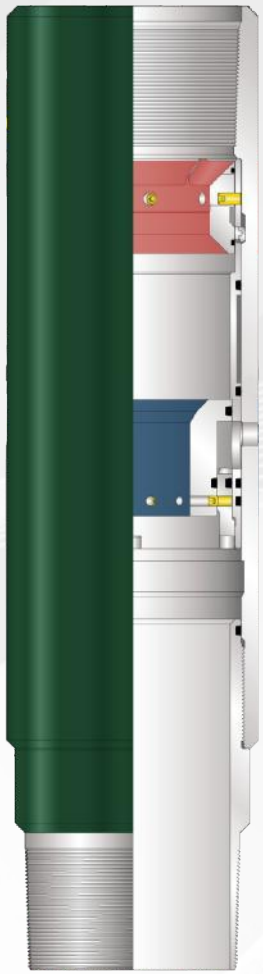
MDVX Stage Cementing Collar
Hydraulic Type (two stage)



MDVX Hydraulic Stage Cementing Collar is a field-proven stage tool that meets the challenges of cementing holes at any angle with a hydraulically opened port system.

MDVX is specifically designed for horizontal sections / formations, the multistage cementing tool can be placed anywhere in the casing string.

MDVX is PDC-drillable and field-adjustable shear pins system.

When the first-stage shutoff plug lands on the shutoff baffle, increased internal casing pressure hydraulically opens the stage tool, enabling circulation and then second-stage cement to pass though the ports into the annulus above the tool.

The closing plug when released, wipes the casing ID clean of cement before bumping on a closing seat.

Increased pressure shifts the closing seat downward, releasing locking lugs and closing the tool. A snap ring locks the sleeve in position, ensuring the stage tool remains locked.

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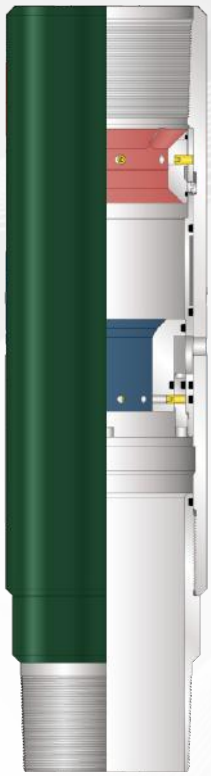
Applications & Features



- MDVX Stage Cementing Collar can be made from material grades up to 135,000 psi minimum yield, including material suitable for sour gas service.
- Common steel grades i.e. J-55, K-55, L-80, P-110 form standard manufacturing steel grades, how ever other grades are available upon request.
- API & Premium connections are available upon request.
- No welds are used on any portion of the tool.
- The MDVX could be used successfully as secondary stage when placed above External Casing Inflatable Packers.
- The seals providing internal and external pressure integrity are housed in the stage collar body and remain stationary throughout operation, minimizing chances of their being damaged.
- The pressure-relief design prevents fluid trapping and compression between the opening device and the closing plug during the closing phase of the tool's operation.
- The closing sleeve is held in the closed position by an internal lock ring.
- Both the opening and closing sleeves lock against rotation for easy drill-out.
- A minimum amount of aluminum and rubber are the only materials encountered during drill-out.

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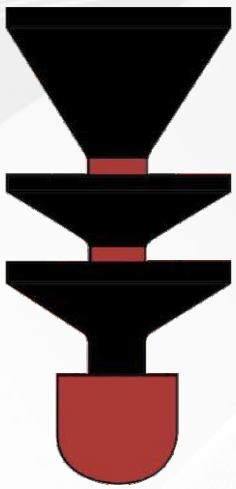
Two-Stage Cementing with MDVX Stage Cementing Collar using:

I. **Baffle Plate**
II. **Shut-off Plug, and**
III. **Closing Plug**

Sequence of Events:

- Float shoe along with Baffle Plate and the MDVX Stage Cementing Collar, are installed in the casing string and the casing is run to bottom.



- Circulation is established and first-stage cement is mixed and pumped.
- When the first-stage shutoff plug lands on the shutoff baffle, increased internal casing pressure hydraulically opens the stage tool, enabling circulation and then second-stage cement to pass though the ports into the annulus above the tool.
- The closing plug when released, wipes the casing ID clean of cement before bumping on a closing seat.
- Increased pressure shifts the closing seat downward, releasing locking lugs and closing the tool. A snap ring locks the sleeve in position, ensuring the stage tool remains locked.

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Specification Tables

Size (in.)	Grade	Wt. Range (Lbs.)	Max. O.D.	Max. Drill-Out I.D.	Overall Length (in.)	Hydraulic Sleeve I.D. (in.)	Closing Seat I.D. (in.)	Opening Pressure (psi/bar)	
					BTC			Per Screw	Range
5-1/2	L80	14.0 to 17.0	6.625	4.897	31.5	3.000	4.062	440 30.3	880 to 3,520 60.6 to 242.7
	L80	15.5 to 20.0		4.835					
	P110	17.0 to 23.0		4.777					
7	L80	20.0 to 26.0	8.200	6.341	32.5	3.750	5.000	340 23.4	680 to 3,400 46.9 to 234.0
	L80	26.0 to 32.0		6.161					
	P110			6.161					
9-5/8	L80	32.3 to 40.0	11.125	8.855	38.8	6.125	7.750	600 41.4	1,200 to 3,600 82.8 to 248.2
	L80	40.0 to 47.0		8.689					
	P110	43.5 to 53.5		8.609					
10-3/4	L80	40.5 to 51.0	12.312	9.904	38.8	7.250	8.875	630 43.4	1,260 to 3,780 86.8 to 260.6
	P110	51.0 to 60.7		9.704					
13-3/8	L80	61.0 to 72.0	15.000	12.375	38.8	9.250	11.000	500 34.5	1,000 to 3,000 69.0 to 207.0
	P110			12.375					