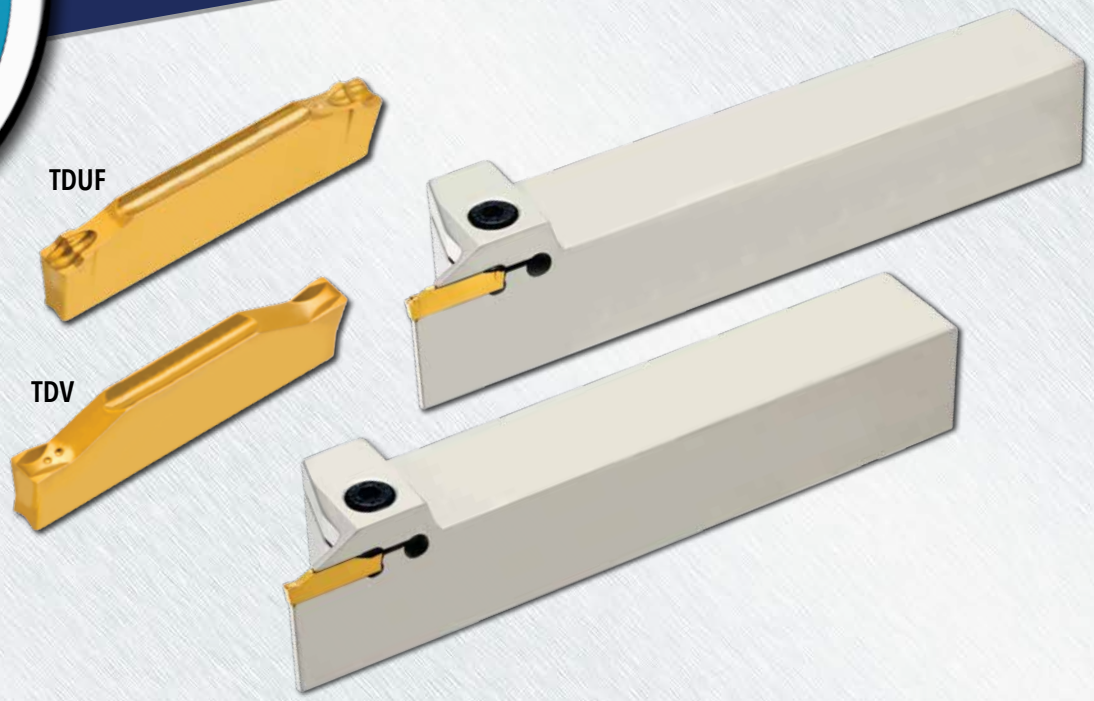
SFEEDUP HIGH SPEED & FEED

INDUSTRY 4.0 NEW PRODUCT ANNOUNCEMENT 2020

T-CLAMP ULTRA+

PARTING AND GROOVING PRODUCTS



TDUF
Insert Widths:
2mm & 3mm (.079" & .118")
Feed Rates: .0012 - .005 ipr
Double-Ended
Overall Length: 20mm (.787")
Grade: TT9080

TDV
Insert Widths: 2mm, 3mm & 4mm (.079", .118" & .157")
Feed Rate: .0016 - .008 ipr
Double-Ended
Overall Length: 20mm (.787")
Grades: TT9080 & TT8020

Compatible with All T-Clamp Ultra+ Holders

New Specialized Chip Breakers

New parting & grooving chip breakers focused on specific work piece materials.

The **TDUF** chip breaker is designed with a unique shape suitable for parting and grooving of low carbon steel, chrome-nickel alloy steel and bearing steel. Exceptional chip control performance is achieved in these materials during low feed rate cutting conditions.

The **TDV** chip breaker features a sharp cutting edge and wide chip grooves that generate low cutting forces during machining. The straight cutting edge produces a true flat bottom groove. Targeted materials for this geometry include mild steel and stainless steel where built-up-edge can create premature insert failure. This chip breaker is the perfect solution for small diameter work pieces and tubes, particularly at low feed rates.

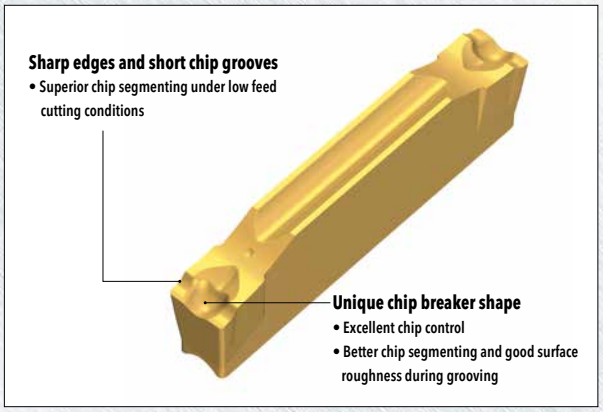
TDUF Insert Features:
- Suitable for the machining of chrome-nickel alloy steel and low carbon steel
- Exceptional performance in bearing steel machining
- Specialized for low feed cutting conditions
- Excellent chip control

TDV Insert Features:
- Sharp cutting edges and a wide chip groove that generates low cutting load during operations
- Superior chip segmenting power, which reduces built-up-edges
- Excellent performance in stainless steel and mild steel machining
- Optimally designed for small size workpieces and tubes in low feed cutting conditions
- Capable of precision flat surfaces during grooving

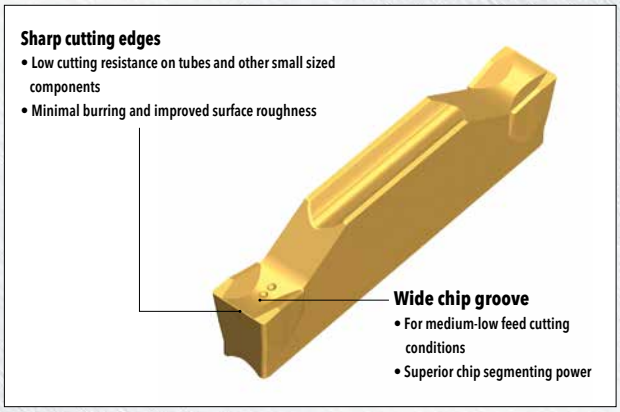
Member IMC Group Ingersoll Cutting Tools

TOCLAMP ULTRA+

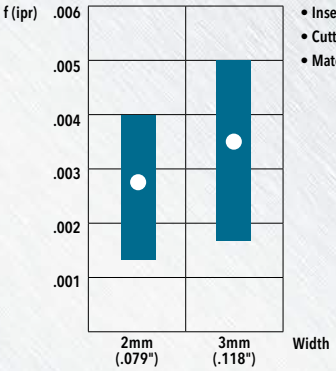
TDUF Insert



TDV Insert

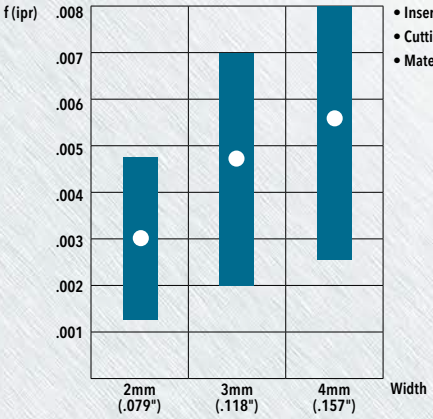


TDUF Insert Recommended Feed Range



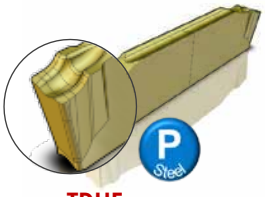
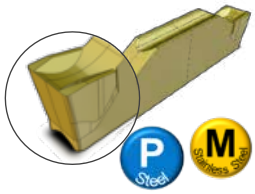
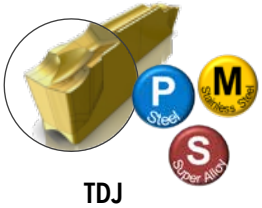
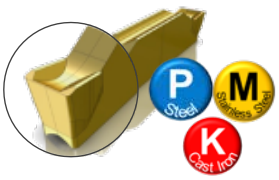
- Insert: TDUF
- Cutting speed (V): 400 sfm
- Material: DIN 1.3505 (HB 150 ~ 180)

TDV Insert Recommended Feed Range



- Insert: TDV
- Cutting speed (V): 330 sfm
- Material: AISI 304 (HB 150 ~ 180)

Chip Breakers for Parting & Grooving line

Low Feed	Sharp cutting edges	Positive cutting edge	Tough edge for High feed
			
TDUF Bearing steel & Cr base steel	**TDV** Pipe & Stainless steel	**TDJ** Light cut, low and Medium feed	**TDC** General, Medium and High feed

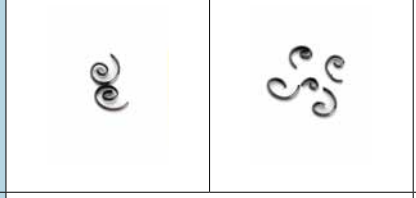
LOW ← Feed → HIGH

TDUF : Excellent chip breaking under low feed rate for bearing or mild steels and recommended for feed rate under 0.004 ipr.
If you have chip control problems please select this chip breaker.

TOOLCLAMP ULTRA+ TEST RESULTS

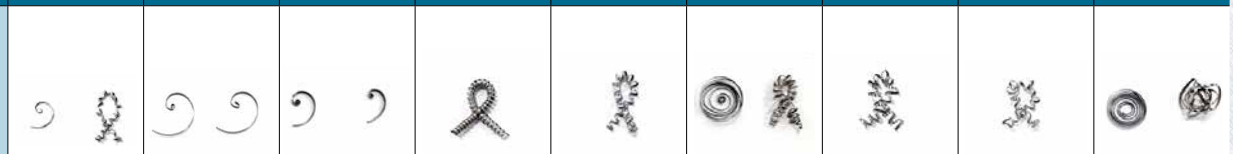
TDUF chip segmenting and surface roughness comparison test 1

Bearing steel (DIN 1.3505), cutting speed=400 sfm

	TDUF 2		Competitor A		Competitor B	
feed (ipr)	.001	.002	.001	.002	.001	.002
Chip						
Surface	feed=.001(ipr) 		feed=.001(ipr) 		feed=.001(ipr) 	

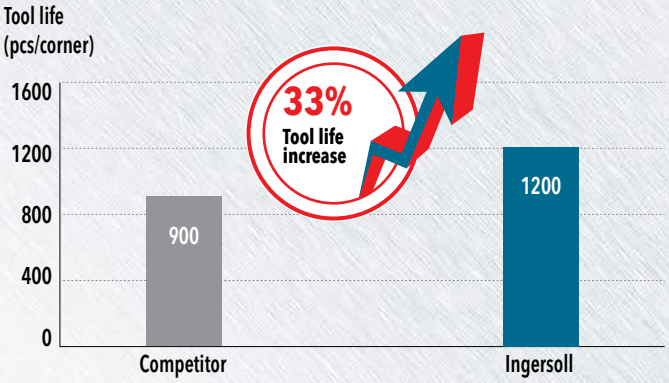
TDUF chip segmenting comparison test 2

Low carbon steel (AISI 1020), cutting speed=500 sfm

	TDUF 2			Competitor A			Competitor B		
feed (ipr)	.001	.002	.003	.001	.002	.003	.001	.002	.003
Chip									

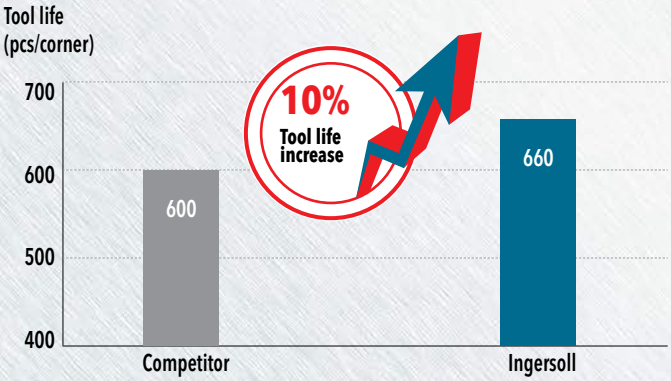
TOCLAMP ULTRA+ CASE STUDY 1 - TDUF

		Competitor	Ingersoll
Material		Bearing steel (DIN 1.3505)	
Operation		Parting	
Insert		Double ended insert for parting and grooving	TDUF 2 TT9080
Cutting speed	V (sfm)	425	425
Feed rate	f ipr)	.003	.003
Depth of cut	ap (inch)	590	.590
Coolant		Wet	Wet
Tool life (pcs/corner)		900	1200



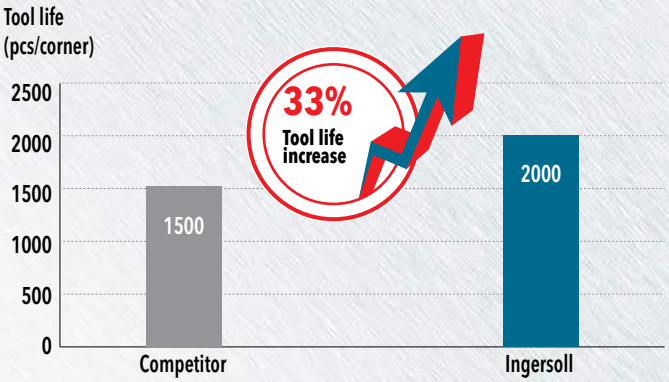
TOCLAMP ULTRA+ CASE STUDY 2 - TDUF

		Competitor	Ingersoll
Material		Bearing steel (DIN 1.3505)	
Operation		Parting	
Insert		Double ended insert for parting and grooving	TDUF 2 TT9080
Cutting speed	V (sfm)	425	425
Feed rate	f ipr)	.004	.004
Depth of cut	ap (inch)	.118	.118
Coolant		Wet	Wet
Tool life (pcs/corner)		600	660



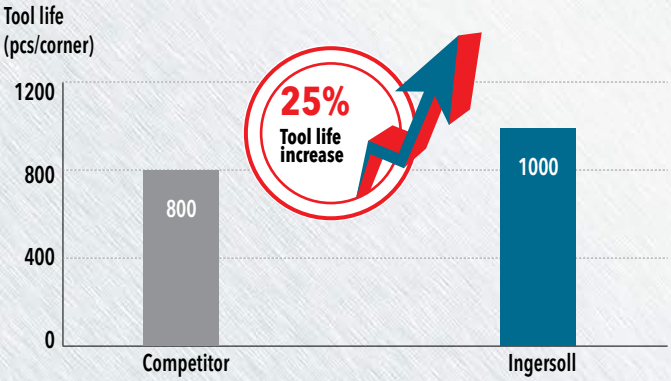
TOOLAMP ULTRA+ CASE STUDY 3 - TDV

		Competitor	Ingersoll
Material		Stainless steel (AISI 304)	
Machine		Sliding head machine	
Operation		Parting	
Insert		Double ended insert for parting and grooving	TDV 2 TT9080
Cutting speed	V (sfm)	530	530
Feed rate	f ipr)	.0012	.0012
Depth of cut	ap (inch)	.118	.118
Coolant		Wet	Wet
Tool life (pcs/corner)		1500	2000

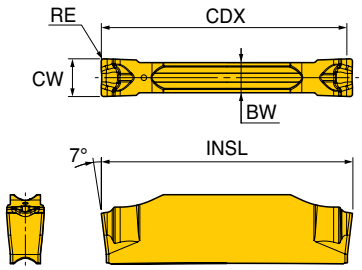


TOOLAMP ULTRA+ CASE STUDY 4 - TDV

		Competitor	Ingersoll
Material		Alloy steel	
Machine		Sliding head machine	
Operation		Parting	
Insert		Double ended insert for parting and grooving	TDV 2 TT9080
Cutting speed	V (sfm)	310	310
Feed rate	f ipr)	.0047	.0047
Depth of cut	ap (inch)	.230	.230
Coolant		Wet	Wet
Tool life (pcs/corner)		800	1000



TOCLAMP ULTRA+ TDUF DOUBLE-ENDED INSERTS FOR PARTING AND GROOVING WITH UF TYPE CHIP BREAKER

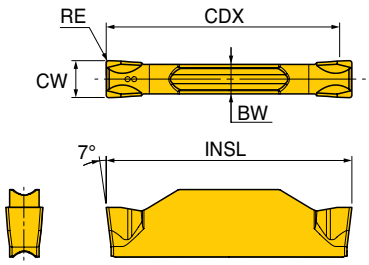


Size	Dimensions (inch)				
	CW	RE Corner Radius	BW	INSL	CDX
2	.079" (2mm)	.008	.060	.787	.748
3	.118" (3mm)	.008	.095	.787	.748

Insert	Designation ANSI (ISO)	Insert Seat Size	Feed (ipr)	Coated
				TT9080
	TDUF 2	2	.0012" - .0043"	•
	TDUF 3	3	.0016" - .0051"	•

•: Standard items

TOCLAMP ULTRA+ TDV DOUBLE-ENDED INSERTS FOR PARTING AND GROOVING WITH V TYPE CHIP BREAKER



Size	Dimensions (inch)				
	CW	RE Corner Radius	BW	INSL	CDX
2	.079" (2mm)	.008	.067	.787	.748
3	.118" (3mm)	.008	.095	.787	.748
4	.157" (4mm)	.012	.118	.787	.748

Insert	Designation ANSI (ISO)	Insert Seat Sizr	Feed (ipr)	Coated	
				TT9080	TT8020
	TDV 2	2	.0016" - .0047"	•	•
	TDV 3	3	.0024" - .007"	•	•
	TDV 4	4	.0031" - .008"	•	•

• : Standard items