

Bainidur® 1300

Bainitic steel for serial production

GENERAL INFORMATION

Bainidur® 1300 is designed especially for robust processes with low dependence of mechanical properties on size and a low risk of cracks or distortion during cooling. Usually the hardness values are between 36 and 40 HRC.

Bainidur® 1300 is the ideal solution for a lot of forging applications regarding economic, mechanical properties and process stability. The newly developed Bainidur® 1300 is characterized by the following properties:

- Good processability with LPBF.
- High strength and toughness.
- Excellent case hardening and carbonitriding properties.

STANDARDS AND DESIGNATIONS

SEL 1.7979 (18MnCrMoV6-4-8)
SEW 605

PHYSICAL PROPERTIES¹

Density	~ 7.79 g/cm ³
Young's modulus	~ 205 GPa
Specific heat capacity	460 J/kg K
Thermal conductivity	44.5 W/m K
Temperature conductivity	0.125 cm ² /s

* at ambient temperature

CHEMICAL COMPOSITION [WEIGHT-%]

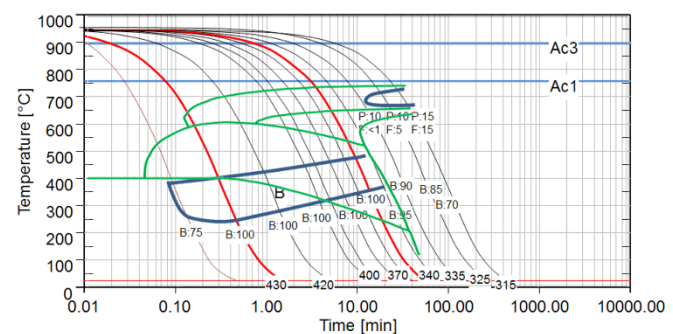
	C	Si	Mn	Mo	Cr	V	Other
min.	0.12	0.50	1.20	0.5	0.80	0.05	
max.	0.25	1.30	1.50	1.1	1.50	0.15	
typical	0.17	0.51	1.35	0.7	1.00	0.12	+

Customer specific adjustments or limitations of the chemical composition are possible after consultation with Deutsche Edelstahlwerke.

TEMPERATURES OF PHASE TRANSFORMATIONS

Austenite formation at heating (3 °C/min)	A _{e1} : 760 °C A _{e3} : 895 °C
Bainite start temperature	B _s : 500 °C

CONTINUOUS-TIME-TRANSFORMATION DIAGRAM



The green lines are indicating the transformation of grade 16MnCr5 for comparison.

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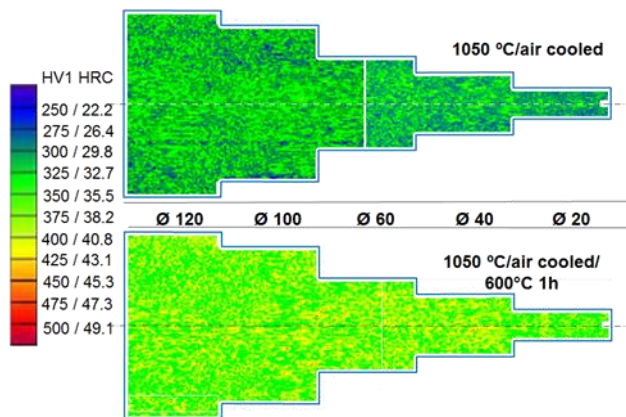
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WELDING

Due to the low carbon content Bainidur® 1300 has a superior weldability. The formation latent heat during the bainitic transformation reduces thermal stresses and therefor the risk of cracking.

UNIFORMITY OF MECHANICAL PROPERTIES FOR DIFFERENT SIZES

The mechanical properties show a very low dependency on the size of the component or the location in the component. This is demonstrated by cooling a step-down-specimen by air cooling. The final hardness can be increased by a simple precipitation hardening at 600 °C.



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ADDITIVE MANUFACTURING²

For Additive Manufacturing we specially designed the modified AM-version of Bainidur® 1300. Bainidur® AM can be processed on LPBF systems. Please contact us for further information.

² Process parameters for LPBF systems have been developed for our alloys and can be supplied on request. Depending on the system, it may be necessary to deviate from these recommendations. We would be pleased to support you in the implementation.

POWDER PROPERTIES

The powder is produced by gas atomization. This manufacturing process ensures spherical powder particles in combination with excellent flow characteristics.

Our production is certified according to DIN EN ISO 9001 (quality management systems) and IATF 16949 (quality management automotive). Thus, we can guarantee a constant high quality of our metal powder.

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