Industeel

ArcelorMittal

UR™ 64

UR™ 64: A non magnetic high strength stainless steel

UR™ 64 is a non magnetic stainless steel combining:

> **excellent pitting corrosion resistance in marine environments**

> **high strength**

> **excellent ductility**

PROPERTIES

STANDARDS

> EURONORM: EN 1.3964 X2 CrNiMnMoNNb 21-16-5-3 according to SEW 390/W1.3964

CHEMICAL ANALYSIS - WEIGHT %

Typical values

C	S	P	Si	Mn	Cr	Mo	Ni	N	Nb
<.030	<.005	<.025	<1.0	4.0 - 6.0	20 - 21.5	3.0 - 3.5	15 - 17	.20 - .35	<.25

PHYSICAL PROPERTIES

Temperature interval (°C)	Thermal expansion (α x10^{-6} K^{-1})	Thermal conductivity (W.m^{-1}.K^{-1})	Relative permeability	Young modulus E (GPa)
-196 - +20	12.0	13.9	≤ 1.01	195
20 - +100	15.7			
20 - +200	17.0			

MECHANICAL PROPERTIES

Temperature	$R_{p0.2}$	R_m	A %	KCV T (1)
°C	(YS 0.2 MPa)	(UTS MPa)	(Elongation %)	J/cm²
20	> 430	700 - 950	> 35	> 70

(1) th = 8 - 12 mm KCV > 55J/cm²

Low temperature properties

Temperature	$R_{p0.2}$	R_m	A %	Young Modulus
°C	(YS 0.2 MPa)	(UTS MPa)	(Elongation %)	GPa
-269 °C	1340	1750	20	213
-196°C	900	1400	25	-
-78°C	900	550	30	195

Fatigue strength

> **in air :** 250 - 300 N/mm²

> **sea water (base metal) :** 200-250 N/mm²

> **sea water (welds) :** 150 - 200 N/mm²

IN SERVICE CONDITIONS

CORROSION RESISTANCE

Thanks to its high content in Cr, Mo, N, UR™ 64 has good resistance to :

> **intergranular corrosion in the delivery and as weld condition**

> **pitting corrosion in chloride containing media**

> **crevice corrosion**
Consult in case of doubt.

DELIVERY CONDITIONS

SIZES

Thickness	Width	Length	Weight
≤ 100 mm	up to 3200 mm	up to 12000 mm	up to 6 T

Consult for dimensions as all values are not compatible.

PLATE PROCESSING

HEAT TREATMENT

Heating between 1020°C and 1100°C followed by rapid quenching in water. Air cooling can be applied to the thinner products.

CUTTING

By plasma, or other techniques applicable to stainless steels.

WELDING

UR™ 64 is welded without preheating nor postheating.
As for all fully austenitic steels, precautions should be taken to limit the risks of hot cracking: controlled heat input and travel speed, filler diameter...

Welding fillers

> **Electrodes :**
- **Thermanit 20/16 SM**
- **Fox AM 400**

> **MIG wire :**
- **Thermanit 20/16 SM**
- **Fox AM 400 IG**

> **Submerged Arc :**
- **Novonit 3954 + OP76S**
- **Fox AM 500 UP + OP76S**

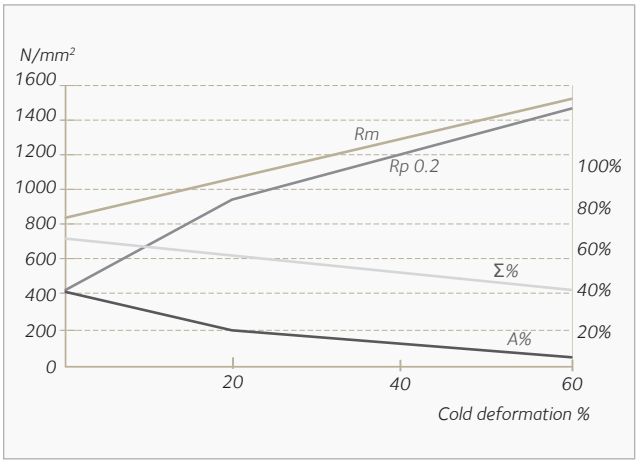
Consult producers for details.

FORMING

UR™ 64 can be cold or hot formed using the usual precautions for stainless steels.
The relative permeability of UR™ 64 remains low after cold deformations up to 80%.
In the case of hot forming, care must be taken to maintain the mechanical properties : heating before forming and final heat treatment conditions must be studied.

Surface finishing

UR™ 64 should be cleaned and descaled after welding. Nitric/hydrofluoric acid mixtures (15% HNO_3, 1% HF) can be used between 20°C and 55°C. Rinse after pickling.



APPLICATIONS

Non magnetic steels

Industeel currently delivers non magnetic stainless steels for nuclear physics and military applications. Consult to determine the best available grades.

Submarine hulls

Industeel has qualified to deliver hull plates and other components according to the requirements of BWB/GL. UR™ 64 can also be used in mine sweeper construction. Industeel delivers a full range of high strength steels for submarine hulls.

Low temperatures

UR™ 64 is also used for the liquid oxygen and hydrogen tanks.

YOUR CONTACTS

Nathalie Mottu - Bellier
Tel. +33 3 85 80 53 02
nathalie.mottubellier@arcelormittal.com

http://industeel.arcelormittal.com

Industeel France
Le Creusot Plant
56 rue Clemenceau
F - 71202 Le Creusot Cedex