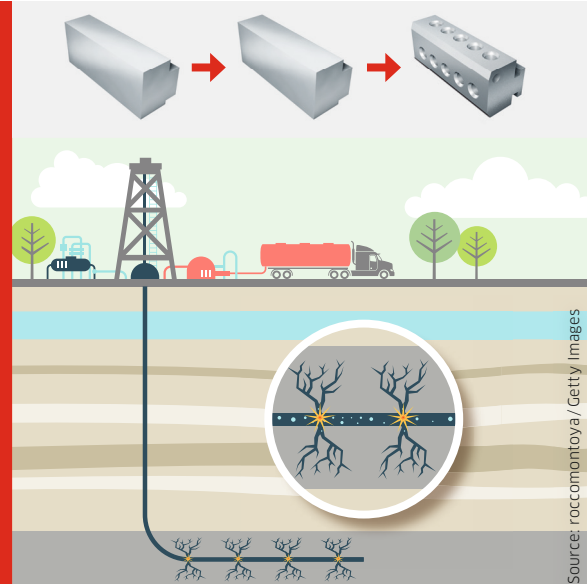


Product group Fluid Ends for fracking industry

Application Component for fracking pumps



Source: roccomontoya/Getty Images

MATERIALS

Age hardening steels

Type 630

(UNS S17400 / 17-4PH)

Type XM-12

(UNS S15500 / 15-5PH)

Martensitic stainless steel

F6NM UNS S41500

comparable with

1.4313 - X3CrNiMo13-4

PRODUCTION PROCESSES

Age hardening stainless steel

Electric arc furnace (EAF) → ladle furnace (LF) → vacuum degassing (VD) → ingot casting → forging process → age hardening treatment → mechanical properties testing → pre-machining → ultrasonic testing → final machining → surface testing

Martensitic stainless steel

Electric arc furnace (EAF) → ladle furnace (LF) → vacuum degassing (VD) → ingot casting → forging process → quality heat treatment → mechanical properties testing → pre-machining → ultrasonic testing → final machining → surface testing

CERTIFICATE

3.1 certificate or according to customer requirement

Age hardening stainless steel

Type 630 / UNS S17400 / 17-4PH

Standard	ASTM A564/A564M, ASTM A705/A705M									
	Comparable with DIN steel grades 1.4542, 1.4548									
Chem. composition*	C	Si	Mn	P	S	Cr	Mo	Ni	Cu	Nb/Cb
	≤ 0.07	≤ 0.70	≤ 1.00	≤ 0.025	≤ 0.015	15-17	≤ 0.60	3.00-5.00	3.00-5.00	0.15-0.45
Properties*	class	H1075		H1100		H1150		H1150D		
	Long. values	MPa / ksi		MPa / ksi		MPa / ksi		MPa / ksi		
	Yield strength	≥ 860 / ≥ 125		≥ 795 / ≥ 115		≥ 725 / ≥ 105		≥ 725 / ≥ 105		
	Tensile strength	≥ 1000 / ≥ 145		≥ 965 / ≥ 140		≥ 930 / ≥ 135		≥ 860 / ≥ 125		
	Elongation 4D	≥ 13 %		≥ 14 %		≥ 16 %		≥ 16 %		
	Reduction of area	≥ 45 %		≥ 45 %		≥ 50 %		≥ 50 %		
	Charpy-V @ AT	≥ 27 J / ≥ 20 ft-lbs		≥ 34 J / ≥ 25 ft-lbs		≥ 41 J / ≥ 30 ft-lbs		≥ 41 J / ≥ 30 ft-lbs		
Surface Hardness	≥ 311 HB		≥ 302 HB		≥ 277 HB		255-311 HB			

Age hardening stainless steel

Type XM-12 / UNS S15500 / 15-5PH

Standard	ASTM A564/A564M, ASTM A705/A705M									
	Comparable with DIN steel grade 1.4545									
Chem. composition*	C	Si	Mn	P	S	Cr	Mo	Ni	Cu	Nb/Cb
	≤ 0.07	≤ 1.00	≤ 1.00	≤ 0.025	≤ 0.015	14-15.5	≤ 0.50	3.50-5.50	2.50-4.50	0.15-0.45
Properties*	class	H1075		H1100		H1150		H1150M		
	Long. values	MPa / ksi		MPa / ksi		MPa / ksi		MPa / ksi		
	Yield strength	≥ 860 / ≥ 125		≥ 795 / ≥ 115		≥ 725 / ≥ 105		≥ 515 / ≥ 75		
	Tensile strength	≥ 1000 / ≥ 145		≥ 965 / ≥ 140		≥ 930 / ≥ 135		≥ 795 / ≥ 115		
	Elongation 4D	≥ 13 %		≥ 14 %		≥ 16 %		≥ 18 %		
	Reduction of area	≥ 45 %		≥ 45 %		≥ 50 %		≥ 55 %		
	Charpy-V @ AT	≥ 27 J / ≥ 20 ft-lbs		≥ 34 J / ≥ 25 ft-lbs		≥ 41 J / ≥ 30 ft-lbs		≥ 41 J / ≥ 30 ft-lbs		
Surface Hardness	≥ 311 HB		≥ 302 HB		≥ 277 HB		≥ 255 HB			

Martensitic stainless steel

Type S41500 / F6NM

Standard	ASTM A473/A473M Type S41500									
	Comparable with DIN EN 10250-4, 1.4313 - X3CrNiMo13-4									
Chem. composition*	C	Si	Mn	P	S	Cr	Mo	Ni	N	
	≤ 0.05	≤ 0.70	≤ 1.50	≤ 0.025	≤ 0.015	12-14	0.30-0.60	3.50-4.50	≥ 0.020	
Properties*	class	ASTM A473		DIN EN QT 650		DIN EN QT 780		DIN EN QT 900		
	Long. values	MPa / ksi		MPa / ksi		MPa / ksi		MPa / ksi		
	Yield strength	≥ 620 / ≥ 90		≥ 520 / ≥ 75		≥ 620 / ≥ 90		≥ 800 / ≥ 116		
	Tensile strength	≥ 795 / ≥ 115		650-830 / 94-120		780-980 / 113-142		900-1100 / 131-160		
	Elongation 4D	≥ 15 %		≥ 15 %		≥ 15 %		≥ 12 %		
	Reduction of area	≥ 45 %		≥ 45 %		≥ 45 %		≥ 40 %		
	Charpy-V @ AT	≥ 70 J / ≥ 52 ft-lbs		≥ 70 J / ≥ 52 ft-lbs		≥ 70 J / ≥ 52 ft-lbs		≥ 50 J / ≥ 37 ft-lbs		
Surface Hardness	≤ 295 HB		205-261 HB		245-308 HB		284-346 HB			

*or according to customer requirements

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