



NEW PRODUCTS

- Milling cutter with ONEN inserts
- New ceramic Grades (ST800 / SZ1000)



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MILLING CUTTER WITH ONEN INSERT

Maximize Your Efficiency with 16 Cutting Edges

Detail of cutter



Newly designed 16 corner Milling Insert

Union Materials introduces newly designed 16 corner milling insert optimized for Cost Saving and high volume milling

Insert	Shape	Specification		
		Size	IC	t
	ONEN	20S0708	20	7.94

Grade of insert

- SN Series (Si₃N₄ & SiAlON)

Characteristics

- Excellent performance for Cast Iron Milling
- High volume cutting with big cutting depth
- Cost savings are possible (Maximum 16 corner using)
- Cutter diameters : D63 ~ D200
- Inch-Type Cutters Available

Applications

- ISO Classification : K05 ~ K30
- Cast iron machining from roughing to medium-cutting (interrupted machining possible)

Recommended Cutting Condition

Work piece	Machining	Cutter dia.	Cutting speed (m/min)	Feed (tooth/rev)	DOC (mm)	Coolant
Cast Iron	Rough	80	400~1000	0.2 ~ 0.4	2 ~ 5	Dry

Test result

- Steering housing for truck (GGG50)

- * Same processing conditions
- * Compared to competitor's milling insert and cutter

UNION
Materials

100 parts

Competitor

80 parts

+25 %

MILLING CUTTER WITH HNHX INSERT

Maximize Tool Life with Ceramic Insert

Detail of cutter



Newly designed 12 corner Milling Insert

Union Materials introduces newly designed 12 corner HNHX milling insert optimized for heavy interrupted cast iron milling

Insert	Shape	Specification		
		Size	IC	t
	HNHX	100610	10	6.35

Grade of insert

– SN Series (Si3N4 & SiAlON)

Characteristics

- Excellent performance for Cast Iron Roughing
- Heavy interrupted machining at high speed
- Better tool life than carbide
- Cutter diameters : D63 ~ D160
- Inch-Type Cutters Available

Applications

- Cylinder head, engine block, brake disc
- Cast iron heavy interrupted milling

Recommended Cutting Condition

Work piece	Machining	Cutter dia.	Vc (m/min)	Feed (mm/tooth)	DOC (mm)	Coolant
Cast Iron	Roughing	125	400~900	0.25 ~ 0.125	1.5 ~ 5.0	Dry

– Cylinder Head for truck

- * Same processing conditions (Vc 1100, Feed 1.50, DOC 2.5)
- * Compared to competitor's HNHX carbide insert (Better tool life)

Test result

UNION
Materials

200 parts

Competitor (Carbide)

100 parts

+100 %

GRADE OVERVIEW

Physical Properties

GRADE	Composition	Color	Density (g/cm ³)	Hardness (Hv, HRA)	Toughness (MPa·m ^{1/2})
SW400	Al ₂ O ₃ + SiC-Whisker	Green	3.8	2,100	6.0
SW800		Green	3.7	2,100	6.5
ST100	Al ₂ O ₃ + TiC	Black	4.2	2,100	4.5
ST300	Al ₂ O ₃ + TiCN	Black	4.4	2,150	4.0
ST500		Black	4.3	2,200	4.0
ST900		Black	4.3	2,200	4.5
ST800		Black	4.3	2,200	5.0
SD200	TiC + Al ₂ O ₃	Black	4.6	2,250	5.0
SZ200	Al ₂ O ₃ + ZrO ₂	White	4.1	1,800	4.5
SZ300		Pink	4.1	1,850	4.0
SZ1000		White	4.0	1,800	5.0
SN26	Si ₃ N ₄	Black	3.3	1,600	6.0
SN300		Gray	3.2	1,600	6.5
SN400		Gray	3.2	1,650	6.5
SN500		Gray	3.2	1,650	6.5
SN600		Black	3.2	1,700	7.0
SN800	Si ₃ N ₄ + Al ₂ O ₃	Black	3.2	1,900	6.5
SN950		Black	3.3	1,750	7.5
SN1000		Black	3.3	1,800	7.0

Choice of Ceramic Grade for Workpiece

Workpiece		SW400	SW800	ST100 ST300	ST500 ST800 ST900	SD200	SZ200 SZ300 SZ1000	SN26 SN300 SN400 SN500 SN600	SN800	SN950 SN1000
Cstt iron	Gray cast iron			★	○	○	★	★	★	○
	Chilled cast iron			○	○		○	○	★	○
	Ductile cast iron			○		★		○	○	○
Steel	Mild steel			○			○			
	Carbon steel			○			○			
	Alloy steel	○	○	★	○		○		○	○
	Forged steel			○	★					
	Heat treated steel			○	★					
	High speed steel	★	○	○	★					
	High manganese steel	★	○	○	○			○	○	○
	Heat resistant super alloy	○	★						○	★

★ : Excellent ○ : Good