

Insert Overview

The Inserts

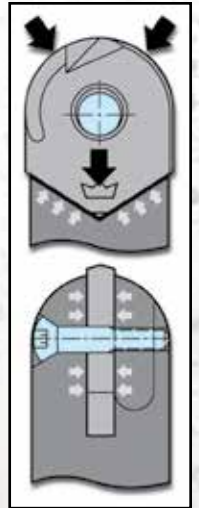
Millstar inserts are fully ground precision inserts for better chip control, faster metal removal and higher surface accuracies. They are far more accurate than pressed and O.D. sharpened inserts.

- Positive ground chipbreaker or strong negative cutting edge designs guarantee outstanding cutting performance in a wide variety of ferrous and non-ferrous materials.
- A choice of state-of-the-art insert grades, designs and tool coatings allow for optimum speed and feed rates in wet and dry machining. Reduced machining times by 25% to 60% are not uncommon.
- Economical one-piece inserts with two cutting edges are cost-effective for contour milling. True radius geometry is fully CNC-ground for higher machining accuracy and greatly reduced manual finishing and polishing time.

- Choose from side-cutting ball nose inserts with 180 degree nose radius, and popular ball nose inserts with a cutting edge covering 230 degrees for steep wall up-and-down ramping, profiling, contour milling and blending, and for a wider range of applications compared to conventional ball nose tools.
- Select from a variety of flat bottom, back draft and toroid inserts for steep or straight wall milling with long extensions on hard to reach cores, cavities or fillets. Milling with small radii prevents deflection and results in superior finishes and contour accuracies. Available with or without chipbreaker and coating in a variety of corner radii and sizes.

Rock Solid Insert Clamping

Cutting insert clamping is highly accurate and rigid. Unique V-pocket design gives a truly positive seat for the insert and will not allow insert movement when milling with a side thrust. "Sandwiched" insert clamping with single locking screw is unsurpassed for rigidity. The advanced design of Millstar inserts eliminates heat-seizing of locking screws or insert movement due to costly locating screws or pins of less advanced design. Positive V-pocket seating eliminates mismatch when changing to fresh inserts. It also eliminates the need to program new length or diameter offsets.



Ball Nose Inserts

MBT SuperFinisher Ball Nose Insert

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.



MB Ball Nose Insert

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.



VRBS Small Ball Nose Insert

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.



RB-N Ball Nose Insert

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.



RBT Insert

Precision ground for semi-finish and finish milling. Excellent choice for unattended finish milling at small depth and high speed and feed rates.



BS-N Ball Nose Insert

Sidecutting, non-chipbreaker. Side cutting insert used in cavity and core profiling, for blending of fillets on medium and hard materials.



Flat Bottom Inserts

BDS Flat Bottom Insert

Precision ground, non-chipbreaker. Unique crossover design between flat bottom FB and back draft BD inserts. Allows straight walls with a larger step down than BD, but less cutting forces than FB; allows higher cutting speeds and feed



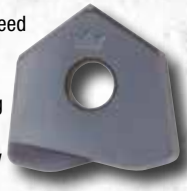
FB-R Flat Bottom Insert

Precision ground, with positive ground chipbreaker. Flat bottom insert for shoulder milling, fillet finishing and long reach angular wall finishing of softer materials



HF (High Feed) Inserts

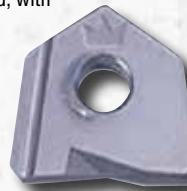
Millstar's new HF insert is designed for High Speed and High Feed machining. The HF is designed to run at high cutting speeds and feed rates with shallow depth of cut. The NEW curved geometry allows the chip to flow up and out of the cut quickly and smoothly allowing for the use of heavy chip loads. The geometry of the new HF insert generates cutting forces upward, toward the spindle, which helps eliminate vibration and deflection, allowing for very high chip loads. The HF insert is designed to fit into Millstar's standard flat holders, style 4 (CYF, TAF and CBCYF) making these holders more versatile than ever.



Back Draft Inserts

BD-R Back Draft Insert

Precision ground, with positive ground chipbreaker and 7 degree back-taper. Used for milling of cores, cavities, fillets with straight or very steep walls of softer material.



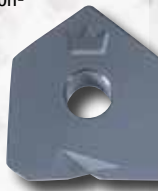
VBD Small Back Draft Insert

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, aluminum alloys, graphite, etc. Suitable for high speed and hard milling.



BD-N Back Draft Insert

Precision ground, non-chipbreaker and 7 degree backtaper. Used for milling of cores, cavities, fillets with straight or very steep walls of harder material.



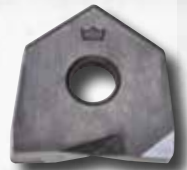
TOBD-NF Back Draft Inserts for Non-Ferrous Materials

Millstar's new TOBD-NF insert is specifically designed for high speed and high feed roughing of Aluminum, but also has the versatility to be used for fine finishing as well. This unique cutting edge design allows the chips to flow freely up the flute allowing higher speeds and feeds. The TOBD-NF comes in diameters from 1/2 inch (12mm) up to 1 inch (25mm) and fits into our standard flat type tool holders making the holders more versatile than ever.



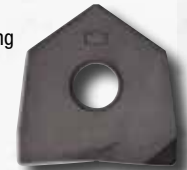
CBN Tipped

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



PCD Tipped

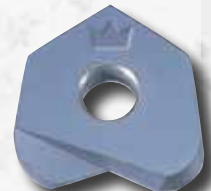
For carbon milling with longer tool life.



Toroid

TO Toroid Bull Nose Insert

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



Profile Milling Inserts

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 m/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 Inserts

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)

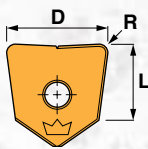
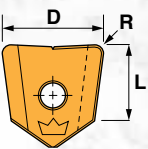
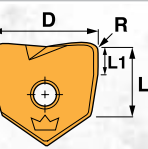
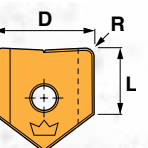
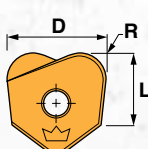
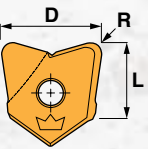
Titanium Aluminum Nitride advanced PVD coating. A special, improved ALTiN coating approaching surface hardness of CBN on a tough substrate. Recommended for tough and hard metal machining applications.

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.

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

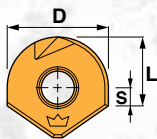
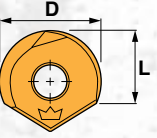
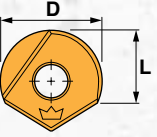
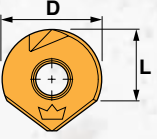
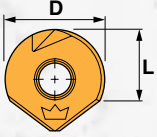
Radius Ordering Numbers:

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 Inserts

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
	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			•		

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.