



OIL STATES PIPER VALVE

Series MST Valves



Piper[™]

OIL STATES PIPER VALVE Series MST Valves

Permanent Service Topside Metal-Seated Ball Valves

OPTIMUM-FLOW TECHNOLOGY FOR EXTREME SERVICE APPLICATIONS

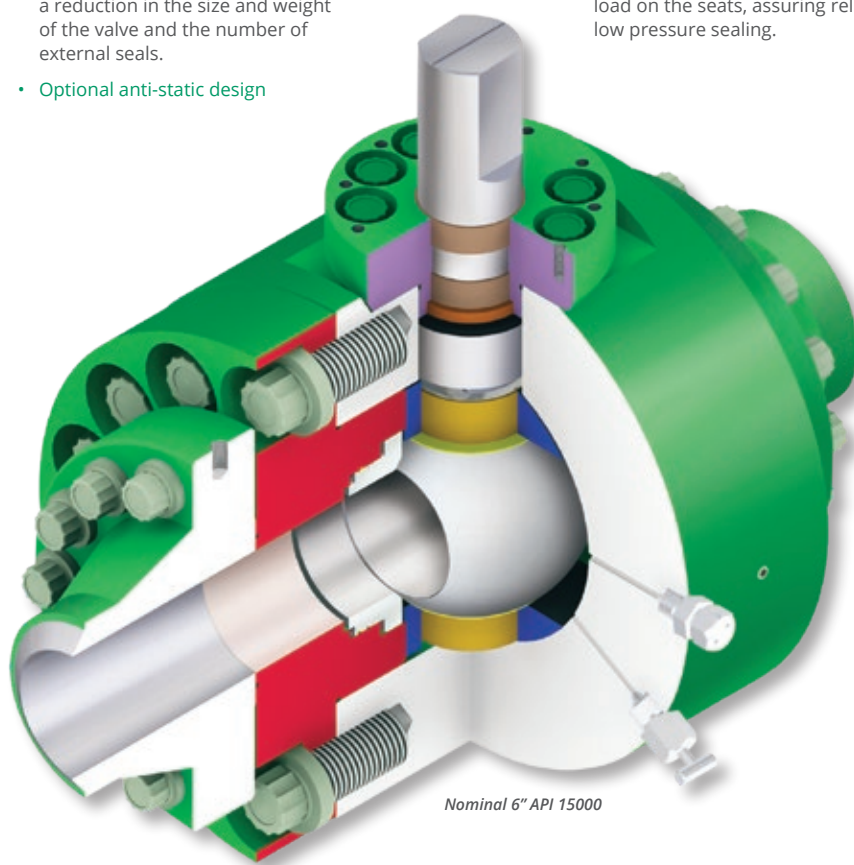
Designed to Perform in Severe Service

Oil States Piper Valve Series MST Permanent Service Topside Metal-Seated Ball Valve offers the following features:

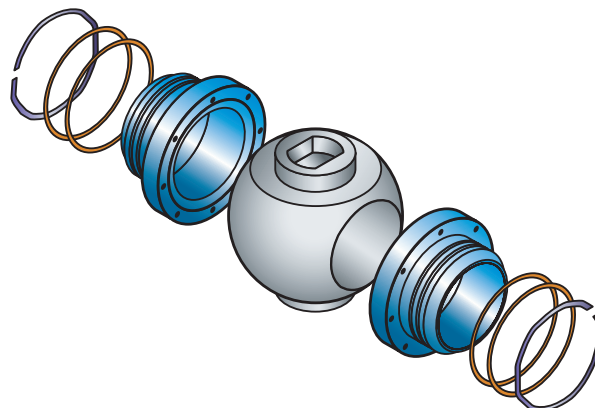
- Tungsten carbide overlay on ball/seat mating surfaces, lapped to each other for positive sealing.
- Internal trunnion blocks allow for a reduction in the size and weight of the valve and the number of external seals.
- Optional anti-static design
- Double block & bleed design for testing seat integrity prior to installation.
- Wave spring provide uniform pre-load on the seats, assuring reliable low pressure sealing.

MST DESIGN FEATURES

- ANSI Class 2500 valve bores are sized to closely or identically match the inside diameters of ASTM A106 Grade B pipe. API 10000 and 15000 valve bores are sized to match high strength API 5L piping and API 6A bore sizes.
- High pressure lap joint flange design requires minimal line spread for easy removal of the body group for service.
- Bolted retainer is designed to allow removal of either flanged connection for emergency end-of-line service.
- Xylan® coating on key carbon/alloy steel valve components retards corrosion, allowing field reparability, if necessary.
- Modular 3-piece design offers a wide range of end connection options.
- Compact valve design offers up to 60% less weight and 50% shorter end-to-end dimension than conventional API 6D ball valves.



- Double 'D' stem design easily adapts to both gear operators and actuators, eliminating the need for keys.
- Eight separate bearing surfaces inside the MST ball valves help reduce friction, resulting in lower break and operating torque.
- Pressure-containing components machined from bar steel and forgings and are available in a wide range of material options.
- Double block & bleed valve configurations available, along with integral ball/check valve combinations.
- The MST valve design can be fitted with either metal or soft seat.



Service Applications

Designed for Service in the Most Challenging Applications & Environments

Upstream Production Manifolds: Tungsten carbide over-laid ball & seats extend valve life in this most demanding service. The compact design can reduce the manifold footprint by over 50%, allowing room for other critical production components.

FPSO Turret Manifolds: Using compact MST valve dimensions in the initial turret design phase significantly reduces the manifold size and number of decks required. The lighter weight of the MST compact valves provides additional cost savings by reducing the amount of buoyancy required to offset the manifold weight.

Abrasive Flow Applications: The metal-to-metal sealing and “through conduit” bore design of the Series MST ball valve make it ideal for many high pressure flow applications that contain solids, including:

- Choke & Kill Manifolds
- Frac Valves
- SURF Applications
- Well Testing
- Standpipe Manifolds
- PLETs & PLEMs

Sizes & Working Pressures Available					
Size			Pressure Class		
Nominal (in.)	Nominal (mm)	Bore (in)	ANSI 2500	API 10000	API 15000
1	25	0.812	▲	▲	▲
2	50	1.500	▲	▲	▲
2	50	1.688	●		
3	75	2.624	●		
3	75	2.125		■	
3	75	2.063			■
4	100	3.250	●		
4	100	3.063		■	
4	100	2.625			■
6	150	4.897	●		
6	150	4.600			●
6	150	5.125		■	
6	150	4.063		■	
6	150	3.875			●
8	200	7.090	●		
8	200	7.063		■	
8	200	6.063		●	
8	200	5.187			●
10	250	8.500	●		
10	250	7.750		●	
10	250	6.063			●
12	300	10.126	●		
12	300	9.750		●	
12	300	7.750			●

▲ 'PB' Series

● 'MST' Series

■ 'MST' Series API 6A Values



Photo Courtesy of Tullow Oil

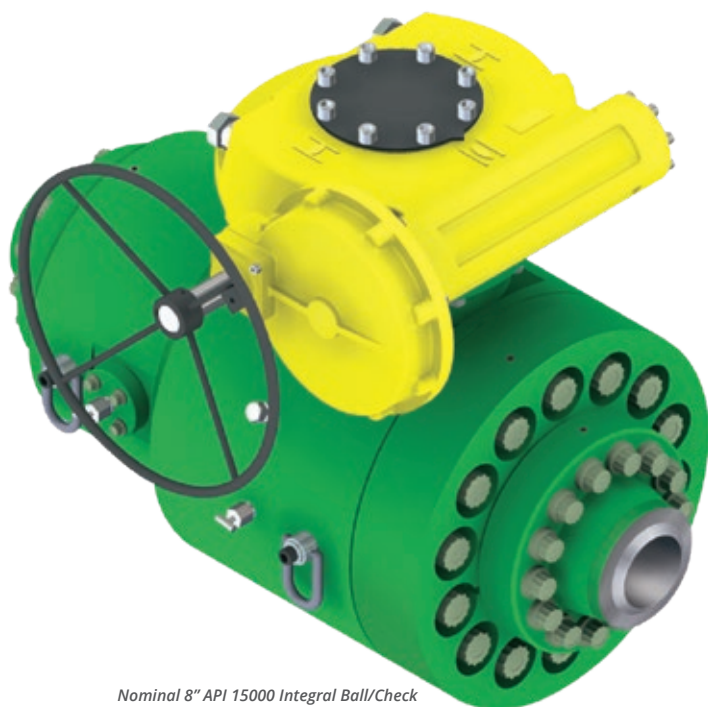
OIL STATES PIPER VALVE Series MST Valves

Multiple Valve Configurations

DESIGNED FOR EXTREME SPACE SAVING

Ball/Check Valve Combination Assemblies

Oil States Piper Valve Ball/Check combinations offer the shortest overall assembly length available for maximum space savings. For even greater space and weight reduction, we offer integral ball/check valve assemblies.



Nominal 8" API 15000 Integral Ball/Check

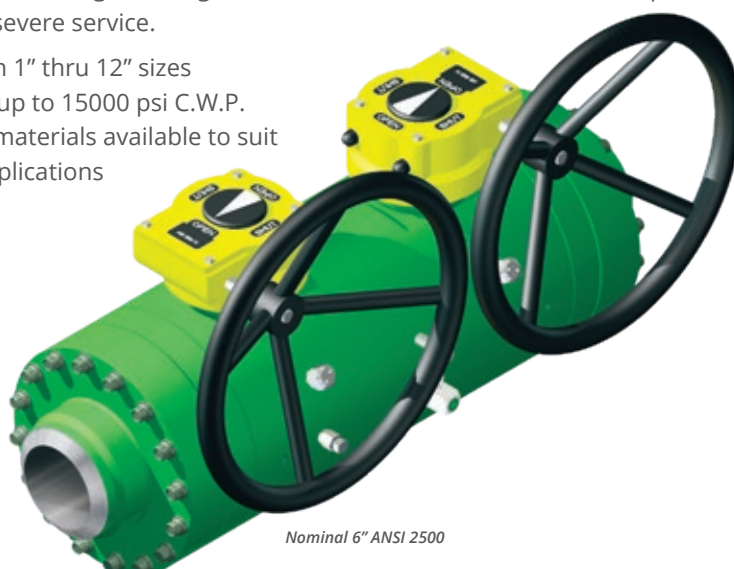
MULTIPLE VALVE CONFIGURATION BENEFITS

- Provides shut-off redundancy for compliance with double isolation requirements.
- Piper's compact valve design results in significant space and weight savings. Valves can be ordered with bonnets offset at any angle to fit in tight locations.
- Elimination of as many as two external connections required for mating two separate valves.
- All MST double block & bleed and ball/check combinations include our secured retainer design, allowing emergency end-of-line service on any end connection.

Double Ball, Double Block & Bleed Valves

For valve applications requiring double barrier protection, Oil States Piper Valve offers a full range of integral double block and bleed valves for topside and subsea severe service.

- Available in 1" thru 12" sizes
- Pressures up to 15000 psi C.W.P.
- Variety of materials available to suit specific applications

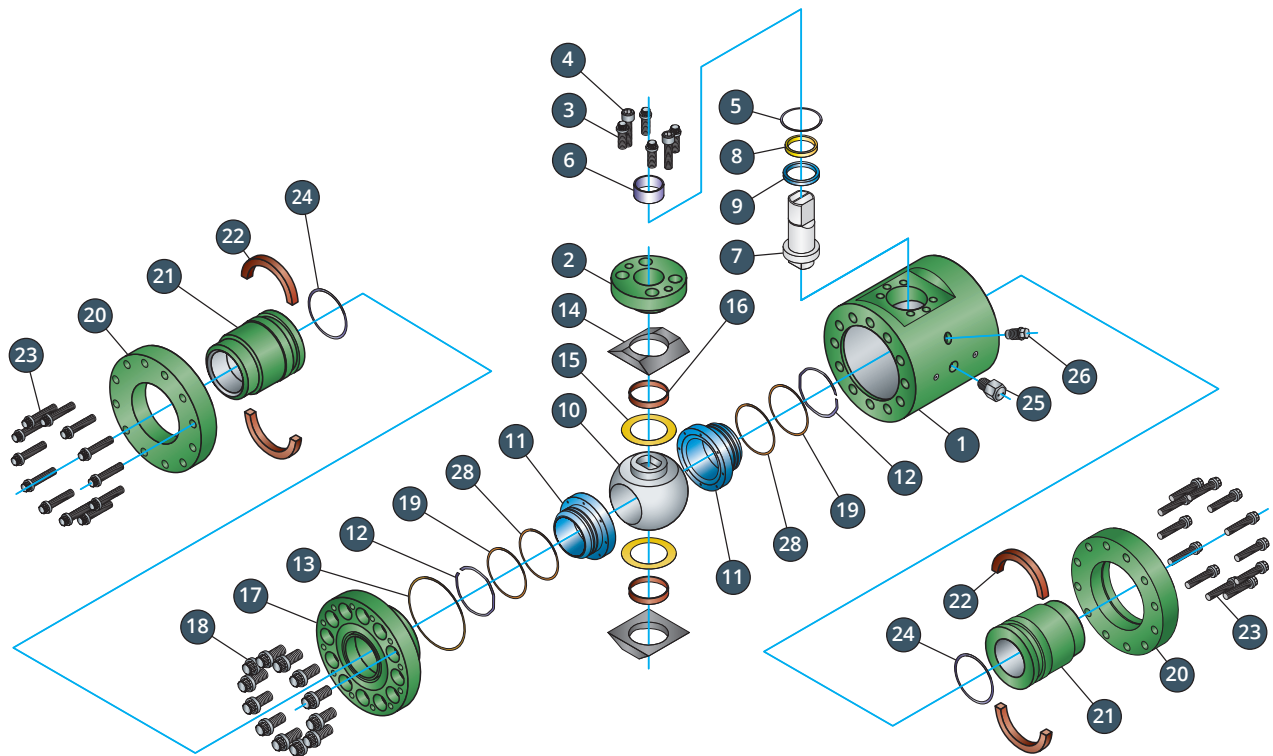


Nominal 6" ANSI 2500



MST Ball Valve Component Parts

Illustration shows weld end connections. Other end connections available upon request.



Index	Quantity	Description	Standard Materials	Optional Materials
1	1	Body	1040/42/45 CS (ANSI 2500)/4130 AS	Duplex & Super Duplex SS
2	1	Bonnet	1040/42/45 CS (ANSI 2500)/4130 AS	Duplex & Super Duplex SS
3	4	Bonnet Cap Screw	ASTM A193-B7 (Xylan® Coated)	ASTM A320-L7 (Xylan® Coated), Gr. 660
4	2	Stop Cap Screw	ASTM A193-B7 (Xylan® Coated)	ASTM A320-L7 (Xylan® Coated), Gr. 660
5	1	Bonnet Seal	Peroxide-Cured Nitrile	HNBR, Low Temp Nitrile, Viton®, Viton® B
6	1	Stem Bearing	Bronze/PTFE/STL	Bronze/PTFE/SS
7	1	Stem	17-4PH SS (HH1150)	Duplex & Super Duplex SS, Inconel®
8	1	Stem Seal	PolyMyte/Nitrile, PTFE/Elgiloy (15K)	Duplex & Super Duplex SS, Inconel®
9	1	Thrust Washer	Nitronic 60 (Xylan® Coated)	
10	1	Ball	1040 CS w. Carbide (ANSI 2500) 4130 AS w. Carbide (10K & 15K Models)	Duplex and Super Duplex SS w/Carbide, 17-4PH SS
11	2	Seat	1040 CS w. Carbide (ANSI 2500) 4130 AS w. Carbide (10K & 15K Models)	Duplex and Super Duplex SS w/Carbide, 17-4PH SS
12	2	Wave Spring	Inconel® X-750	Consult Factory
13	1	Retainer Seal	Peroxide-Cured Nitrile	HNBR, Low Temp Nitrile, Viton®, Viton® B
14	2	Trunnion Block	4130 AS (SBN/QPQ)	17-4PH SS, Super Duplex SS
15	2	Trunnion Thrust Bearing	PTFE	
16	2	Trunnion Bearing	Bronze/PTFE/STL	Bronze/PTFE/SS
17	1	Retainer	1040/42/45 CS 4130 AS (Xylan® Coated)	Duplex and Super Duplex SS
18	8	Retainer Cap Screw	ASTM A193-B7 (Xylan® Coated)	ASTM A320-L7 (Xylan® Coated), Gr. 660
19	2	Seat Seal	PC Nitrile (ANSI 2500), PTFE Elgiloy (ISR)	HNBR, Low Temp Nitrile, Viton®, Viton® B
20	2	Swivel Flange	1040 CS/4130 AS (Xylan® Coated)	Duplex and Super Duplex SS
21	2	Weld Nipple	CS/AS/Duplex SS (Customer Spec.)	Super Duplex SS
22	4	Half Ring	Alloy Steel (Xylan® Coated)	Duplex and Super Duplex SS
23	24	Flange Cap Screw	ASTM A193-B7 (Xylan® Coated)	ASTM A320-L7 (Xylan® Coated), Gr. 660
24	2	Flange Seal	Peroxide-Cured Nitrile	HNBR, Low Temp Nitrile, Viton®, Viton® B
25	1	Body Grease Fitting	ENP Alloy Steel	316 SS, Super Duplex SS
26	1	Body Vent Fitting	ENP Alloy Steel	316 SS, Super Duplex SS
27	4	Socket Head Set Screw	18-8 Stainless Steel	
28	2	Seat Fire Seal	PTFE	

Note: Consult factory for other material.

OIL STATES PIPER VALVE Series MST Valves

Permanent Service Subsea Metal-Seated Ball Valves

OPTIMUM-FLOW TECHNOLOGY FOR PERMANENT SUBSEA SERVICE

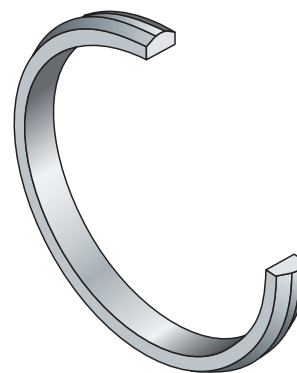
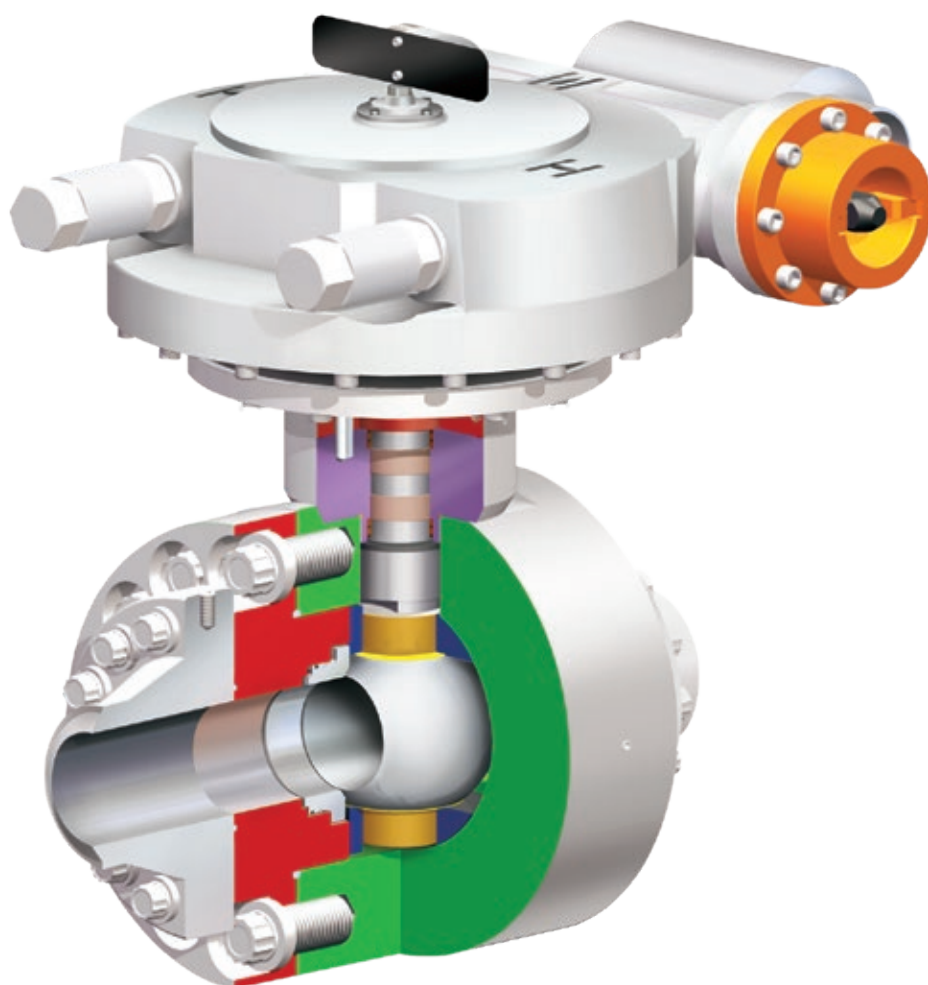
Designed for 30 Year Submerged Service

Oil States Piper Valve Series MST Permanent Service Subsea Metal-Seated Ball Valve offers the following features:

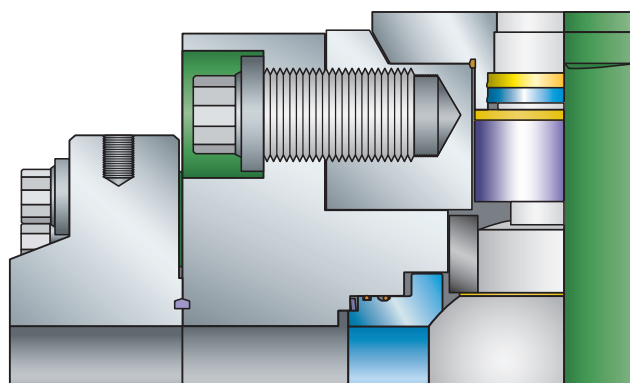
- **Tungsten carbide overlay** on ball/seat mating surfaces, lapped to each other for positive sealing.
- **Double metal barrier seals** employ Z-ring technology on all external connections.
- **Internal trunnion blocks** allow for a reduction in the size and weight of the valve and the number of external seals.
- **Double block & bleed design** for testing seat integrity prior to installation.

DOUBLE METAL BARRIER SEAL TECHNOLOGY

Piper employs our patented Z-Ring sealing technology on all external connections of our permanent service subsea valves. The ring is designed to deform under the proper bolt torque and allow the two flange faces to fully contact each other. Each flange seal groove and face have a corrosion resistant alloy (CRA) overlay which, when properly made up, will form a metal-to-metal seal between the Z-Ring and the ring grooves, and a second metal-to-metal seal between flange faces.



- **ROV operable interfaces** or subsea actuation options available.
- **Eight separate bearing surfaces** inside the MST ball valves help reduce friction, resulting in lower break and operating torque.
- **Wave springs** provide uniform pre-load on the seats, assuring reliable low pressure sealing.
- **Valves are designed for 30 year submerged service** in water depths to 12,000 feet.
- **Single & double ball designs** available.
- **Available in integral ball/check valve combinations.**
- **Optional anti-static design**



Quality Commitment

Product Verification & Testing

Oil States Piper Valve continually strives to improve its products and increase their performance. A direct result of this commitment is product verification that is obtained through stringent testing guidelines of API 6A, API 6D, API 598, API 17D, and others. Piper valves are also subjected to the following performance testing.

- **API 6FA/6FD**
Specification for Fire Test for Ball Valves and Check Valves.
- **API 6A Appendix F PR2**
Performance Verification Testing combining both the effects of pressure and temperature.
- **Erosive Flow Testing**
Consisting of 1,000 Open/Close cycles against a 0.1%, by volume, sand-laden slurry flowing at a velocity of 3 m/s.
- **Hyperbaric Testing (Subsea Applications)**
100% of Piper's subsea valves are subjected to external pressure equal to 10,000 feet of submerged service and held to prove the valves external pressure integrity.
- **API 6A PSL 3 & 3G, PSL 4**
Additional material testing, extended hydrostatic and gas testing.



Piper Certification

- OSI Piper Valve has maintained **ISO 9001** certification since August 2002.
- OSI Piper Valve has also maintained **API Q1** certification with **API 6A** and **6D mono-gramming** licenses since March 2012.



PIPER OPTIMUM-FLOW TECHNOLOGY



OIL STATES INDUSTRIES

VALVE SYSTEMS | Oil States Piper Valve

valve.systems@oilstates.com

Sales, Service, Engineering & Manufacturing
NORTH AMERICA
1020 E. Grand Boulevard
Oklahoma City, Oklahoma 73129 USA
Tel +1 405 671 2000

Your Local Piper Representative

oilstates.com



© 2020, Oil States Industries. All Rights Reserved.

CB\0620

Viton® is a registered trademark of DuPont Dow Elastomers • Celcon® is a registered trademark of Ticona • Xylan® is a registered trademark of Whitford • PEEK™ is a trademark of Victrex Plc