Mill with High Economical and 10 Cutting Edge Insert for Higher Productivity

## ● Applicable Inserts

Usage Classification	P	Steel	★							
	M	Stainless		★						
	K	Cast iron	★							
	N	Non-ferrous								
	S	Superalloys		★						
	H	Hard materials								

★ 1st Choice  
☆ 2nd Choice

Insert	Insert No.	Size(mm)					Coated Carbide				Carbide		
		LC	S	D1	BS	BCH	TG4025	TG4035	TY602	TI960	HC200		
	 PNMU0905XNER-UG	14.6	5.56	4.7	2	2	●						
	 PNMU0905XNER-SG	14.6	5.56	4.7	2	2		●					

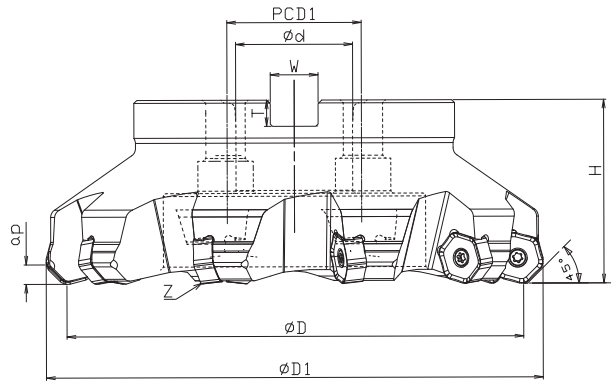
## ● Recommended Cutting Conditions

ISO	Workpiece material	Hardness	Grade	Cutting Speed		Feed	
				Vc (m/min)	fz (mm/t)		
P	Carbon Steel	≤HB300	TG4025	120-250	0.10-0.30		
	Alloy Steel	HB200-300		100-220	0.10-0.30		
	Mold Steel	≤HB300		80-180	0.10-0.25		
M	Stainless Steel	≤HB200	TG4035	100-200	0.06-0.20		

# THN45 SERIES

45° Face Mill with High Economical and 12 Cutting Edge Insert for Higher Productivity

- ★ Enhanced cutting edge for cutting stability and high feed machining.
- ★ Acute cutter pocket design and inclined screw clamping enables robust clamping.
- ★ High helical cutting edges for smooth machining double-sided 12 corner insert.



Designation	Size(mm)									Clamping Screw	Wrench
	D	D1	d	H	W	T	Z	PCD1	Max.ap		
THN45-50R04HN09M22	50	61.4	22	40	10.4	6.3	4	-	5	TH3009	THP09
THN45-63R06HN09M22	63	74.4	22	40	10.4	6.3	6	-	5		
THN45-80R06HN09M27	80	91.4	27	50	12.4	7.0	6	-	5		
THN45-100R06HN09M32	100	111.4	32	50	14.4	8.0	6	-	5		
THN45-125R08HN09M40	125	136.4	40	63	16.4	9.0	8	-	5		
THN45-160R10HN09M40	160	171.4	40	63	16.4	9.0	10	66.7	5	TH3009	TTL15P

# THN45 SERIES

45° Face Mill with High Economical and 12 Cutting Edge Insert for Higher Productivity

## ● Applicable Inserts

Usage Classification	P	Steel	★										
★ 1st Choice ☆ 2nd Choice	M	Stainless	★										
	K	Cast iron	★										
	N	Non-ferrous											
	S	Superalloys											
	H	Hard materials											

Insert	Insert No.	Size(mm)					Coated Carbide			Carbide			
		IC	S	D1	BS	RE	TY602	TY622	TY625	TI960	HC200		
	HNMU0906ANSN-GR	16.5	6.36	5	1.5	1.2	●						

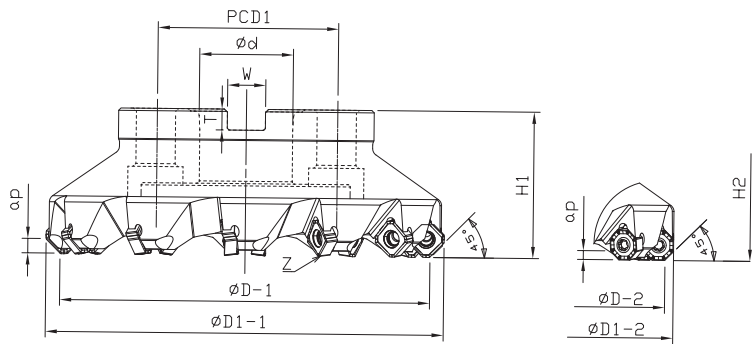
## ● Recommended Cutting Conditions

ISO	Workpiece material	Hardness	Grade	Cutting Speed	
				Vc (m/min)	fz (mm/t)
P	Low Carbon Steel	≤HB180	TY602	200-300	0.20-0.40
	High Carbon and Alloy Steel	HB180-280		100-250	0.15-0.25
	Alloy Steel	HB280-350		100-180	0.20-0.40
M	Stainless Steel	≤HB200		100-200	0.10-0.30
K	Gray Cast Iron	HB150-250		130-230	0.20-0.40
	Ductile Cast Iron	HB150-250		120-220	0.10-0.30

# TSO45 SERIES

45° Face Mill Offers Advantage of Using Square, Octagonal Inserts in the Same Pocket

- ★SNMU inserts offers double-sided, square inserts with eight cutting edges.
- ★Most suitable for a large depth of cut and free cutting inserts with excellent chip control.
- ★ONMU inserts offers double-sided, octagonal insert with 16 cutting edges – high economy inserts.
- ★Light cutting force due to excellent chip control.
- ★The optimized cutting edge creates barrel-formed chips for easy removal, allowing an operation at higher feed rate.



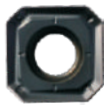
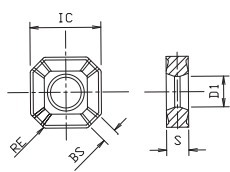

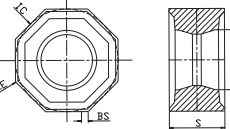
Designation	Size (mm)											Clamping Screw	Wrench
	D-1	D-2	D1-1	D1-2	d	H1	H2	W	T	Z	PCD1		
TSO45-50R04S13O05M22	50	52.3	62.5	62	22	40	38.77	10.4	6.3	4	-	TSO1013	TSOP1305
TSO45-63R06S13O05M22	63	65.3	75.5	75	22	40	38.77	10.4	6.3	6	-		
TSO45-80R06S13O05M27	80	82.3	92.5	92	27	50	48.77	12.4	7.0	6	-		
TSO45-100R08S13O05M32	100	102.3	112.5	112	32	50	48.77	14.4	8.0	8	-		
TSO45-125R10S13O05M40	125	127.3	137.5	137	40	63	61.77	16.4	9.0	10	-		
TSO45-160R12S13O05M40	160	162.3	172.5	172	40	63	61.77	16.4	9.0	12	66.7	TSO1013	TTL20

# TSON45 SERIES

45° Face Mill Offers Advantage of Using Square, Octagonal Inserts in the Same Pocket

## ● Applicable Inserts

Usage Classification	P	Steel	★											
★ 1st Choice ☆ 2nd Choice	M	Stainless	★											
	K	Cast iron	★											
	N	Non-ferrous												
	S	Superalloys												
	H	Hard materials												

Insert	Insert No.	Size(mm)							Coated Carbide			Carbide				
		IC	S	D1	BS	RE	Max.ap	TY602	TY622	TY625	TI960	HC200				
 	SNMU1305ANTR-PR	13	5.5	5.6	3	0.8	4.5	●								
 	ONMU050505-PR	13	5.5	5.6	5	0.5	2.5	●								

## ● Recommended Cutting Conditions

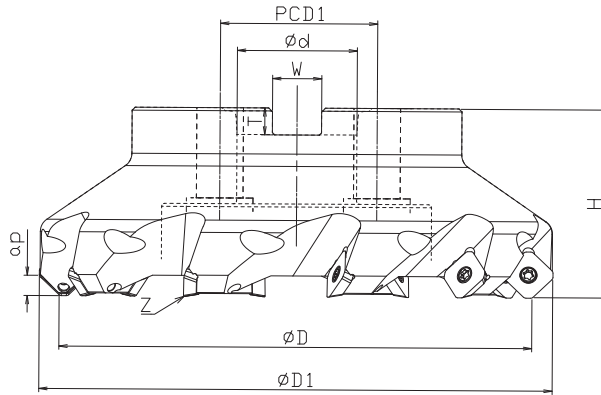
ISO	Workpiece material	Hardness	Grade	Cutting Speed		Feed	
				Vc (m/min)	fz (mm/t)		
P	Low Carbon Steel	≤HB180	TY602	120-250	0.10-0.50		
	High Carbon and Alloy Steel	HB180-280		100-180	0.15-0.40		
	Alloy Steel	HB280-350		70-150	0.15-0.40		
M	Stainless Steel	≤HB200		100-200	0.10-0.30		
K	Gray Cast Iron	HB150-250		100-180	0.10-0.50		
	Ductile Cast Iron	HB150-250		100-180	0.10-0.30		



# TSE45 SERIES

45° Face Mill with High Precision and 4 Cutting Edge Insert for Higher Productivity

- ★ 4 cutting edges on one insert for highly economical machining.
- ★ Optimized relief geometry on the positive insert ensures low cutting force and minimal chattering.
- ★ Helical cutting edges and optimized positioning on cutter provide high wall accuracy and surface quality.
- ★ Sharp yet tough rake geometry reduces fracture of cutting edges.



Designation	Size(mm)									Clamping Screw	Wrench
	D	D1	d	H	W	T	Z	PCD1	Max.ap		
TSE45-50R04SE12M22	50	62.9	22	40	10.4	6.3	4	-	6.5	TS2012	TSP12
TSE45-63R05SE12M22	63	75.9	22	40	10.4	6.3	5	-	6.5		
TSE45-80R06SE12M27	80	92.9	27	50	12.4	7.0	6	-	6.5		
TSE45-100R07SE12M32	100	112.9	32	50	14.4	8.0	7	-	6.5		
TSE45-125R08SE12M40	125	137.9	40	63	16.4	9.0	8	-	6.5		
TSE45-160R10SE12M40	160	172.8	40	63	16.4	9.0	10	66.7	6.5	TS3512	TTL15


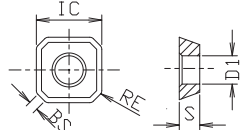

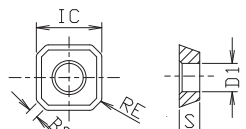
# TSE45 SERIES

45° Face Mill with High Precision and 4 Cuttign Edge Insert for Higher Productivity

## ● Applicable Inserts

Usage Classification	P	M	K	N	S	H
Steel	★					
Stainless	★					
Cast iron	★					
Non-ferrous				★		
Superalloys						
Hard materials						

★ 1st Choice  
☆ 2nd Choice

Insert	Insert No.	Size(mm)					Coated Carbide				Carbide		
		IC	S	D1	BS	RE	TY602	TY622	TY625	TI960	HC200		
 	SEKT12T3AGTN	13.4	4	5.5	1.3	1.5	●						
 	SEHT12T3-HL	13.4	4	5.5	1.3	1.5					●		

## ● Recommended Cutting Conditions

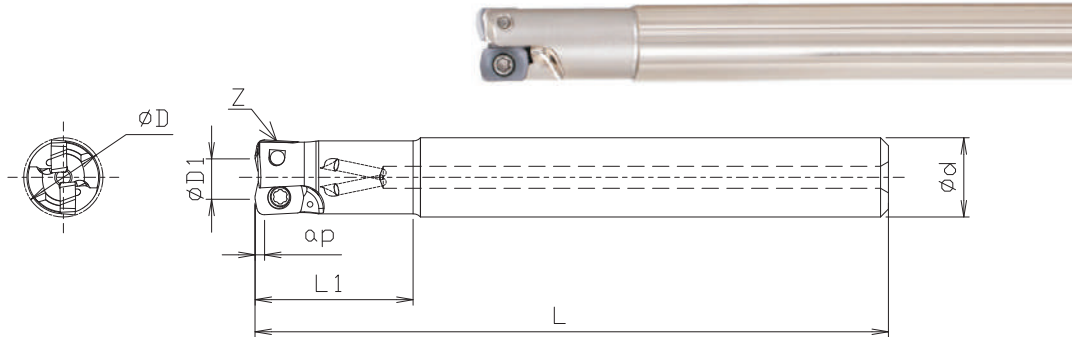
ISO	Workpiece material	Hardness	Grade	Cutting Speed		Feed	
				Vc (m/min)	fz (mm/t)		
P	Low Carbon Steel	≤ HB180	TY602	120-220	0.15-0.30		
	High Carbon and Alloy Steel	HB180-280		70-150	0.15-0.30		
	Alloy Steel	HB280-350		70-150	0.15-0.30		
M	Stainless Steel	≤ HB200		120-200	0.15-0.30		
K	Gray Cast Iron	HB150-250		140-220	0.15-0.30		
	Ductile Cast Iron	HB150-250		150-240	0.15-0.30		
N	Aluminum	—	HC200	300-800	0.07-0.55		

Indexable Milling Cutter  
High-Feed Milling

# MFH SERIES

## Micro-Diameter , High-Feed Milling

- ★ Durable Design Aids in Chatter Resistance.
- ★ Stable High Feed Machining on a Wide Range of Applications.
- ★ Controls Chip Biting with Convex Cutting Edge.
- ★ Replaces Solid End Mills to Reduce Machining Costs.



### ● Standard Type

Designation	Size(mm)							Clamping Screw	Wrench
	D	D1	d	L	L1	Z	Max.ap		
MFH08-S10-120-1T	8	4.2	10	120	35	1	0.5	TB1002	TBP02
MFH10-S10-120-2T	10	6.2	10	120	35	2	0.5		
MFH12-S12-120-3T	12	8.2	12	120	35	3	0.5		

### ● Non-interference Type

Designation	Size(mm)							Clamping Screw	Wrench
	D	D1	d	L	L1	Z	Max.ap		
MFH10-S08-120-2T	10	6.2	8	120	35	2	0.5	TB1002	TBP02
MFH12-S10-120-3T	12	8.2	10	120	35	3	0.5		
MFH14-S12-120-3T	14	10.2	12	120	35	3	0.5		


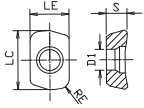

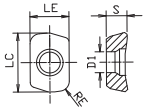
# MFH SERIES

Micro-Diameter , High-Feed Milling

## ● Applicable Inserts

Usage Classification	P	M	K	N	S	H
Steel	★					
Stainless	★					
Cast iron	★					
Non-ferrous						
Superalloys	★					
Hard materials				★		

★ 1st Choice  
☆ 2nd Choice

Insert	Insert No.	Size(mm)					Coated Carbide				Carbide		
		LC	LE	S	D1	RE	TY125	TH105	TY602	TY622	HC200		
	 BPMT020210R-UF	6.38	4.19	2.59	2.1	1.0	●						
	 BPGT020210R-UH	6.38	4.19	2.59	2.1	1.0		●					

## ● Recommended Cutting Conditions

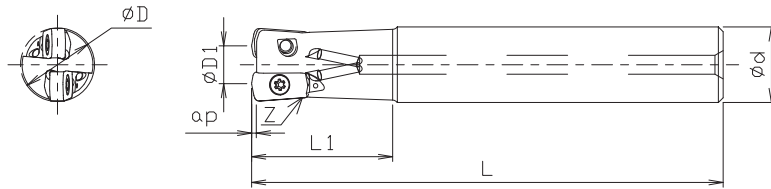
ISO	Workpiece material	Hardness	Grade	Cutting Speed		Feed	
				Vc (m/min)	fz (mm/t)		
P	Carbon Steel	≤ HB300	TY125	100-300	0.2-0.8		
	Alloy Steel	HB200-300		100-300	0.2-0.8		
	Mold Steel	< HRC40		100-200	0.2-0.5		
M	Stainless Steel	≤ HB200		100-150	0.2-0.5		
K	Grey Cast Iron	HB150-250		100-300	0.2-0.8		
	Ductile Cast Iron	HB150-250		80-200	0.2-0.6		
S	Ni-base HeatResistant Alloy	< HRC40		20-50	0.1-0.3		
	Titanium Alloy	< HRC40		30-60	0.1-0.3		
H	Hard Materials	HRC40-50		TH105	80-150	0.1-0.5	
		HRC50-60			50-70	0.1-0.3	

Indexable Milling Cutter  
High-Feed Milling

# MRH SERIES

## High-Feed Milling

- ★ High feed milling for small diameters and small machining centers.
- ★ Economical inserts with 4 cutting edges.
- ★ Both of standard type and non-interference type are available.



### ● Standard Type

Designation	Size(mm)							Clamping Screw	Wrench
	D	D1	d	L	L1	Z	Max.ap		
MRH16-S16-03-2T	16	8	16	100	30	2	1	M3065-S	FT08
MRH20-S20-03-3T	20	12	20	130	50	3	1		
MRH25-S25-03-3T	25	17	25	140	60	3	1		
MRH32-S32-03-4T	32	24	32	150	70	4	1		

### ● Non-interference Type


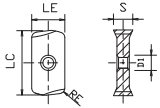
Designation	Size(mm)							Clamping Screw	Wrench
	D	D1	d	L	L1	Z	Max.ap		
MRH17-S16-03-2T	17	9	16	150	25	2	1	M3065-S	FT08
MRH21-S20-03-3T	21	13	20	150	30	3	1		
MRH26-S25-03-3T	26	18	25	150	35	3	1		

# MRH SERIES

## High-Feed Milling

### ● Applicable Inserts

Usage Classification	P	Steel	★											
★ 1st Choice ☆ 2nd Choice	M	Stainless	☆	★										
	K	Cast iron												
	N	Non-ferrous												
	S	Superalloys		★										
	H	Hard materials												

Insert	Insert No.	Size(mm)										Coated Carbide		Carbide		
		LC	LE	S	D1	RE	KX402	KX405	TY602	TY622	HC200					
 	LOGU030310ER-GM	11.9	6.2	3.96	3.45	1.0	●	●								

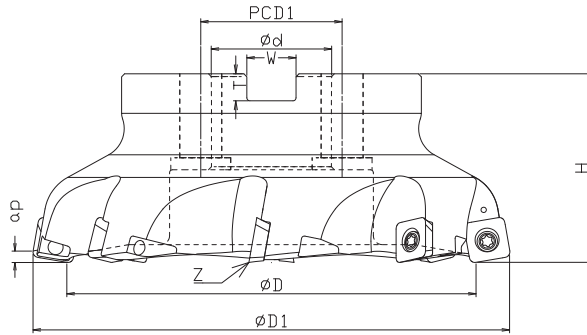
### ● Recommended Cutting Conditions

ISO	Workpiece material	Hardness	Grade	Cutting Speed		Feed	
				Vc (m/min)	fz (mm/t)		
P	Carbon Steel	≤HB300	KX402	120-250	0.2-1.2		
	Alloy Steel	HB200-300		100-220	0.2-1.2		
	Mold Steel	<HRC40		80-180	0.2-0.9		
	Mold Steel	HRC40-50		60-130	0.2-0.5		
M	Stainless Steel	≤HB200	KX405	100-200	0.2-0.9		
S	Ni-base HeatResistant Alloy	—		20-50	0.2-0.6		
	Titanium Alloy	—		40-80	0.2-0.6		

Indexable Milling Cutter  
High-Feed Milling

# MRH SERIES

## High-Feed Milling



Designation	Size(mm)								Clamping Screw	Wrench
	D	D1	d	H	W	T	Z	Max.ap		
MRH050R-14-3T-22M	27	50	22	50	10.4	6	3	2	M5011-S	WT20
MRH063R-14-4T-22M	40	63	22	50	10.4	6	4	2		
MRH080R-14-5T-M	57	80	27	63	12.4	7	5	2		
MRH100R-14-7T-M	77	100	32	63	14.4	8	7	2		
MRH125R-14-7T-M	102	125	40	63	16.4	9	7	2		
MRH160R-14-8T-M	137	160	40	63	16.4	9	8	2		

### ● Applicable Inserts

Usage Classification	P	Steel	★											
★ 1st Choice ☆ 2nd Choice	M	Stainless	☆											
	K	Cast iron												
	N	Non-ferrous												
	S	Superalloys												
	H	Hard materials												

Insert	Insert No.	Size(mm)						Coated Carbide		Carbide				
		IC	S	D1	RE	AN	KX402	KX405	TY602	TY622	HC200			
		SOMT140520ER-GM	14.1	5.56	5.8	2.0	16°	●						

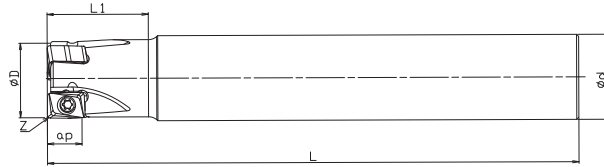
### ● Recommended Cutting Conditions

ISO	Workpiece material	Hardness	Grade	Cutting Speed		Feed	
				Vc (m/min)	fz (mm/t)		
P	Carbon Steel	<HB300	KX402	120-250	0.5-2.0		
	Alloy Steel	HB200-300		100-220	0.5-2.0		
	Mold Steel	<HRC40		80-180	0.2-1.8		
	Mold Steel	HRC40-50		60-130	0.2-1.0		

# TAN90 SERIES

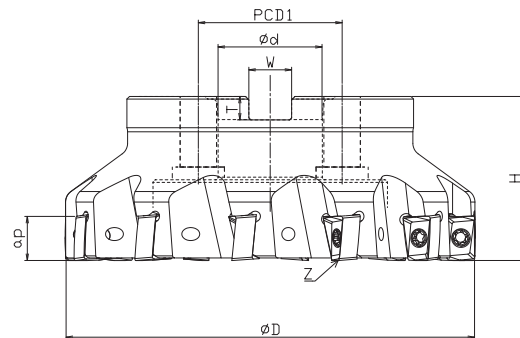
## Shoulder Milling with 4 Cutting-Edge Double-Sided Insert for High-Feed Machining

- ★ Double sided insert with 4 sharp and tough cutting edges.
- ★ Available in 3 sizes and wiper edge for excellent surface finish.
- ★ Low cutting force due to large rake angle.
- ★ Positive rake face for smooth machining and reduced vibration.
- ★ Highly rigid cutter body.



● Endmills

Designation	Size(mm)						Insert	Clamping Screw	Wrench
	D	d	L1	L	Z	Max.ap			
TANE90-16R02D16AN09L125	16	16	26	125	2	8	ANKT090408	TA4009	TEP09
TANE90-20R03D20AN09L125	20	20	26	125	3	8	ANKT090408		
TANE90-25R04D25AN09L125	25	25	26	125	4	8	ANKT090408		
TANE90-32R05D32AN09L160	32	32	26	160	5	8	ANKT090408		
TANE90-25R02D25AN12L125	25	25	26	125	2	12	ANKT120508	TA4012	TEP12
TANE90-32R03D32AN12L160	32	32	26	160	3	12	ANKT120508		
TANE90-40R04D32AN12L200	40	32	26	200	4	12	ANKT120508		



● Milling Cutters

Designation	Size (mm)								Insert	Clamping Screw	Wrench
	D	d	H	W	T	Z	PCD1	Max.ap			
TANF90-50R04AN17M22	50	22	50	10.4	6.3	4	-	16.3	ANKT170608	TA4017	TFP17
TANF90-63R06AN17M27	63	22	50	10.4	6.3	6	-	16.3	ANKT170608		
TANF90-80R07AN17M27	80	27	50	12.4	7.0	7	-	16.3	ANKT170608		
TANF90-100R08AN17M32	100	32	50	14.4	8.0	8	-	16.3	ANKT170608		
TANF90-125R10AN17M40	125	40	63	16.4	9.0	10	-	16.3	ANKT170608	TA4017	TTL20
TANF90-160R12AN17M40	160	40	63	16.4	9.0	12	66.7	16.3	ANKT170608		


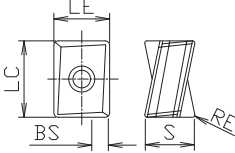


# TAN90 SERIES

Shoulder Milling with 4 Cutting-Edge Double-Sided Insert for High-Feed Machining

## ● Applicable Inserts

Usage Classification	P	Steel																
★ 1st Choice ☆ 2nd Choice	M	Stainless																
	K	Cast iron																
	N	Non-ferrous																
	S	Superalloys																
	H	Hard materials																

Insert	Insert No.	Size(mm)					Coated Carbide				Carbide							
		LC	LE	S	BS	RE	TY602	TY622	TY625	Ti960	HC200							
 	ANKT090408-MT	8.6	6.6	5.20	2.5	0.8			●									
	ANKT120508-MT	13.7	10.0	9.15	3.8	0.8			●									
	ANKT170608-MT	16.7	11.2	10.40	4.7	0.8			●									

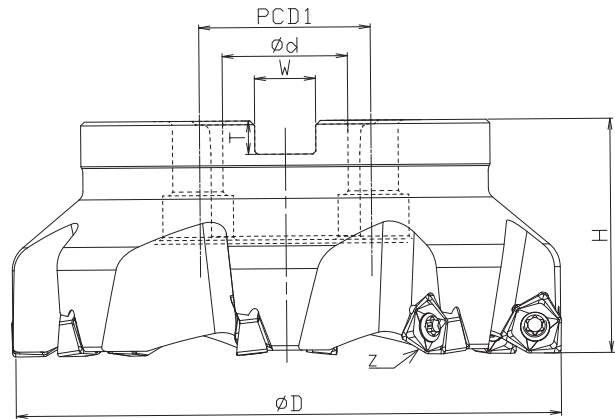
## ● Recommended Cutting Conditions

ISO	Workpiece material	Hardness	Grade	Cutting Speed	Feed
				Vc (m/min)	fz (mm/t)
P	Low Carbon Steel	≤HB180	TY625	120-180	0.05-0.15
	High Carbon and Alloy Steel	HB200-300		100-160	0.05-0.10
	Mold Steel	≤HB300		80-120	0.05-0.10
M	Stainless Steel	≤HB200		80-100	0.10-0.25
K	Gray Cast Iron	HB150-250		150-200	0.10-0.20
	Ductile Cast Iron	HB150-250		120-150	0.05-0.15

## TWN90 SERIES

Shoulder Milling Cutter with 6 Double-Sided Cutting Edge and Low Cutting Forces for Reduced Chattering and Superior Fracture Resistance

- ★ Sharp cutting due to lower cutting forces.
- ★ Reduced chattering even with extended milling adapters.
- ★ Superior fracture resistance with thick edge design.

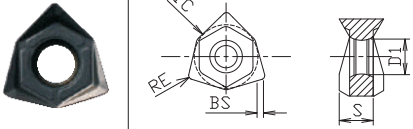


Designation	Size(mm)								Clamping Screw	Wrench
	D	d	H	W	T	Z	PCD1	Max.ap		
TWN90-63R03WN08M22	63	22	40	10.4	6.3	3	-	6.5	TW1008	TWP1008
TWN90-80R04WN08M27	80	27	50	12.4	7.0	4	-	6.5		
TWN90-100R05WN08M32	100	32	50	14.4	8.0	5	-	6.5		
TWN90-125R06WN08M40	125	40	63	16.4	9.0	6	-	6.5	TW1008	TTL20
TWN90-160R08WN08M40	160	40	63	16.4	9.0	8	66.7	6.5		

# TWN90 SERIES

Shoulder Milling Cutter with 6 Double-Sided Cutting Edge and Low Cutting Forces for Reduced Chattering and Superior Fracture Resistance

## ● Applicable Inserts

Insert		Insert No.	Size(mm)					Coated Carbide		Carbide		
			IC	S	D1	BS	RE	TY602	TY622	TY625	TI960	HC200
		WNMU080608PTN-CR	14	6.65	6.2	1.3	0.8	●				

Usage Classification	P	Steel	★								
★ 1st Choice ☆ 2nd Choice	M	Stainless	★								
	K	Cast iron	★								
	N	Non-ferrous									
	S	Superalloys									
	H	Hard materials									

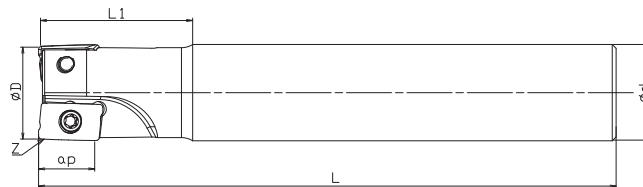
## ● Recommended Cutting Conditions

ISO	Workpiece material	Hardness	Grade	Cutting Speed		Feed	
				Vc (m/min)	fz (mm/t)		
P	Carbon Steel	≤HB300	TY602	120-250	0.05-0.15		
	Alloy Steel	HB200-300		100-220	0.05-0.10		
	Mold Steel	≤HB300		80-180	0.05-0.10		
M	Stainless Steel	≤HB200		80-150	0.10-0.25		
K	Gray Cast Iron	HB150-250		120-250	0.10-0.20		
	Ductile Cast Iron	HB150-250		100-200	0.05-0.15		

# TAP90 SERIES

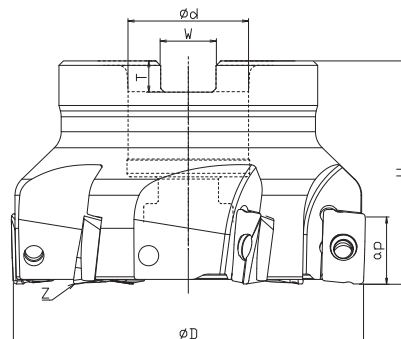
Shoulder Milling with High Precision Cutting Edge and Low Cutting Forces for Reduced Chattering

- ★ Suitable for 11° positive angle insert, applicable to alloy steel, hardened steel and aluminium alloy.
- ★ Sharp cutting due to lower cutting forces.
- ★ Reduced chattering even with extended milling adapters.



● Endmills

Designation	Size(mm)						Insert	Clamping Screw	Wrench
	D	d	L1	L	Z	Max.ap			
TAPE90-16R02D16AP10L150	16	16	28	150	2	9	APKT1003..	TK1000	TKP10
TAPE90-16R02D16AP10L200				200	2	9	APKT1003..		
TAPE90-20R02D20AP10L150	20	20	30	150	2	9	APKT1003..		
TAPE90-20R02D20AP10L200				200	2	9	APKT1003..		
TAPE90-25R02D25AP16L150	25	25	40	150	2	15	APKT1604..	TK1600	TKP16
TAPE90-25R02D25AP16L200				200	2	15	APKT1604..		
TAPE90-32R03D32AP16L150	32	32	45	150	3	15	APKT1604..		
TAPE90-32R03D32AP16L200				200	3	15	APKT1604..		



● Milling Cutters


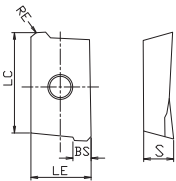

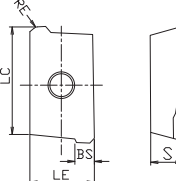

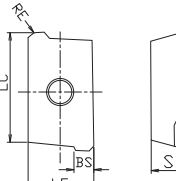
Designation	Size (mm)							Insert	Clamping Screw	Wrench
	D	d	H	W	T	Z	Max.ap			
TAPF90-50R04AP16M22	50	22	50	10.4	6.3	4	15	APKT1604..	TK1600	TKP16
TAPF90-63R05AP16M22	63	22	50	10.4	6.3	5	15	APKT1604..		
TAPF90-80R06AP16M27	80	27	50	12.4	7.0	6	15	APKT1604..		
TAPF90-100R08AP16M32	100	32	50	14.4	8.0	8	15	APKT1604..		

# TAP90 SERIES

Shoulder Milling with High Precision Cutting Edge and Low Cutting Forces for Reduced Chattering

## ● Applicable Inserts

Usage Classification	P	Steel	★								
★ 1st Choice ☆ 2nd Choice	M	Stainless	★								
	K	Cast iron	★								
	N	Non-ferrous							★		
	S	Superalloys									
	H	Hard materials		★							

Insert	Insert No.	Size(mm)					Coated Carbide				Carbide		
		LC	LE	S	BS	RE	TY602	TY622	TY625	TI960	HC200		
 	APKT100305PDTR	9.9	6.7	3.6	0.86	0.5	●						
	APKT100308PDTR	9.9	6.7	3.6	0.9	0.8	●						
	APKT160404PDTR	15.2	9.4	5.3	1.11	0.4	●						
	APKT160408PDTR	15.2	9.4	5.3	1.32	0.8	●						
	APKT160412PDTR	15.2	9.4	5.3	1.13	1.2	●						
	APKT160416PDTR	15.2	9.4	5.3	1.13	1.6	●						
	APKT160424PDTR	15.2	9.4	5.3	—	2.4	●						
 	APKT160404-TR	15.2	9.4	5.3	1.11	0.4	●						
	APKT160408-TR	15.2	9.4	5.3	1.32	0.8	●						
	APKT160412-TR	15.2	9.4	5.3	1.13	1.2	●						
	APKT160416-TR	15.2	9.4	5.3	1.13	1.6	●						
	APKT160424-TR	15.2	9.4	5.3	—	2.4	●						
 	APKT100305	9.9	6.7	3.6	0.86	0.5					●		
	APKT100308	9.9	6.7	3.6	0.9	0.8					●		
	APKT160402PDER-AK	15.2	9.4	5.3	1.11	0.2					●		
	APKT160404PDER-AK	15.2	9.4	5.3	1.11	0.4					●		
	APKT160408PDER-AK	15.2	9.4	5.3	1.32	0.8					●		
	APKT160412PDER-AK	15.2	9.4	5.3	1.13	1.2					●		
	APKT160416PDER-AK	15.2	9.4	5.3	1.13	1.6					●		
	APKT160420PDER-GW	15.2	9.4	5.3	—	2.0					●		

# TAP90 SERIES

Shoulder Milling with High Precision Cutting Edge and Low Cutting Forces for Reduced Chattering

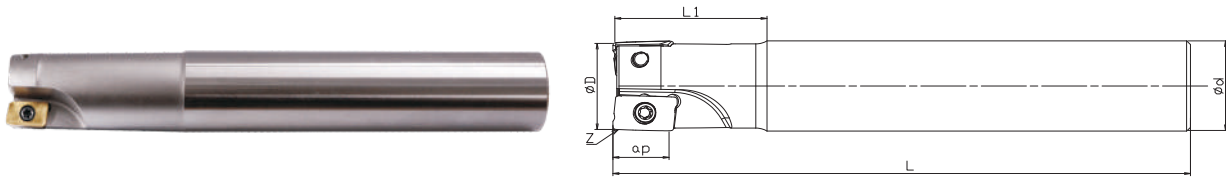
## ● Recommended Cutting Conditions

ISO	Workpiece material	Hardness	Grade	Cutting Speed		Feed	
				Vc (m/min)	fz (mm/t)		
P	Low Carbon Steel	≤HB180	TY602	120-220	0.15-0.30		
	High Carbon and Alloy Steel	HB180-280		70-150	0.15-0.30		
	Alloy Steel	HB280-350		70-150	0.15-0.30		
M	Stainless Steel	≤HB200		120-200	0.08-0.25		
K	Gray Cast Iron	HB150-250		140-220	0.15-0.30		
	Ductile Cast Iron	HB150-250		150-240	0.15-0.30		
N	Aluminum	—	HC200	300-800	0.07-0.50		
H	Hardened Material	<HRC55	TY622	40-80	0.26-0.40		

# EAP SERIES

## EAP Right Angle Shoulder Milling Cutter Bar

- ★ Suitable for heavy cutting, rotary and feed volume is 3 times the normal cutter.
- ★ Suitable for economical inserts, high cost performance.



Designation	Size(mm)							Insert	Clamping Screw	Wrench		
	D	d	L1	L2	L	Z	Max.a					
EAP300R-C10-10-120L-1T	10	10	30	-	120	1	9	APMT1135	TT1011	TTP11		
EAP300R-C10-11-120L-1T	11	10	30	-	120	1	9	APMT1135				
EAP300R-C12-12-130L-1T	12	12	30	-	130	1	9	APMT1135				
EAP300R-C12-13-130L-1T	13	12	30	-	130	1	9	APMT1135				
EAP300R-C16-16-120L-2T	16	16	40	-	120	2	9	APMT1135				
EAP300R-C16-16-150L-2T	16	16	40	-	150	2	9	APMT1135				
EAP300R-C16-16-200L-2T	16	16	40	100	200	2	9	APMT1135				
EAP300R-C15-16-150L-2T	16	15	40	-	150	2	9	APMT1135				
EAP300R-C16-17-150L-2T	17	16	40	-	150	2	9	APMT1135				
EAP300R-C16-17-200L-2T	17	16	40	-	200	2	9	APMT1135				
EAP300R-C20-20-150L-2T	20	20	50	-	150	2	9	APMT1135				
EAP300R-C19-20-150L-2T	20	19	50	-	150	2	9	APMT1135				
EAP300R-C20-20-200L-2T	20	20	50	100	200	2	9	APMT1135				
EAP300R-C19-20-200L-2T	20	19	50	-	200	2	9	APMT1135				
EAP300R-C20-21-150L-2T	21	20	50	-	150	2	9	APMT1135				
EAP300R-C20-21-200L-2T	21	20	50	-	200	2	9	APMT1135				
EAP300R-C25-25-150L-3T	25	25	50	-	150	3	9	APMT1135				
EAP400R-C24-25-150L-2T	25	24	40	-	150	2	14	APMT1604			TT1016	TTP16
EAP400R-C25-25-200L-2T	25	25	75	-	200	2	14	APMT1604				
EAP400R-C24-25-200L-2T	25	24	50	-	200	2	14	APMT1604				
EAP400R-C32-32-150L-3T	32	32	50	-	150	3	14	APMT1604				
EAP400R-C32-32-200L-3T	32	32	80	-	200	3	14	APMT1604				
EAP400R-C32-35-150L-3T	35	32	60	-	150	3	14	APMT1604				
EAP400R-C32-35-200L-3T	35	32	60	-	200	3	14	APMT1604				


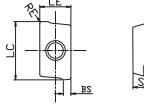
# EAP SERIES

## EAP Right Angle Shoulder Milling Cutter Bar

### ● Applicable Inserts

		Usage Classification	P	Steel	★										
		★ 1st Choice ☆ 2nd Choice	M	Stainless	☆										
			K	Cast iron	★										
			N	Non-ferrous							★				
			S	Superalloys											
			H	Hard materials			★								

	Insert	Insert No.	Size(mm)					Coated Carbide				Carbide		
			LC	LE	S	BS	RE	TI960	TH910	TY602	TY622	HC200		
		APMT1135PDER-M2	11.0	6.35	3.50	1.5	0.8	●	●					
		APMT1604PDER-M2	16.5	9.53	4.76	1.7	0.8	●	●					

### ● Recommended Cutting Conditions

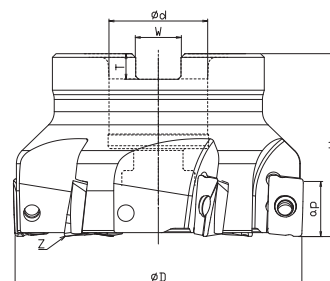
ISO	Workpiece material	Hardness	Grade	Cutting Speed		Feed	
				Vc (m/min)	fz (mm/t)		
P	Low Carbon Steel	≤HB180	TY602	120-220	0.15-0.30		
	High Carbon and Alloy Steel	HB180-280		70-150	0.15-0.30		
	Alloy Steel	HB280-350		70-150	0.15-0.30		
M	Stainless Steel	≤HB200		120-200	0.10-0.25		
K	Gray Cast Iron	HB150-250		140-220	0.15-0.30		
	Ductile Cast Iron	HB150-250		150-240	0.15-0.30		
H	Hardened Material	≤HRC50	TH910	40-80	0.10-0.30		



# EAP SERIES

## EAP Right Angle Shoulder Face Mill


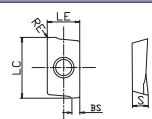
- ★ Suitable for 11° positive angle insert tip.
- ★ Suitable for various types of inserts, applicable to aluminum and steel milling.
- ★ Screw locking, large space for chipping, excellent chip removal performance.
- ★ Cutting smoothly, low resistance.
- ★ Customized aluminium milling cutter is available.



Designation	Size(mm)							Insert	Clamping Screw	Wrench
	D	d	H	W	T	Z	Max.ap			
EAP400R-50-22-4T	50	22	50	10.4	6.3	4	14	APMT1604	TT1016	TTP16
EAP400R-63-22-4T	63	22	50	10.4	6.3	4	14	APMT1604		
EAP400R-80-27-6T	80	27	50	12.4	7	6	14	APMT1604		
EAP400R-100-32-6T	100	32	50	14.4	8	6	14	APMT1604		
EAP400R-125-40-7T	125	40	63	16.4	9	7	14	APMT1604		
EAP400R-160-40-8T	160	40	63	16.4	9	8	14	APMT1604		
EAP400R-200-60-10T	200	60	63	25.7	14	10	14	APMT1604		

### Applicable Inserts

Usage Classification	P	M	K	N	S	H
★ 1st Choice	Steel	Stainless	Cast iron	Non-ferrous	Superalloys	Hard materials
☆ 2nd Choice	★	☆	★	★		★

Insert	Insert No.	Size					Coated Carbide				Carbide		
		LC	LE	S	BS	RE	TI960	TH910	TY602	TY622	HC200		
		APMT1604PDER-M2	16.5	9.53	4.76	1.7	0.8	●	●				

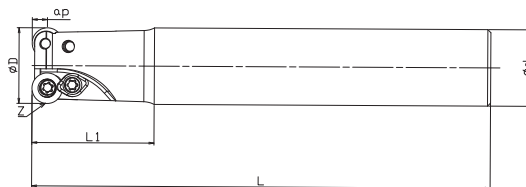
### Recommended Cutting Conditions

ISO	Workpiece material	Hardness	Grade	Cutting Speed	Feed
				V <sub>c</sub> (m/min)	f <sub>z</sub> (mm/t)
P	Low Carbon Steel	≤ HB180	TI960	120-220	0.15-0.30
	High Carbon and Alloy Steel	HB180-280		70-150	0.15-0.30
	Alloy Steel	HB280-350		70-150	0.15-0.30
M	Stainless Steel	≤ HB200		120-200	0.10-0.25
K	Gray Cast Iron	HB150-250		140-220	0.15-0.30
	Ductile Cast Iron	HB150-250		150-240	0.15-0.30
H	Hardened Material	≤ HRC50	TH910	40-80	0.10-0.30

# TRD SERIES

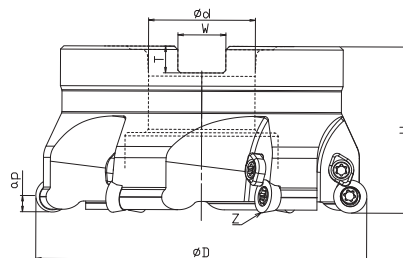
Radius Milling with Lowers Cutting Costs and Increases Efficiency

- ★ Low cutting forces with helical cutting edge design .
- ★ Suitable for 11°positive angle insert, applicable to alloy steel , hardened steel and aluminium alloy.
- ★ Reduced chattering even with extended milling adapters .



● Endmills

Designation	Size(mm)						Insert	Clamping Screw	Wrench	Clamping Piece
	D	d	L1	L	Z	Max.ap				
TRDE4R-16R02D16RD08L150	16	16	28	150	2	4	RDKT0802M0	TR1008	TRP08	TRS08
TRDE4R-16R02D16RD08L200				200	2	4	RDKT0802M0			
TRDE4R-20R02D20RD08L150	20	20	30	150	2	4	RDKT0802M0			
TRDE4R-20R02D20RD08L200				200	2	4	RDKT0802M0			
TRDE5R-20R02D20RD10L150	20	20	30	150	2	5	RDKT10T3M0	TR1010	TRP10	TRS10
TRDE5R-20R02D20RD10L200				200	2	5	RDKT10T3M0			
TRDE5R-25R02D25RD10L150	25	25	40	150	2	5	RDKT10T3M0			
TRDE5R-25R02D25RD10L200				200	2	5	RDKT10T3M0			
TRDE6R-32R03D32RD12L150	32	32	45	150	3	6	RDKT1204M0	TR1012	TRP12	TRS12
TRDE6R-32R03D32RD12L200				200	3	6	RDKT1204M0			



● Milling Cutters





Designation	Size (mm)							Insert	Clamping Screw	Wrench	Clamping Piece
	D	d	H	W	T	Z	Max.ap				
TRDF5R-50R04RD10M22	50	22	50	10.4	6.3	4	5	RDKT10T3M0	TR1010	TRP10	TRS10
TRDF5R-63R04RD10M22	63	22	50	10.4	6.3	4	5	RDKT10T3M0			
TRDF5R-80R06RD10M27	80	27	50	12.4	7.0	6	5	RDKT10T3M0			
TRDF5R-100R06RD10M32	100	32	50	14.4	8.0	6	5	RDKT10T3M0			
TRDF6R-50R04RD12M22	50	22	50	10.4	6.3	4	6	RDKT1204M0	TR1012	TRP12	TRS12
TRDF6R-63R04RD12M22	63	22	50	10.4	6.3	4	6	RDKT1204M0			
TRDF6R-80R06RD12M27	80	27	50	12.4	7.0	6	6	RDKT1204M0			
TRDF6R-100R06RD12M32	100	32	50	14.4	8.0	6	6	RDKT1204M0			

# TRD SERIES

Radius Milling with Lowers Cutting Costs and Increases Efficiency

## ● Applicable Inserts

Usage Classification	P	Steel	★											
★1st Choice ☆2nd Choice	M	Stainless	★											
	K	Cast iron	★											
	N	Non-ferrous						★						
	S	Superalloys												
	H	Hard materials		★										

Insert	Insert No.	Size(mm)			Coated Carbide				Carbide					
		IC	S	RE	TY602	TY622	TY625	T1960	HC200					
 General Chipbreaker	RDKT0802M0	8	2.4	4	●									
	RDKT10T3M0	10	4.0	5	●									
	RDKT1204M0	12	4.8	6	●									
	RDMT0802M0	8	2.4	4	●									
	RDMT10T3M0	10	4.0	5	●									
	RDMT1204M0	12	4.8	6	●									
 Stainless Steel Chipbreaker	RDKT0802M0-ST	8	2.4	4	●									
	RDKT10T3M0-ST	10	4.0	5	●									
	RDKT1204M0-ST	12	4.8	6	●									
 	RDKT0802M0-TR	8	2.4	4		●								
	RDKT10T3M0-TR	10	4.0	5		●								
	RDKT1204M0-TR	12	4.8	6		●								
 	RDKT0802M0	8	2.4	4						●				
	RDKT10T3M0	10	4.0	5						●				
	RDKT1204M0	12	4.8	6						●				

# TRD SERIES

Radius Milling with Lowers Cutting Costs and Increases Efficiency

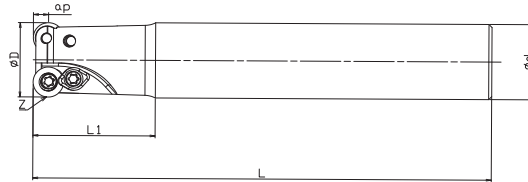
## ● Recommended Cutting Conditions

ISO	Workpiece material	Hardness	Grade	Cutting Speed		Feed	
				Vc (m/min)	fz (mm/t)	fz (mm/t)	fz (mm/t)
P	Low Carbon Steel	< HB180	TY602	120-220	0.15-0.30		
	High Carbon and Alloy Steel	HB180-280		70-150	0.15-0.30		
	Alloy Steel	HB280-350		70-150	0.15-0.30		
M	Stainless Steel	< HB200		120-200	0.10-0.25		
K	Gray Cast Iron	HB150-250		140-220	0.15-0.30		
	Ductile Cast Iron	HB150-250		150-240	0.15-0.30		
N	Aluminum	—	HC200	300-800	0.07-0.55		
H	Hardened Material	< HRC55	TY622	40-80	0.22-0.40		

# EMR SERIES

## EMR Round Dowel Milling Cutter Bar

★ Suitable for a variety of economical inserts, high cost performance

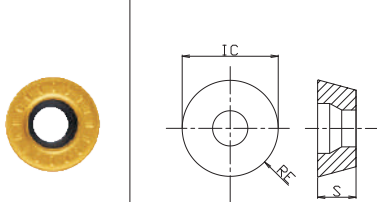


Designation	Size(mm)							Insert	Clamping Screw	Wrench	Clamping Piece
	D	d	L1	L2	L	Z	Max.ap				
EMR 4R-C12-12-130L-1T	12	12	40	-	130	1	4	RPMT08T2	TT1008	TTP08	TTS08
EMR 4R-C12-13-130L-1T	13	12	40	-	130	1	4	RPMT08T2			
EMR 4R-C16-16-150L-2T	16	16	40	-	150	2	4	RPMT08T2			
EMR 4R-C15-16-150L-2T	16	15	40	-	150	2	4	RPMT08T2			
EMR 4R-C16-16-200L-2T	16	16	40	100	200	2	4	RPMT08T2			
EMR 4R-C15-16-200L-2T	16	15	40	-	200	2	4	RPMT08T2			
EMR 4R-C16-17-150L-2T	17	16	40	-	150	2	4	RPMT08T2			
EMR 4R-C16-17-200L-2T	17	16	50	-	200	2	4	RPMT08T2			
EMR 4R-C20-20-150L-2T	20	20	50	-	150	2	4	RPMT08T2			
EMR 4R-C19-20-150L-2T	20	19	50	-	150	2	4	RPMT08T2			
EMR 4R-C20-20-200L-2T	20	20	50	100	200	2	4	RPMT08T2			
EMR 4R-C19-20-200L-2T	20	19	50	-	200	2	4	RPMT08T2			
EMR 4R-C20-21-150L-2T	21	20	50	-	150	2	4	RPMT08T2			
EMR 4R-C20-21-200L-2T	21	20	50	-	200	2	4	RPMT08T2			
EMR 5R-C20-30-110L-2T	30	20	40	-	110	2	5	RPM□10□3	TT1011	TTP10	TTS10
EMR 5R-C20-20-150L-2T	20	20	50	-	150	2	5	RPM□10□3			
EMR 5R-C20-20-200L-2T	20	20	50	100	200	2	5	RPM□10□3			
EMR 5R-C20-21-150L-2T	21	20	50	-	150	2	5	RPM□10□3			
EMR 5R-C20-21-200L-2T	21	20	50	-	200	2	5	RPM□10□3			
EMR 5R-C25-25-150L-2T	25	25	50	-	150	2	5	RPM□10□3			
EMR 5R-C20-25-150L-2T	25	20	50	-	150	2	5	RPM□10□3			
EMR 5R-C24-25-150L-2T	25	24	50	-	150	2	5	RPM□10□3			
EMR 5R-C25-25-200L-2T	25	25	75	-	200	2	5	RPM□10□3			
EMR 5R-C25-25-250L-2T	25	25	60	115	250	2	5	RPM□10□3			
EMR 5R-C20-25-200L-2T	25	20	50	-	200	2	5	RPM□10□3			
EMR 5R-C24-25-200L-2T	25	24	50	-	200	2	5	RPM□10□3			
EMR 5R-C24-25-250L-2T	25	24	50	-	250	2	5	RPM□10□3			
EMR 5R-C25-26-150L-2T	26	25	50	-	150	2	5	RPM□10□3			
EMR 5R-C25-26-200L-2T	26	25	50	-	200	2	5	RPM□10□3			
EMR 5R-C25-26-250L-2T	26	25	50	-	250	2	5	RPMT1204	TT1012	TRP12	TRS12
ERP-6R-C32-32-150L-2T	32	32	50	-	150	2	6	RPMT1204			
ERP-6R-C32-32-200L-2T	32	32	50	-	200	2	6	RPMT1204			
ERP-6R-C32-35-150L-3T	35	32	50	-	150	3	6	RPMT1204			
ERP-6R-C32-35-200L-3T	35	32	50	-	200	3	6	RPMT1204			

# EMR SERIES

## EMR Round Dowel Milling Cutter Bar

### ● Applicable Inserts

Insert		Insert No.	Size(mm)			Coated Carbide		Carbide		
			IC	S	RE	TI960	TH910	TY602	TY622	HC200
		RPMT08T2M0-MT1	8	2.78	4	●				
		RPMW1003MT	10	3.18	5	●	●			
		RPMT10T3MT	10	3.97	5	●	●			
		RPMT1204M0-MT1	12	4.76	6	●	●			

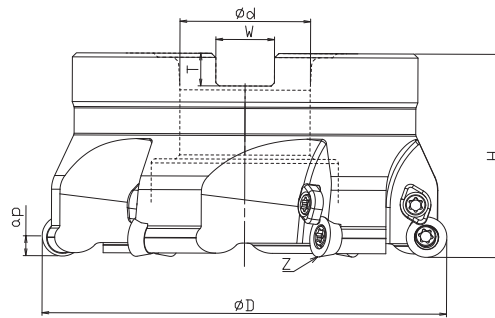
### ● Recommended Cutting Conditions

ISO	Workpiece material	Hardness	Grade	Cutting Speed		Feed	
				Vc (m/min)	fz (mm/t)		
P	Low Carbon Steel	≤ HB180	TI960	120-220	0.15-0.30		
	High Carbon and Alloy Steel	HB180-280		70-150	0.15-0.30		
	Alloy Steel	HB280-350		70-150	0.15-0.30		
M	Stainless Steel	≤ HB200		120-200	0.10-0.25		
K	Gray Cast Iron	HB150-250		140-220	0.15-0.30		
	Ductile Cast Iron	HB150-250		150-240	0.15-0.30		
H	Hardened Material	≤ HRC50	TH910	40-80	0.22-0.40		

# EMR SERIES

## EMR Round Dowel Mill

- ★ Suitable for 11° positive angle insert tip
- ★ Working with very economical insert
- ★ Large space for chipping, excellent chip removal performance
- ★ Taper design with high rigidity
- ★ Customized aluminium milling cutter is available



Designation	Size(mm)							Insert	Clamping Screw	Wrench	Clamping Piece
	D	d	H	W	T	Z	Max.ap				
EMR-5R-50-22-4T	50	22	50	10.4	6.3	4	5	RPMW1003 RPMT10T3	TW1010 TT1011	TTP10	TTS10
EMR-5R-63-22-4T	63	22	50	10.4	6.3	4	5				
EMR-5R-80-27-6T	80	27	50	12.4	7	6	5				
EMR-5R-100-32-6T	100	32	50	14.4	7	6	5				
EMR-5R-125-40-7T	125	40	63	16.4	9	7	5				
EMR-5R-160-40-8T	160	40	63	16.4	9	8	5				
ERP-6R-50-22-4T	50	22	50	10.4	6.3	4	6	RPMT1204	TT1012	TRP12	TRS12
ERP-6R-63-22-4T	63	22	50	10.4	6.3	4	6				
ERP-6R-80-27-6T	80	27	50	12.4	7	6	6				
ERP-6R-100-32-6T	100	32	50	14.4	8	6	6				

# EMR SERIES

## EMR Round Dowel Mill

### ● Applicable Inserts

Insert		Insert No.	Usage Classification			Size(mm)				Coated Carbide		Carbide		
			P	M	K	IC	S	RE	TI960	TH910	TY602	TY622	HC200	
 		RPMW1003MT	★			10	3.18	5	●	●				
		RPMT10T3MT	★			10	3.97	5	●	●				
		RPMT1204M0-MT1	★			12	4.76	6	●	●				
			☆											

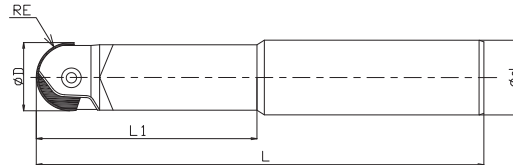
### ● Recommended Cutting Conditions

ISO	Workpiece material	Hardness	Grade	Cutting Speed		Feed	
				Vc (m/min)	fz (mm/t)		
P	Low Carbon Steel	≤HB180	TI960	120-220	0.10-0.35		
	High Carbon and Alloy Steel	HB180-280		70-150	0.10-0.35		
	Alloy Steel	HB280-350		70-150	0.10-0.35		
M	Stainless Steel	≤HB200		120-200	0.10-0.30		
K	Gray Cast Iron	HB150-250		140-220	0.15-0.30		
	Ductile Cast Iron	HB150-250		150-240	0.15-0.30		
H	Hardened Material	≤HRC50	TH910	40-80	0.10-0.30		



# C-ABPF SERIES

Indexable End Mills for High Precision Finish



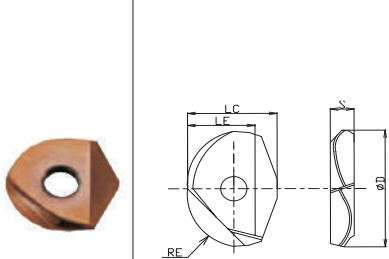
Designation	Size(mm)					Insert	Clamping Screw	Wrench
	D	d	L	L1	RE			
C-ABPF-10S10x30x150L	10	10	150	30	5	SP1W100	TSB-5842	TX10
C-ABPF-10S10x30x180L	10	10	180	30	5	SP1W100		
C-ABPF-12S12x35x165L	12	12	165	35	6	SP1W120	TSB-5843	TX20
C-ABPF-12S12x35x200L	12	12	200	35	6	SP1W120		
C-ABPF-16S16x50x200L	16	16	200	50	8	SP1W160	TSB-5844	
C-ABPF-16S16x50x250L	16	16	250	50	8	SP1W160		
C-ABPF-20S20x70x220L	20	20	220	70	10	SP1W200	TSB-5845	TX25
C-ABPF-20S20x70x250L	20	20	250	70	10	SP1W200		
C-ABPF-20S20x70x300L	20	20	300	70	10	SP1W200		
C-ABPF-25S25x100x200L	25	25	200	100	12.5	SP1W250	TSB-5846	TX30
C-ABPF-25S25x100x250L	25	25	250	100	12.5	SP1W250		
C-ABPF-25S25x100x300L	25	25	300	100	12.5	SP1W250		
C-ABPF-30S32x100x250L	30	32	250	100	15	SP1W300		
C-ABPF-30S32x100x300L	30	32	300	100	15	SP1W300	TSB5847	
C-ABPF-30S32x100x300L	30	32	300	100	15	SP1W300		

# C-ABPF SERIES

Indexable End Mills for High Precision Finish

## ● Applicable Inserts

Usage Classification	P	Steel	★											
★ 1st Choice ☆ 2nd Choice	M	Stainless												
	K	Cast iron												
	N	Non-ferrous												
	S	Superalloys												
	H	Hard materials	☆											

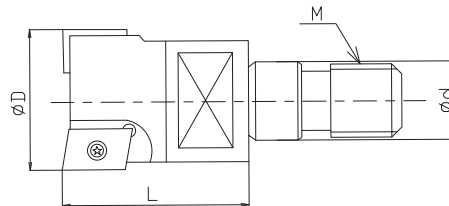
Insert	Insert No.	Size(mm)					Coated Carbide					Carbide					
		RE	D	LE	LC	S	TD300	TY622	TY625	TI960	HC200						
	SP1W100	5.0	10	5.6	12.1	2.7	●										
	SP1W120	6.0	12	6.6	14.6	3.2	●										
	SP1W160	8.0	16	9.0	16.6	4.2	●										
	SP1W200	10.0	20	11.5	20.3	5.2	●										
	SP1W250	12.5	25	14.5	24.1	6.2	●										
	SP1W300	15.0	30	18.5	29.2	7.2	●										

## ● Recommended Cutting Conditions

ISO	Workpiece material	Hardness	Grade	Cutting Speed	
				Vc (m/min)	Feed fz (mm/t)
P	Carbon Steel	<HB300	TD300	160-200	0.1-0.25
	Alloy Steel	HB200-300		160-200	0.1-0.25
	Mold Steel	HRC≤55		120-160	0.1-0.25

# MODULAR BAPM SERIES

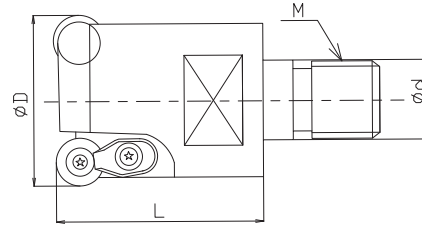
## BAPM Square Shoulder Series Screwed End Mill



Designation	Size(mm)					Insert	Clamping Screw	Wrench
	D	L	d	M	Z			
BAPM-16-M8-2T-11	16	25	8.5	M8	2	APMT1135	TT1011	TTP11
BAPM-17-M8-2T-11	17	25	8.5	M8	2	APMT1135		
BAPM-20-M10-2T-11	20	27	10.5	M10	2	APMT1135		
BAPM-21-M10-2T-11	21	27	10.5	M10	2	APMT1135		
BAPM-22-M10-3T-11	22	29	10.5	M10	3	APMT1135		
BAPM-25-M12-3T-11	25	29	12.5	M12	3	APMT1135		
BAPM-26-M12-3T-11	26	29	12.5	M12	3	APMT1135		
BAPM-28-M12-4T-11	28	31.5	12.5	M12	4	APMT1135		
BAPM-30-M16-4T-11	30	30	16.5	M16	4	APMT1135		
BAPM-32-M16-4T-11	32	33	16.5	M16	4	APMT1135		
BAPM-35-M16-4T-11	35	34	16.5	M16	4	APMT1135		
BAPM-40-M16-4T-11	40	37	16.5	M16	4	APMT1135		
BAPM-25-M12-2T-16	25	35	12.5	M12	2	APMT1604	TT1016	TTP16
BAPM-26-M12-2T-16	26	35	12.5	M12	2	APMT1604		
BAPM-30-M16-3T-16	30	39	16.5	M16	3	APMT1604		
BAPM-32-M16-3T-16	32	39	16.5	M16	3	APMT1604		
BAPM-35-M16-3T-16	35	42	16.5	M16	3	APMT1604		
BAPM-40-M16-4T-16	40	43	16.5	M16	4	APMT1604		


# MODULAR EMRM SERIES

## EMRM Round Nose Series Screwed End Mill



Designation	Size(mm)					Insert	Clamping Screw	Wrench
	D	L	d	M	Z			
EMRM-4R16-M8-2T	16	25	8.5	M8	2	RPMT08T2	TT1008	TTP08
EMRM-4R17-M8-2T	17	25	8.5	M8	2	RPMT08T2		
EMRM-4R20-M10-2T	20	27	10.5	M10	2	RPMT08T2		
EMRM-4R21-M10-2T	21	27	10.5	M10	2	RPMT08T2		
EMRM-4R25-M12-3T	25	29	12.5	M12	3	RPMT08T2		
EMRM-4R26-M12-3T	26	29	12.5	M12	3	RPMT08T2		
EMRM-4R30-M16-4T	30	31	16.5	M16	4	RPMT08T2		
EMRM-4R32-M16-4T	32	32	16.5	M16	4	RPMT08T2		
EMRM-4R35-M16-4T	35	34	16.5	M16	4	RPMT08T2		
EMRM-4R40-M16-5T	40	34	16.5	M16	5	RPMW1003		
EMRM-5R25-M12-2T	25	32	12.5	M12	2	RPMW1003	TT1011	TTP10
EMRM-5R26-M12-2T	26	32	12.5	M12	2	RPMW1003		
EMRM-5R30-M16-2T	30	35	16.5	M16	2	RPMW1003		
EMRM-5R32-M16-3T	32	35	16.5	M16	3	RPMW1003		
EMRM-5R35-M16-3T	35	37	16.5	M16	3	RPMW1003		
EMRM-5R40-M16-4T	40	39	16.5	M16	4	RPMW1003		
EMRM-6R25-M12-2T	25	34	12.5	M12	2	RPMT1204	TT1012	TRP12
EMRM-6R26-M12-2T	26	35	12.5	M12	2	RPMT1204		
EMRM-6R30-M16-2T	30	36	16.5	M16	2	RPMT1204		
EMRM-6R32-M16-2T	32	36	16.5	M16	2	RPMT1204		
EMRM-6R35-M16-3T	35	38	16.5	M16	3	RPMT1204		
EMRM-6R40-M16-3T	40	38	16.5	M16	3	RPMT1204		

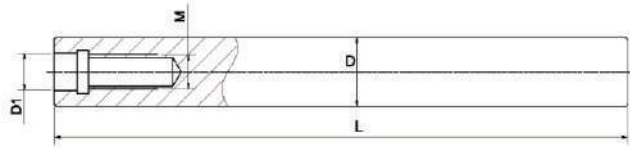
# End Mills with Exchangeable Heads

Square	Designation	Size(mm)				
		Diameter	Flute Length	Neck Diameter	Tread Size	Z
	HHD1004	10	10	9.7	M05	4
	HHD1204	12	12	11.7	M06	4
	HHD1604	16	16	15.7	M08	4
	HHD2004	20	20	19.5	M10	4
	HHD2504	25	25	24.5	M12	4

Ball Nose	Designation	Size(mm)				
		Radius	Flute Length	Neck Diameter	Tread Size	Z
	HSB1002	R5.0	10	9.7	M05	2
	HSB1202	R6.0	12	11.7	M06	2
	HSB1602	R8.0	16	15.7	M08	2
	HSB2002	R10.0	20	19.5	M10	2
	HSB2502	R12.5	25	24.5	M12	2
	HSB1004	R5.0	10	9.7	M05	4
	HSB1204	R6.0	12	11.7	M06	4
	HSB1604	R8.0	16	15.7	M08	4
	HSB2004	R10.0	20	19.5	M10	4
	HSB2504	R12.5	25	24.5	M12	4

Corner Radius	Designation	Size(mm)				
		Diameter xCorner R	Flute Length	Neck Diameter	Tread Size	Z
	HRTA100054	10x0.5R	10	9.7	M05	4
	HRTA100104	10x1R	10	9.7	M05	4
	HRTA100204	10x2R	10	9.7	M05	4
	HRTA120054	12x0.5R	12	11.7	M06	4
	HRTA120104	12x1R	12	11.7	M06	4
	HRTA120204	12x2R	12	11.7	M06	4
	HRTA160104	16x1R	16	15.7	M08	4
	HRTA160204	16x2R	16	15.7	M08	4
	HRTA200104	20x1R	20	19.5	M10	4
	HRTA200204	20x2R	20	19.5	M10	4
	HRTA250104	25x1R	25	24.5	M12	4
	HRTA250204	25x2R	25	24.5	M12	4

## Tungsten Anti-Vibration Milling Arbor

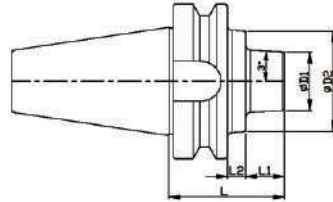


Designation	Size(mm)				
	Model	L	D1	D	M
MFT-10-100-M5	Φ 10mm*100L*M5	100	5.5	10	M5
MFT-10-150-M5	Φ 10mm*150L*M5	150	5.5	10	M5
MFT-12-100-M6	Φ 12mm*100L*M6	100	6.5	12	M6
MFT-12-150-M6	Φ 12mm*150L*M6	150	6.5	12	M6
MFT-12-200-M6	Φ 12mm*200L*M6	200	6.5	12	M6
MFT-16-100-M8	Φ 16mm*100L*M8	100	8.5	16	M8
MFT-16-150-M8	Φ 16mm*150L*M8	150	8.5	16	M8
MFT-16-200-M8	Φ 16mm*200L*M8	200	8.5	16	M8
MFT-16-250-M8	Φ 16mm*250L*M8	250	8.5	16	M8
MFT-20-100-M10	Φ 20mm*100L*M10	100	10.5	20	M10
MFT-20-150-M10	Φ 20mm*150L*M10	150	10.5	20	M10
MFT-20-200-M10	Φ 20mm*200L*M10	200	10.5	20	M10
MFT-20-250-M10	Φ 20mm*250L*M10	250	10.5	20	M10
MFT-20-300-M10	Φ 20mm*300L*M10	300	10.5	20	M10
MFT-25-100-M12	Φ 25mm*100L*M12	100	12.5	25	M12
MFT-25-150-M12	Φ 25mm*150L*M12	150	12.5	25	M12
MFT-25-200-M12	Φ 25mm*200L*M12	200	12.5	25	M12
MFT-25-250-M12	Φ 25mm*250L*M12	250	12.5	25	M12
MFT-25-300-M12	Φ 25mm*300L*M12	300	12.5	25	M12
MFT-32-150-M16	Φ 32mm*150L*M16	150	17.0	32	M16
MFT-32-200-M16	Φ 32mm*200L*M16	200	17.0	32	M16
MFT-32-250-M16	Φ 32mm*250L*M16	250	17.0	32	M16
MFT-32-300-M16	Φ 32mm*300L*M16	300	17.0	32	M16
MFT-32-350-M16	Φ 32mm*350L*M16	350	17.0	32	M16

Tooling System  
Shrink Fit Chuck

# BT SERIES

## BT-HS Shrink Fit Chuck

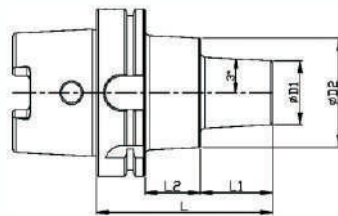


Model No.	D1	D2	L	L1	L2	Stock	List USD
BT40-HS12-45	38	-	45	18	-	●	\$328.30
BT40-HS12-75	38	-	75	48	-	●	\$328.30
BT40-HS12-135	38	-	135	108	-	○	\$447.60
BT50-HS12-75	38	65	75	25	12	●	\$596.80
BT50-HS12-105	38	65	105	55	12	●	\$596.80
BT50-HS12-135	38	65	135	85	12	○	\$686.30

Note: ● Stock ○ Non-stock

# HSK SERIES

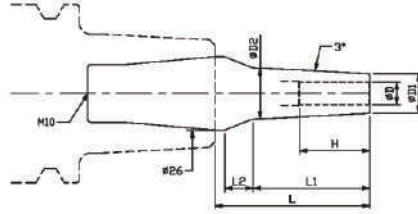
## HSK-HS Shrink Fit Chuck



Model No.	D1	D2	L	L1	L2	Stock	List USD
HSK63A-HS12-75	38	-	75	49	-	●	\$431.70
HSK63A-HS12-135	38	-	135	109	-	○	\$507.90
HSK100A-HS12-105	38	65	105	43	33	●	\$761.90
HSK100A-HS12-135	38	65	135	73	33	○	\$838.10

Note: ● Stock ○ Non-stock

## HS-SRS Shrink Fit Chuck



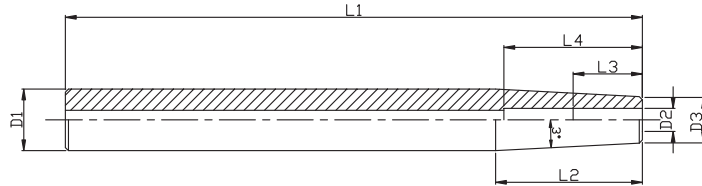
Model No.	D	D1	D2	L	L1	L2	T	H	Stock	List USD
HS12-SRS04-35	4	10	12.4	35	22	9.5	3	12	○	\$228.60
HS12-SRS04-55	4	10	14.5	55	42	9.5	3	12	●	\$254.00
HS12-SRS04-80	4	10	17.1	80	67	9.5	3	12	○	\$279.40
HS12-SRS06-35	6	12	14.4	35	22	9.5	3	18	○	\$228.60
HS12-SRS06-55	6	12	16.5	55	42	9.5	3	18	●	\$254.00
HS12-SRS06-80	6	12	19.1	80	67	9.5	3	18	○	\$279.40
HS12-SRS08-35	8	14	16.4	35	22	9.5	3	25	○	\$228.60
HS12-SRS08-55	8	14	18.5	55	42	9.5	3	25	●	\$254.00
HS12-SRS08-80	8	14	21.1	80	67	9.5	3	25	○	\$279.40
HS12-SRS10-35	10	16	18.4	35	22	9.5	3	30	○	\$228.60
HS12-SRS10-55	10	16	20.5	55	42	9.5	3	30	●	\$254.00
HS12-SRS10-80	10	16	23.1	80	67	9.5	3	30	○	\$279.40
HS12-SRS12-35	12	20	22.4	35	22	9.5	4	30	○	\$228.60
HS12-SRS12-55	12	20	24.5	55	42	9.5	4	30	●	\$254.00
HS12-SRS12-80	12	20	25.5	80	-	-	4	30	○	\$279.40

Note: ● Stock ○ Non-stock



Tooling System  
Shrink Fit Tool Rod

# ST-SRS Fit Tool Rod

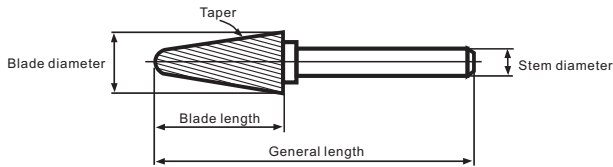


Model No.	D1	D2	D3	L1	L2	L3	L4	Stock	List USD
ST12-SRS04-110TE	12	4	10	110	19	12	-	○	\$214.70
ST16-SRS04-110TE	16	4	10	110	57	12	-	●	\$214.70
ST16-SRS04-150TE	16	4	10	150	57	12	-	○	\$233.10
ST16-SRS04-200TE	16	4	10	200	57	12	-	●	\$283.90
ST16-SRS06-110TE	16	6	12	110	38	18	-	●	\$214.70
ST16-SRS06-150TE	16	6	12	150	38	18	-	○	\$233.10
ST16-SRS06-200TE	16	6	12	200	38	18	-	●	\$289.60
ST16-SRS08-110TE	16	8	14	110	19	24	36	●	\$214.70
ST16-SRS08-150TE	16	8	14	150	19	24	36	○	\$233.10
ST20-SRS06-250TE	20	6	12	250	76	18	-	○	\$417.80
ST20-SRS08-110TE	20	8	14	110	57	24	-	○	\$214.70
ST20-SRS08-150TE	20	8	14	150	57	24	-	●	\$233.10
ST20-SRS08-200TE	20	8	14	200	57	24	-	●	\$289.60
ST20-SRS08-250TE	20	8	14	250	57	24	-	○	\$417.80
ST20-SRS10-110TE	20	10	16	110	38	30	42	●	\$214.70
ST20-SRS10-150TE	20	10	16	150	38	30	42	○	\$233.10
ST20-SRS10-200TE	20	10	16	200	38	30	42	●	\$289.60
ST20-SRS12-110TE	20	12	18	110	19	32	47	○	\$214.70
ST20-SRS12-150TE	20	12	18	150	19	32	47	●	\$233.10
ST25-SRS12-200TE	25	12	18	200	66	32	47	●	\$289.60
ST25-SRS12-250TE	25	12	18	250	66	32	47	○	\$447.70


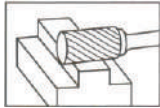



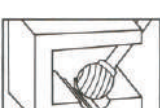




Note: ● Stock ○ Non-stock

# Universal Carbide Rotary Burr

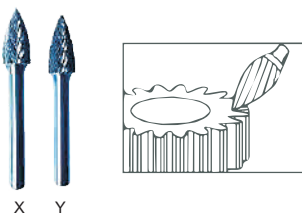
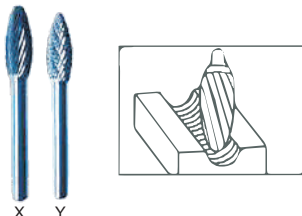
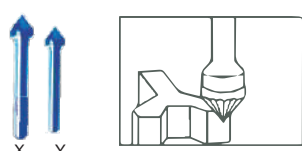
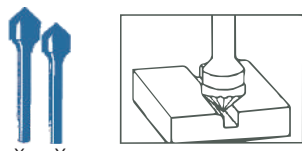
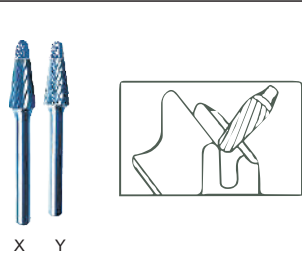
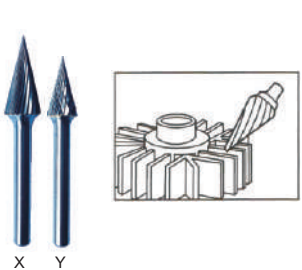
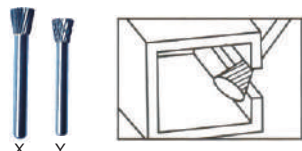
No.Note



S	10	20	M	06	X/Y
Model code	Blade diameter	Blade length	Gear type	Stem diameter	Blade type

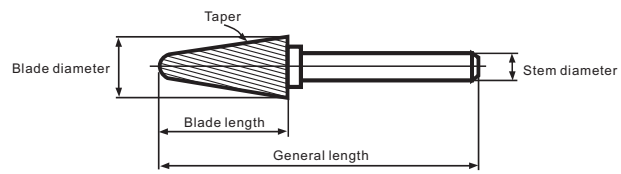
Shape & Code	Legend	Order No.	Size				List USD	
			Blade diameter	Blade length	Stem diameter	Total length		Typer
Cylindrical Code A	 X Y 	A0313M03...	3	13	3	50	-	\$8.90
		A0413M04...	4	13	4	50	-	\$9.70
		A0616M06...	6	16	6	56	-	\$10.80
		A0820M06...	8	20	6	60	-	\$12.40
		A1020M06...	10	20	6	60	-	\$13.90
		A1225M06...	12	25	6	65	-	\$18.50
		A1425M06...	14	25	6	65	-	\$24.70
		A1625M06...	16	25	6	65	-	\$33.10
Cylindrical ball nose Code C	 X Y 	C0313M03...	3	13	3	50	-	\$8.90
		C0413M04...	4	13	4	50	-	\$9.70
		C0616M06...	6	16	6	56	-	\$10.80
		C0820M06...	8	20	6	60	-	\$13.10
		C1020M06...	10	20	6	60	-	\$14.70
		C1225M06...	12	25	6	65	-	\$21.60
		C1425M06...	14	25	6	65	-	\$27.00
		C1625M06...	16	25	6	65	-	\$33.90
Spherical Code D	 X Y 	D0302M03...	3	2.7	3	50	-	\$8.90
		D0403M04...	4	3.6	4	50	-	\$9.70
		D0605M06...	6	5.4	6	55	-	\$10.00
		D0807M06...	8	7.2	6	57	-	\$10.80
		D1009M06...	10	9	6	54	-	\$12.40
		D1210M06...	12	10.8	6	55	-	\$15.40
		D1412M06...	14	12	6	52	-	\$20.80
		D1614M06...	16	14.4	6	54	-	\$22.40
Oval Code E	 X Y 	E0610M06...	6	10	6	50	-	\$13.60
		E0813M06...	8	13	6	53	-	\$15.40
		E1016M06...	10	16	6	56	-	\$16.70
		E1220M06...	12	20	6	60	-	\$23.10
		E1422M06...	14	22	6	62	-	\$29.30
Arc round nose Code F	 X Y 	F0313M03...	3	13	3	50	-	\$8.90
		F0618M06...	6	18	6	58	-	\$12.40
		F0820M06...	8	20	6	60	-	\$13.90
		F1020M06...	10	20	6	60	-	\$16.00
		F1225M06...	12	25	6	65	-	\$22.00
		F1425M06...	14	25	6	65	-	\$25.00
		F1625M06...	16	25	6	65	-	\$28.10

# Universal Carbide Rotary Burr

Shape & Code	Legend	Order No.	Size					List USD
			Blade diameter	Blade length	Stem diameter	Total length	Typer	
Arc pointed nose Code G		G0313M03...	3	13	3	50	-	\$8.90
		G0618M06...	6	18	6	58	-	\$13.90
		G0820M06...	8	20	6	60	-	\$15.40
		G1020M06...	10	20	6	60	-	\$17.40
		G1225M06...	12	25	6	65	-	\$23.90
		G1425M06...	14	25	6	65	-	\$27.70
Torch-shaped Code H		H0307M03...	3	7	3	50	-	\$8.90
		H0618M06...	6	18	6	58	-	\$14.70
		H0820M06...	8	20	6	60	-	\$15.40
		H1025M06...	10	25	6	65	-	\$19.30
		H1232M06...	12	32	6	72	-	\$27.70
		H1433M06...	14	33	6	73	-	\$30.00
60° Conical Code J		J0605M06...	6	5.2	6	50	60°	\$10.80
		J0807M06...	8	7	6	52	60°	\$12.40
		J1008M06...	10	8	6	53	60°	\$13.90
		J1210M06...	12	10.4	6	55	60°	\$15.40
		J1613M06...	16	13.8	6	56	60°	\$17.40
		90° Conical Code K		K0603M06...	6	3	6	50
K0804M06...	8			4	6	50	90°	\$11.60
K1005M06...	10			5	6	50	90°	\$13.10
K1206M06...	12			6	6	51	90°	\$14.70
K1608M06...	16			8	6	53	90°	\$17.40
taper with round top Code L				L0313M03...	3	13	3	50
		L0413M04...	4	13	4	50	10°	\$9.70
		L0616M06...	6	16	6	56	14°	\$10.80
		L0822M06...	8	22	6	62	14°	\$13.90
		L1025M06...	10	25	6	65	14°	\$18.10
		L1228M06...	12	28	6	68	14°	\$22.40
		L1428M06...	14	28	6	68	14°	\$36.20
Conical pointed nos Code M		M0313M03...	3	13	3	50	14°	\$8.90
		M0413M04...	4	13	4	50	14°	\$9.70
		M0618M06...	6	18	6	58	14°	\$13.60
		M0820M06...	8	20	6	60	26°	\$15.40
		M1020M06...	10	20	6	60	25°	\$17.00
		M1225M06...	12	25	6	65	25°	\$19.30
		M1425M06...	14	25	6	65	30°	\$23.50
Inverted conical Code N		N1213M06...	12	13	6	53	30°	\$13.90
		N1613M06...	16	13	6	53	30°	\$17.70
		N1005M06...	10	5	6	50	20°	\$12.40
		N1205M06...	12	5	6	50	26°	\$13.90
		N1606M06...	16	6	6	50	26°	\$16.20

# Rotary Burr for Steel and Cast Steel Processing

By the innovation of G-type blade structure, the rotary burr can significantly improve the sharpness and guiding, ensuring safe and precise operation. The extremely high cutting performance of rotary burr can save processing time and achieve high economic benefits.  
Advantages: The cutting performance of steel and cast steel is 30%-50% higher than traditional products. The improved blade type can significantly improve the sharpness of the rotary burr, achieve better cutting performance and protect workpieces and tools from damage.



No.Note

S 10 20 G 06  
Model code Blade diameter Blade length Gear type Stem diameter

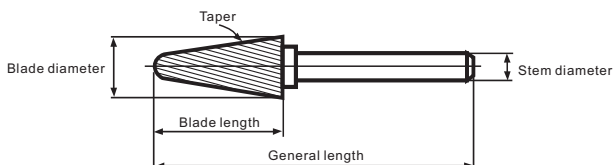
Shape & Code	Legend	Order No.	Size				List USD	
			Blade diameter	Blade length	Stem diameter	Total length		Typer
Cylindrical Code A		A0616G06GZG	6	16	6	56	-	\$30.80
		A0820G06GZG	8	20	6	60	-	\$31.40
		A1020G06GZG	10	20	6	60	-	\$32.70
		A1225G06GZG	12	25	6	65	-	\$36.40
		A1425G06GZG	14	25	6	65	-	\$39.40
		A1625G06GZG	16	25	6	65	-	\$42.50
Cylindrical ball nose Code C		C0616G06GZG	6	16	6	46	-	\$31.70
		C0820G06GZG	8	20	6	60	-	\$32.40
		C1020G06GZG	10	20	6	60	-	\$33.30
		C1225G06GZG	12	25	6	65	-	\$37.90
		C1425G06GZG	14	25	6	65	-	\$41.00
		C1625G06GZG	16	25	6	65	-	\$45.00
Spherical Code D		D0605G06GZG	6	5.4	6	55	-	\$29.90
		D0807G06GZG	8	7.2	6	57	-	\$30.80
		D1009G06GZG	10	9	6	54	-	\$31.70
		D1210G06GZG	12	10.8	6	55	-	\$32.40
		D1412G06GZG	14	12	6	52	-	\$33.90
		D1614G06GZG	16	14.4	6	54	-	\$35.40
Arc round nose Code F		F0618G06GZG	6	18	6	58	-	\$31.70
		F0818G06GZG	8	18	6	58	-	\$33.30
		F1020G06GZG	10	20	6	60	-	\$33.90
		F1225G06GZG	12	25	6	65	-	\$36.00
		F1425G06GZG	14	25	6	65	-	\$40.70
		F1625G06GZG	16	25	6	65	-	\$44.70
Arc pointed nose Code G		G0618G06GZG	6	18	6	58	-	\$33.30
		G0817G06GZG	8	17	6	57	-	\$34.50
		G1020G06GZG	10	20	6	60	-	\$36.00
		G1225G06GZG	12	25	6	65	-	\$37.90
		G1425G06GZG	14	25	6	65	-	\$42.50
		G1625G06GZG	16	25	6	65	-	\$46.20
Torch-shaped Code H		H0820G06GZG	8	20	6	60	-	\$34.50
		H1025G06GZG	10	25	6	65	-	\$36.00
		H1232G06GZG	12	32	6	72	-	\$40.00
		H1430G06GZG	14	30	6	70	-	\$44.70
		H1636G06GZG	16	36	6	76	-	\$48.70
Taper with round top Code L		L0822G06GZG	8	22	6	62	14°	\$32.40
		L1025G06GZG	10	25	6	65	14°	\$34.50
		L1228G06GZG	12	28	6	68	14°	\$35.40
		L1428G06GZG	14	28	6	68	14°	\$37.60
		L1633G06GZG	16	33	6	73	14°	\$42.50

Carbide Rotary Burr  
Rotary Burr for Stainless Steel, Titanium Alloy, High Temperature Alloy Processing

# Rotary Burr for Stainless Steel, Titanium Alloy, High Temperature Alloy Processing

The new N-type blade structure provides excellent cutting performance for austenite and rust-resistant and acid-resistant steels, and significantly reduces chattering compared to traditional products.

Advantages: Innovative blade structure could supply better cutting performance and longer working life.



No. Note

S 10 20 N 06  
Model code Blade diameter Blade length Gear type Stem diameter

Shape & Code	Legend	Order No.	Size					List USD
			Blade diameter	Blade length	Stem diameter	Total length	Typer	
Cylindrical Code A		A0313N03BXG	3	13	3	50	-	\$31.70
		A0413N04BXG	4	13	4	50	-	\$33.00
		A0616N06BXG	6	16	6	56	-	\$35.40
		A0820N06BXG	8	20	6	60	-	\$36.00
		A1020N06BXG	10	20	6	60	-	\$37.90
		A1225N06BXG	12	25	6	65	-	\$42.50
		A1425N06BXG	14	25	6	65	-	\$45.60
Cylindrical ball nose Code C		A1625N06BXG	16	25	6	65	-	\$49.90
		C0313N03BXG	3	13	3	50	-	\$31.70
		C0413N04BXG	4	13	4	50	-	\$33.00
		C0616N06BXG	6	16	6	46	-	\$36.00
		C0820N06BXG	8	20	6	60	-	\$37.00
		C1020N06BXG	10	20	6	60	-	\$38.50
		C1225N06BXG	12	25	6	65	-	\$42.80
Spherical Code D		C1425N06BXG	14	25	6	65	-	\$46.20
		C1625N06BXG	16	25	6	65	-	\$50.80
		D0605N06BXG	6	5.4	6	55	-	\$34.50
		D0807N06BXG	8	7.2	6	57	-	\$35.40
		D1009N06BXG	10	9	6	54	-	\$36.00
		D1210N06BXG	12	10.8	6	55	-	\$37.00
Arc round nose Code E		D1412N06BXG	14	12	6	52	-	\$38.50
		D1614N06BXG	16	14.4	6	54	-	\$39.70
		E0813N06BXG	8	13	6	58	-	\$38.80
		E1016N06BXG	10	16	6	61	-	\$40.40
		E1220N06BXG	12	20	6	60	-	\$42.20
Arc round nose Code F		E1422N06BXG	14	22	6	62	-	\$45.60
		E1625N06BXG	16	25	6	65	-	\$48.70
		F0618N06BXG	6	18	6	58	-	\$36.40
		F0818N06BXG	8	18	6	58	-	\$37.60
		F1020N06BXG	10	20	6	60	-	\$38.50
		F1225N06BXG	12	25	6	65	-	\$40.70
		F1425N06BXG	14	25	6	65	-	\$42.20
F1625N06BXG	16	25	6	65	-	\$46.20		

Rotary Burr  
Universal Carbide

Rotary Burr  
for Steel/Cast Steel

Rotary Burr  
for Superalloys/Titanium

Rotary Burr  
for Non-ferrous Metal

Rotary Burr  
for Cast Iron

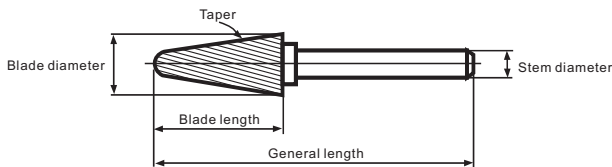
Carbide Rotary Burr  
Rotary Burr for Stainless Steel, Titanium Alloy, High Temperature Alloy Processing

## Rotary Burr for Stainless Steel, Titanium Alloy, High Temperature Alloy Processing

Shape & Code	Legend	Order No.	Size					List USD
			Blade diameter	Blade length	Stem diameter	Total length	Typers	
Arc pointed nose Code G		G0618N06BXG	6	18	6	58	-	\$37.90
		G0817N06BXG	8	17	6	57	-	\$38.80
		G1020N06BXG	10	20	6	60	-	\$40.70
		G1225N06BXG	12	25	6	65	-	\$42.50
		G1425N06BXG	14	25	6	65	-	\$47.10
		G1625N06BXG	16	25	6	65	-	\$49.30
Torch-shaped Code H		H0820N06BXG	8	20	6	60	-	\$38.80
		H1025N06BXG	10	25	6	65	-	\$40.70
		H1232N06BXG	12	32	6	72	-	\$44.70
		H1430N06BXG	14	30	6	70	-	\$49.30
		H1636N06BXG	16	36	6	76	-	\$53.30
taper with round top Code L		L0822N06BXG	8	22	6	62	14°	\$37.00
		L1025N06BXG	10	25	6	65	14°	\$38.80
		L1228N06BXG	12	28	6	68	14°	\$40.40
		L1428N06BXG	14	28	6	68	14°	\$45.60
		L1633N06BXG	16	33	6	73	14°	\$50.20

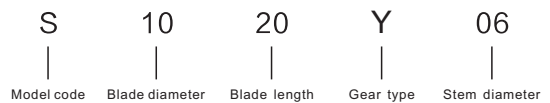
## Rotary Burr for Aluminum and Non-ferrous Metal Processing

The newly developed Y-type blade structure enables the product to achieve extremely high cutting performance, and the large chip flutes can reduce material bonding. Long working life, smooth operation, cutting speed up to 800-1000M/min. Widely used in the rough processing of non-ferrous metals, brass, copper, plastic and fiber reinforced materials.



No. Note

S102Y006



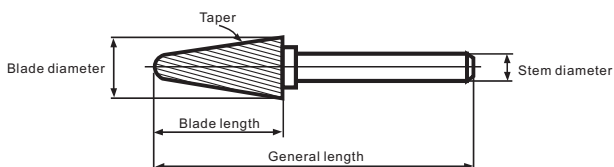
Shape & Code	Legend	Order No.	Size					List USD
			Blade diameter	Blade length	Stem diameter	Total length	Typers	
Cylindrical Code A		A0413Y04LVS	4	13	4	50	-	\$29.30
		A0616Y06LYS	6	16	6	56	-	\$30.80
		A0820Y06LYS	8	20	6	60	-	\$32.00
		A1020Y06LYS	10	20	6	60	-	\$33.30
		A1225Y06LYS	12	25	6	65	-	\$37.00
		A1425Y06LYS	14	25	6	65	-	\$40.40
		A1625Y06LYS	16	25	6	65	-	\$43.70

## Rotary Burr for Aluminum and Non-ferrous Metal Processing

Shape & Code	Legend	Order No.	Size					List USD
			Blade diameter	Blade length	Stem diameter	Total length	Typers	
Cylindrical ball nose Code C		C0413Y04LYS	4	13	4	50	-	\$29.90
		C0616Y06LYS	6	16	6	46	-	\$33.30
		C0820Y06LYS	8	20	6	60	-	\$34.50
		C1020Y06LYS	10	20	6	60	-	\$36.40
		C1225Y06LYS	12	25	6	65	-	\$37.60
		C1425Y06LYS	14	25	6	65	-	\$41.60
Spherical Code D		D0605Y06LYS	6	5.4	6	55	-	\$29.90
		D0807Y06LVS	8	7.2	6	57	-	\$31.40
		D1009Y06LYS	10	9	6	54	-	\$32.40
		D1210Y06LYS	12	10.8	6	55	-	\$33.00
		D1412Y06LYS	14	12	6	52	-	\$35.40
		D1614Y06LYS	16	14.4	6	54	-	\$36.70
Arc round nose Code F		F0618Y06LYS	6	18	6	58	-	\$31.70
		F0818Y06LYS	8	18	6	58	-	\$33.30
		F1020Y06LYS	10	20	6	60	-	\$34.50
		F1225Y06LYS	12	25	6	65	-	\$37.00
		F1425Y06LYS	14	25	6	65	-	\$41.60
		F1625Y06LYS	16	25	6	65	-	\$45.60
taper with round top Code L		L0616Y06LYS	6	16	6	56	14°	\$32.70
		L0822Y06LYS	8	22	6	62	14°	\$34.50
		L1025Y06LYS	10	25	6	65	14°	\$36.40
		L1228Y06LYS	12	28	6	68	14°	\$37.90
		L1428Y06LYS	14	28	6	68	14°	\$43.10
		L1633Y06LVS	16	33	6	73	14°	\$47.70

## Rotary Burr for Cast Iron Processing

The innovative Z-type blade structure significantly improves the high cutting performance of cast iron, enabling smooth milling and significantly reducing chatter and noise.



No.Note

S102Z006

S	10	20	Z	06
Model code	Blade diameter	Blade length	Gear type	Stem diameter



# Rotary Burr for Cast Iron Processing

Shape & Code	Legend	Order No.	Size					List USD
			Blade diameter	Blade length	Stem diameter	Total length	Typical	
Cylindrical Code A		A0616Z06ZT	6	16	6	56	-	\$30.20
		A0820Z06ZT	8	20	6	60	-	\$31.40
		A1020Z06ZT	10	20	6	60	-	\$32.70
		A1225Z06ZT	12	25	6	65	-	\$38.50
		A1425Z06ZT	14	25	6	65	-	\$41.90
		A1625Z06ZT	16	25	6	65	-	\$45.60
Cylindrical ball nose Code C		C0616Z06ZT	6	16	6	46	-	\$31.40
		C0820Z06ZT	8	20	6	60	-	\$32.70
		C1020Z06ZT	10	20	6	60	-	\$33.90
		C1225Z06ZT	12	25	6	65	-	\$38.50
		C1425Z06ZT	14	25	6	65	-	\$41.90
		C1625Z06ZT	16	25	6	65	-	\$46.80
Spherical Code D		D0605Z06ZT	6	5.4	6	55	-	\$29.60
		D0807Z06ZT	8	7.2	6	57	-	\$30.20
		D1009Z06ZT	10	9	6	54	-	\$31.40
		D1210Z06ZT	12	10.8	6	55	-	\$32.40
		D1412Z06ZT	14	12	6	52	-	\$33.90
		D1614Z06ZT	16	14.4	6	54	-	\$35.40
Oval Code E		E1016Z06ZT	10	16	6	61	-	\$39.10
		E1220Z06ZT	12	20	6	60	-	\$41.60
		E1422Z06ZT	14	22	6	62	-	\$45.00
		E1625Z06ZT	16	25	6	65	-	\$48.70
Arc round nose Code F		F0818Z06ZT	8	18	6	58	-	\$32.70
		F1020Z06ZT	10	20	6	60	-	\$33.90
		F1225Z06ZT	12	25	6	65	-	\$36.40
		F1425Z06ZT	14	25	6	65	-	\$40.70
		F1625Z06ZT	16	25	6	65	-	\$44.70
Arc pointed nose Code G		G1020Z06ZT	10	20	6	60	-	\$35.40
		G1225Z06ZT	12	25	6	65	-	\$37.00
		G1425Z06ZT	14	25	6	65	-	\$41.60
		G1625Z06ZT	16	25	6	65	-	\$44.70
Torch-shaped Code H		H1025Z06ZT	10	25	6	65	-	\$36.00
		H1232Z06ZT	12	32	6	72	-	\$40.00
		H1430Z06ZT	14	30	6	70	-	\$44.70
		H1636Z06ZT	16	36	6	76	-	\$48.70
taper with round top Code L		L0616Z06ZT	6	16	6	56	14°	\$31.40
		L0822Z06ZT	8	22	6	62	14°	\$33.00
		L1025Z06ZT	10	25	6	65	14°	\$35.40
		L1228Z06ZT	12	28	6	68	14°	\$36.70
		L1428Z06ZT	14	28	6	68	14°	\$42.80
Conical pointed nos Code M		M1020Z06ZT	10	20	6	60	25°	\$35.70
		M1225Z06ZT	12	25	6	65	25°	\$38.50
		M1425Z06ZT	14	25	6	65	32°	\$40.40
		M1625Z06ZT	16	25	6	65	32°	\$43.70