

**Turning
Operations
V-Series**

Indexable Inserts for turning

VF Breaker

New

Features

Finishing-purpose of negative chip breaker for steel turning

- Improved chip control on various workpiece such as soft steel and alloy steel. etc.
- Combination of specially designed 3 dimensional chip breaker and rigid cutting edge guarantee long tool life.
- Very good surface finish in medium-finishing.



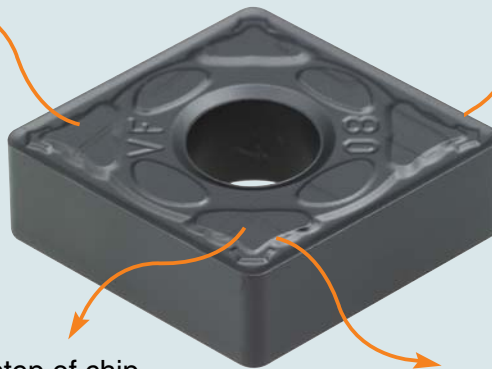
VF Breaker

Concept of VF-Design | Recommended Cutting Conditions

Concept of VF-Design

- Wide contact area of insert with holder prevents chipping due to fully clamped of insert.

- Unique design in cutting area ensures superior chip control in extremely small depth-of-cut

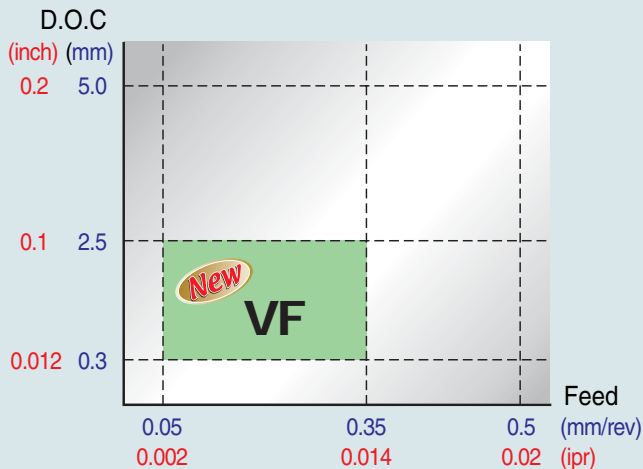


- Smooth chip curling in 2-step of chip breaker.
- Reduce chip control resistance at high speed & feed cutting

- Proper rake angle of cutting edge ensures better surface finish and low cutting resistance

Chip Control Range

$f = 0.05 \sim 0.35$ mm/rev (0.002 ~ 0.014 ipr)
 D.O.C = 0.3 ~ 2.5 mm (0.012 ~ 0.1 inch)



Recommended Cutting Conditions


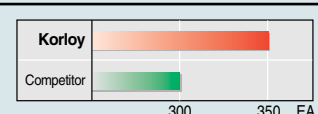

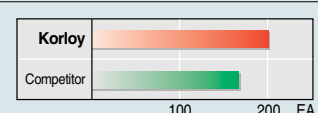
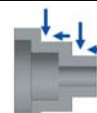
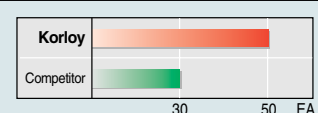

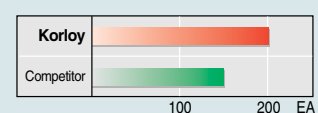
Workpiece	Hardness	Grade	V (m/min) (sfm)
Soft Steels (SM10C~SM25C SS400, SCR415 SCM415. etc)	≤180HB	NC3010	310 (270~350) 1020 (890~1160)
		NC3120	290 (250~330) 960 (830~1090)
		NC3030	270 (230~300) 890 (760~990)
General Steels (S45C, S55C, SCM430, SCM440. etc)	180~260HB	NC3010	220 (180~250) 730 (590~830)
		NC3120	200 (170~230) 660 (560~760)
		NC3030	190 (160~210) 630 (530~690)
Hardened Steels (SNC415, SNC815, SNCM240, SNCM439, STS12, STS61. etc)	260~350HB	NC3010	130 (100~150) 430 (330~500)
		NC3120	120 (90~140) 400 (300~460)
		NC3030	110 (80~130) 360 (260~430)



VF Breaker

Application examples | Chip Control Evaluation

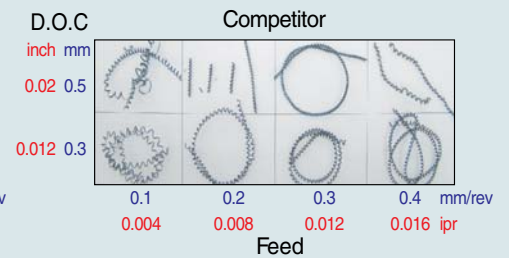
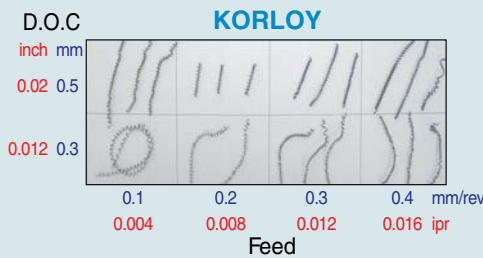
Application examples

Workpiece	Workpiece (Material)	Designation (Grade)	Cutting condition		Result
	Shaft (S20C)	DNMG150604-VF (NC3020)	V	200 m/min 650 sfm	
			f	0.3~0.35 mm/rev 0.012~0.014 ipr	
			d	0.5~1.0 mm 0.02~0.04 inch	
	Front Piston (S10C)	CNMG120408-VF (NC3020)	V	180 m/min 590 sfm	
			f	0.35 mm/rev 0.014 ipr	
			d	0.5~1.0 mm 0.02~0.04 inch	
	Flange (SM45)	CNMG120408-VF (NC3020)	V	250 m/min 820 sfm	
			f	0.3 mm/rev 0.012 ipr	
			d	1.0~1.5 mm 0.04~0.06 inch	
	bearing parts (SUJ2)	DNMG150608-VF (NC3010)	V	270 m/min 880 sfm	
			f	0.2~0.25 mm/rev 0.008~0.01 ipr	
			d	1.0~2.0 mm 0.04~0.08 inch	

Chip Control Evaluation

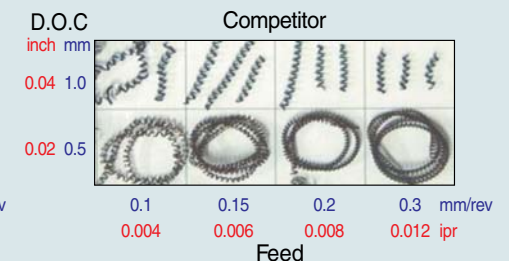
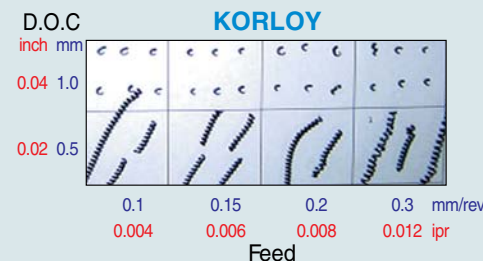
■ Cutting condition

- Workpiece : S25C
- Designation : CNMG120408-VF
- V = 200m/min / 660sfm



■ Cutting condition

- Workpiece : SCM440
- Designation : CNMG120408-VF
- V = 200m/min / 660sfm



VF Breaker

VF-Insert

VF-Insert

Geometry	Designation	Coated			Cermet	Dimensions(mm)			
		NC3010	NC3120	NC3030	CN200	d	t	r	d ₁
	CNMG090304-VF	○	●	○	●	9.525	3.18	0.4	3.81
	CNMG090308-VF	○	●	○	●	9.525	3.18	0.8	3.81
	CNMG120404-VF	●	●	●	●	12.7	4.76	0.4	5.16
	CNMG120408-VF	●	●	●	●	12.7	4.76	0.8	5.16
	CNMG120412-VF	○	●	○	○	12.7	4.76	1.2	5.16
	DNMG110402-VF	○	●	○	●	9.525	4.76	0.2	3.81
	DNMG110404-VF	○	●	○	●	9.525	4.76	0.4	3.81
	DNMG110408-VF	○	●	○	●	9.525	4.76	0.8	3.81
	DNMG150404-VF	○	●	○	●	12.7	4.76	0.4	5.16
	DNMG150408-VF	○	●	○	●	12.7	4.76	0.8	5.16
	DNMG150412-VF	○	○	○	○	12.7	4.76	1.2	5.16
	DNMG150604-VF	●	●	○	●	12.7	6.35	0.4	5.16
	DNMG150608-VF	●	●	○	●	12.7	6.35	0.8	5.16
	SNMG090304-VF	○	●	○	●	9.525	3.18	0.4	3.81
	SNMG090308-VF	○	●	○	●	9.525	3.18	0.8	3.81
	SNMG120404-VF	○	●	○	●	12.7	4.76	0.4	5.16
	SNMG120408-VF	●	●	○	●	12.7	4.76	0.8	5.16
	TNMG110304-VF	○	●	○	●	6.35	3.18	0.4	2.26
	TNMG160404-VF	○	●	●	●	9.525	4.76	0.4	3.81
	TNMG160408-VF	●	●	○	●	9.525	4.76	0.8	3.81
	TNMG160412-VF	○	●	○	○	9.525	4.76	1.2	3.81
	TNMG220404-VF	○	●	○	●	12.7	4.76	0.4	5.16
	TNMG220408-VF	○	●	○	○	12.7	4.76	0.8	5.16
	VNMG160402-VF	○	●	○	●	9.525	4.76	0.2	3.81
	VNMG160404-VF	●	●	○	●	9.525	4.76	0.4	3.81
	VNMG160408-VF	○	●	○	●	9.525	4.76	0.8	3.81
	WNMG060404-VF	●	●	○	●	9.525	4.76	0.4	3.81
	WNMG060408-VF	○	●	○	●	9.525	4.76	0.8	3.81
	WNMG080404-VF	○	●	○	●	12.7	4.76	0.4	5.16
	WNMG080408-VF	○	●	○	●	12.7	4.76	0.8	5.16

● Stock item, ○ Under preparing for stock



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