ODIN44: 440C | 1.4125 | X105CrMoV17 | S44004

ODIN44 is available as an ingot that can be further processed into bars, sheets, or directly machined.

Due to the patent-pending spray forming process, the resulting **ODIN44** ingot and **THOR44** powder share the same chemical composition, making it ideal for hybrid additive manufacturing (e.g., via Laser Powder Bed Fusion or Direct Energy Deposition).

ODIN44 build plates for Laser Powder Bed Fusion made from the ingot are readily available and reduce the risk of potential delamination of parts from the build plate.

ODIN44 is a high-carbon martensitic stainless steel and can be tailored by dedicated heat treatments to adapt final properties such as hardness and wear resistance to your application. Typical applications include:

- Rolling, ball, and roller bearings
- Valve parts
- Gears
- Dies and injection molds
- …

Due to its stainless properties, further excellent applications include:

- Food processing tools
- Knife blades
- Surgical instruments
- …

CHEMICAL COMPOSITION	
ELEMENT	***MASS FRACTION (W.-%)***
Fe	Balance
C	0.95 – 1.20
Cr	16.00 – 18.00
Mo	< 0.75
Si	< 1.00
Mn	< 1.00
P	< 0.04
O	< 0.05
S	< 0.03

PHYSICAL PROPERTIES	
Density	7.80 g/cm^3
Melting range ($T_{solidus}$ – $T_{liquidus}$)	1285 – 1419 °C
Thermal conductivity	24.2 W/mK at 0 – 100°C
Thermal expansion	10.1 µm/m °C at 0 – 100°C

MECHANICAL PROPERTIES OF SPRAY-FORMED INGOTS	
PROPERTIES	***HEAT-TREATED***
Rockwell hardness, ISO6508-1	Up to 61 HRC
Vickers hardness, ISO6507-1	$HV_{0.1} \leq 750$
Carbide size	2 – 5 µm
Tensile strength	1790 – 2030 MPa
Elongation	3 – 4 %

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HEAT TREATMENT

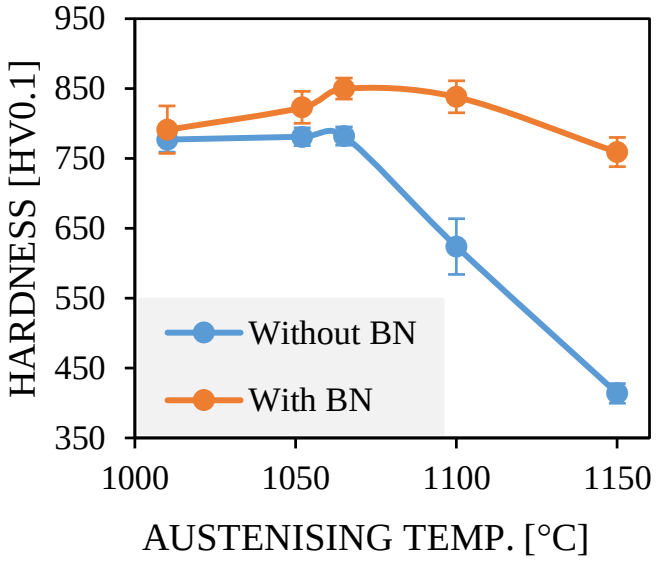

Figure 1: Austenization chart for ODIN44 ingot. BN: Boiling nitrogen as a cryogenic treatment.

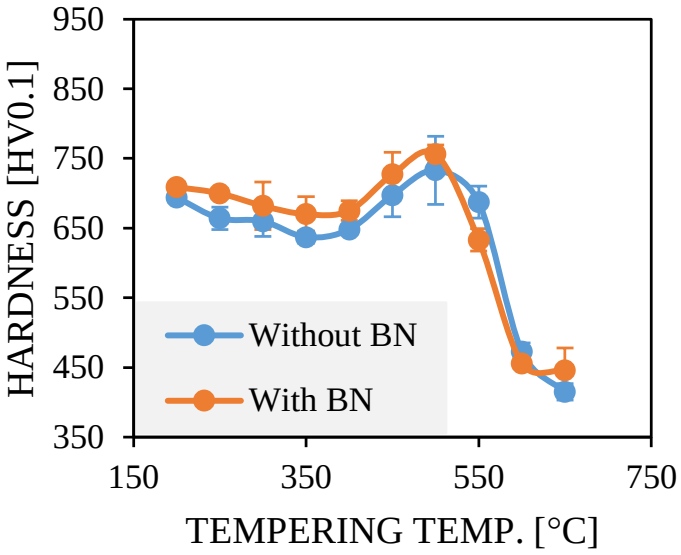

Figure 2: Tempering hardness of ODIN44 ingot. BN: Boiling nitrogen as a cryogenic treatment.