TURNING INSERTS · NEGATIVE INSERTS · TNMG - 60° TRIANGULAR

TNMG-SM

60° negative triangular insert from semi-finishing to roughing of superalloys and titanium, with SM chipbreaker and INNOT PVD grades.

KEY DATA	
Product type	Turning Inserts
ISO materials	S superalloys
Operation	Semi-finishing · Roughing
Chipbreaker	**SM**
INNOT grades	IT7115 · **IT9205** ★ · **IT9215** ★ ★ recommended
Nose radii	R0.4 · R0.8 · R1.2
Online page	innot-it.com/en/prodotto/tnmg-sm

ISO specifications

ISO	RADIUS (RE)	AVAILABLE GRADES	CHIPBREAKER
TNMG1604	0.4 - 0.8 - 1.2	IT7115 - IT9205 - IT9215	SM

SM chipbreaker data sheet

Operation	Semi-finishing
ISO material	S (heat-resistant superalloys and titanium alloys)
Tolerance	M
Features	Rompitruciolo dalla semi-finitura alla sgrossatura di superleghe e titanio. Unisce robustezza del tagliente e controllo del truciolo per una lavorazione sicura e affidabile. Il taglio leggero rallenta l'incrudimento del materiale, limita l'usura a intaglio e allunga la durata dell'inserto. Forma triangolare 60°: 6 taglienti utilizzabili (3 per faccia), molto versatile per tornitura longitudinale e sfacciatura con un'ampia scelta di portautensili.

Available INNOT grades

Grade	ISO	Coating	Composition	Application
IT7115	**M · S**	**PVD**	AlTiSiN + TiSiN	Sub-micron grain substrate with nano-gradient coating: excellent wear and oxidation resistance, great stability. Suitable for titanium alloys and superalloys.
IT9205 ★	**S**	**PVD**	AlTiN + TiSiN + AlCrN	Highly wear-resistant grade for superalloys. Uniform sub-micron hard phase and alloying elements for greater reliability; excellent thermal stability and oxidation resistance.
IT9215 ★	**S**	**PVD**	AlTiN + TiSiN + AlCrN	Universal grade for turning superalloys. Greater toughness and reliability; the multilayer structure limits cracks and protects the coating from flaking and chipping.

★ Recommended grade for this chipbreaker. PVD = physical vapour deposition coating. ISO S = superalloys and titanium. ISO M = stainless steels.

Recommended cutting data

External turning of superalloys (ISO S)

Heat-resistant superalloys (Inconel 718 and similar). Recommended cutting data for the SM chipbreaker.

Condition	Grade	Vc (m/min)	fn (mm/rev)	ap (mm)
Stable	IT9205	40 – 80	0.15 – 0.40	0.70 – 3.00
Stable	IT9215	30 – 70	0.15 – 0.40	0.70 – 3.00
Average	IT9205	40 – 80	0.15 – 0.35	0.70 – 3.00
Average	IT9215	30 – 70	0.15 – 0.35	0.70 – 3.00
Difficult	IT9205	40 – 80	0.15 – 0.30	0.70 – 3.00
Difficult	IT9215	30 – 70	0.15 – 0.30	0.70 – 3.00

IT9205 permette velocità di taglio più alte; IT9215 offre maggiore tenacità. Partire dal valore minimo di Vc e aumentare in base all'usura. Usare sempre refrigerante abbondante.

Internal turning (boring) of superalloys (ISO S)

Starting values for internal turning with a boring bar, derived from this insert's external turning data: cutting speed −15%, feed −20%, maximum depth of cut −40%. Negative inserts are mounted on boring bars for bores from about Ø 25 mm upwards (Ø 32–40 mm for the larger sizes).

Condition	Grade	Vc (m/min)	fn (mm/rev)	ap (mm)
Stable	IT9205	35 – 70	0.12 – 0.32	0.70 – 1.80
Stable	IT9215	25 – 60	0.12 – 0.32	0.70 – 1.80
Average	IT9205	35 – 70	0.12 – 0.28	0.70 – 1.80
Average	IT9215	25 – 60	0.12 – 0.28	0.70 – 1.80
Difficult	IT9205	35 – 70	0.12 – 0.24	0.70 – 1.80
Difficult	IT9215	25 – 60	0.12 – 0.24	0.70 – 1.80

With a boring bar overhang above 3 times the diameter (steel bar) or 5 times (carbide or anti-vibration bar), reduce speed and feed further. Use the bar's internal coolant to clear the chips.

Application case: nickel-iron superalloy

Part	Main steam valve
Material	Nickel-iron-based superalloy (Incoloy 901 type)
Operation	External turning, emulsion
Insert	CNMG120408-SM · IT9215
Vc	41.7 m/min
fn	0.2 mm/rev
ap	2.5 mm
Result	Usura uniforme, durata +30% rispetto all'inserto precedente

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Cutting data are indicative starting values: adjust them to machine, clamping, tool overhang and workpiece material. Data and images may change without notice.