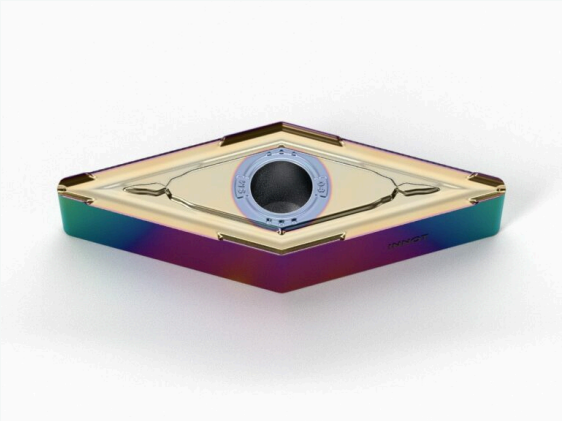
TURNING INSERTS · NEGATIVE INSERTS · VNMG - 35° RHOMBIC

# VNMG-SM

35° negative rhombic 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** ★<br>★ recommended |
| **Nose radii** | R0.4 · R0.8 |
| **Online page** | innot-it.com/en/prodotto/vnmg-sm |

## ISO specifications

| ISO | RADIUS (RE) | AVAILABLE GRADES | CHIPBREAKER |
|---|---|---|---|
| VNMG1604 | 0.4 - 0.8 | 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 rombica 35°: la punta più sottile della gamma, per copiatura e profilatura di gole, raggi e spallamenti dove le altre forme non arrivano. |

## 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.