

# TURNING HIGH TEMPERATURE ALLOYS



**LAMINA**  
TECHNOLOGIES

**MAGIA PRO**

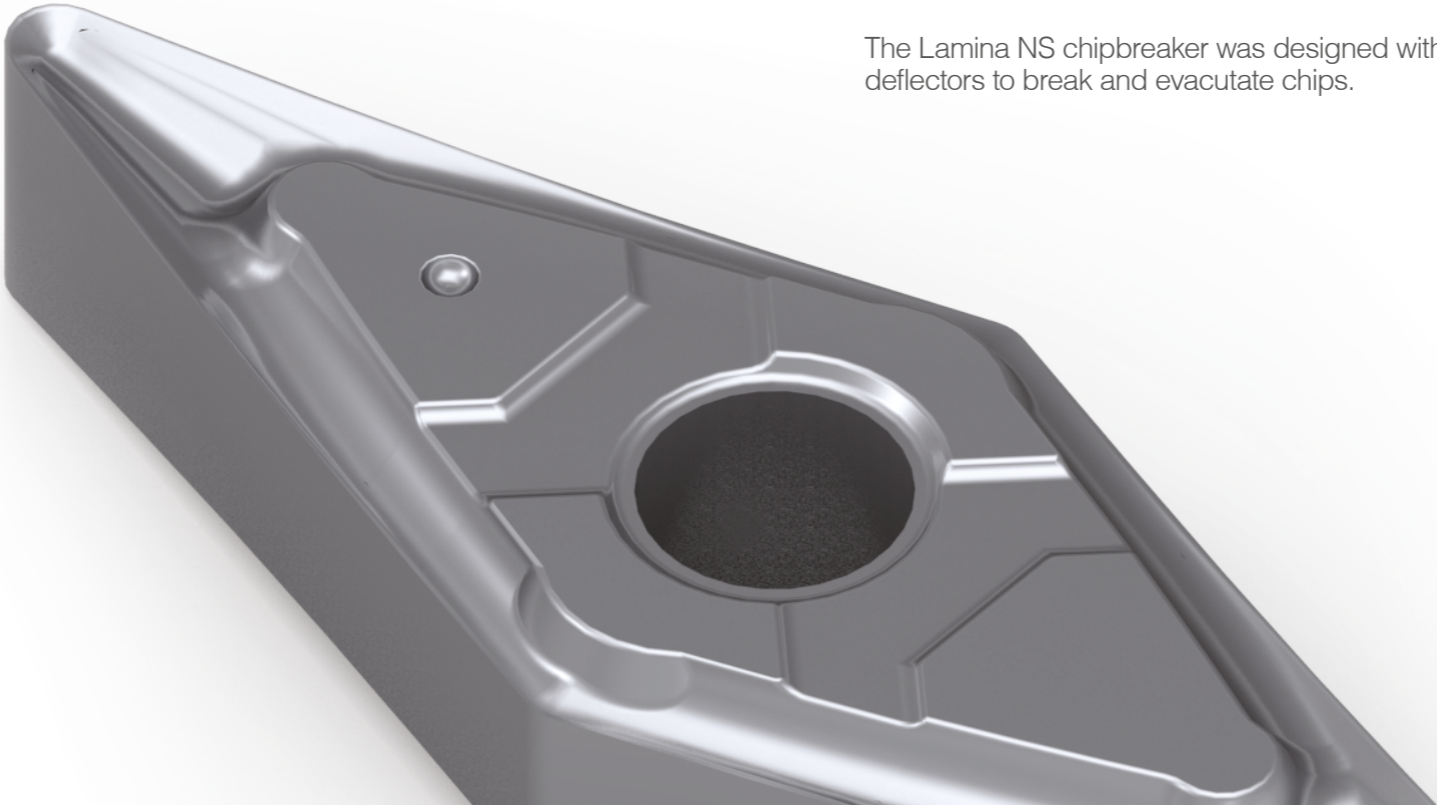
**LT 1110S**

# STRONG ENOUGH TO TACKLE HIGH TEMPERATURE ALLOYS

Lamina introduces our new advanced Magia Pro grade combining optimized positive turning geometries with a nano-structured PVD coating. Lamina's LT 1110S grade is strong enough to tackle even the most difficult of the high temperature alloys.

HIGH TEMPERATURE ALLOYS	TURNING CHALLENGES	LAMINA SOLUTION
Strength retained at high temperatures	Cutting forces remain high, susceptible to plastic deformation	Magia Pro LT 1110S  Lamina's solution to the challenges of turning high temperature alloys is our revolutionary new high wear resistant dedicated grade.  LT 1110S combines a sub-micron substrate and nano-structured PVD coating with positive geometries designed to reduce plastic deformation, notch and crater wear, the three most common challenges when machining high temperature alloys.
Poor thermal conductivity	Heat does not dissipate with the chips, instead it sinks into the cutting zone causing crater wear	
Surface tendency to work hardening (After each pass, the machined surface becomes harder due to high temperature)	Hardened workpiece surface makes notch wear the most common failure mechanism	

**MAGIA PRO**  
**LT 1110S**



# THE CHALLENGES OF TURNING HIGH TEMPERATURE ALLOYS

High temperature alloys display characteristics that make them essential in applications with extreme environments. Their excellent temperature and corrosion resistance are essential for application in the aerospace, marine, medical and power generation industries.

The properties that create these important features are also those that cause machinists trouble. These materials are notoriously difficult to machine and are tough on cutting tools.

The good news is that Lamina Technologies has developed tools with sharp cutting edges, high wear resistance and low friction coatings that work remarkably well in the S material group, particularly in titanium and INCONEL™.

## LAMINA MATERIAL GROUPS

Lamina divides high temperature alloys in two categories; group 9, including all nickel, iron and cobalt based alloys and group 10, consisting of titanium alloys.

### GROUP 9 - Ni, Fe, Co BASED ALLOYS

This group of alloys, including INCONEL™ have a tendency to work harden during the machining process causing notch wear. They are also prone to plastic deformation.

Lamina's nano-structure PVD coating with its low chemical affinity and low friction co-efficiency resists notch wear.

### GROUP 10 - TITANIUM

The propensity to work hardening exacerbates notch, a common fail mechanism when machining titanium.

The Lamina NS chipbreaker was designed with sharp edges and precisely positioned deflectors to break and evacuate chips.

# BREAKTHROUGH GRADE FOR HIGH TEMPERATURE ALLOYS

First choice, dedicated grade for high temperature alloys.

Thanks to its combination of sub-micron grain and unique nano-structured PVD coating, LT 1110S exhibits excellent wear and temperature resistance allowing machinists to overcome the challenges inherent in machining material group S.

Lamina's new grade takes the stress out of turning high temperature alloys. Demanding machinists trust Lamina when turning the superalloys.

# INNOVATION IN CHIPBREAKER DESIGN

## NS CHIPBREAKER

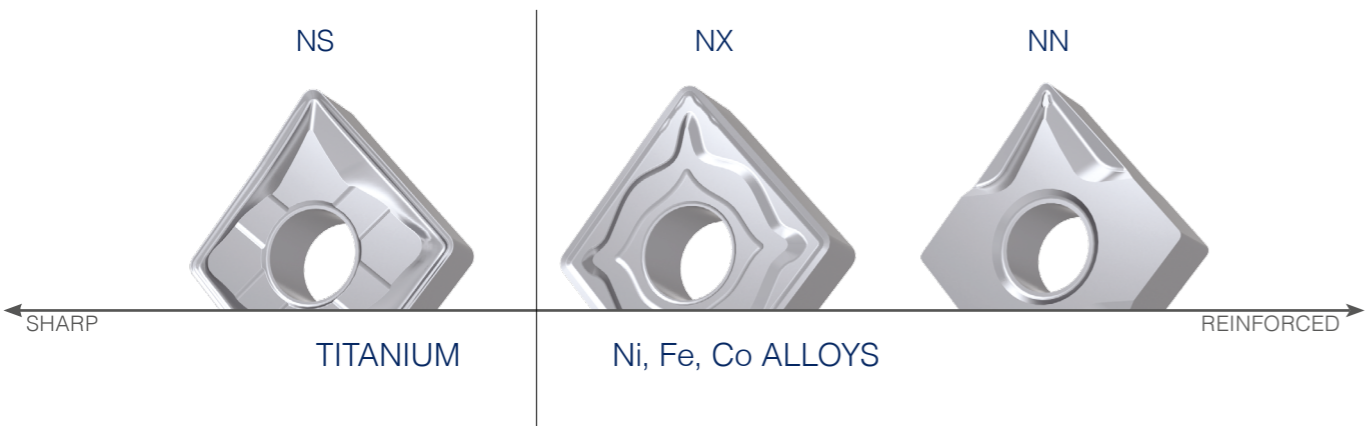
Lamina's new NS chipbreaker features

- Sharp edges to cut through even the most difficult titanium alloys
- Specially designed deflectors facilitate chip flow eliminating heat build up in the work zone
- Highly positive geometry for better finish

## NX CHIPBREAKER

Lamina's best selling, general purpose chipbreaker now available in Magia Pro LT 1110S grade

- Fully positive rake angle
- Precisely positioned deflectors
- Addition of bumps designed to avoid crater wear



**MAGIA PRO**  
**LT 1110S**

INITIAL PRODUCT RANGE

For cutting conditions and more information on our products, please visit us on our website.  
www.lamina-tech.ch/products

DESIGNATION	L	S	R	CATALOG #
NS				
CCGT 060204 NS LT 1110S	6	2.38	0.4	T0004671
CCGT 09T304 NS LT 1110S	9	3.97	0.4	T0004672
CNGG 09T304 NS LT 1110S	9	3.97	0.4	T0004581
CNGG 120404 NS LT 1110S	12	4.76	0.4	T0004579
CNGG 120408 NS LT 1110S	12	4.76	0.8	T0004580
DCGT 11T304 NS LT 1110S	11	3.97	0.4	T0004674
DNGG 110404 NS LT 1110S	11	4.76	0.4	T0004593
DNGG 110408 NS LT 1110S	11	4.76	0.8	T0004606
DNGG 150604 NS LT 1110S*	15	6.35	0.4	T0004561
DNGG 150608 NS LT 1110S*	15	6.35	0.8	T0004562
TNGG 160404 NS LT 1110S	16	4.76	0.4	T0004608
TNGG 160408 NS LT 1110S	16	4.76	0.8	T0004609
VNGG 160404 NS LT 1110S	16	4.76	0.4	T0004571
VNGG 160408 NS LT 1110S	16	4.76	0.8	T0004575
WNGG 060404 NS LT 1110S	6	4.76	0.4	T0004610
WNGG 060408 NS LT 1110S	6	4.76	0.8	T0004611
WNGG 080404 NS LT 1110S	8	4.76	0.4	T0004612
WNGG 080408 NS LT 1110S	8	4.76	0.8	T0004613
NX				
CNMG 120408 NX LT 1110S	12	4.76	0.8	T0004694
DNMG 150408 NX LT 1110S	15	4.76	0.8	T0004707
DNMG 150608 NX LT 1110S	15	6.35	0.8	T0004709
SNMG 120408 NX LT 1110S	12	4.76	0.8	T0004698
TNMG 160408 NX LT 1110S	16	4.76	0.8	T0004700
TNMG 220408 NX LT 1110S	22	4.76	0.8	T0004703
WNMG 060408 NX LT 1110S	6	4.76	0.8	T0004695
WNMG 080408 NX LT 1110S	8	4.76	0.8	T0004696
NN				
CNMG 120404 NN LT 1110S	12	4.76	0.4	T0004714
CNMG 120412 NN LT 1110S	12	4.76	1.2	T0004715
DNMG 150404 NN LT 1110S	15	4.76	0.4	T0004725
DNMG 150412 NN LT 1110S	15	4.76	1.2	T0004727
DNMG 150604 NN LT 1110S	15	6.35	0.4	T0004728
DNMG 150612 NN LT 1110S	15	6.35	1.2	T0004730
TNMG 160404 NN LT 1110S	16	4.76	0.4	T0004719
TNMG 160412 NN LT 1110S	16	4.76	1.2	T0004720
TNMG 220404 NN LT 1110S	22	4.76	0.4	T0004724
TNMG 220412 NN LT 1110S	6	4.76	1.2	T0004722
WNMG 060404 NN LT 1110S	6	4.76	0.4	T0004716
WNMG 080404 NN LT 1110S	8	4.76	0.4	T0004717
WNMG 080412 NN LT 1110S	8	4.76	1.2	T0004718

\*AVAILABLE Q4 2018

LAMINA GRADES

Lamina Technologies strives to provide our customers the best products for their machining challenges. We continue to combine the best substrates, coatings and geometries per application.

Following the enormous success of our Magia Pro milling grade, LT 3130, Lamina continues to add grades to our product line.

MAGIA PRO

- Dedicated grades and selected geometries chosen for their impressive capabilities and extended tool life
- Extensive R&D investment in the development of cutting tools for specific materials and applications
- Magia Pro is a family of our highest performance dedicated grades

MAGIA

- Multi-Mat™ grades capable of outperforming the best on the market on most materials
- Highest performance Multi-Mat™ grades for top level machining and greatest versatility
- For customers that need ultimate performance and flexibility particularly in stops with short production runs

ALPHA

- Lamina's original, pioneering universal grades
- Excellent performance at attractive price
- Best choice for machine shops with short product runs

TURNING		MILLING	
PREMIUM	<div>MAGIA PRO</div> <div>LT 1110S    LT 1120M</div> <div>S                M*</div> <div>MAGIA PRO</div> <div>LT 1000</div> <div>MULTI-MAT™</div>	<div>MAGIA PRO</div> <div>LT 3130</div> <div>P M</div> <div>MAGIA PRO</div> <div>LT 3000</div> <div>MULTI-MAT™</div>	
	<div>ALPHA</div> <div>LT 10</div> <div>MULTI-MAT™</div>	<div>ALPHA</div> <div>LT 30</div> <div>MULTI-MAT™</div>	



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