Schematic “Family tree”
of high-pressure hydrogen susceptibility of stainless steels

Deutsche Edelstahlwerke

Increasing hydrogen resistance RRA

1.4435 (A) — X2CrNiMo18-14-3/316L

590				
230				
100				
C	Mn	Cr	Mo	Ni
		17.0	2.5	12.0
0.03	2.00	19.0	3.0	15.0

1.3964 (A) — X2CrNiMoNNb21-15-5-3/XM-19

710				
410				
100				
C	Mn	Cr	Mo	Ni
	4.00	20.0	2.5	17.0
0.03	6.00	21.5	3.0	15.0

1.4418 (M) — X4CrNiMo16-5-1

970				
830				
94				
C	Mn	Cr	Mo	Ni
		15.0	0.8	4.0
0.06	1.50	17.0	1.5	6.0

1.4401 (A) — X5CrNiMo17-12-2/316

590				
230				
90				
C	Mn	Cr	Mo	Ni
		16.5	2.0	10.0
0.07	2.00	18.5	2.5	13.0

1.4003 (F) — X12CrNi12

525				
260				
88				
C	Mn	Cr	Mo	Ni
		10.5		0.3
0.03	1.50	12.5		1.0

1.4005 (M) — X12CrS13

425				
400				
79				
C	Mn	Cr	S	Ni
0.06		12.0	0.15	4.0
0.15	1.00	14.0	0.35	6.0

1.4410 (D) — X2CrNiMoN25-7-4/Alloy 2507

910				
740				
54				
C	Mn	Cr	Mo	Ni
		24.0	3.0	6.0
0.03	2.00	26.0	4.5	8.0

1.4307 (A) — X2CrNi18-9/304L

650				
210				
45				
C	Mn	Cr	Mo	Ni
		17.0		8.0
0.03	2.00	19.0		10.5

a. R_m
b. $R_{p0.2}$
c. RRA
D. Material number
e. Grade
f. Structure

1.DDDD (f) — eeeeee

a				
b				
c				
C	Mn	Cr	Mo	Ni
min.				
max.				

RRA: Relative Reduction of Area

1.4006 (M) — X10Cr14/410

1520				
1320				
20				
C	Mn	Cr	Mo	Ni
0.08		11.5		
0.15	1.50	13.5		0.8

1.4568 (Marag) — X7CrNiAl17-7

1200				
1120				
6				
C	Mn	Cr	Al	Ni
		16.0	0.7	6.5
0.09	1.00	18.0	1.5	7.5

1.4034 (M) — X46Cr13

2162				
18				
C	Mn	Cr	Mo	Ni
0.43		12.5		
0.50	1.00	14.5		

$$RRA = \frac{Z\,H_2}{Z\,Ref.} \times 100\%$$

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Increasing strength

No responsibilty is taken for the correctness of this information