

UR™ 32615

UR™ 32615: A material dedicated to highly concentrated sulfuric and nitric acids

Addition of silicon to austenitic stainless steels has a beneficial influence on its resistance to intergranular corrosion. With 5 w% silicon, **UR™ 32615** has proven to be corrosion-resistant in strongly oxidizing acid environments, particularly in sulfuric and nitric acids. It has been used successfully for sulfuric service for more than 40 years.

PROPERTIES

STANDARDS

> ASTM: UNS S32615 A240

Approved by the ASME Boiler and Pressure Vessel Code, Section VIII

CHEMICAL ANALYSIS - WEIGHT %

Typical values

C	Cr	Ni	Mo	N	Si
≤ .015	17	19.5	0.4	-	5

PREN [Cr%] + 3.3 [Mo%] + 16 [N%] ≥ 17

MECHANICAL PROPERTIES

Properties at room temperature in the transverse direction

	UTS MPa (ksi)	YS MPa (ksi)	Elongation %
Typical value	605 (88)	275 (40)	25
Minimal values	550 (80)	220 (32)	25

At elevated temperature:

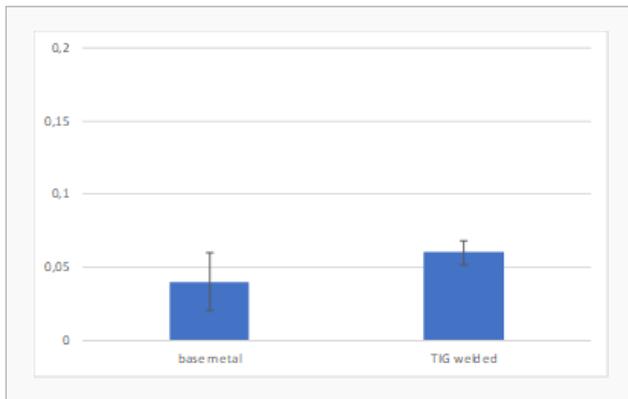
	UTS MPa (ksi)	YS MPa (ksi)
200°C (392F)	555 (80)	215 (31)
250°C (492F)	550 (80)	209 (30)

IN SERVICE CONDITIONS

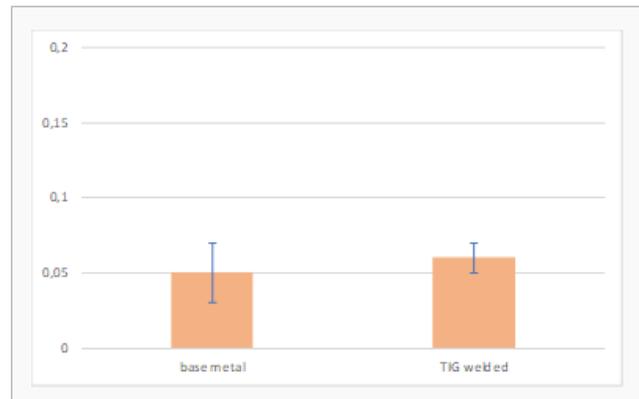
CORROSION

UR™ 32615 is particularly recommended for highly concentrated sulfuric or nitric service. Very low corrosion rates are measured on UR™32615 base material and GTAW (TIG) welded samples in these two media. The corrosion rates are far below the commonly used 0.1 mm/yr threshold. Please consult for results with impurities (chlorides, fluorides, ...).

UR™ 32615 is not recommended for weak acids or oleum.



Results in boiling sulfuric acid
(98% sulfuric acid at 110°C, aerated and stirred)



Results in fuming nitric acid
(100% fuming nitric acid, aerated and stirred)

PLATE PROCESSING

HOT FORMING

The forming temperature of UR™ 32615 shall be in the range from 1150 to 900°C (2100 - 1650°F).

COLD FORMING

Cold forming of UR™ 32615 can be performed by conventional methods: bending, profiling, stamping.

HEAT TREATMENT

The only heat treatment allowed for UR™ 32615 is solution annealing at 1100 - 1150°C (2010 - 2100°F) followed by water cooling.

CUTTING

All classical mechanical or thermal processes for stainless steels can be used to cut UR™ 32615.

WELDING

The recommended welding process for UR™ 32615 is GTAW (TIG) with a low heat input equal or lower than 1.0 kJ/mm. The welding speed must be limited to 15 cm/mn for GTAW. The interpass temperature shall be kept below 100°C (212°F). Preheating or post heating treatments are not necessary.

UR™ 32615 can be welded with matching filler materials.

PICKLING AND PASSIVATION

Pickling can be performed in a bath containing 15 % vol. nitric acid + 3 % vol. hydrochloric acid for a few hours at 20°C or 30 minutes at 60°C, followed by careful rinsing in water. Passivation can be conducted in 25% vol. nitric acid at 20°C for 30 minutes, followed by water rinsing.

Our research center can provide technical assistance for welding and forming of UR™ 32615.



Micrographic view of a UR™ 32615 welded sample

APPLICATIONS

- > Various equipment in the sulfuric industry:
absorption towers, drying towers, stripping towers,
pumps, piping systems, coolers, heat exchangers
- > Hydrometallurgy
- > Concentrated nitric service



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Technical data and information are to the best of our knowledge at the time of printing. However, they may be subject to some slight variations due to our ongoing research programme on steels. Therefore, we suggest that information be verified at time of enquiry or order. Furthermore, in service, real conditions are specific for each application. The data presented here are only for the purpose of description, and considered as guarantees when written formal approval has been delivered by our company. Further information may be obtained from the address opposite.