







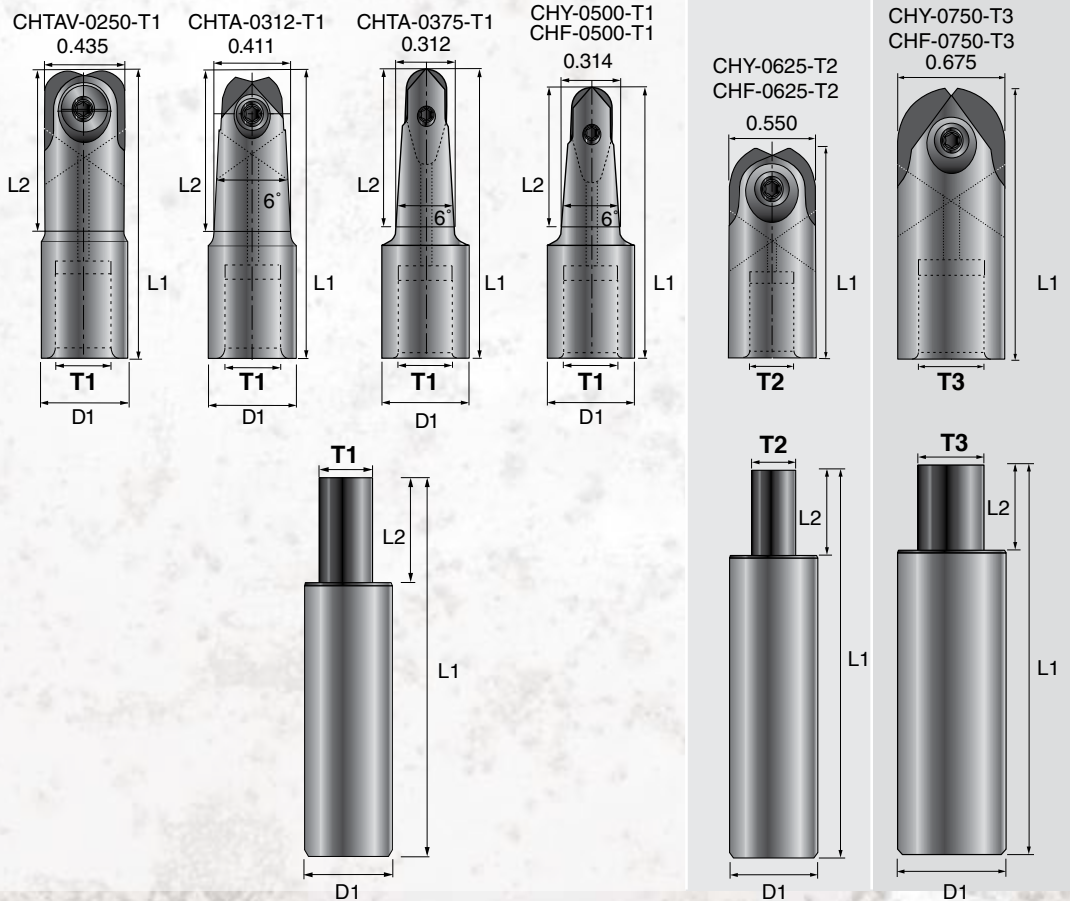


Carbide Modular Shrink System

Insert		Shrink Fit HEAD				Shrink Fit SHANK						
Type	Code	Tool Number	Dimensions			Tool Number	Dimensions					
			ØD1	L1	L2		ØD1	L1	L2			
	VBD, VRBS	CHTAV-0250-T1	0.460	1.700	0.879	CSS-0500-2.9-T1 CSS-0500-4.9-T1	0.500	2.900	0.600			
		CHTAV-0312-T1	0.460	1.700	0.827							
	TO, HF, FB, BDS, MB, MBT, BD, TOBD-NF, RBT	CHTA-0375-T1	0.460	1.700	0.845							
		CHY-0500-T1	0.460	1.700	0.857							
	RB, MB, MBT, BS, RBT	CHY-0500-T1	0.460	1.700	0.857							
	FB, BD, BDS, HF, TO, TOBD-NF	CHF-0500-T1	0.460	1.700	0.857							
	BS, RB, MB, MBT, RBT	CHY-0625-T2	0.550	1.500	CSS-0625-4.1-T2 CSS-0625-7.1-T2					0.625	4.100	0.650
	FB, BD, BDS, HF, TO, TOBD-NF	CHF-0625-T2	0.550	1.500								
	RB, BS, MB, MBT, RBT	CHY-0750-T3	0.675	1.900	CSS-0750-3.8-T3 CSS-0750-6.8-T3 CSS-18-150-T3					0.750	3.800	0.700
	FB, BD, BDS, HF, TO, TOBD-NF	CHF-0750-T3	0.675	1.900								
					18mm					6.000	0.700	



Profile Milling Program Tools

Small Ball Nose & Back Draft Inserts

VRBS	Tool Ordering Number	Dimensions			Grade			Description
		D	L	R	XRN	TLN	HSN	
	VRBS-0250	0.250	0.294	0.125	•	•	•	Used for semi and finish-milling small radius or detail work, and surface milling in soft and hard steel, cast iron, aerospace and non-ferrous alloys, graphite, etc. Suitable for high speed and hard milling.
	VRBS-0312	0.312	0.184	0.156	•	•	•	
VBD	Tool Ordering Number	Dimensions			Grade			Description
		D	L	R	XRN	TLN	HSN	
	VBD-0250-R01	0.250	0.313	0.015	•	•	•	Used for semi and finish-milling small radius or detail work, and surface milling in soft and hard steel, cast iron, aerospace and non-ferrous alloys, graphite, etc. Suitable for high speed and hard milling.
	VBD-0312-R01	0.312	0.215	0.015	•	•	•	

High Feed Inserts

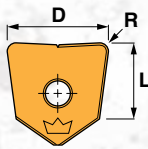
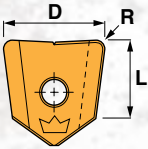
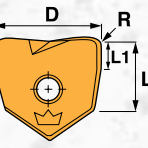
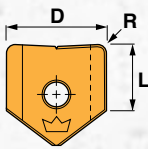
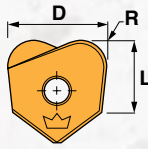
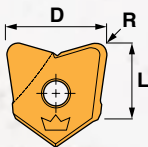
HF	Tool Ordering Number	Dimensions			Grade			Description
		D	L	PR	XRN	TLN	HSN	
	HF-0375...	0.375	0.0125	0.028	•	•	•	Millstar HF insert is designed for High feed and High speed machining. It runs at high cutting speed and feed rates with shallow depth of cut. It allows the chip to flow up and out of the cut quickly. It allows heavy chip loads.
	HF-0500...	0.500	0.0203	0.052	•	•	•	
	HF-0625...	0.625	0.0235	0.071	•	•	•	
	HF-0750...	0.750	0.0315	0.094	•	•	•	
	HF-1000...	1.000	0.0345	0.111	•	•	•	

Cutting Recommendations for High Feed Inserts

Work Material	Material Hardness	Cutting Depth at Diameter ap max						Cutting Width	Insert	Coating Type Recom.	Cut speed at D sfm/min	Max feed per tooth fz at cutting insert diameter D				
		0.375	0.500	0.625	0.750	1.000	Ae max					0.375	0.500	0.625	0.750	1.000
H13/1,2344/ SKD61	<41	0,014	0,019	0,023	0,028	0,037	60 - 75%	HF	XRN/HSN	515 - 715	0,012~0,016	0,017~0,021	0,021~0,025	0,026~0,030	0,035~0,039	
H13/1,2344/ SKD61	41-50	0,012	0,016	0,019	0,023	0,031	60 - 75%	HF	XRN/HSN	415 - 615	0,010~0,014	0,014~0,018	0,017~0,021	0,021~0,025	0,029~0,033	
H13/1,2344/ SKD61	51+	0,009	0,013	0,016	0,019	0,025	60 - 75%	HF	HSN	315 - 515	0,007~0,011	0,011~0,015	0,014~0,018	0,017~0,021	0,023~0,027	
A2/1,2363/ SKD12	<41	0,014	0,019	0,023	0,028	0,037	60 - 75%	HF	XRN/HSN	515 - 715	0,012~0,016	0,017~0,021	0,021~0,025	0,026~0,030	0,035~0,039	
A2/1,2363/ SKD12	14-50	0,012	0,016	0,019	0,023	0,0319	60 - 75%	HF	XRN/HSN	415 - 615	0,010~0,014	0,014~0,018	0,017~0,021	0,021~0,025	0,029~0,033	
A2/1,2363/ SKD12	51+	0,009	0,013	0,016	0,019	0,025	60 - 75%	HF	HSN	315 - 515	0,007~0,011	0,011~0,015	0,014~0,018	0,017~0,021	0,023~0,027	
P20/1,2330	<41	0,014	0,019	0,023	0,028	0,037	60 - 75%	HF	XRN/HSN	515 - 715	0,012~0,016	0,017~0,021	0,021~0,025	0,026~0,030	0,035~0,039	
P20/1,2330	14-50	0,012	0,016	0,019	0,023	0,031	60 - 75%	HF	XRN/HSN	415 - 615	0,010~0,014	0,014~0,018	0,017~0,021	0,021~0,025	0,029~0,033	
D2/1,2379/ SKD11	<41	0,014	0,019	0,023	0,028	0,037	60 - 75%	HF	XRN/HSN	515 - 715	0,012~0,016	0,017~0,021	0,021~0,025	0,026~0,030	0,035~0,039	
D2/1,2379/ SKD11	14-50	0,012	0,016	0,019	0,023	0,031	60 - 75%	HF	XRN/HSN	415 - 615	0,010~0,014	0,014~0,018	0,017~0,021	0,021~0,025	0,029~0,033	
D2/1,2379/ SKD11	51+	0,009	0,013	0,016	0,019	0,025	60 - 75%	HF	HSN	315 - 515	0,007~0,011	0,011~0,015	0,014~0,018	0,017~0,021	0,023~0,027	
Grey Cast Iron/ GG	<41	0,014	0,019	0,023	0,028	0,037	60 - 75%	HF	XRN/HSN	515 - 715	0,012~0,016	0,017~0,021	0,021~0,025	0,026~0,030	0,035~0,039	
Cast Iron/GGG	41+	0,012	0,016	0,019	0,023	0,031	60 - 75%	HF	XRN/HSN	515 - 715	0,012~0,016	0,017~0,021	0,021~0,025	0,026~0,030	0,035~0,039	

Copy Milling Program Tools

Flat Bottom, Back Draft, Toroid

BD-N	Tool Ordering Number	Dimensions			Grade			Description	
		D	L	R	XRN	TLN	HSN		
	BD-0375-N	0.375	0.357	1/32,1/16	•	•	•	Precision ground with 7° back taper. Used for milling of cores, cavities, fillets with straight or very steep walls of harder materials.	
	BD-0500-N	0.500	0.380	1/32,1/16	•	•	•		
	BD-0625-N	0.625	0.457	1/32,1/16	•	•	•		
	BD-0750-N	0.750	0.540	1/32,1/16,1/8	•	•	•		
	BD-1000-N	1.000	0.740	1/32,1/16,1/8	•	•	•		
	BD-1250-N	1.250	0.919	1/32,1/16,1/8	•	•	•		
BD-R	Number	D	L	R	XRN	TLN	HSN	Description	
	BD-0375-R	0.375	0.340	1/32	•	•	•	Precision ground with positive ground chip-breaker and 7° back taper. Used for milling of cores, cavities, fillets with straight or very steep walls of softer materials.	
	BD-0500-R	0.500	0.380	1/32,1/16,1/8	•	•	•		
	BD-0625-R	0.625	0.457	1/32,1/16	•	•	•		
	BD-0750-R	0.750	0.540	1/32,1/16,1/8	•	•	•		
	BD-1000-R	1.000	0.740	1/32,1/16,1/8	•	•	•		
	BD-1250-R	1.250	0.919	1/32,1/16,1/8	•	•	•		
BDS	Number	D	L	R	L1	XRN	TLN	HSN	Description
	BDS-0375-N	0.375	0.340	1/32,1/16	0.125	•	•	•	Precision ground with unique crossover design between flat bottom FB and back draft DB inserts. Allows straight walls with a larger step down than BD. Allows higher cutting speeds and feeds.
	BDS-0500-N	0.500	0.380	015,1/32,1/16	0.125	•	•	•	
	BDS-0625-N	0.625	0.457	1/32,1/16	0.125	•	•	•	
	BDS-0750-N	0.750	0.540	1/32,1/16,1/8	0.125	•	•	•	
	BDS-1000-N	1.000	0.740	1/32,1/16,1/8	0.125	•	•	•	
	BDS-1250-N	1.250	0.919	1/16	0.125	•	•	•	
FB-R	Number	D	L	R	XRN	TLN	HSN	Description	
	FB-0375-R	0.375	0.341	1/32	•	•	•	Precision ground with positive ground chip-breaker. Flat bottom inserts for shoulder milling, fillet finishing and long reach angular wall finishing of softer materials.	
	FB-0500-R	0.500	0.350	1/32,1/16,1/8	•	•	•		
	FB-0625-R	0.625	0.421	1/32,1/16	•	•	•		
	FB-0750-R	0.750	0.496	1/32,1/16,1/8	•	•	•		
	FB-1000-R	1.000	0.679	1/32,1/16,1/8	•	•	•		
	FB-1250-R	1.250	0.843	1/32,1/16,1/8	•	•	•		
TO	Number	D	L	R	XRN	TLN	HSN	Description	
	TO-0375	0.375	0.349	0.125	•	•	•	Precision ground large corner radius & back taper for spiral and pocket milling. Milling of pre-hard and hardened flat surfaces at higher speeds than tools with smaller corner radii. Good choice for HS milling of Aluminum.	
	TO-0500	0.500	0.377	0.125	•	•	•		
	TO-0625	0.625	0.433	0.156	•	•	•		
	TO-0750	0.750	0.518	0.187	•	•	•		
	TO-1000	1.000	0.716	0.250	•	•	•		
	TO-1250	1.250	0.865	0.312	•	•	•		
TOBD-NF	Number	D	L	R	XRN	TLN	HSN	Description	
	TOBD-0500-NF	0.500	0.377	0.125				Millstar inserts designed for high speed high feed roughing of Aluminum, but also has the versatility to be used for fine finishing as well.	
	TOBD-0625-NF	0.625	0.433	0.125					
	TOBD-0750-NF	0.750	0.518	0.125					
	TOBD-1000-NF	1.000	0.716	0.125					

Radius Ordering Numbers:

For .015 use ordering # .015 • For 1/32" use ordering # 02 1/16" use ordering # 04

For 1/8" use ordering # 08

Example: 1/2" BDS-0500N-04-HSN

NA

Non-coated grade.

XRN

Multi-layer hybrid coating of AlCrN. This coating has very good heat resistance and also a low friction coefficient. The XRN coating is designed for use in HSM of un-heat treated softer materials such as Titanium, Inconel, Stainless Steels and other gummy materials that require the use of liquid coolant.

HSN

Millstar's new coating is a multi-layer hybrid Nano coating. This new coating has very good heat resistance and high hardness. The HSN coating is designed for use in HSM of Heat Treated materials up to 72 HRC.

ALTiN-EXALON (TLN)

Titanium Aluminum Nitride advanced PVD coating. A special, improved ALTiN coating approaching surface hardness of CBN on a tough substrate. Recommended for tough and hard metal machining applications.

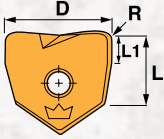
DMD

Diamond coating. Custom coating for cutting non-ferrous, non-metallic and very abrasive materials at highly elevated speeds. Use on copper, bronze, brass, aluminum-silicon alloys, carbon graphite, solid and fiber-reinforced plastics, ceramics and composite materials.

Custom tool coatings for specific applications are available by request.

BDS Series in PCD and CBN Tipped

Back Draft

BDS	Tool Ordering Number	Dimensions				Grade			Description
		D	L	R	L1	XRN	TLN	HSN	
	BDS-0375-N	0.375	0.340	1/32,1/16	0.125	•	•	•	Precision ground with unique crossover design between flat bottom FB and back draft BD inserts. Allows straight walls with a larger step down than BD. Allows higher cutting speeds and feeds.
	BDS-0500-N	0.500	0.380	015,1/32,1/16	0.125	•	•	•	
	BDS-0625-N	0.625	0.457	1/32,1/16	0.125	•	•	•	
	BDS-0750-N	0.750	0.540	1/32,1/16,1/8	0.125	•	•	•	
	BDS-1000-N	1.000	0.740	1/32,1/16,1/8	0.125	•	•	•	

PCD Tipped

For carbon milling with longer tool life

CBN Tipped

For high speed machining or milling of high hardness materials with longer tool life and superior finishes.

NEW!

Higher cutting speeds and feeds with new Back Draft Tools

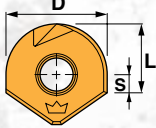
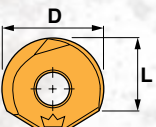
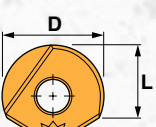
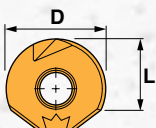
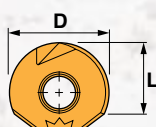
Radius Ordering Numbers:

For .015 use ordering # .015 • For 1/32" use ordering # 02 1/16" use ordering # 04
For 1/8" use ordering # 08

Example: 1/2" BDS-0500N-04-PCD or CBN

Copy Milling Program Tools

Ball Nose Inserts

BS-N	Tool Ordering Number	Dimensions			Grade			Description
		D	L	S	XRN	TLN	HSN	
	BS-0375-N	0.375	0.390	0.154	•	•	•	Sidecutting, non-chipbreaker. Side cutting insert used in cavity and core profiling, for blending of fillets on medium and hard materials.
	BS-0500-N	0.500	0.350	0.100	•	•	•	
	BS-0625-N	0.625	0.421	0.109	•	•	•	
	BS-0750-N	0.750	0.496	0.121	•	•	•	
	BS-1000-N	1.000	0.679	0.179	•	•	•	
	BS-1250-N	1.250	0.828	0.203	•	•	•	
MB	Number	D	L	XRN	TLN	HSN	Description	
	MB-0375	0.375	0.349	•	•	•	Unique cutting edge allows performance in all operations in material below 42 HRc; in semi- & finishing operations above. Significant benefits in chip evacuation. Insert geometry allows smoother cutting motion-diminishing heat build up & tool deflection, reduces vibration caused by cutting action.	
	MB-0500	0.500	0.377	•	•	•		
	MB-0625	0.625	0.443	•	•	•		
	MB-0750	0.750	0.518	•	•	•		
	MB-1000	1.000	0.716	•	•	•		
	MB-1250	1.250	0.865	•	•	•		
MBT	Number	D	L	XRN	TLN	HSN	Description	
	MBT-0375	0.375	0.349	•	•	•	Precision ground, harder grade, for semi-finish and finish milling. Excellent choice for unattended finish milling at small depth and high speeds and feed rates.	
	MBT-0500	0.500	0.377	•	•	•		
	MBT-0625	0.625	0.443	•	•	•		
	MBT-0750	0.750	0.518	•	•	•		
	MBT-1000	1.000	0.716	•	•	•		
	MBT-1250	1.250	0.865	•	•	•		
RB-N	Number	D	L	XRN	TLN	HSN	Description	
	RB-0375-N	0.375	0.390	•	•	•	Precision ground, non-chipbreaker. Best choice for cavity, core and profile milling of pre-hard and fully hard die/mold steels, cast steels and cast iron. Strongest cutting edge design.	
	RB-0500-N	0.500	0.377	•	•	•		
	RB-0625-N	0.625	0.443	•	•	•		
	RB-0750-N	0.750	0.518	•	•	•		
	RB-1000-N	1.000	0.716	•	•	•		
	RB-1250-N	1.250	0.865	•	•	•		
RBT	Number	D	L	XRN	TLN	HSN	Description	
	RB-0375-T	0.375	0.349	•	•	•	Precision ground for semi-finish and finish milling. Excellent choice for unattended finish milling at small depth and high speed and feed rates.	
	RB-0500-T	0.500	0.377	•	•	•		
	RB-0625-T	0.625	0.443	•	•	•		
	RB-0750-T	0.750	0.518	•	•	•		
	RB-1000-T	1.000	0.716	•	•	•		
	RB-1250-T	1.250	0.865	•	•	•		

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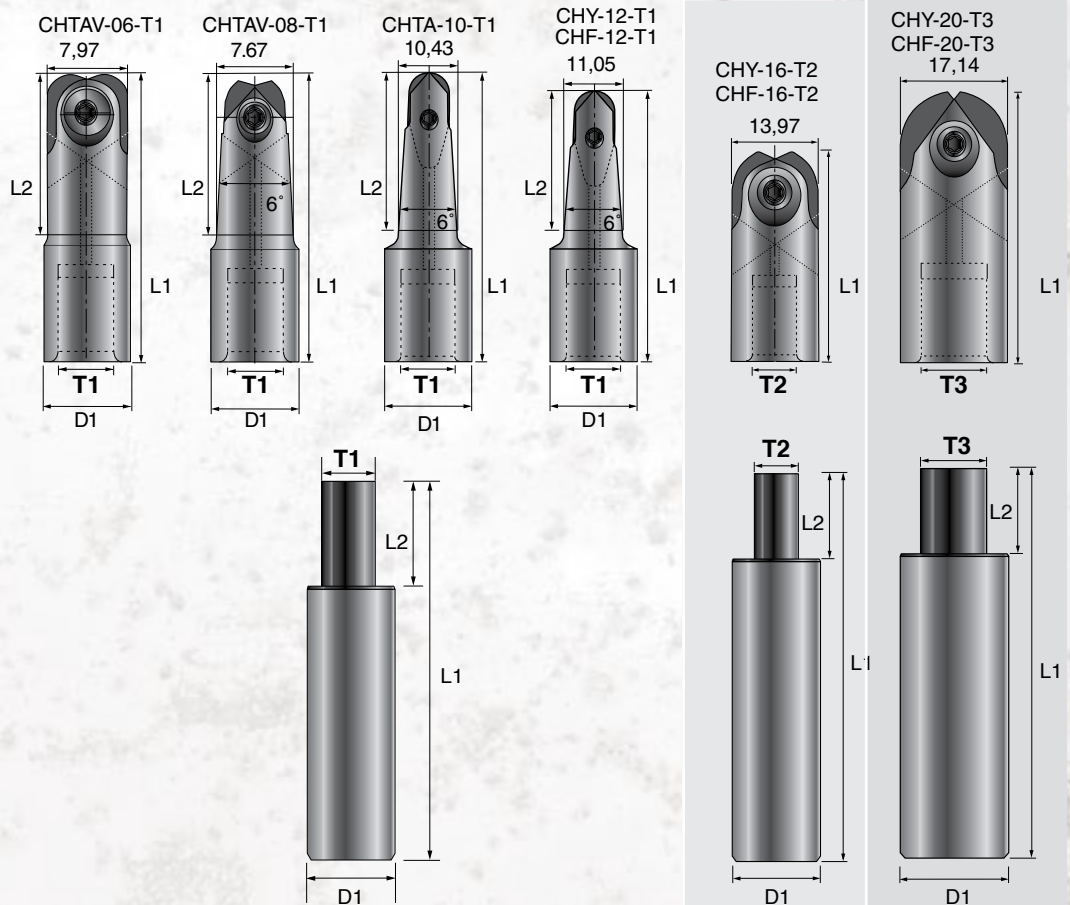
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Custom tool coatings for specific applications are available by request.

Carbide Modular Shrink System, Metric

Insert		Shrink Fit HEAD				Shrink Fit SHANK			
Type	Code	Tool Number	Dimensions			Tool Number	Dimensions		
			ØD1	L1	L2		ØD1	L1	L2
	VBD, VRBS	CHTAV-06-T1	11,7	43,2	22,3	CSS-12-75-T1 CSS-12-125-T1	12	73,60	15,24
		CHTAV-08-T1	11,7	43,2	20,9				
	TO, HF, FB, BDS, MB, MBT, BD, TOBD-NF, RBT	CHTA-10-T1	11,7	43,2	21,5				
		CHY-12-T1	11,7	43,2	21,5				
	RB, MB, MBT, BS, RBT	CHY-12-T1	11,7	43,2	21,5				
	FB, BD, BDS, HF, TO, TOBD-NF	CHF-12-T1	11,7	43,2	21,5				
	BS, RB, MB, MBT, RBT	CHY-16-T2	14,0	38,2	CSS-16-105-T2 CSS-16-180-T2		16	104,80	16,51
	FB, BD, BDS, HF, TO, TOBD-NF	CHF-16-T2	14,0	38,2					
	RB, BS, MB, MBT, RBT	CHY-20-T3	17,1	48,3	CSS-20-95-T3 CSS-20-175-T3 CSS-18-150-T3	20	96,50	17,78	
	FB, BD, BDS, HF, TO, TOBD-NF	CHF-20-T3	17,1	48,3					



Profile Milling Program Tools

Small Ball Nose & Back Draft Inserts

VRBS	Tool Ordering Number	Dimensions			Grade			Description
		D	L	R	XRN	TLN	HSN	
	VRBS-6	6	8,10	3	•	•	•	Used for semi and finish-milling small radius or detail work, and surface milling in soft and hard steel, cast iron, aerospace and non-ferrous alloys, graphite, etc. Suitable for high speed and hard milling.
	VRBS-8	8	4,50	4	•	•	•	
VBD	Tool Ordering Number	Dimensions			Grade			Description
		D	L	R	XRN	TLN	HSN	
	VBD-06	6	8,6	0,1/0,4	•	•	•	Used for semi and finish-milling small radius or detail work, and surface milling in soft and hard steel, cast iron, aerospace and non-ferrous alloys, graphite, etc. Suitable for high speed and hard milling.
	VBD-08	8	5	0,1/0,4	•	•	•	

Metric High Feed Inserts

HF	Tool Ordering Number	Dimensions			Grade			Description
		D	L	PR	XRN	TLN	HSN	
	HF-10	10	3	1,00	•	•	•	Millstar HF insert is designed for High feed and High speed machining. It runs at high cutting speed and feed rates with shallow depth of cut. It allows the chip to flow up and out of the cut quickly. It allows heavy chip loads.
	HF-12	12	4	1,43	•	•	•	
	HF-16	16	5	1,94	•	•	•	
	HF-20	20	6	2,26	•	•	•	
	HF-25	25	7	2,82	•	•	•	

Cutting Recommendations for High Feed Inserts

Work Material	Material Hardness	Cutting Depth at Diameter ap max					Cutting Width Ae max	Insert	Coating Type Recom.	Cut speed at D sfm/min	Max feed per tooth fz at cutting insert diameter D				
		10	12	16	20	25					10	12	16	20	25
H13/1,2344/ SKD61	<41	0,38	0,46	0,61	0,76	0,95	60 - 75%	HF	XRN/HSN	157 - 218	0,28~0,48	0,36~0,56	0,051~0,71	0,66~0,86	0,85~1,05
H13/1,2344/ SKD61	41-50	0,32	0,38	0,51	0,64	0,80	60 - 75%	HF	XRN/HSN	126 - 187	0,22~0,42	0,28~0,48	0,41~0,61	0,54~0,74	0,70~0,90
H13/1,2344/ SKD61	51+	0,26	0,31	0,42	0,52	0,65	60 - 75%	HF	HSN	96 - 157	0,16~0,36	0,21~0,41	0,32~0,52	0,42~0,62	0,55~0,75
A2/1,2363/ SKD12	<41	0,38	0,46	0,61	0,76	0,95	60 - 75%	HF	XRN/HSN	157 - 218	0,28~0,48	0,36~0,56	0,51~0,71	0,66~0,86	0,85~1,05
A2/1,2363/ SKD12	14-50	0,32	0,38	0,51	0,64	0,80	60 - 75%	HF	XRN/HSN	126 - 187	0,220~0,42	0,28~0,48	0,32~0,52	0,54~0,74	0,70~0,90
A2/1,2363/ SKD12	51+	0,26	0,31	0,42	0,52	0,65	60 - 75%	HF	HSN	96 - 157	0,16~0,36	0,21~0,41	0,51~0,71	0,42~0,62	0,55~0,75
P20/1,2330	<41	0,38	0,46	0,61	0,76	0,95	60 - 75%	HF	XRN/HSN	157 - 218	0,28~0,48	0,36~0,56	0,41~0,61	0,66~0,86	0,85~1,05
P20/1,2330	14-50	0,32	0,38	0,51	0,64	0,80	60 - 75%	HF	XRN/HSN	126 - 187	0,22~0,42	0,28~0,48	0,51~0,71	0,54~0,74	0,70~0,90
D2/1,2379/ SKD11	<41	0,38	0,46	0,61	0,76	0,95	60 - 75%	HF	XRN/HSN	157 - 218	0,28~0,48	0,36~0,56	0,41~0,71	0,66~0,86	0,85~1,05
D2/1,2379/ SKD11	14-50	0,32	0,38	0,51	0,64	0,80	60 - 75%	HF	XRN/HSN	126 - 187	0,22~0,42	0,28~0,48	0,41~0,61	0,54~0,744	0,70~0,90
D2/1,2379/ SKD11	51+	0,26	0,31	0,42	0,52	0,65	60 - 75%	HF	HSN	96 - 157	0,16~0,36	0,21~0,41	0,32~0,52	0,42~0,62	0,55~0,75
Grey Cast Iron/ GG	<41	0,38	0,46	0,61	0,76	0,95	60 - 75%	HF	XRN/HSN	157 - 218	0,282~0,48	0,36~0,56	0,51~0,71	0,66~0,86	0,85~1,05
Cast Iron/GGG	41+	0,38	0,46	0,61	0,76	0,95	60 - 75%	HF	XRN/HSN	157 - 218	0,28~0,48	0,36~0,56	0,51~0,71	0,66~0,86	0,85~1,05

Copy Milling Program Tools

NA

Non-coated grade.

XRN

Multi-layer hybrid coating of AlCrN. This coating has very good heat resistance and also a low friction coefficient. The XRN coating is designed for use in HSM of un-heat treated softer materials such as Titanium, Inconel, Stainless Steels and other gummy materials that require the use of liquid coolant.

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ALTiN-EXALON (TLN)

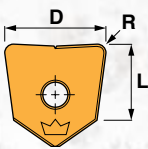
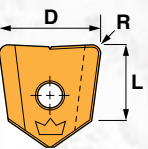
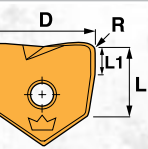
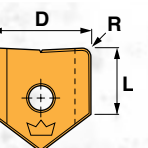
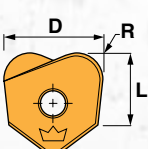
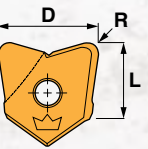
Titanium Aluminum Nitride advanced PVD coating. A special, improved ALTiN coating approaching surface hardness of CBN on a tough substrate. Recommended for tough and hard metal machining applications.

DMD

Diamond coating. Custom coating for cutting non-ferrous, non-metallic and very abrasive materials at highly elevated speeds. Use on copper, bronze, brass, aluminum-silicon alloys, carbon graphite, solid and fiber-reinforced plastics, ceramics and composite materials.

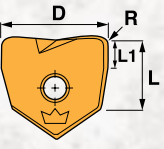
Custom tool coatings for specific applications are available by request.

Flat Bottom, Back Draft, Toroid

BD-N	Tool Ordering Number	Dimensions			Grade			Description	
		D	L	R	XRN	TLN	HSN		
	BD-10-N	10	8,5	0,5/0,8/1,0	•	•	•	Precision ground with 7° back taper. Used for milling of cores, cavities, fillets with straight or very steep walls of harder materials.	
	BD-12-N	12	9,95	0,5/1,0/2,0	•	•	•		
	BD-16-N	16	11,55	0,5/1,0/1,3/2,0/3,0	•	•	•		
	BD-20-N	20	13,35	0,5/1,0/1,6/2,0/3,0	•	•	•		
	BD-25-N	25	19,95	1,0/2,0	•	•	•		
	BD-32-N	32	8,5	1,0/2,6	•	•	•		
BD-R	Number	D	L	R	XRN	TLN	HSN	Description	
	BD-10-R	10	8,5	0,5/0,8/1,0	•	•	•	Precision ground with positive ground chip-breaker and 7° back taper. Used for milling of cores, cavities, fillets with straight or very steep walls of softer materials.	
	BD-12-R	12	9,95	0,5/1,0	•	•	•		
	BD-16-R	16	11,55	0,5/1,0/1,3	•	•	•		
	BD-20-R	20	13,35	0,5/1,0/1,6	•	•	•		
	BD-25-R	25	19,95	1,0/2,0	•	•	•		
	BD-32-R	32	23,35	2,6	•	•	•		
BDS	Number	D	L	R	L1	XRN	TLN	HSN	Description
	BDS-10-N	10	8,5	0,1/0,8/1,0	3	•	•	•	Precision ground with unique crossover design between flat bottom FB and back draft DB inserts. Allows straight walls with a larger step down than BD. Allows higher cutting speeds and feeds.
	BDS-12-N	12	9,95	0,1/1,0	3	•	•	•	
	BDS-16-N	16	11,55	0,1/1,0/1,3	3	•	•	•	
	BDS-20-N	20	13,35	0,1/1,0/1,6	3	•	•	•	
	BDS-25-N	25	19,95	1,0/2,0	3	•	•	•	
	BDS-32-N	32	23,35	1,0/2,0	3	•	•	•	
FB-R	Number	D	L	R	XRN	TLN	HSN	Description	
	FB-10-R	10	8,5	0,8	•	•	•	Precision ground with positive ground chip-breaker. Flat bottom inserts for shoulder milling, fillet finishing and long reach angular wall finishing of softer materials.	
	FB-12-R	12	9,15	1,0	•	•	•		
	FB-16-R	16	10,65	0,5/1,3	•	•	•		
	FB-20-R	20	12,25	1,6	•	•	•		
	FB-25-R	25	16,35	2,0	•	•	•		
	FB-32-R	32	21,3	2,6	•	•	•		
TO	Number	D	L	R	XRN	TLN	HSN	Description	
	TO-10	10	8,65	3,0	•	•	•	Precision ground large corner radius & back taper for spiral and pocket milling. Milling of pre-hard and hardened flat surfaces at higher speeds than tools with smaller corner radii. Good choice for HS milling of Aluminum.	
	TO-12	12	9,20	3,0	•	•	•		
	TO-16	16	11,25	4,0	•	•	•		
	TO-20	20	13,15	5,0	•	•	•		
	TO-25	25	18,25	6,0	•	•	•		
	TO-30	30	22,15	7,5	•	•	•		
	TO-32	32	21,95	8,0	•	•	•		
TOBD-NF	Number	D	L	R	XRN	TLN	HSN	Description	
	TOBD-12-NF	12	9,2	3,0	•	•	•	Millstar inserts designed for high speed high feed roughing of Aluminum, but also has the versatility to be used for fine finishing as well.	
	TOBD-16-NF	16	11,25	3,0	•	•	•		
	TOBD-20-NF	20	13,15	3,0	•	•	•		
	TOBD-25-NF	25	18,25	3,0	•	•	•		

BDS Series in PCD and CBN Tipped

Back Draft

BDS	Tool Ordering Number	Dimensions				Grade			Description
		D	L	R	L1	XRN	TLN	HSN	
	BDS-10-N	10	8,5	0,1/0,8/1,0	3	•	•	•	Precision ground with unique crossover design between flat bottom FB and back draft BD inserts. Allows straight walls with a larger step down than BD. Allows higher cutting speeds and feeds.
	BDS-12-N	12	9,95	0,1/1	3	•	•	•	
	BDS-16-N	16	11,55	0,1/1/1,3	3	•	•	•	
	BDS-20-N	20	13,35	0,1/1/1,6	3	•	•	•	
	BDS-25-N	25	19,95	1/2	3	•	•	•	

PCD Tipped

For carbon milling with longer tool life

CBN Tipped

For high speed machining or milling of high hardness materials with longer tool life and superior finishes.

NEW!

Higher cutting speeds and feeds with new Back Draft Tools

Radius Ordering Numbers:

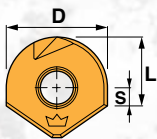
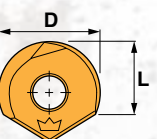
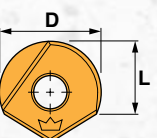
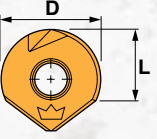
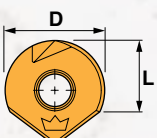
For .015 use ordering # .015 • For 1/32" use ordering # 02 1/16" use ordering # 04

For 1/8" use ordering # 08

Example: 1/2" BDS-0500N-04-PCD or CBN

Copy Milling Program Tools

Ball Nose Inserts

BS-N	Tool Ordering Number	Dimensions			Grade			Description
		D	L	S	XRN	TLN	HSN	
	BS-10-N	10	9,50	3,65	•	•	•	Sidecutting, non-chipbreaker. Side cutting insert used in cavity and core profiling, for blending of fillets on medium and hard materials.
	BS-12-N	12	8,80	2,90	•	•	•	
	BS-16-N	16	10,70	2,85	•	•	•	
	BS-20-N	20	12,75	2,85	•	•	•	
	BS-25-N	25	17,20	4,85	•	•	•	
	BS-30-N	30	20,00	5,10	•	•	•	
	BS-32-N	32	21,00	5,30	•	•	•	
MB	Number	D	L	XRN	TLN	HSN	Description	
	MB-10	10	8,65	•	•	•	Unique cutting edge allows performance in all operations in material below 42 HRC; in semi- & finishing operations above. Significant benefits in chip evacuation. Insert geometry allows smoother cutting motion-diminishing heat build up & tool deflection, reduces vibration caused by cutting action.	
	MB-12	12	9,20	•	•	•		
	MB-16	16	11,25	•	•	•		
	MB-20	20	13,15	•	•	•		
	MB-25	25	18,25	•	•	•		
	MB-30	30	22,15	•	•	•		
	MB-32	32	21,95	•	•	•		
MBT	Number	D	L	XRN	TLN	HSN	Description	
	MBT-10	10	8,65	•	•	•	Precision ground, harder grade, for semi-finish and finish milling. Excellent choice for unattended finish milling at small depth and high speeds and feed rates.	
	MBT-12	12	9,20	•	•	•		
	MBT-16	16	11,25	•	•	•		
	MBT-20	20	13,15	•	•	•		
	MBT-25	25	18,25	•	•	•		
	MBT-30	30	22,15	•	•	•		
	MBT-32	32	21,95	•	•	•		
RB-N	Number	D	L	XRN	TLN	HSN	Description	
	RB-10-N	10	9,50	•	•	•	Precision ground, non-chipbreaker. Best choice for cavity, core and profile milling of pre-hard and fully hard die/mold steels, cast steels and cast iron. Strongest cutting edge design.	
	RB-12-N	12	9,20	•	•	•		
	RB-14-N	14	9,45	•	•	•		
	RB-16-N	16	11,25	•	•	•		
	RB-20-N	20	13,15	•	•	•		
	RB-22-N	22	17,45	•	•	•		
	RB-25-N	25	18,25	•	•	•		
	RB-30-N	30	22,15	•	•	•		
	RB-32-N	32	21,95	•	•	•		
RBT	Number	D	L	XRN	TLN	HSN	Description	
	RB-10-T	10	8,65	•	•	•	Precision ground for semi-finish and finish milling. Excellent choice for unattended finish milling at small depth and high speed and feed rates.	
	RB-12-T	12	9,20	•	•	•		
	RB-16-T	16	11,25	•	•	•		
	RB-20-T	20	13,15	•	•	•		
	RB-25-T	25	18,25	•	•	•		
	RB-30-T	30	22,15	•	•	•		
	RB-32-T	32	21,95	•	•	•		

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