S Series SPM Mandrel (1-in. ID Pocket)

Provides oval-body, forged and machined SF, SFO, SIFO, SM, and SMO series mandrels for onshore wells

Applications

- Robust design enables installation of mandrels in applications where annular and standard flow configurations are required and/or increased pressure and tensile strength capabilities are required
- SIFO models have integrally forged swedges
- SFO-1 mandrel has a one-piece forged pocket/deflector, a 1-in. ID pocket, and an integral orienting sleeve for installing gas lift devices in deviated wellbores
- SMO-1 and SMO-2 mandrels have machined pockets and tool guards; 1- and 1 1/2-in. ID pockets, respectively; and integral orienting sleeves for installing gas lift devices in straight and deviated wellbores

Features and Benefits

- Side-pocket design eliminates the need to pull or rerun the tubing string to install or replace gas lift equipment
- Side pocket is offset from the tubing bore to maximize the flow area and allow full tubing drift for well servicing operations through the mandrel without restriction
- Slotted orienting sleeve in select models enables precise installation and retrieval of gas lift equipment in straight and deviated wellbores
- Tool guard protects gas lift equipment from damage by deflecting tools larger than the pulling/running tool from the flow-control device
- Forged pocket has recessed opposing ports that prevent flow erosion and port blockage if the mandrel pocket is positioned against the casing wall
- Mandrel material is fully heat treated to provide the best combination of strength and corrosion resistance for its intended use
- The one-piece forged pocket/deflector (SF and SFO series) provides a smooth internal profile to enhance the passage of wireline tools and reduce flow turbulence around the pocket section

Tool Description

The Weatherford McMurry-Macco® forged-pocket (SF and SFO series) oval-body, side-pocket mandrels feature both oval and round body design and threaded connections for installation in the tubing string.

SIFO series mandrels are commonly used in unconventional applications as receivers for wireline-retrievable gas-lift valves and various other flow-control devices for high performance wells throughout its entire life.

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S Series SPM Mandrel (1-in. ID Pocket)

Tool Description (continued)

The robust design enables installation of these mandrels in applications where annular and standard flow configurations are required and/or increased pressure and tensile strength capabilities are required. The side pocket is offset from the bore of the tubing to allow full tubing drift for well-servicing operations through the mandrel without restriction. The side pocket encompasses profiles and sealed bores to land appropriate flow-control devices.

Weatherford's McMurry-Macco® forged-pocket (SF and SFO series) side-pocket mandrels feature both oval and round body design and threaded connections for installation in the tubing string. The side pocket is offset from the bore of the tubing, allowing full tubing drift, through the mandrel and without restriction, for well-servicing operations.

The SFO and SMO series mandrels include an integral orienting sleeve that aligns the kickover tool and injection devices with the side pocket for precise installation in straight and deviated wellbores.

The SF and SFO series mandrels have a one-piece forged pocket/deflector, which guides the flow-control device into the pocket and deflects tools larger than the pulling/running tool back into the tubing bore of the mandrel. The SM and SMO series mandrels have a machined pocket and tool guard to perform the same function.

Options

- All oval-body side-pocket mandrels are available in AISI 4130 alloy material that can be heat treated specifically for corrosive hydrogen sulfide (HS) service; high-alloy materials such as 13 chrome and 9 chrome are also available
- For specialized applications such as chemical injection, water flood, bypass injection, and pressure gauge monitoring, multiple mandrel configurations with a variety of features are available

S Series SPM Mandrel (1-in. ID Pocket)

Specifications

Mandrel Model	Assembly Number	Tubing Size (in.)	Test Pressure[1,2]			
			Standard Service		Sour Service	
			Internal PSI (bar)	External PSI (bar)	Internal PSI (bar)	External PSI (bar)
SM-1	1812-XXX	2-3/8	8,000 (551.0)	6,000 (413.4)	6,000 (413.4)	4,000 (275.6)
	1813-XXX	2-7/8				
	1814-XXX	3-1/2				
SIM-1	1812-5XX	2-3/8	8,000 (551.0)	6,000 (413.4)	6,000 (413.4)	5,000 (344.5)
	1813-5XX	2-7/8				
	1814-5XX	3-1/2	7,000 (482.3)	5,500 (379.0)		4,500 (310.1)
SMO-1	1912-XXX	2-3/8	8,000 (551.2)	6,000 (413.4)	6,000 (413.4)	4,000 (275.6)
	1913-XXX	2-7/8				
	1914-XXX	3-1/2				
	1916-XXX	4-1/2	7,000 (482.3)	5,000 (379.0)		
SIMO-1	1912-XXX	2-3/8	8,000 (551.2)	6,000 (413.4)	6,000 (413.4)	5,000 (344.5)
	1913-XXX	2-7/8				
	1914-XXX	3-1/2	7,000 (482.3)	5,500 (379.0)		4,500 (310.1)
SF-1	1612-XXX	2-3/8	8,000 (551.2)	6,000 (413.4)	6,000 (413.4)	5,000 (344.5)
	1613-XXX	2-7/8				
	1614-XXX	3-1/2	7,000 (482.3)	5,500 (379.0)		4,500 (310.1)
SIF-1	1612-XXX	2-3/8	8,000 (551.2)	6,000 (413.4)	6,000 (413.4)	5,000 (344.5)
	1613-XXX	2-7/8				
	1614-XXX	3-1/2	7,000 (482.3)	5,500 (379.0)		4,500 (310.1)
SFO-1	1712-XXX	2-3/8	8,000 (551.2)	6,000 (413.4)	6,000 (413.4)	5,000 (344.5)
	1713-XXX	2-7/8				
	1714-XXX	3-1/2	7,000 (482.3)	5,500 (379.0)		4,500 (310.1)
SIFO-1	1712-5XX	2-3/8	8,000 (551.2)	6,000 (413.4)	6,000)413.4)	5,000 (344.5)
	1713-5XX	2-7/8				
	1714-5XX	3-1/2	7,000 (482.3)	5,500 (379.0)		4,500 (310.1)
SM-2	2012-XXX	2-3/8	8,000 (551.2)	6,000 (413.4)	6,000 (413.4)	4,000 (275.6)
	2013-XXX	2-7/8				
	2014-XXX	3-1/2				

S Series SPM Mandrel (1-in. ID Pocket)

Specifications (continued)

Mandrel Model	Assembly Number	Tubing Size (in.)	Test Pressure[1,2]			
			Standard Service		Sour Service	
			Internal PSI (bar)	External PSI (bar)	Internal PSI (bar)	External PSI (bar)
SIM-2	2012-5XX	2-3/8	8,000 (551.2)	6,000 (413.4)	6,000 (413.4)	5,000 (344.5)
SMO-2	2412-XXX	2-3/8	8,000 (551.2)	6,000 (413.4)	6,000 (413.4)	4,000 (275.6)
	2413-XXX	2-7/8				
	2414-XXX	3-1/2				
SFO-2	2113-XXX	2-7/8	7,500 (516.8)	6,000 (413.4)	6,000 (413.4)	5,000 (344.5)
	2114-XXX	3-1/2	8,000 (551.2)	6,500 (447.9)	7,000 (482.3)	5,500 (379.0)
	2116-XXX	4-1/2	7,500 (516.8)	6,000 (413.4)	6,000 (413.4)	5,000 (344.5)
	2118-XXX	5-1/2	8,500 (585.7)	7,000 (482.3)	6,500 (447.9)	5,500 (379.0)

[1] Pressures are based on low-alloy steel, heat treated for standard and corrosive environments.
[2] Pressure may vary with type of end connections and with special-clearance applications.

SMOR Series Side-Pocket Mandrel (1-in. ID)

Provides round-body, machined (SMOR and SMR series mandrels) for onshore wells

Applications

- SMOR and SMR series mandrels are used as internal receivers for gas lift valves and other flow-control devices in standard, high-pressure, and corrosive service typically in high-performance wells
- SMOR and SMR series mandrels are available with a variety of features for specialized applications such as chemical injection, waterflood, bypass injection, and pressure gauge monitoring

Features and Benefits

- High-pressure design allows use of these mandrels in unconventional applications requiring high pressure and/or tensile ratings
- Side pocket is offset from the tubing bore to maximize the flow area and allow full tubing drift for well servicing operations through the mandrel without restriction
- Side pocket eliminates the need to pull or rerun the tubing string to install or replace gas lift equipment
- Machined pocket and tool guard protect gas lift equipment by preventing tools larger than the pulling/running tool from damaging the valve latch
- Slotted orienting sleeve ensures positive alignment of the kickover tool to ensure reliable running and pulling of gas lift equipment in deviated wellbores
- Mandrel material is fully heat treated to provide the best combination of strength and corrosion resistance for its intended use
- SMOR-A and SMR-A series mandrel configurations are available with a special-clearance OD for installation in smaller-diameter casing where standard-diameter mandrels may not be practical
- SMR-1 and SMR-2 series mandrels have 1- and 1 1/2-in. ID pockets, respectively, and are designed for installation in straight wellbores
- SMOR-1 and SMOR-2 series mandrels have 1- and 1 1/2-in. ID pockets, respectively, and integral orienting sleeves and tool guards for installation in straight and deviated wellbores

Tool Description

The Weatherford McMurry-Macco® SMOR and SMR series side-pocket mandrels feature a round cross-sectional profile with machined swages, pocket, and tool guards.

SMOR Series Side-Pocket Mandrels provide round-body, machined (SMOR and SMR series mandrels) for onshore wells.

SMOR Series Side-Pocket Mandrel (1-in. ID)

Tool Description (continued)

The mandrels have threaded connections for installation in the tubing string. The robust design enables installation of these mandrels in applications where premium alloy, special dimensional requirements, and/or increased pressure and tensile strength capabilities are required. The side pocket is offset from the bore of the tubing to allow full tubing drift for well-servicing operations through the mandrel without restriction. The side pocket encompasses profiles and sealed bores to land appropriate flow-control devices.

Flow-control devices are installed in the side pocket using a kickover tool that is then run into the well using standard wireline techniques.

SMOR series mandrels include an integral orienting sleeve that aligns the kickover tool and flow-control device above the pocket for precise installation in straight and deviated wellbores. SMR series mandrels do not have orienting sleeves and should only be installed in straight wellbores. SMOR series mandrels feature a tool guard at the top of the pocket. The tool guard deflects tools larger than the pulling/running tool back into the tubing bore to prevent damage to the valve latch.

Options

- SMOR and SMR series mandrels are available in AISI 4130 alloy material that can be heat treated specifically for corrosive hydrogen sulfide (HS) service; other materials are available on request
- SMOR and SMR series mandrels are available with a variety of features for specialized applications such as chemical injection, waterflood, bypass injection, and pressure gauge monitoring
- SMR-2RA and SMOR-2RA mandrels have a 1 1/2-in. ID pocket and a 360° latch lug profile
- SMR-2RA mandrel is designed for installation in straight wellbores
- SMOR-2RA mandrel includes an orienting sleeve for installation in straight and deviated wellbores

SMOR Series Side-Pocket Mandrel (1-in. ID)

Specifications

Mandrel Model	Assembly Number	Tubing Size (in.)	Test Pressure							
			Standard Service				Sour Service			
			Internal		External		Internal		External	
			(PSI)	(bar)	(PSI)	(bar)	(PSI)	(bar)	(PSI)	(bar)
SMR-1	2512-XXX	2-3/8	13,500	930.2	13,500	930.2	12,000	826.8	11,000	757.9
	2513-XXX	2-7/8								
	2514-XXX	3-1/2								
SMOR-1	2212-XXX	2-3/8	13,500	930.2	13,500	930.2	12,000	826.8	11,000	757.9
	2213-XXX	2-7/8	15,600	1,074.8	14,400	992.2	11,000	757.9	9,600	661.4
	2214-XXX	3-1/2	11,500	792.4	9,700	668.3	8,300	571.9	7,000	482.3
SMOR-1A	2312-XXX	2-3/8	7,600	523.6	5,000	344.5	5,800	399.6	3,850	265.3
	2313-XXX	2-7/8	8,800	606.3	8,400	578.8	6,700	461.6	6,400	441.0
	2314-XXX	3-1/2	12,700	875.0	11,000	797.9	9,600	661.4	8,400	578.8
SMR-2	3012-XXX	2-3/8	13,000	895.7	13,000	895.7	10,000	689.0	10,000	689.0
	3013-XXX	2-7/8								
	3014-XXX	3-1/2	11,500	792.4	11,500	792.4	9,000	620.1	9,000	620.1
SMOR-2	2912-XXX	2-7/8	13,000	895.7	13,000	895.7	10,000	689.0	10,000	689.0
	2913-XXX	3-1/2								
	2914-XXX	4-1/2	11,500	792.4	11,500	792.4	9,000	620.1	9,000	620.1