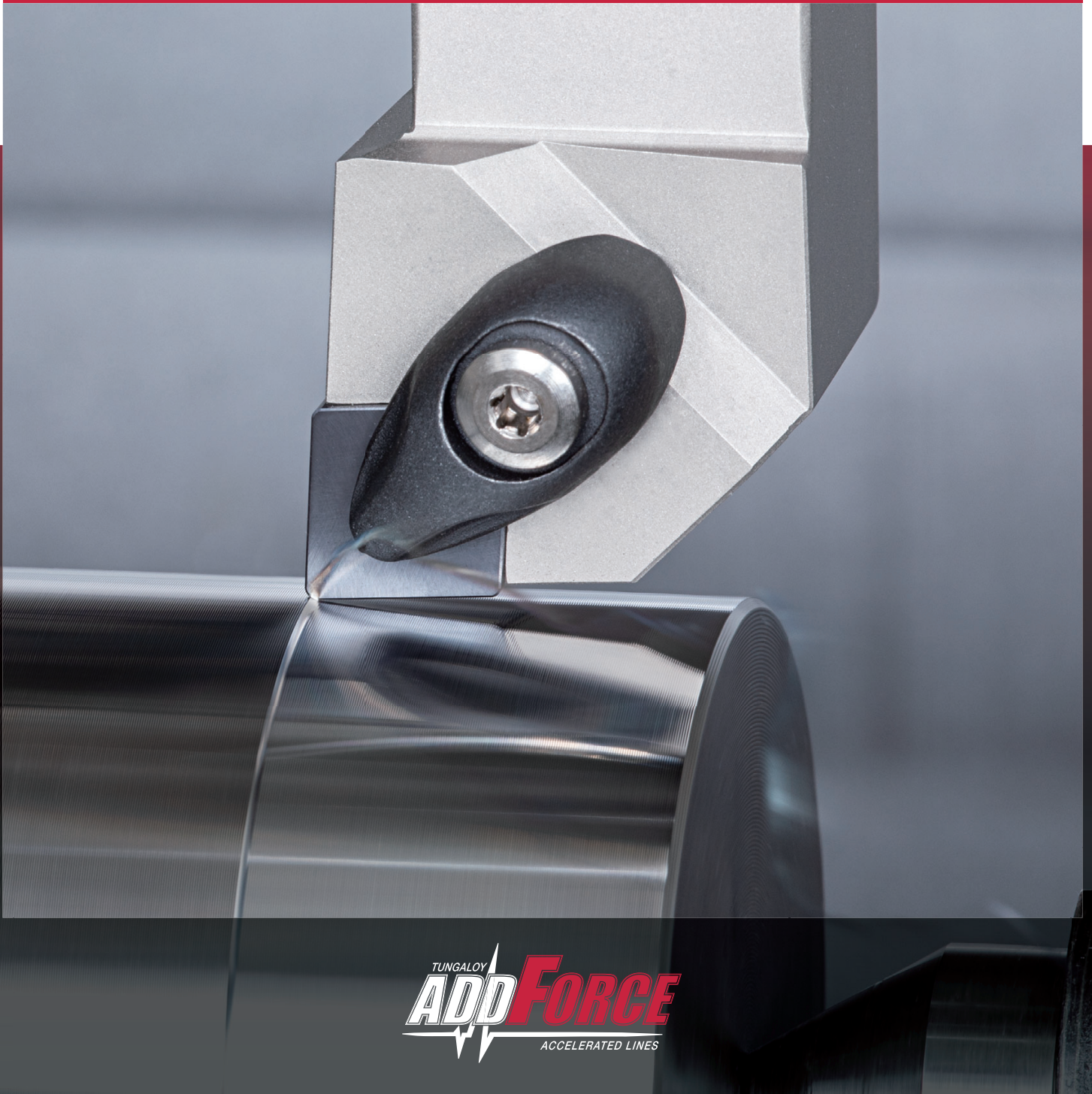


LX10

Tungaloy Report No. 542-G

Ceramic inserts for hardened steel machining

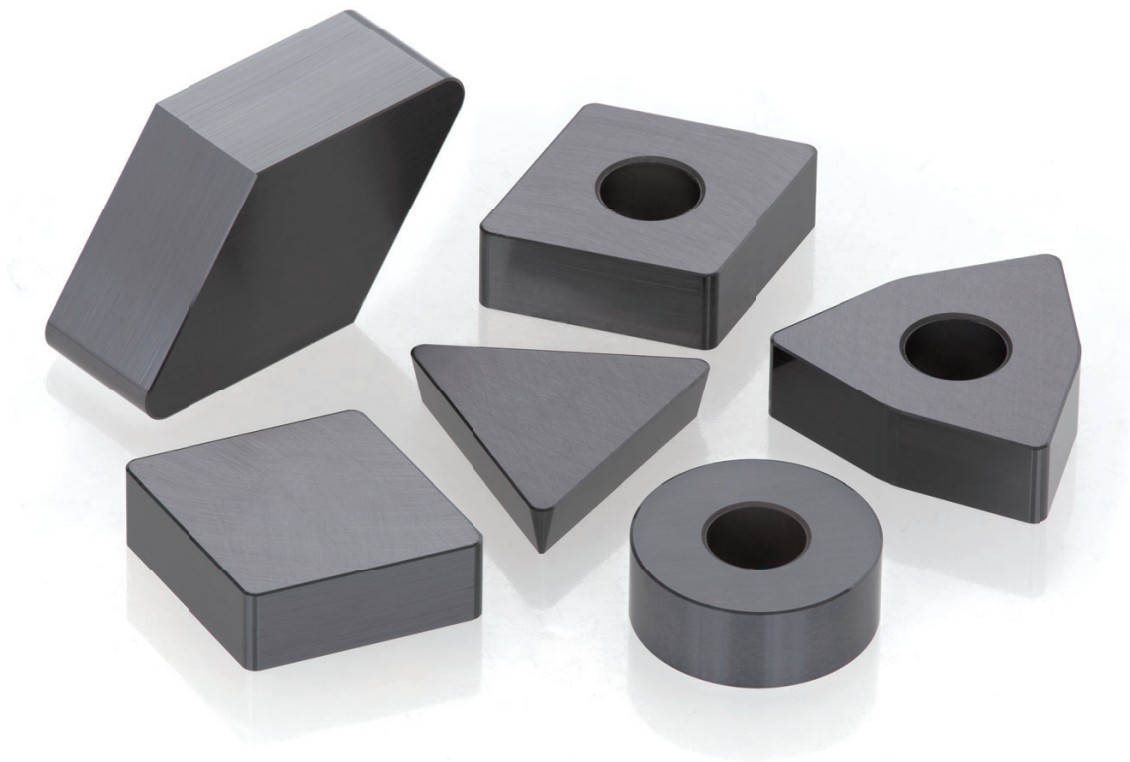




INDUSTRY 4.0
FEED the SPEED!



Leading ceramic grade - **LX10**



Expanded ceramic insert range for continuous cuts of hardened steel parts

Economical option for continuous machining of hardened steels

LX10

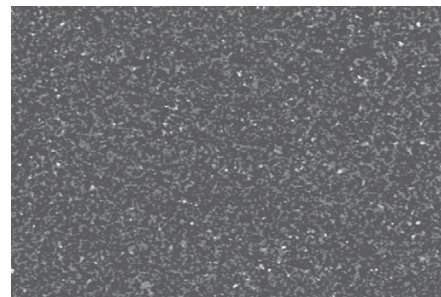
Consists of TiC mixed with aluminum oxide sintered to a highly dense, fine grain microstructure

High hardness and low coefficient of friction

→ **High wear resistance**

Fine microstructure

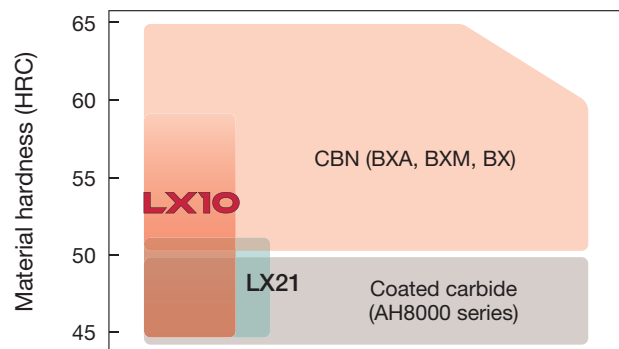
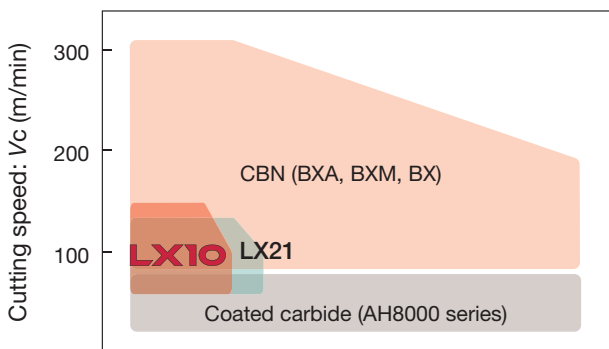
→ **Good machined surface roughness**



Microstructure image of LX10

Application range for hardened steel machining

- Suitable for medium speed continuous machining
- Surface quality < $R_z 6.3 \mu\text{m}$ at various depths of cut
- Higher wear resistance than CBN for part hardness less than 55 HRC



STANDARD CUTTING CONDITIONS

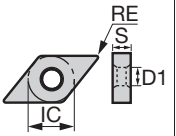
ISO	Grade	Workpiece materials	Cutting mode	Coolant	Cutting speed V_c (m/min)	Feed f (mm/rev)	Depth of cut a_p (mm)
H	LX10	Hardened steel	Continuous	Wet	50 - 150	0.05 - 0.2	0.05 - 2

Insert NEGATIVE TYPE

- : Continuous cutting
- ◐ : Light interrupted cutting
- ✱ : Heavy interrupted cutting

DN

Rhombic, 55° with hole

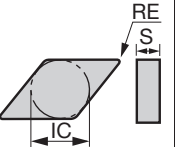


Application	Chipbreaker	Designation	Ceramic										Dimension (mm)										
			LX10	LX11	LX21											RE	IC	S	D1				
Finishing to medium cutting	-	DNGA150404	●	▲	●															0.4	12.7	4.76	5.16
		DNGA150408	●	▲	●															0.8	12.7	4.76	5.16
		DNGA150412	●	▲	●															1.2	12.7	4.76	5.16
		DNGA150604	●	▲																0.4	12.7	6.35	5.16
		DNGA150608	●	▲	●															0.8	12.7	6.35	5.16
		DNGA150612	●	▲																1.2	12.7	6.35	5.16
		DNGA150616	●	▲																1.6	12.7	6.35	5.16
		DNGA150620	●	▲																2	12.7	6.35	5.16

● : Line up
▲ : To be discontinued

DN

Rhombic, 55° without hole



Application	Chipbreaker	Designation	Ceramic										Dimension (mm)									
			LX10	LX11											RE	IC	S	D1				
Finishing to medium cutting	-	DNGN150408	●	▲															0.8	12.7	4.76	-
		DNGN150708	●	▲															0.8	12.7	7.94	-
		DNGN150712	●	▲															1.2	12.7	7.94	-
		DNGN150716	●	▲															1.6	12.7	7.94	-

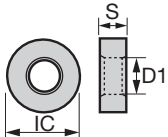
● : Line up
▲ : To be discontinued


Insert NEGATIVE TYPE

- : Continuous cutting
- ◐ : Light interrupted cutting
- ✱ : Heavy interrupted cutting

RN

Round, with hole

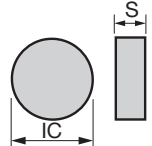



Application	Chipbreaker	Designation	Ceramic										Dimension (mm)						
			LX10	LX11											RE	IC	S	D1	
Finishing to medium cutting	-	RNGA120400	●	▲												-	12.7	4.76	5.16
																			

● : Line up
▲ : To be discontinued

RN

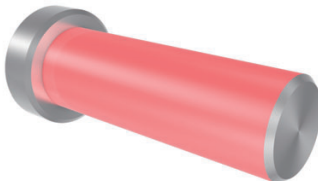
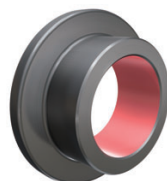
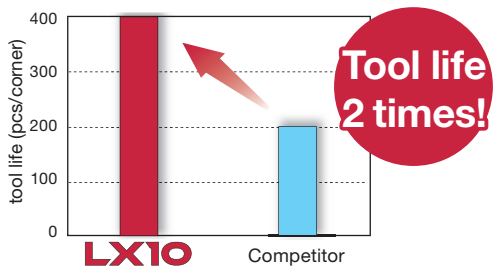
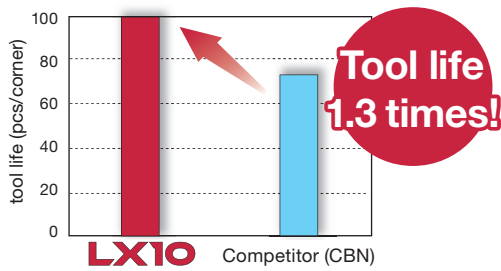
Round, without hole



Application	Chipbreaker	Designation	Ceramic										Dimension (mm)					
			LX10	LX11											RE	IC	S	D1
Finishing to medium cutting	-	RNGN120400	●	▲											-	12.7	4.76	-
		RNGN120700	●	▲											-	12.7	7.94	-
																		

● : Line up
▲ : To be discontinued

PRACTICAL EXAMPLES

Workpiece type		Guide pin	Housing
Insert		DNGA150408	TNGA160412
Grade		LX10	LX10
Toolholder		ADJNR2525M15	A32S-ATFNL16-D400
		D2 tool steel (60 HRC)	16MnCr5 (54 HRC)
Workpiece material		 H	 H
Cutting conditions	Cutting speed: V_c (m/min)	120	80
	Feed : f (mm/rev)	0.2	0.2
	Depth of cut : a_p (mm)	1	0.3
	Machining	External turning	Internal turning
	Coolant	Wet	Wet
Results		 <p>Tool life 2 times!</p> <p>With excellent fracture and wear resistance, LX10 provided double tool life at 1 mm d.o.c.</p>	 <p>Tool life 1.3 times!</p> <p>LX10 provides 1.3x longer tool life than CBN when machining hardened steel part of 54 HRC.</p>



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