

RAPID PLASMA DEPOSITION (RPD®) IS ENGINEERING THE FUTURE AT THE SPEED OF INNOVATION

RPD® REDUCES MACHINING COST AND TIME

RPD® OFFERS AN EFFICIENT NEAR-NET SHAPE AND REDUCES RAW MATERIAL COST

RPD® OFFERS DESIGN FLEXIBILITY AND REDUCED LEAD TIMES

Our Markets

- Aerospace
- Defense
- Industrial
- Oil & Gas

RPD® Delivered

Norsk Titanium delivers RPD® OEM-qualified metal components at the speed customer programs demand. We have delivered more than 2,500 qualified titanium structural components to leading aerospace customers, with parts in active flight service since 2018.

Mission

Enable fast, clean, sustainable metals manufacturing.

Strategy

Provide an alternative to traditional manufacturing with a lower cost and shorter lead time.

Value

Cost savings from reduced raw material and machining input, and improved design flexibility through shorter lead times.



PERFORMANCE THAT MOVES MARKETS



NORSK TITANIUM



100+
Employees



700 Metric Tonne
Annual Capacity



35 Machines

High quality in a rapid production process.



Proven process across three facilities and two continents.

We bring deep expertise in materials science, non-destructive testing, and process control.

Testing and Specifications



We have established robust, metallurgy-based methods using state-of-the-art practices to ensure consistent quality and meet industry standards.

Metal Alloys



We have expertise in titanium wire and nickel alloys. RPD applies to any weldable material available in wire.

Process Characteristics

- **Gross Deposition Rate**
 - 6+ kg/hr
- **Gen 4 Machine Max Part Size**
 - 900 mm X 600 mm X 300 mm
- **Gen 4L Machine Max Part Size**
 - 1900 mm X 400 mm X 600 mm
- **Typical Material Yield Efficiency**
 - 2.5 to 1
- **Qualified Material**
 - Ti 6Al 4V
- **Development Materials**
 - Inconel 625, Inconel 718, Copper Nickel, CP Ti

Achievements

- EN9100/AS9100D Certification
- SAE AMS-7004
 - Material Specifications - Ti 6Al 4V
- SAE AMS-7005
 - Additive Production Process
- First MMPDS Volume II Values
 - Ti 6Al 4V
- Qualified to Commercial OEM Production Specifications
- Qualified to U.S. Department of Defense Prime Contractor Production Specifications
- Structural parts in service on Commercial and Department of Defense platforms



INCONEL DEVELOPMENT

RPD® Inconel Properties

Material Properties, Typical Value	RPD® + Aging		RPD® + Solution Heat Treatment + Aging		As-Deposited (Deposition rate: 6.8 kg/h)	
	X/Y Directions	Z Direction	X/Y Directions	Z Direction	X/Y Directions	Z Direction
Yield Strength (MPa)	551	514	317	324	414	379
Ultimate Tensile Strength (MPa)	763	721	703	717	593	600
Elongation (%)	34	66	59	58	52	67
Hardness [Hv5]	264		183		218	

For Reference

	Casting (ASTM A494)	MIL-C-24615 Grade B	Forging (ASTM B564-22) all sizes, solution annealed	Forging (ASTM B564-22) *[4-10] inches, annealed
Yield Strength (MPa)	275✓	275✓	276✓	345✓
Ultimate Tensile Strength (MPa)	485✓	483✓	690✓	758✓
Elongation (%)	25✓	30✓	30✓	25✓

*condition "RPD + aging" meets criteria in the X and Y directions

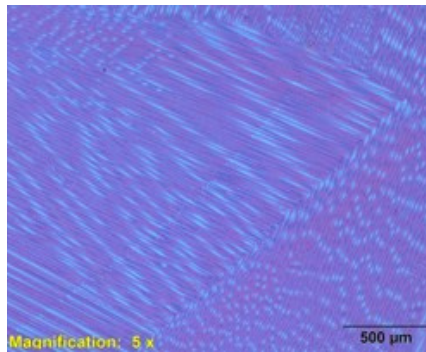
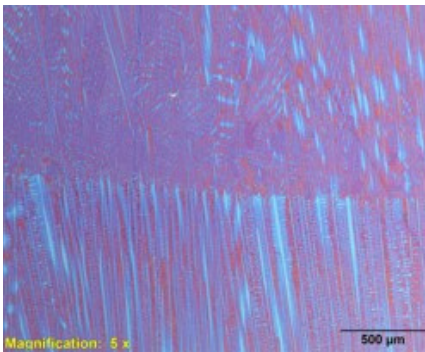


BENEATH THE SURFACE

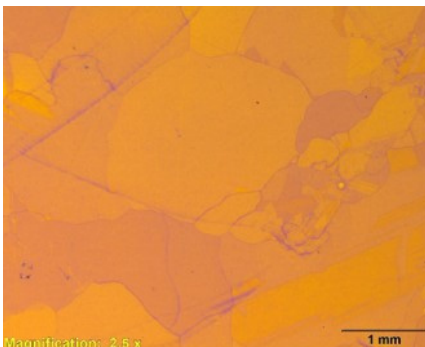


RPD® Inconel Microstructures

RPD® + Aging



RPD® + Solution Heat Treatment + Aging



Advantages of Each Condition

RPD® + Aging

- Promotes precipitation of nano precipitates (γ' / γ'')
- Strength and hardness increased from as-deposited condition
- Properties meet the "reference standards"
- Large grains

RPD® + Solution Heat Treatment + Aging

- Reduces anisotropy in the material
- Precipitates form uniformly
- Promotes stress-relief



SMARTER PRODUCTION ENGINEERED FOR ADVANTAGE

THE FUTURE OF ADDITIVE MANUFACTURING IS NOW

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