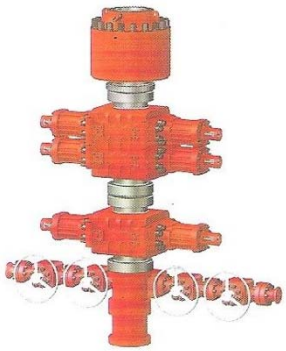
# Blowout Preventer (BOP) Stack
# API Spec 16A

Blowout preventer stack is the main wellhead pressure control equipment for oil & gas drilling, no matter onshore or offshore drilling. It consists of annular blowout preventer, single ram blowout preventer, double ram blowout preventer and drilling spool. This blowout preventer stacks which Sunry supplies are similar to Shaffer's BOP or Cameron's BOP. It is designed and fabricated in accordance to API Spec 16A.



**Annular BOP**

The design and manufacture of Annular BOP is according to API Spec 16A standard.

21 1/4'' X 2,000 PSI

13 5/8'' X 10,000 PSI

13 5/8'' X 5,000 PSI

**Structure Features:**

● Packing element is spherical or tapered type with massive storage volume, low operation pressure and excellent sealing function;

● Bonnet is hemispherical-shaped, so there is no stress concentration on bonnet whenever bearing the pressure.

● Bonnet and body are connected by a wedge block, so the pressure is evenly distributed;

● Packing element is interchangeable with similar overseas products;

● Use observation hole to check the life span of the packing element;

● Piston is set in low position to have a shorter moving distance; Use wear ring on piston.

## Cameron-Shaped Ram BOP

Cameron-Shaped Ram BOP is designed and manufactured according to API Spec 16A standard. It can be equipped with rams of various sizes. With the best quality front ram rubber, top ram rubber and flange sealing stacks, Cameron-shaped ram BOP can work during the extreme working condition including extremely high or low temperature and extreme chemical environment.

**STRUCTURE FEATURES**

● The pressure-bearing components are forged, so it has better strength and impact toughness;

● Floating sealing is applied to the cylinder cover and the open/close of the cover is realized by hydraulic power, so it is quick and convenient for changing rams;

● The auxiliary oil cylinder affords a smaller volume with same function;

● The standard configuration includes a manual locking device, which ensures the ram is closed tightly in case there is a hydraulic pressure loss;

● Both the manual and hydraulic locking device and the auxiliary oil cylinder can be installed flexibly into different positions according to customers' requirements, and the installation positions can be changed easily.

## Shaffer - Shaped Ram BOP

Shaffer-shaped Ram BOP is designed and manufactured according to API Spec 16A standard. It can be equipped with rams of various sizes from 2-3/8"~13-3/8", also Blind and Shear Ram.

**Structure Features:**

● Body and side door are made of alloy steel;

● Use seal rings assembly to improve sealing of side door;

● Use floating type ram. Front ram rubber is separated from top ram rubber, making it more reliable in sealing and easier to change;

● Use buried oil way inside body. Loading hinge is separated from hydraulic hinge;

● Compact hinge structure makes it easy to assemble and disassemble;

● Use arc-shaped body chamber with four round corners as transition section to reduce stress peak value whenever bearing the pressure;

- Ram cavity can be fitted with ram assembly of same type BOP made abroad;
- Flange grooves are stainless steel lined.

Type S Ram

Type H Ram

Type F Ram

Type HF Ram

Shear / Blind Ram

**Type S Ram Size**

| Working Pressure | 15,000 PSI (105 MPa) | | 10,000 PSI (70 MPa) | | 5,000 PSI (35 MPa) | | | | 3,000 PSI (21 MPa) | | 2,000 PSI (14 MPa) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bore (in) | 13 5/8 | 11 | 13 5/8 | 11 | 7 1/16 | 13 5/8 | 11 | 9 | 7 1/16 | 20 3/4 | 9 | 21 1/4 |
| 1 1/2 | | | | | √ | | | | √ | | | |
| 2 3/8 | √ | | √ | √ | √ | | | | √ | | | |
| 2 7/8 | √ | √ | √ | √ | √ | √ | √ | √ | √ | | √ | |
| 3 1/2 | √ | √ | √ | √ | √ | √ | √ | √ | √ | | √ | |
| 4 1/2 | √ | √ | √ | √ | √ | √ | √ | √ | | | √ | |
| 5 | √ | √ | √ | √ | | √ | √ | √ | | √ | √ | √ |
| 5 1/2 | √ | √ | √ | √ | | √ | √ | √ | | √ | √ | √ |
| 7 | √ | √ | √ | √ | | √ | √ | | | √ | | √ |
| 9 5/8 | √ | | √ | | | √ | | | | √ | | √ |
| 13 3/8 | | | | | | | | | | √ | | √ |
| Blind | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| Variable Bore | | | √ | √ | | √ | | | | | | |
| Shear /Blind | √ | √ | √ | √ | | | √ | | | | | |

## Specifications of Shaffer-shaped ram BOP and Annular BOP

| Working Pressure | Bore (in) for Shaffer-shaped ram BOP | | | | | | Bore (in) for Annular BOP | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 7-1/16 | 9 | 11 | 13-5/8 | 20 -3/4 | 21-1/4 | 7-1/16 | 9 | 11 | 13-5/8 | 21-1/4 |
| 105MPa (15000Psi) | √ | | √ | √ | | | | | | | |
| 70MPa (10000Psi) | √ | √ | √ | √ | | | √ | | √ | √ | |
| 35MPa (5000Psi) | √ | √ | √ | √ | | | √ | √ | √ | √ | |
| 21MPa (3000Psi) | √ | | | | √ | | √ | | | | |
| 14MPa (2000Psi) | | | | | | √ | | | | | √ |