Weir Oil & Gas provides superior products and service solutions which make our upstream customers more efficient. More customers choose our pressure pumping solutions than any other. We provide well service and stimulation pumps, flow control products and replacement expendable parts from leading brands including SPM, Mesa and Novatech. Pressure Control includes trusted brands such as Seaboard, which provides wellheads, valves and frac trees, and Mathena, which delivers drilling mud-gas separation equipment including chokes, separators, and environmental containment equipment. Engineered mechanical and rotating equipment repairs and upgrades, oilfield and drilling equipment repair and certification, rapid prototyping of spares parts, including robust asset management and field engineering services, are delivered globally by Weir Oil & Gas Services [based in Dubai, UAE].

Founded in 1871, The Weir Group PLC is one of the world’s leading engineering businesses. Weir designs, manufactures and services innovative solutions for minerals, oil and gas, power and other process markets. The Group aims to be a partner of choice to our customers with a worldwide network of around 200 manufacturing and service facilities.

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Seaboard™ Conventional Wellhead Systems

Designed to accommodate all casing and tubing sizes with pressure ratings up to 10,000 psi and can be customized to any type of completion. The Seaboard conventional wellhead system high capacity bowel design allows for suspension of casing and tubing to almost any depth. Our advanced sealing technology provides robust sealing in high sour environments for oil and gas applications up to 650°F. The system is offered in all the API material classes, our metallurgical engineers will ensure that the material selected is the best to suit the required application and well parameters.

Features:

Casing Head Housing
- Straight bore design uses 45° shoulder to minimize the risk of bowel damage
- Offered in three bottom connections; slip-lock, slip on weld or threaded
- Accommodates general service, as well as high capacity casing hangers

Casing Spools
- Straight bore design uses 45° shoulder to minimize hoop load while maintaining high hanging capacity
- Accommodates slip type, as well as mandrel type hangers
- Optional lock down screws
- Offered in various bottom connections, elastomer or metal sealing

Tubing Head Spools
- Straight bore design uses 45° load shoulders to support maximum loads
- Offered with lock down screw or internal lock mechanisms to reduce possible leak paths
- Accommodates all types of completions
- Tubing hangers offered with elastomer or metal sealing according to requirement
- Available in hub, flanged and studded connections

Christmas Tree
- Offering stack or block type Christmas tree with pressure ratings up to 10,000 psi
- Bottom connections and bottom sealing type are customized to suit the application
- Valves’ actuation is offered in pneumatic or hydraulic according to requirements
- Available for single or dual completions
Seaboard™ SMB-22 Multi-Bowl Wellhead

The Seaboard™ SMB-22 multi-bowl wellhead system is designed to decrease the time and cost associated with surface drilling and production by containing multiple strings of casing suspended within one wellhead. This also helps decrease the number of times the BOP connection is made or broken, which reduces downtime or non-productive time (NPT). Being able to suspend multiple strings within one wellhead decreases the size, making it a preferred solution where there are concerns about limited space and time.

**Features**
- Lower casing hanger is fluted to allow ample bypass for circulating mud and cement
- Ability to suspend multiple strings of casing or tubing within one wellhead system
- Annular seal for surface casing hanger may be re-energized, if necessary
- Conductor hanger seals may be re-energized, if necessary
- Conductor hanger may be tested externally once landed
- Surface casing hangers may be landed prior to cementing, eliminating the need to reciprocate
- All running/retrieving tools run on casing
- Emergency suspension systems are available for the hangers
- No welding required

**Benefits**
- Faster and safer than many conventional surface wellhead systems
- Comprehensive product line offering “off the shelf” or customized solutions
- Reliability and performance in major oil and gas locations and conditions

**Sizes/Availability**

<table>
<thead>
<tr>
<th>Size</th>
<th>Availability</th>
</tr>
</thead>
<tbody>
<tr>
<td>13 1/8 inch</td>
<td>5,000</td>
</tr>
<tr>
<td>13 3/8 inch</td>
<td>10,000</td>
</tr>
<tr>
<td>11 inch</td>
<td>5,000</td>
</tr>
<tr>
<td>11 inch</td>
<td>10,000</td>
</tr>
</tbody>
</table>
Seaboard™ FAS-LOC™ Hybrid (FLH)

Save production time and get more value from the wellhead with the comprehensive Seaboard™ FAS-LOC™ hybrid (FLH) wellhead system. Its wellhead system is quick to connect and requires no API flanges in the casing head, resulting in a significant time-saving advantage. The system is designed to enhance safety because cutting and welding operations normally associated with casing head installation are done prior to installation away from the well bore, which potentially minimizes work underneath a suspended BOP in a confined space.

Features
- Comprehensive system designed to save time and rig costs
- Dedicated diverter adapter that transfers from well to well for BOP quick-connect
- Metal-to-metal seal and elastomer back-up at the BOP connection
- FAS-LOC™ casing head accepts mandrel or slip-type casing hangers

Benefits
- Wellhead systems have back pressure valve (BPV) threaded profiles for installation of a safe, effective, low-cost surface well-control barrier during nipple down activities
- Easily adapts to accept intermediate casing string/spool, if needed
- Reduces the need for field cutting and welding operations during casing head installation
- Makes up quickly with no special tools
- Designed to land the casing head through the BOP and eliminate the need to wait for cementing operations
Seaboard™ Frac Tree Rental Equipment

Program Delivers Cost-Effective Solutions and Service
Weir Seaboard offers rental of frac trees and support equipment to meet high-performance drilling and production needs, while managing operators’ capital expenditures. The program includes a full complement of associated equipment and services for per-day or campaign rentals.

Service Under Pressure®
Weir Seaboard built its reputation on providing excellent customer service including field and office support, quotes and drawings—all available when you need them. Field service includes installation, onsite testing, maintenance, removal and refurbishment. To reduce set-up time, crane trucks with sufficient reach and capacity are used to lift and assemble the frac trees. Torque and testing services are also available. Everything needed to get the job done.

Seaboard™ equipment undergoes a rigorous inspection and quality assurance program so that operations can move forward with confidence. Customers can reduce inventory in a way that is convenient and affordable without reducing production potential.

Benefits
- Provides smooth operation during stressed thermal cycles
- Easily closed with minimal force resulting in elimination of potential valve cavity pressure lock
- Easy to maintain in-line without the use of special tools
- Stem packing can be replaced while the valve is under 15,000 psi

Features
- Cost-effective option for managing capital expenditures
- Minimal repairs
- Support services including crane trucks and torque units
- Full hydrostatic testing
- Flexibility with all standard sizes ranging from $2\frac{\text{1}}{\text{16}}$ inch 10,000 psi to $7\frac{\text{1}}{\text{16}}$ inch 15,000 psi
Seaboard™ Zip Pack

The efficiencies gained by pad drilling are multiplied when frac operations utilize zipper manifold technologies. Zip Pac™ takes zipper frac manifold technology and pairs it with qualified technicians to create a package that enhances safety, saves time and money.

Features
• Equipped with both hydraulic and manually operated valves
• Configured to allow for rapid rig-up on location
• Fully inspected and recertified after every job
• Customizable equipment configurations to meet individual well/pad site requirements are configured to maximize output

Benefits
• Enhances safety–trained technicians connect pressure control system and monitor through each stage of the process. Single rig-up by trained technicians reduces likelihood of related incidents
• Saves time–significant completions cost savings; numerous wells can be hydraulically fractured during the same operation decreasing the average time on the well site

<table>
<thead>
<tr>
<th>Design Specifications</th>
<th>7 inch</th>
<th>5 inch</th>
<th>4 inch</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bore size</td>
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<td>5 5/8 in</td>
<td>4 1/16 in</td>
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<tr>
<td>Maximum wellhead working pressure</td>
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<td>10,000 psi</td>
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<tr>
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<tr>
<td>Well configurations</td>
<td>2–4</td>
<td>2–4</td>
<td>2–4</td>
</tr>
</tbody>
</table>
Model WCS-10 Gate Valve

The Weir Model WCS-10 gate valve provides proven Weir features and low maintenance for drilling and production application. The WCS-10 valve features a simple and reliable gate and seat assembly which minimizes inventory issue and offers low maintenance costs. The high performance, bidirectional slab gate valve is ideal for high pressure, critical service applications of 2,000 through 15,000 psi.

Features
- Available in 1 \( \frac{13}{16} \)” through 7 \( \frac{1}{16} \)” nominal sizes
- Slab gate with floating seats
- Non-rising stem
- Self-energized stem seal
- Bi-directional sealing
- Metal to metal sealing
  - Gate to seat
  - Stem backseat seal
  - Body to bonnet seal
- Positive bearing

Available Configurations
The WCS-10 is available with the following preparations:
- API 6A material class AA though HH
- Flanged or threaded end design
- Available in both hydraulic/pneumatic actuated configuration
- Ability to coupled up with a torque reducer for larger size, high pressure gate valve

Standard Operating and Dimensional Data

<table>
<thead>
<tr>
<th>Nominal Size (inches)</th>
<th>Working Pressure (psi)</th>
<th>A (inches)</th>
<th>B (inches)</th>
<th>Weight (pounds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 ( \frac{1}{8} ) in</td>
<td>3,000 / 5,000</td>
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<td>24.3</td>
<td>235</td>
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<tr>
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<td>10,000</td>
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<td>393</td>
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<td></td>
<td>15,000</td>
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</tr>
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<td></td>
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</tr>
</tbody>
</table>
Seaboard™ Model 1640RS Gate Valve

The Seaboard™ Model 1640RS gate valve's design has been rigorously field-tested to maintain high standards of quality and has a one-piece slab gate's floating seats use line pressure to supply the sealing force. Stem packing is chemically inert, using spring energizing rings that requires no plastic injection or reenergizing.

The ball-screw is a low torque design with a maximum of 17 turns for full actuation.

Features

Metalt-to-Metal Seals
- Utilized in the gate/seat, body/bonnet and stem/bonnet backseat

Selective Backseat
- Provides proven safety during venting, lubrication and stem packing replacement
- Backseat can be employed without shifting gate position

Floating Seats
- Allows bi-directional use
- Requires no lubrication to seal

Threaded Packing Gland
- Accommodates replacement of bearings and shear pin at full pressure differential

No Body Penetrations
- A single lubrication injection port is located outboard of the backseat in each bonnet allowing cavity lubrication or venting of trapped pressure after backseat operation

Benefits

- Provides smooth operation during extreme thermal cycles
- Easily closed with minimal force resulting in elimination of potential valve cavity pressure lock
- Easy to maintain in-line without the use of special tools
- Stem packing can be replaced while the valve is under pressure

<table>
<thead>
<tr>
<th>Size (inches)</th>
<th>Pressure</th>
<th>Turns to Operate</th>
</tr>
</thead>
<tbody>
<tr>
<td>4½ in</td>
<td>15,000 psi</td>
<td>11 turns</td>
</tr>
<tr>
<td>5½ in</td>
<td>10,000 and 15,000 psi</td>
<td>14 turns</td>
</tr>
<tr>
<td>7½ in</td>
<td>10,000 and 15,000 psi</td>
<td>17 turns</td>
</tr>
</tbody>
</table>
Seaboard™ NWC-H Overshot Connector

Developed for offshore use, the SeaboardTM NWC-H overshot connector has been specifically designed to decrease critical failures using a safe and reliable method. The NWC-H overshot connector provides a quick response solution where existing well infrastructure no longer offers a conventional point of connection because it is attached to the bottom of a capping stack and enables it to be installed directly over a producing well.

Benefits
- Provides an emergency well containment connection for various casing and pressure ranges
- Creates a point of connection for capping stacks
- Provides a safe reliable method to remediate critical failures and reduces the environmental impact of a wild well
- Increases efficiency, the system can be placed on a barge and ready to go at a moment's notice
- Proprietary patent pending technology protects sealing elements during installation

Features
- Enables the capping stack to connect directly to a wild well’s casing
- Available in a variety of sizes to accommodate a wide range of casing size needs and pressures
Seaboard™ Rotating Torque Tool (RTT)

The patent pending rotating torque tool design helps to eliminate excessive breakout issues by decoupling the mandrel hanger/landing string from the torsional loads created by casing string rotation. Its design and development helps increase safety and reduces cost.

Benefits

• Helps threads on mandrel hanger
• Limits risk of increased cost and installation delay
• Reduces costs associated with stuck pipe
• Allows for casing rotation and low torque release
• Minimizes non-productive rig floor handling time

Features

• The landing string and mandrel hanger are pre-assembled in shop, reducing handling time on the rig floor
• Designed to allow for assembly onto the casing string using top drives or CRT’s, reducing handling time on the rig floor
• Full bore access of the casing string during all stages of casing installation and cementing operations
• User is able to disengage from the mandrel hanger manually once the mandrel hanger has been landed
• Rotation of the casing string assembly, reducing time associated with stuck pipe
• Design allows for sufficient annular flow by for cementing operations
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Where you need us. When you need us.