

# UNS S31254

Special Metallic  
Tube Bundle Materials  
UNS S31254

KME Special Products GmbH & Co. KG  
**SPECIAL DIVISION**  
[EN]



# Special Metallic Tube Bundle Materials



## UNS S31254

*KME is the only manufacturer worldwide capable of supplying Coiled Tubing bundles made of UNS S31254 according to NORSOK M-650*

### Applications

As hydraulic and instrumentation tubing in the

- Oil and Gas Industry
- Marine Industry and Shipbuilding
  - Hull side
  - Top side
- Chemical Process Industry

### Product Forms

UNS S31254 tubes are only available with outer sheath as

- OSNALINE® Tube Bundles  
Tube Bundles are pre-fabricated tube-runs:
  - up to 19 stranded components
- OSNALINE® Heat Traced Tube Bundles  
Self-regulating heater lines for frostprotection
  - with electric tracer

### Corrosion Resistance

Chloride-rich seawater is a particularly harsh environment that can attack stainless steel by causing localised corrosion. Type 316 grades are used widely in marine applications, but their corrosion resistance in contact with seawater is limited and they cannot be considered 'corrosion proof' under all situations.

Crevice and the closely related pitting corrosion mechanisms are the predominant forms of attack that are normally responsible for the failure of the 316 types in seawater service, limiting the scope for their use. In the case of tube bundles, if the outer sheath becomes damaged, standard stainless steel tubes have proved unsuccessful.

The figure shows a graph giving the temperature at which pitting and crevice corrosion is likely to occur.

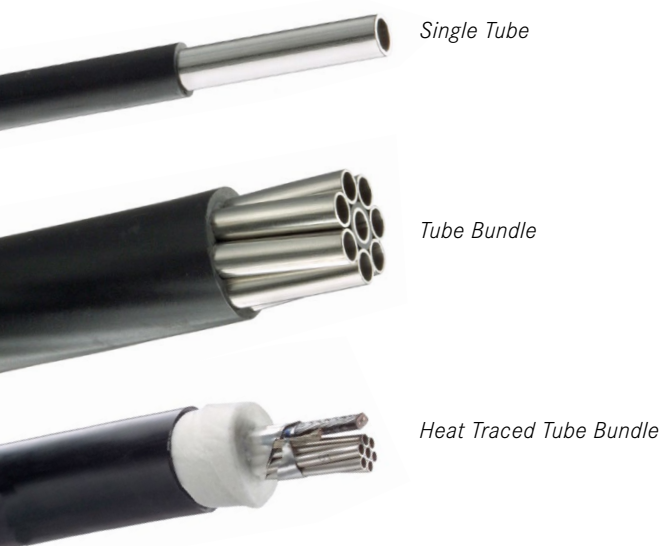
UNS S31254 is a high-alloy stainless steel (superaustenite with 6% Mo) that has been designed to cope with this environment.

The steel is characterized by the following properties:

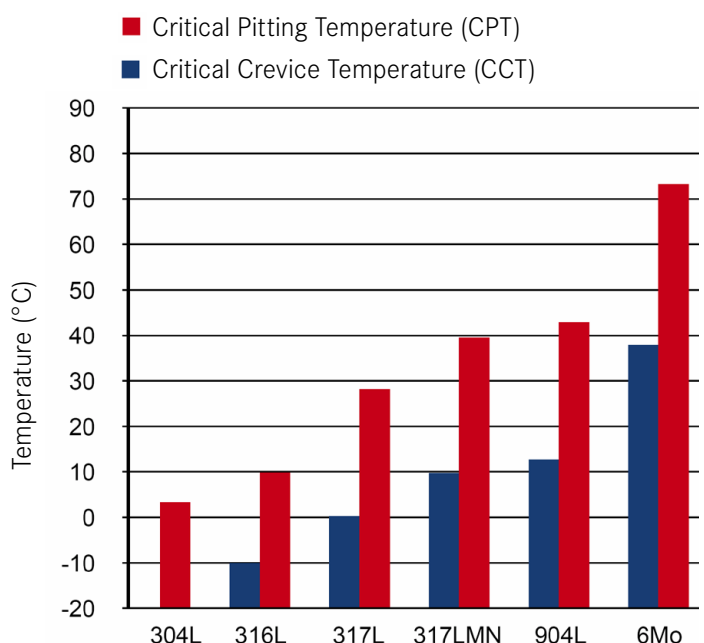
- Excellent resistance to pitting and crevice corrosion
- High resistance to general corrosion
- High resistance to stress corrosion cracking (SCC)
- Higher strength than conventional austenitic steels
- Good weldability

### Figure:

Critical pitting and crevice temperatures for different alloys, rated by ASTM G48 tests



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Chemical Composition (Nominal) %									
C	Si	Mn	P	S	Cr	Ni	Mo	N	Cu
≤ 0.020	≤ 0.80	≤ 1.00	≤ 0.030	≤ 0.010	20	18	6.0-6.5	0.20	0.7

EN name X1CrNiMoCuN20-18-7

Tube Material				
Letter symbol	Material number	Standard	Properties and delivery conditions	Dimensions and tolerances
UNS S31254	EN 1.4547	ASTM A269* UNS S31254	Seamless drawn (CFA) Tube hardness max. HRB 90 (180HV5)	DIN EN ISO 1127 Tolerance class D3, T4

\* Heat treatment in acc. to Norsok standard M-630  
Tests in acc. to ASTM A269  
Inspection certificate in acc. to EN 10204 3.1

Seamless tubes in coils  
Orbital weld with high-quality welded seam only on request

Dimensions and Working Pressure [bar]			
1.4547/UNS S31254			
Design pressure [bar]			
Temperature [°C]			
Dimensions	20	50	100
3/8" x 0.035"	348	272	234
3/8" x 0.049"	443	394	339
3/8" x 0.065"	616	548	472
1/2" x 0,049"	321	286	246
1/2" x 0,065"	441	393	338
10 x 1,0 mm	330	293	253
10 x 1,5 mm	520	463	399
12 x 1,0 mm	270	241	207
12 x 1,5 mm	423	376	324
12 x 2,0 mm	588	524	451
20 x 2,0 mm	330	293	253
25 x 2,5 mm	330	293	253

MATERIAL DATA SHEET		MDS R11	Rev. 4
TYPE OF MATERIAL: Austenitic stainless steel, Type 6Mo			
PRODUCT	STANDARD	GRADE	ACCEPT. CLASS SUPPL. REQ.
Seamless pipes	ASTM A 312	UNS S31254 UNS N08367 UNS N08926	-
1. SCOPE	This MDS specifies the selected options in the referred standard and additional requirements which shall be added or supersede the corresponding requirements in the referred standard.		
2. QUALIFICATION	Manufacturers and the manufacturing process used for manufacturing of product to this MDS shall be qualified in accordance with Norsok Standard M-650.		
3. MANUFACTURING	The manufacturing of products according to this MDS shall be carried out according to the M-650 qualified manufacturing procedure.		
4. STEEL MAKING	The steel melt shall be refined by AOD or equivalent.		
5. HEAT TREATMENT	The pipes shall be solution annealed followed by water quenching.		
6. TENSILE TESTING	R <sub>m</sub> ≥ 310 MPa, R <sub>H</sub> ≥ 675 MPa for t ≤ 5.0 mm and R <sub>H</sub> ≥ 655 MPa for t > 5.0 mm, A ≥ 35 %		
7. CORROSION TESTING	Corrosion test according to ASTM G 48 Method A is required. Test temperature shall be 50 °C and the exposure time 24 hours. The test shall expose the external and internal surfaces and a cross section surface in full wall thickness. Cut edges shall be prepared according to ASTM G48. The whole specimen shall be pickled before being weighed and tested. Pickling may be performed for 5 minutes at 60 °C in a solution of 20 % HNO <sub>3</sub> + 5 % HF. The acceptance criteria are: - No pitting at 20 X magnification. - The weight loss shall be less than 4.0 g/m <sup>2</sup> .		
8. EXTENT OF TESTING	Corrosion test shall be carried out to the same extent as stated for mechanical tests in the referred standard.		
9. TEST SAMPLING	Samples for production testing shall realistically reflect the properties in the actual components.		
10. SURFACE FINISH	White pickled.		
11. REPAIR OF DEFECTS	Weld repair is not acceptable.		
12. MARKING	The component shall be marked to ensure full traceability to melt and heat treatment lot.		
13. CERTIFICATION	The material manufacturer shall have a quality system certified in accordance with ISO 9001 and the system shall have undergone a specific assessment for the relevant materials. The material certificate shall be issued in accordance with EN 10204 Type 3.1, and shall include the following information: - Steel manufacturer; - Steel melting and refining practice; - Heat treatment condition. (Solution annealing temperature and holding time shall be stated.)		



Further information:

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® = registered trademark

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**MARINE APPLICATIONS**

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