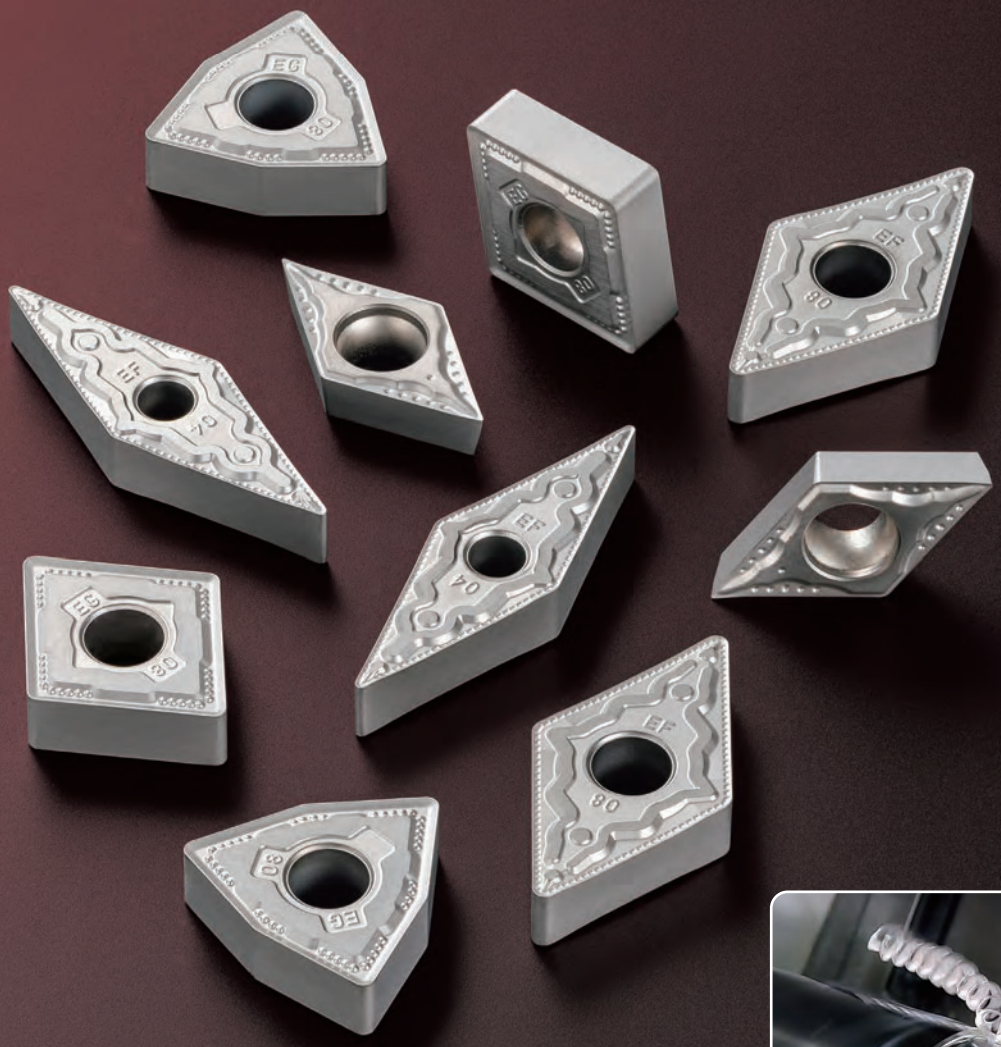
Tooling News No.559

SUMITOMO
CARBIDE - CBN - DIAMOND
Global Support, Global Solutions.

Coated Grades for Titanium Alloy

AC9115T/AC9125T

New grades for titanium alloy turning with a revolutionary new coating to realise amazingly long tool life



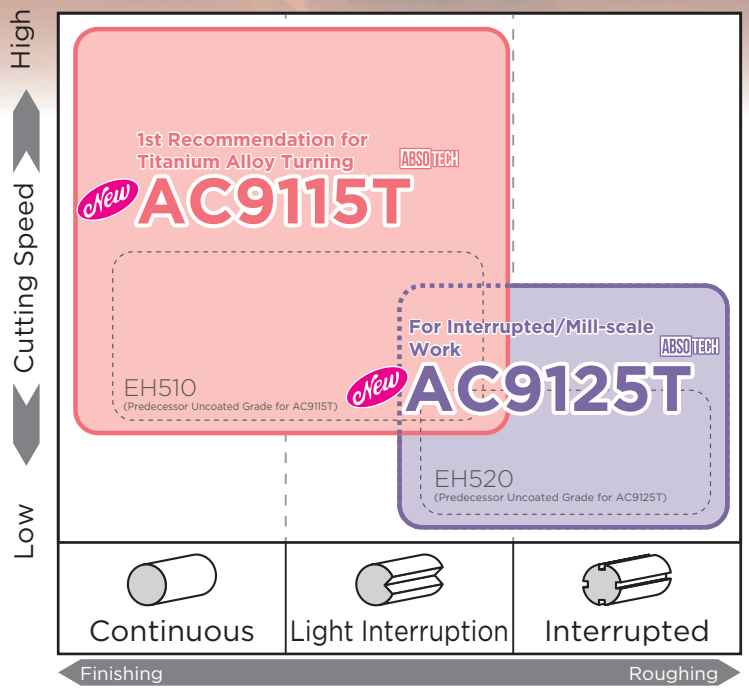
P M K N S H

SUMITOMO ELECTRIC GROUP

Coated Grades for Titanium Alloy

AC9115T/AC9125T

Application Range



AC9115T New PVD ABSOTECH

First recommended grade for titanium alloy turning

Wear Resistance 3x Competitor's Product

AC9125T New PVD ABSOTECH

Long and stable tool life in interrupted turning and mill-scale work

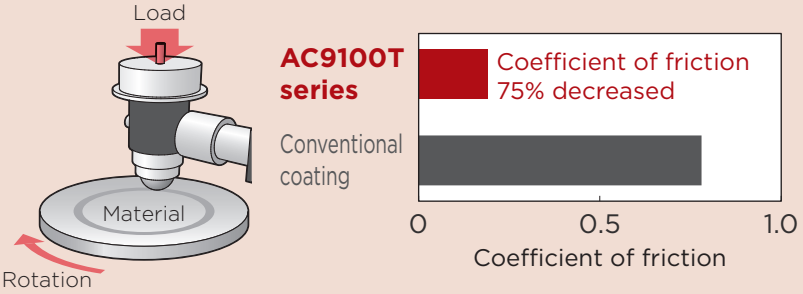
Fracture Resistance 3x Competitor's Product

Features of AC9115T and AC9125T

PVD Coating Technology Absotech™

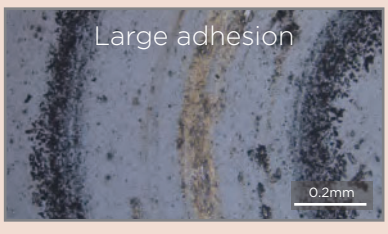
Utilising the industry's first WC-based composition that suppresses chemical reactions to titanium alloy, which significantly improves wear resistance

Coefficient of friction for Ti-6Al-4V



Test conditions ▶ Ball material: Ti-6Al-4V Load: 1N Test time: 30 seconds

AC9100T series

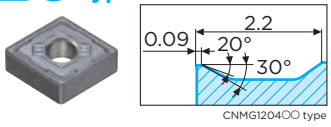
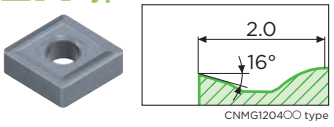


Conventional coating

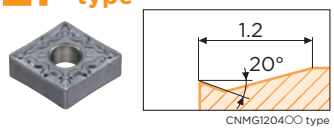
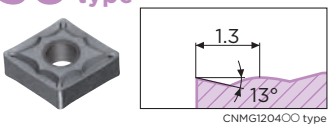
Application Examples for AC9115T and AC9125T (Negative Inserts)

1st Recommended Grade

General-purpose Turning AC9115T

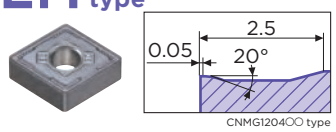
Balanced design for wear resistance and chip control	**EG type** (1st Recommendation) 	Low resistance/ notch chipping suppression
		EX type 

For finishing

Chip control emphasised	**EF type** 
Cutting force suppression	**SU type** 

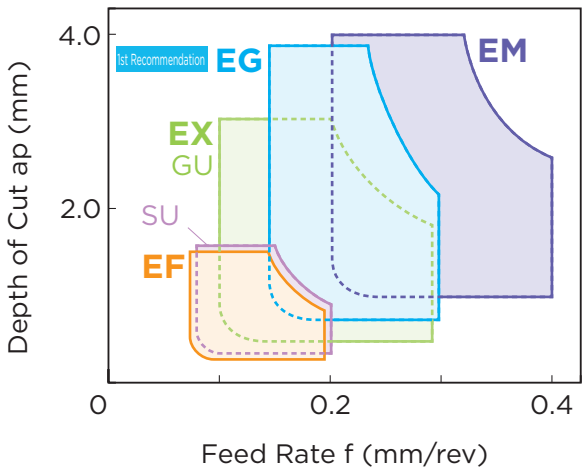
For interrupted turning

Interrupted Turning AC9125T

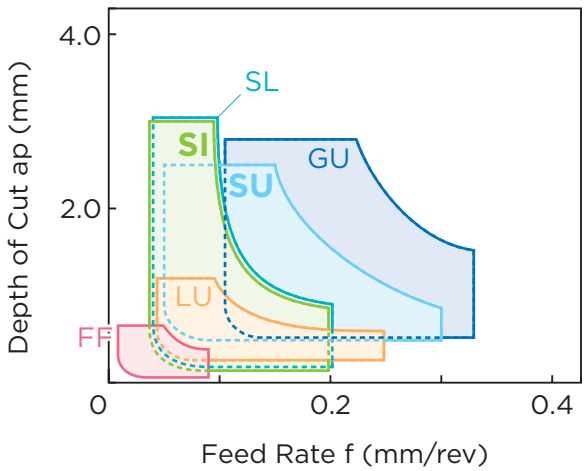
Early-stage fracture suppression	**EM type** 

Chipbreaker Application Range

Negative Inserts

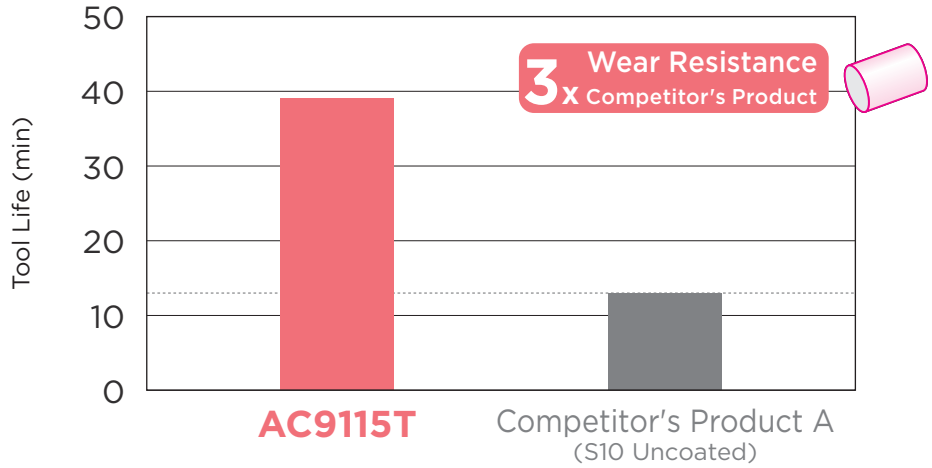


Positive Inserts



AC9115T/AC9125T

AC9115T Wear Resistance Comparison

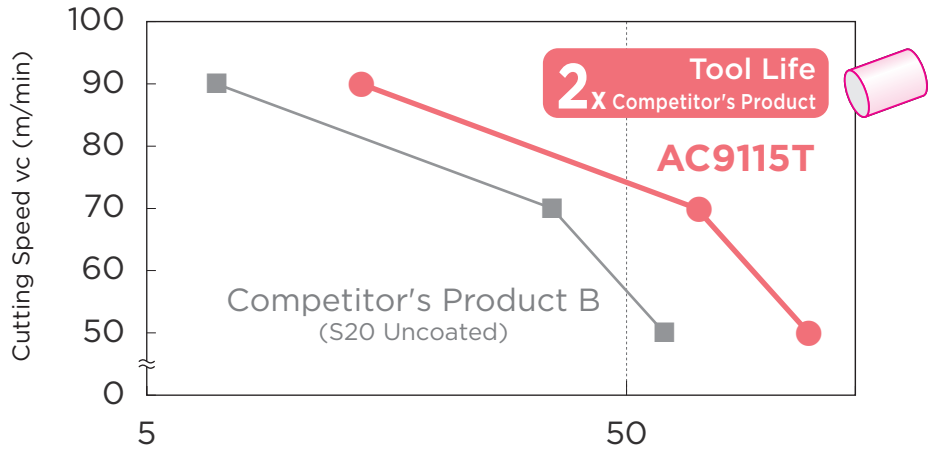


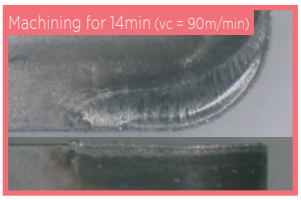
AC9115T

Competitor's Product A (S10 Uncoated)

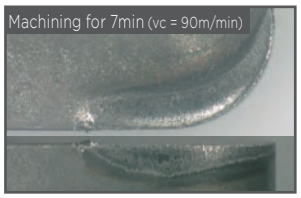
Work Material: Ti-6Al-4V Insert: CNMG120408 Cutting Conditions: vc = 70m/min f = 0.3mm/rev ap = 1.5mm Wet

AC9115T Tool Life Comparison (V-T Chart)





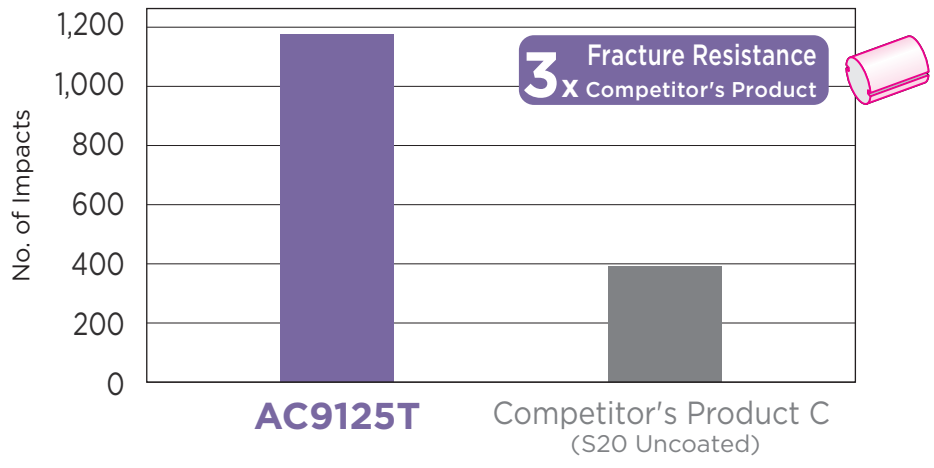
AC9115T



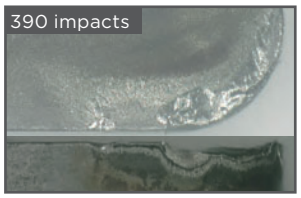
Competitor's Product B (S20 Uncoated)

Work Material: Ti-6Al-4V Insert: CNMG120408 Cutting Conditions: vc = 50, 70, 90m/min f = 0.2mm/rev ap = 1.5mm Wet (Internal Coolant Supply 7MPa)

AC9125T Fracture Resistance Comparison



AC9125T



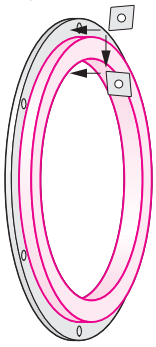
Competitor's Product C (S20 Uncoated)

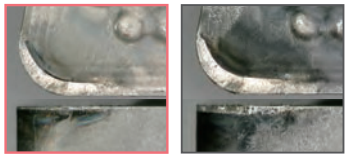
Work Material: Ti-6Al-4V 2 Grooves Insert: CNMG120408 Cutting Conditions: vc = 40m/min f = 0.3mm/rev ap = 1.5mm Wet

Application Examples of AC9115T / AC9125T

α+β type Alloy (Ti-6Al-4V) Aerospace Component AC9115T S

AC9115T reduces flank wear by 60%, with the same number of passes as conventional grades, and extends tool life



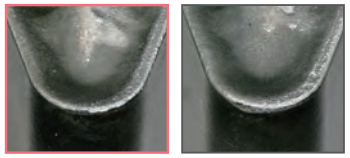


AC9115T+EG | Conventional Grade (S10 PVD)

Insert: CNMG120408N-EG (AC9115T)
Cutting Conditions: vc = 90m/min f = 0.2mm/rev ap = 1.5mm
Wet

β type Alloy Medical Component AC9115T S

AC9115T suppresses wear and adhesion to extend tool life by 2x or more

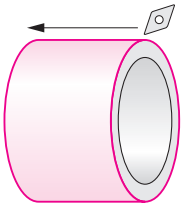


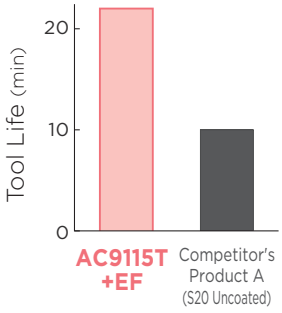
AC9115T+EF (6 pcs/C) | Conventional Grade (S10 Uncoated) (3 pcs/C)

Insert: VNMG160404N-EF (AC9115T)
Cutting Conditions: vc = 30m/min f = 0.1mm/rev ap = 1.5mm
Wet

α+β type Alloy (Ti-6Al-4V) Aerospace Component AC9115T S

AC9115T has good wear resistance with 2.2x longer tool life

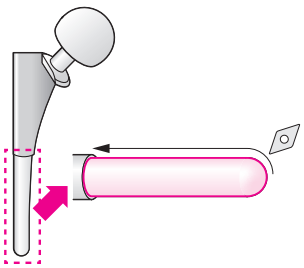


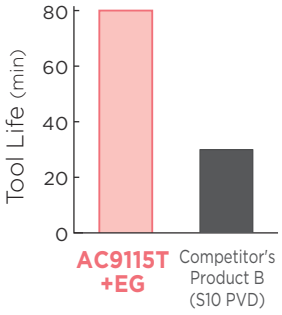


Insert: DNMG150408N-EF (AC9115T)
Cutting Conditions: vc = 120m/min f = 0.15mm/rev ap = 0.5mm
Wet (Internal Coolant Supply High-pressure Coolant)

α+β type Alloy (Ti-6Al-4V) Medical Component AC9115T S

AC9115T has good wear resistance with 2.7x longer tool life

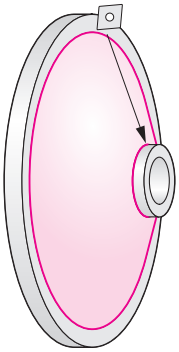


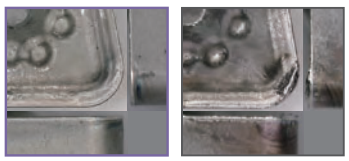


Insert: DNMG150608N-EG (AC9115T)
Cutting Conditions: vc = 50m/min f = 0.3mm/rev ap = 1.8mm
Wet

α+β type Alloy (Ti-6Al-4V) Aerospace Component AC9125T S

AC9125T suppresses wear and adhesion, with the same number of passes as conventional grades, and extends tool life



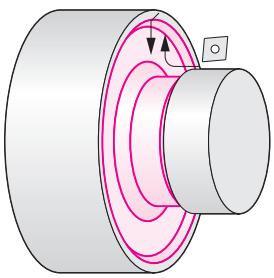


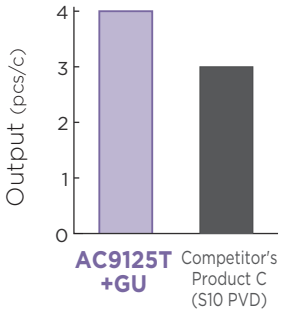
AC9125T+EG | Conventional Grade (S20 PVD)

Insert: CNMG120408N-EG (AC9125T)
Cutting Conditions: vc = 40m/min f = 0.12mm/rev ap = 2.0mm
Wet

α+β type Alloy (Ti-6Al-4V) Industrial Machinery Component AC9125T S

AC9125T has good wear and fracture resistance performance achieving 1.3x longer tool life





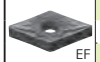
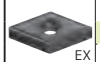
Insert: CNMG120408N-GU (AC9125T)
Cutting Conditions: vc = 50m/min f = 0.3mm/rev ap = 1.8mm
Wet

AC9115T/AC9125T

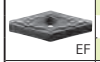
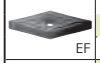
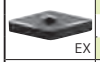
80° Diamond type Negative Inserts

Shape	Cat. No.	Stock AC9115T	Stock AC9125T	Dimensions (mm) Inscribed Circle	Thickness	Hole Dia.	Corner Radius
 SU	CNMG 120402N-SU	●	●	12.7	4.76	5.16	0.2
	120404N-SU	●	●				0.4
	120408N-SU	●	●				0.8
	120412N-SU	●	●				1.2
 EF	CNMG 120404N-EF	●		12.7	4.76	5.16	0.4
	120408N-EF	●					0.8
	120412N-EF	●					1.2
 EX	CNMG 120404N-EX	●	●	12.7	4.76	5.16	0.4
	120408N-EX	●	●				0.8
	120412N-EX	●	●				1.2
 GU	CNMG 120404N-GU	●	●	12.7	4.76	5.16	0.4
	120408N-GU	●	●				0.8
	120412N-GU	●	●				1.2
 EG	CNMG 120404N-EG	●	●	12.7	4.76	5.16	0.4
	120408N-EG	●	●				0.8
	120412N-EG	●	●				1.2
 EM	CNMG 120408N-EM	●	●	12.7	4.76	5.16	0.8
	120412N-EM	●	●				1.2

55° Diamond type Negative Inserts

Shape	Cat. No.	Stock AC9115T	Stock AC9125T	Dimensions (mm) Inscribed Circle	Thickness	Hole Dia.	Corner Radius
 SU	DNMG 150402N-SU	●	●	12.7	4.76	5.16	0.2
	150404N-SU	●	●				0.4
	150408N-SU	●	●				0.8
	150412N-SU	●	●				1.2
 EF	DNMG 150404N-EF	●		12.7	4.76	5.16	0.4
	150408N-EF	●					0.8
	DNMG 150608N-EF	●		12.7	6.35	5.16	0.8
 EF	DNGG 150404N-EF	●		12.7	4.76	5.16	0.4
	150408N-EF	●					0.8
 EX	DNMG 150404N-EX	●	●	12.7	4.76	5.16	0.4
	150408N-EX	●	●				0.8
 EG	DNMG 150404N-EG	●	●	12.7	4.76	5.16	0.4
	150408N-EG	●	●				0.8
	DNMG 150608N-EG	●	●	12.7	6.35	5.16	0.8
 EM	DNMG 150408N-EM	●	●	12.7	4.76	5.16	0.8
	150412N-EM	●	●				1.2
	DNMG 150608N-EM	●	●	12.7	6.35	5.16	0.8

35° Diamond type Negative Inserts

Shape	Cat. No.	Stock AC9115T	Stock AC9125T	Dimensions (mm) Inscribed Circle	Thickness	Hole Dia.	Corner Radius
 SU	VNMG 160404N-SU	●	●	9.525	4.76	3.81	0.4
	160408N-SU	●	●				0.8
 EF	VNMG 160404N-EF	●		9.525	4.76	3.81	0.4
	160408N-EF	●					0.8
 EF	VNGG 160402N-EF	●		9.525	4.76	3.81	0.2
	160404N-EF	●					0.4
 EX	VNMG 160404N-EX	●	●	9.525	4.76	3.81	0.4
	160408N-EX	●	●				0.8
 EG	VNMG 160404N-EG	●	●	9.525	4.76	3.81	0.4
	160408N-EG	●	●				0.8

Trigon type Negative Inserts

Shape	Cat. No.	Stock AC9115T	Stock AC9125T	Dimensions (mm) Inscribed Circle	Thickness	Hole Dia.	Corner Radius
 EF	WNMG 080408N-EF	●		12.7	4.76	5.16	0.8
 EX	WNMG 080408N-EX	●	●	12.7	4.76	5.16	0.8
 EG	WNMG 080408N-EG	●	●	12.7	4.76	5.16	0.8
 EM	WNMG 080408N-EM	●	●	12.7	4.76	5.16	0.8

● mark: Standard stocked item Blank: Made-to-order item

AC9115T/AC9125T

80° Diamond type Positive Inserts

Shape	Relief Angle	Cat. No.	Stock AC9115T	Stock AC9125T	Dimensions (mm) Inscribed Circle	Thickness	Hole Dia.	Corner Radius
 SU	7°	**CCMT 09T304N-SU**	●	●	9.525	3.97	4.4	0.4
		09T308N-SU	●	●				0.8
 SI	7°	**CCGT 09T301MN-SI**	●	●	9.525	3.97	4.4	<0.1
		09T302MN-SI	●	●				<0.2
		09T304MN-SI	●	●				<0.4

55° Diamond type Positive Inserts

Shape	Relief Angle	Cat. No.	Stock AC9115T	Stock AC9125T	Dimensions (mm) Inscribed Circle	Thickness	Hole Dia.	Corner Radius
 FF	7°	**DCGT 11T301MN-FF**	●	●	9.525	3.97	4.4	<0.1
		11T302MN-FF	●	●				<0.2
		11T304MN-FF	●	●				<0.4
 LU	7°	**DCMT 11T302N-LU**	●		9.525	3.97	4.4	0.2
		11T304N-LU	●					0.4
		11T308N-LU	●					0.8
 SU	7°	**DCMT 11T302N-SU**	●	●	9.525	3.97	4.4	0.2
		11T304N-SU	●	●				0.4
		11T308N-SU	●	●				0.8
 SI	7°	**DCGT 070201MN-SI**	●	●	6.35	2.38	2.8	<0.1
		070202MN-SI	●	●				<0.2
		070204MN-SI	●	●				<0.4
		DCGT 11T301MN-SI	●	●	9.525	3.97	4.4	<0.1
		11T302MN-SI	●	●				<0.2
		11T304MN-SI	●	●				<0.4
		11T308MN-SI	●	●				<0.8
 SL	7°	**DCGT 11T301MN-SL**	●	●	9.525	3.97	4.4	<0.1
		11T302MN-SL	●	●				<0.2
		11T304MN-SL	●	●				<0.4
 GU	7°	**DCMT 11T302N-GU**	●		9.525	3.97	4.4	0.2
		11T304N-GU	●					0.4
		11T308N-GU	●					0.8

35° Diamond type Positive Inserts

Shape	Relief Angle	Cat. No.	Stock AC9115T	Stock AC9125T	Dimensions (mm) Inscribed Circle	Thickness	Hole Dia.	Corner Radius
 SU	5°	**VBMT 160404N-SU**	●	●	9.525	4.76	4.4	0.4
		160408N-SU	●	●				0.8
 SI	5°	**VBGT 110301MN-SI**	●	●	6.35	3.18	2.8	<0.1
		110302MN-SI	●	●				<0.2
		110304MN-SI	●	●				<0.4
		VBGT 160402MN-SI	●	●	9.525	4.76	4.4	<0.2
		160404MN-SI	●	●				<0.4
		160408MN-SI	●	●				<0.8
 SU	7°	**VCMT 160404N-SU**	●	●	9.525	4.76	4.4	0.4
		160408N-SU	●	●				0.8
 SI	7°	**VCGT 110301MN-SI**	●	●	6.35	3.18	2.8	<0.1
		110302MN-SI	●	●				<0.2
		110304MN-SI	●	●				<0.4
		VCGT 160402MN-SI	●	●	9.525	4.76	4.4	<0.2
		160404MN-SI	●	●				<0.4
		160408MN-SI	●	●				<0.8

A "<" next to the corner radius indicates negative tolerance.
● mark: Standard stocked item Blank: Made-to-order item

AC9115T/AC9125T

Recommended Cutting Conditions

(Red text indicates 1st recommendation)

Work Material	Application	Chipbreaker	Grade	Cutting Conditions Min. - **Optimum** - Max.		
				Depth of Cut ap (mm)	Feed Rate f (mm/rev)	Cutting Speed vc (m/min)
Titanium Alloy (Pure Titanium (99.5%) α + β Alloy-based)	Finishing	**EF**	**AC9115T**	0.2 - **0.5** - 1.5	0.10 - **0.15** - 0.20	50 - **75** - 100
	Continuous	**EG**/EX	**AC9115T**	0.5 - **1.0** - 2.5	0.10 - **0.20** - 0.25	40 - **60** - 80
	Light Interruption	**EG**/EM	**AC9115T**	0.5 - **2.0** - 3.5	0.15 - **0.25** - 0.30	35 - **50** - 65
	Interrupted	**EM**/EG	**AC9125T**	1.0 - **2.0** - 3.5	0.20 - **0.25** - 0.30	20 - **40** - 60

Characteristic Values

Work Material	Grade	Hardness (HRA)	TRS (GPa)	Coating Type	Coating Thickness (μm)	Features
S Exotic Alloy	**AC9115T**	92.6	2.6	Absotech	1	• First recommended grade for titanium alloy turning • Utilising a specialised coating with reaction resistance in titanium alloy turning realises long tool life with significantly improved wear resistance
	AC9125T	91.7	3.0	Absotech	1	• Grade for interrupted turning of titanium alloy • Utilising a high-toughness substrate for improved stability in interrupted turning applications

< SAFETY NOTES >

- Very hot or lengthy chips may be discharged while the machine is in operation. Therefore, machine guards, safety goggles or other protective covers must be used. Fire safety precautions must also be considered.
- Please handle with care as this product has sharp edges.
- Improper cutting conditions or mis-handling of the tool may result in breakages or projectiles. Therefore, please use the tool within its recommended conditions.
- When using non-water soluble cutting oil, precautions against fire must be taken and please ensure that a fire extinguisher is placed near the machine.

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