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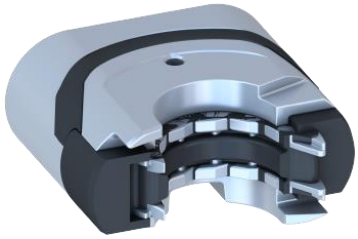
Technical Data Sheet

VBR Ram, Type U, TDS-8012345-27C-11, Rev 02



Equipment Data	
Part number	8012345-27C-11
Description	Ram Assembly, Model U 13-5/8 in [346.0 mm], 3,000/5,000/10,000 psi [20.7/34.5/68.9 MPa] VBR Ram, 3-1/2 in to 5-1/2 in OD Pipe Size/Range, High Temperature API Temperature Class EBE
Performance requirement level	API 16A PR2
Equipment Rated working Pressure	10,000 psi [68.9 MPa]
Temperature range	Low temperature 30 deg F [-1.1 deg C] Continuous operating temperature 180 deg F [82.2 deg C] Extreme high temperature 300 deg F [148.9 deg C]
Weight	316.5 lbm [143.6 kg]
Size [L x W x H]	15.58 in x 14.08 in x 7.55 in [395.7 mm x 357.6 mm x 191.8 mm]

Qualification Test Results	
Sealing Characteristics	MOPFLPS at zero initial wellbore pressure is 325 psi [2.2 MPa] using a 5-1/2 in mandrel. MOPFLPS at zero initial wellbore pressure is 420 psi [2.9 MPa] using a 3-1/2 in mandrel. MOPFLPS at elevated wellbore pressure of 10,000 psi [68.9 MPa] using a 5-1/2 in mandrel is 1,754 psi [12.1 MPa]. Closing pressure required to maintain a wellbore seal on a 5 in mandrel is 1,754 psi [12.1 MPa]. MOPFLPS at elevated wellbore pressure of 10,000 psi [68.9 MPa] using a 3-1/2 in mandrel is 1,849 psi [12.7 MPa]. Closing pressure required to maintain a wellbore seal on a 3-1/2 in mandrel is 1,849 psi [12.7 MPa]. Wellbore pressure assist with 5-1/2 in mandrel: With operating pressure at 1,567 psi [10.8 MPa] and wellbore pressure at 10,123 psi [69.8 MPa], there was no leakage. With operating pressure at 0 psi and wellbore pressure at 10,124 psi [69.8 MPa], there was no leakage. With operating pressure at 0 psi and wellbore pressure at 1,101 psi [7.6 MPa], there was no leakage. Wellbore pressure assist with 3-1/2 in mandrel: With operating pressure at 1,533 psi [10.6 MPa] and wellbore pressure at 10,263 psi [70.8 MPa], there was no leakage. With operating pressure at 0 psi and wellbore pressure at 10,192 psi [70.3 MPa], there was no leakage. With operating pressure at 0 psi and wellbore pressure at 1,076 psi [7.4 MPa], there was no leakage. (ER 7126[1])

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Fatigue	MOPFLPS at zero initial wellbore pressure is 550 psi [3.8 MPa] using a 5-1/2 in mandrel. MOPFLPS at zero initial wellbore pressure is 495 psi [3.4 MPa] using a 3-1/2 in mandrel. Completed 252 successful open/close cycles (36 pressure tests) on 5-1/2 in mandrel with successful pressure test to 200 to 300 psi [1.4 to 2.1 MPa] and 10,000 psi [68.9 MPa] (maximum working pressure) on every seventh closure. Completed 294 successful open/close cycles (42 pressure tests) on a 3-1/2 in mandrel with successful pressure test to 200 to 300 psi [1.4 to 2.1 MPa] and 10,000 psi [68.9 MPa] (maximum working pressure) on every seventh closure. (ER 7108†)
Stripping	Stripped an equivalent length of 10,541 ft [3,213 m] using a 5.0 in [127 mm] OD test mandrel. (ER 7139†)
Hang-off	Achieved a hang-off load of 450,000 lbf [204,117 kg] using API 5-1/2 in tool joint profile. Achieved a hang-off load of 150,000 lbf [68,039 kg] using API 3-1/2 in tool joint profile (ER 7210†)
Low temperature	At 30 deg F [-1.1 deg C] test temperature, completed 3 successful pressure cycles at 200 to 300 psi [1.4 MPa to 2.1 MPa] and 10,000 psi [68.9 MPa] (maximum working pressure). (ER 7067†)
Continuous high temperature	At 180 deg F [82.2 deg C] test temperature, completed 10 successful pressure cycles at 200 to 300 psi [1.4 to 2.1 MPa] and 10,000 psi [68.9 MPa] (maximum working pressure). (ER 7068†)
Extreme high temperature	At 300 deg F [148.9 deg C] test temperature and 10,000 psi [68.9 MPa] (maximum working pressure), achieved a hold time of 8 hours. (ER 7261†)

† Engineering Reports (ER) are for internal use only. If a 3rd party requests an audit or review of the test reports, this must be approved by management and conducted on site with an SLB employee witness.

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