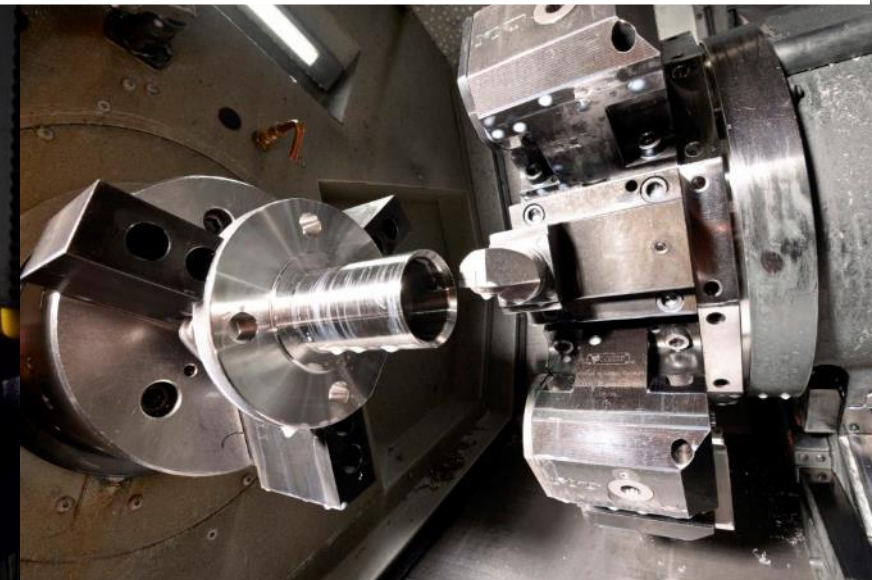


Cryogenic Valves

Graham Blanchard – Sales Director

20th November 2019

Fort Vale Engineering Ltd, Calder Vale Park



INVESTORS
IN PEOPLE



Fort Vale is the world leader in the design and manufacture of manways, valves and ancillaries for ISO Tank Containers, Road Tankers, Rail Cars and Static Vessels. Our product portfolio also includes Petroleum Transfer equipment and a range of bespoke engineering solutions for the Nuclear Industry. The latest product developments now extend to cryogenic equipment.



Current Manufacturing Approvals



- BSI (British Standards Institution)
 - TUV HPO Approval (Germany)
 - BAM (Germany)
 - Bureau Veritas (All countries)
 - S.N.C.F. (France)
 - British Engineering
 - UK Nuclear Design and Fabrication
 - TSG (China)
 - KGS (Korea)
 - AAR M-1002 and M-1003
- US DOT
 - ISO9001: 2008
 - ASME “U” Stamp
 - PED Module D & H
 - Lloyds Register
 - Germanischer Lloyd
 - ADR
 - RID
 - IMO/IMDG (All countries)
 - European Norms EN729-3

- Reduced Parts Count
- Reduced Weight
- Increased Flow
- Innovative shape improving performance
- Range available for sale in early 2020



Cryogenics – Globe Valves



450/5015/X, 450/5025/X, 450/5040/X, 450/5050/X

- Design standards

- I. BS EN 1626:2008
- II. BS EN 23208:2019
- III. BS EN 12266:2012

- Valve sizes

- I. DN15
- II. DN25
- III. DN40
- IV. DN50

- Witness tests completed for range DN15-DN40, currently waiting for final approval documents from Lloyds
- DN80 size globe valves currently going through testing and approval process.
- Approximately 25% lower in weight & approximately 20% increased flow compared with market leader



Cryogenics – Globe Valves



450/5015/X, 450/5025/X, 450/5040/X, 450/5050/X

- Advantages

- 1. Number of turns to operate (DN25)

Fort Vale – 5.5

Leading competitor – 8

- 2. Lower parts count

Fort Vale – 23

Leading competitor – 25



- 3. Lower weight & Increased flow

DN15:

Fort Vale – 1.3Kg & 6.1USgal/min

Leading competitor – 1.7Kg & 5.0 USgal/min

DN25:

Fort Vale – 1.9Kg & 15.2USgal/min

Leading competitor – 2.4Kg & 13.4 USgal/min

DN40:

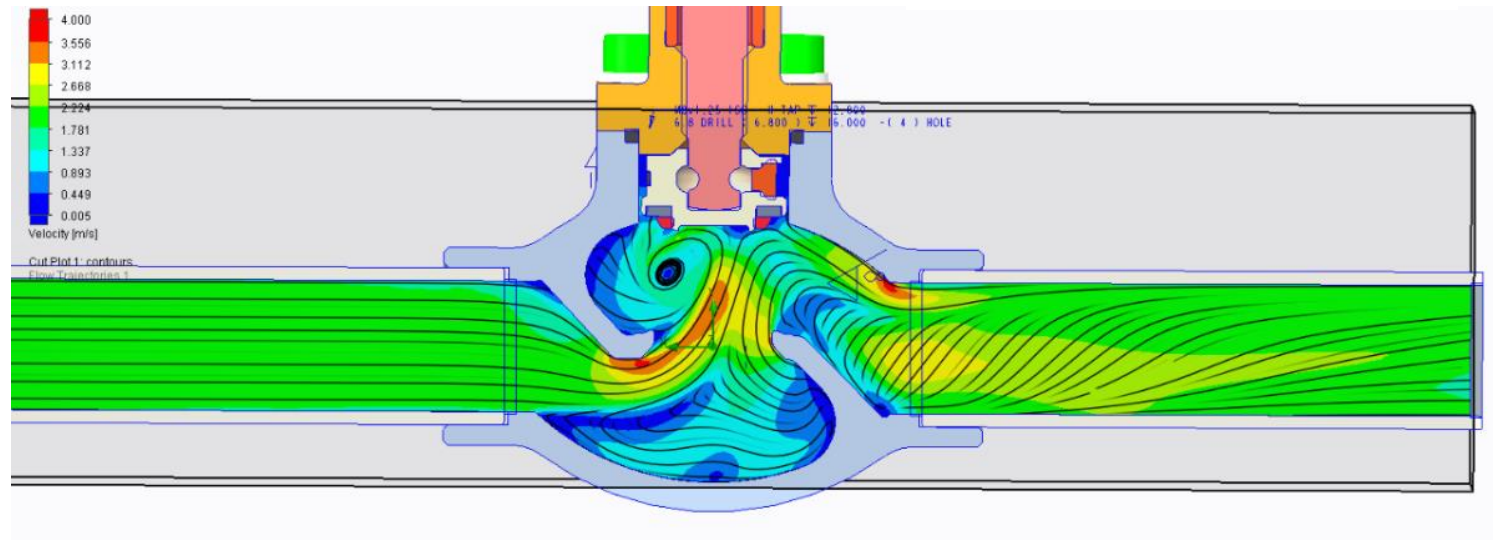
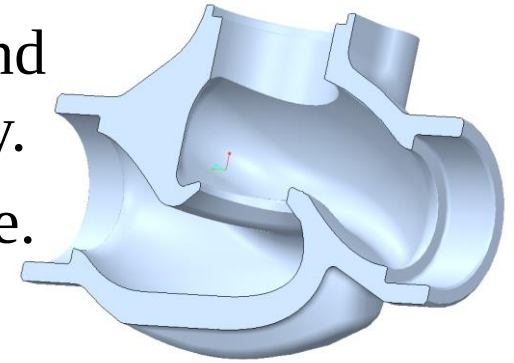
Fort Vale – 3.5Kg & 36.7USgal/min

Leading competitor – 4.7Kg & 26.3 USgal/min

- Increased flow achieved utilising FlowEFD.

- Internal ribs reduce turbulence and help direct the flow economically.

- Distinctive patented unique shape.

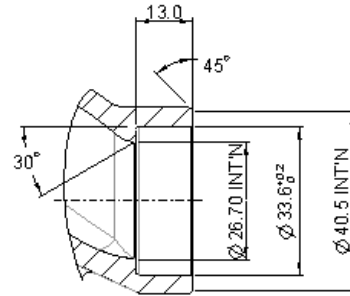


Cryogenics – Globe Valves

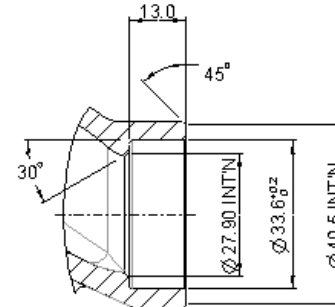
450/5015/X, 450/5025/X, 450/5040/X, 450/5050/X



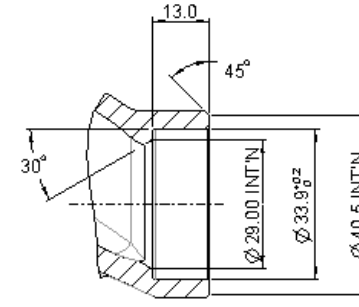
- Available options



PART SECTION A-A DETAIL 450/5026/1
SHOWING END DETAILS FOR 450/5026/1
TO SUIT SOCKET WELDED PIPE AS PER
1.0" NB SCH'D 40.

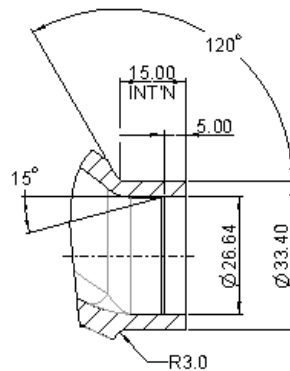


PART SECTION A-A DETAIL 450/5026/2
SHOWING END DETAILS FOR 450/5026/2
TO SUIT SOCKET WELDED PIPE AS PER
1.0" NB SCH'D 10

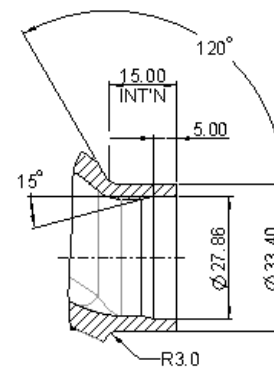


PART SECTION A-A DETAIL 450/5026/3
SHOWING END DETAILS FOR 450/5026/3
TO SUIT SOCKET WELDED PIPE AS PER
EN ISO 1127 O/D 33.7mm x 2.0mm WALL

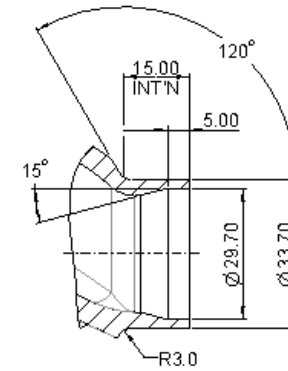
SOCKET WELDED END OPTIONS



PART SECTION A-A DETAIL 450/5026/4
SHOWING END DETAILS FOR 450/5026/4
TO SUIT BUTT WELDED PIPE AS PER
1.0" NB SCH'D 40



PART SECTION A-A DETAIL 450/5026/5
SHOWING END DETAILS FOR 450/5026/5
TO SUIT BUTT WELDED PIPE AS PER
1.0" NB SCH'D 10



PART SECTION A-A DETAIL 450/5026/6
SHOWING END DETAILS FOR 450/5026/6
TO SUIT BUTT WELDED TUBE AS PER
EN ISO 1127 O/D 33.7mm X 2.0mm WALL

BUTT WELDED END OPTIONS

Cryogenics – Relief Valves



64/XXXAAA, 64/XXXAAB, 64/XXXABA, 64/XXXABB

- Design standards
 - I. BS EN 4126-1:2013
 - II. BS EN 23208:2019
- Valve sizes
 - I. ½" BSP inlet to 1" BSP outlet
 - II. ¾" BSP inlet to 1" BSP outlet
 - III. Range from 2.9 to 50 Bar
- Relief valves have undergone initial witness testing with some success, however we need to make some slight changes to the lower pressure settings. Re-testing is hopefully happening in America before the Christmas shutdown, where we are confident that the full range will pass the requirements ready for launch in early 2020.



Cryogenics – Relief Valves

64/XXXAAA, 64/XXXAAB, 64/XXXABA, 64/XXXABB



- Advantages

1. Lower parts count

Fort Vale – 13

Leading competitor – 17

2. Lower weight

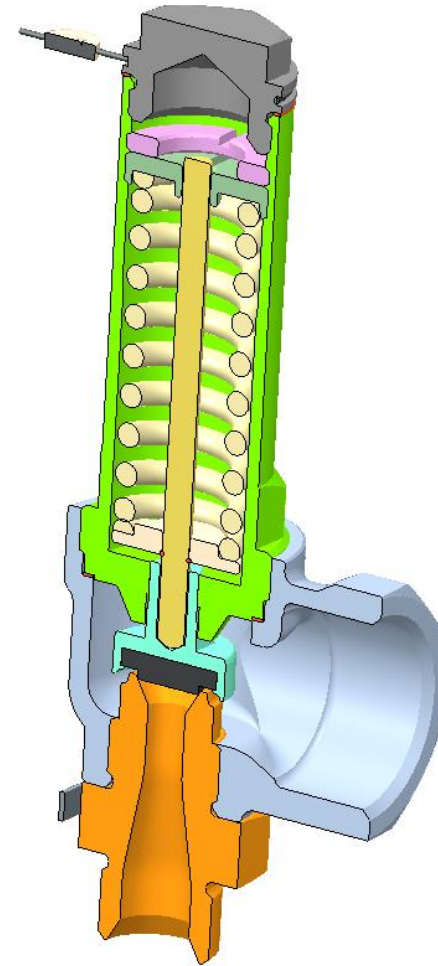
Fort Vale – 0.73Kg

Leading competitor – 0.78Kg

5. Increased poppet lift

Fort Vale – 2.1mm

Leading competitor – 1.7mm



Cryogenics – DN20 Diverter Valve

450/6020



- Design standards

- BS EN 1626:2008
- BS EN 23208:2019
- BS EN 12266:2012

- Valve size

- DN20

- Currently undergoing testing and we are hopeful to have approval by the end of Dec 2019/Jan 2020



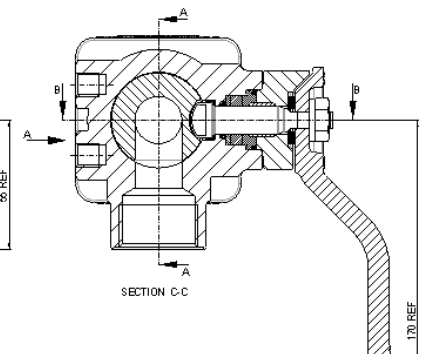
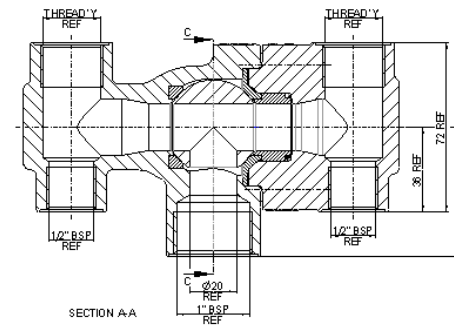
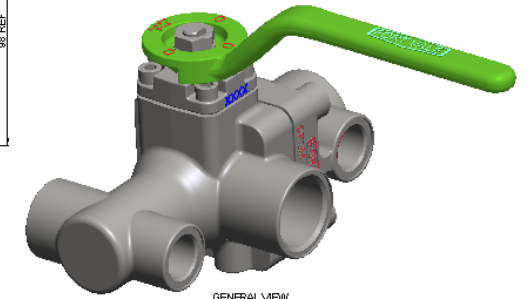
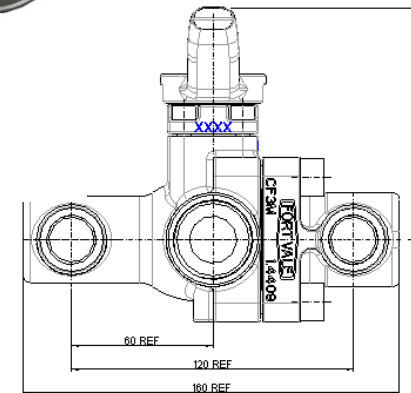
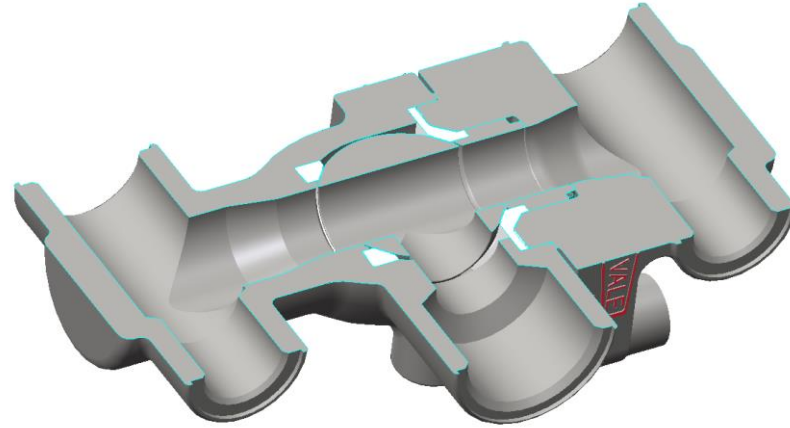
Cryogenics – DN20 Diverter Valve

450/6020



- Advantages

1. Lower weight
Fort Vale – 3.1Kg
Leading competitor – 4.7Kg
2. Compact seal energizing design
3. Smoother flow path than leading competitor
4. Firesafe design



Cryogenics – Check Valves



450/8015/X, 450/8025/X, 450/8040/X

- Design standards

- I. BS EN 1626:2008
- II. BS EN 23208:2019
- III. BS EN 12266:2012

- Valve sizes

- I. DN15
- II. DN25
- III. DN40

- Prototypes produced. Lower weight & improved flow rates compared with market leader.
- Waiting for customer feedback in relation to demand for this type of valve before further development continues.



Cryogenics – DN25 Changeover Valve

450/7025



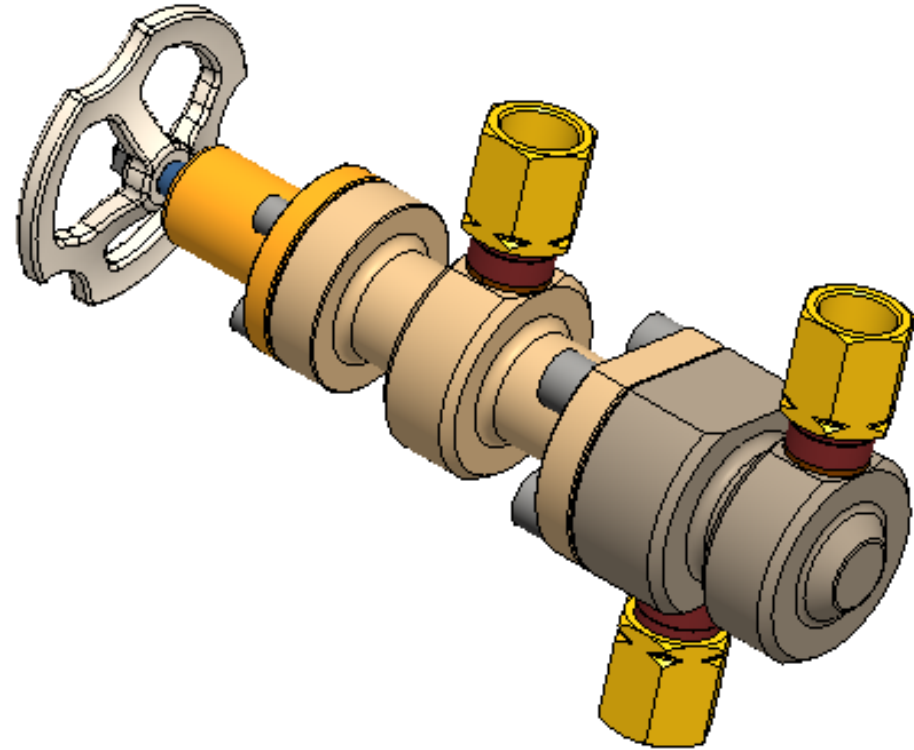
- Design standards

- I. BS EN 1626:2008
- II. BS EN 23208:2019
- III. BS EN 12266:2012

- Valve size

- I. DN25

- Currently under development and testing. We are hopeful for witness testing and approval to be carried out early 2020.



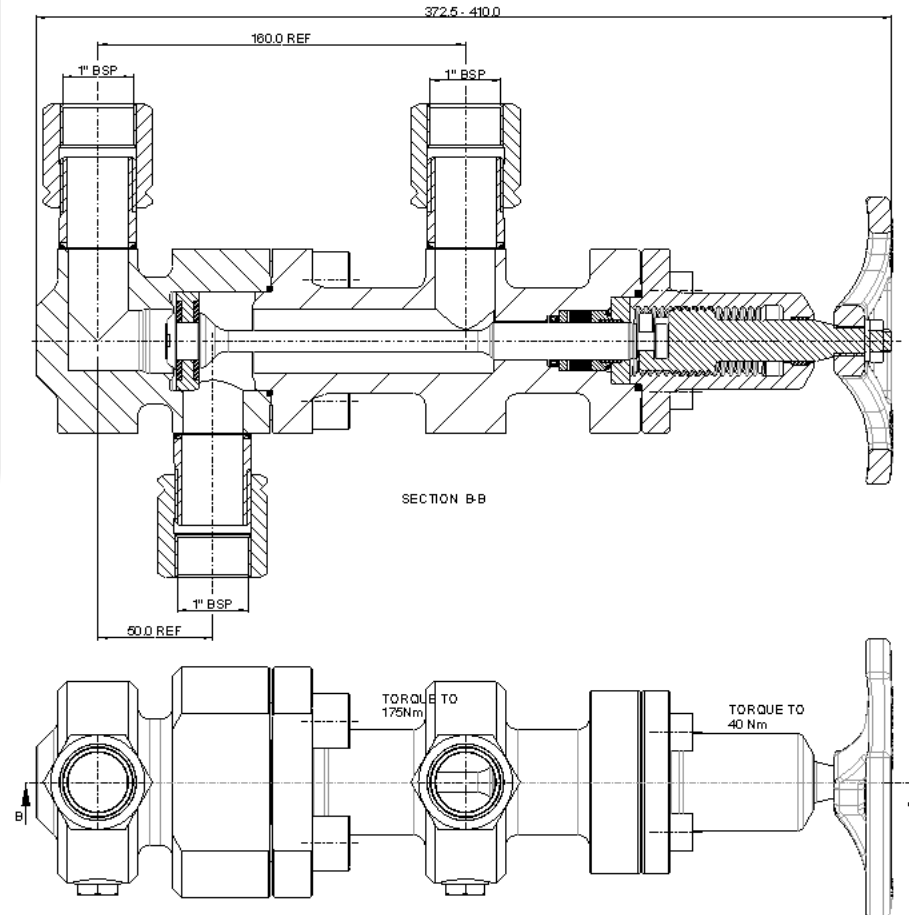
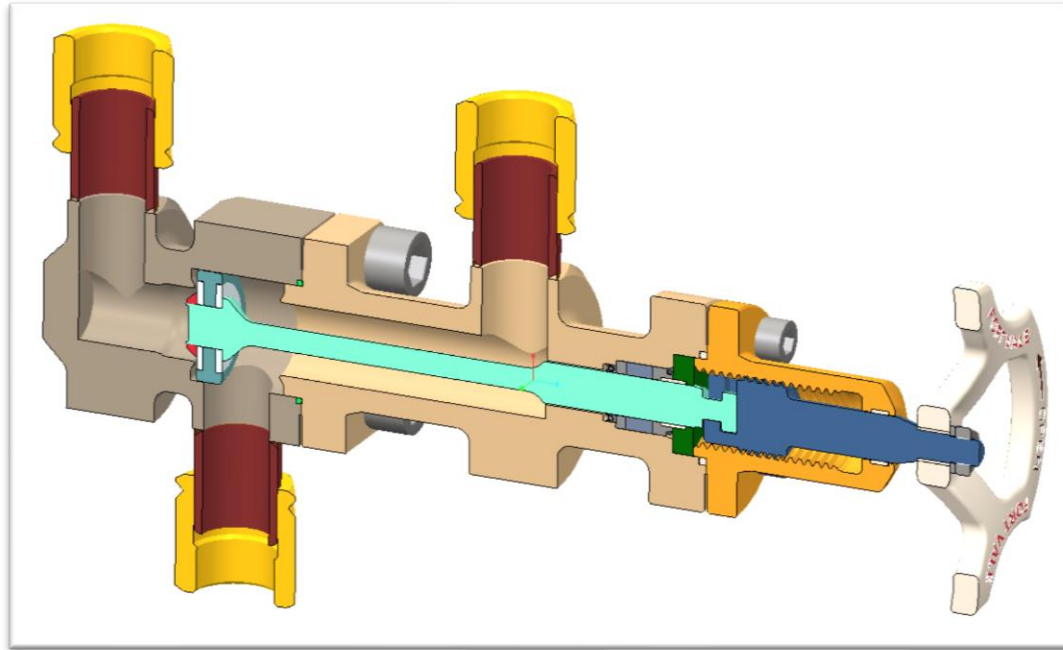
Cryogenics – DN25 Changeover Valve



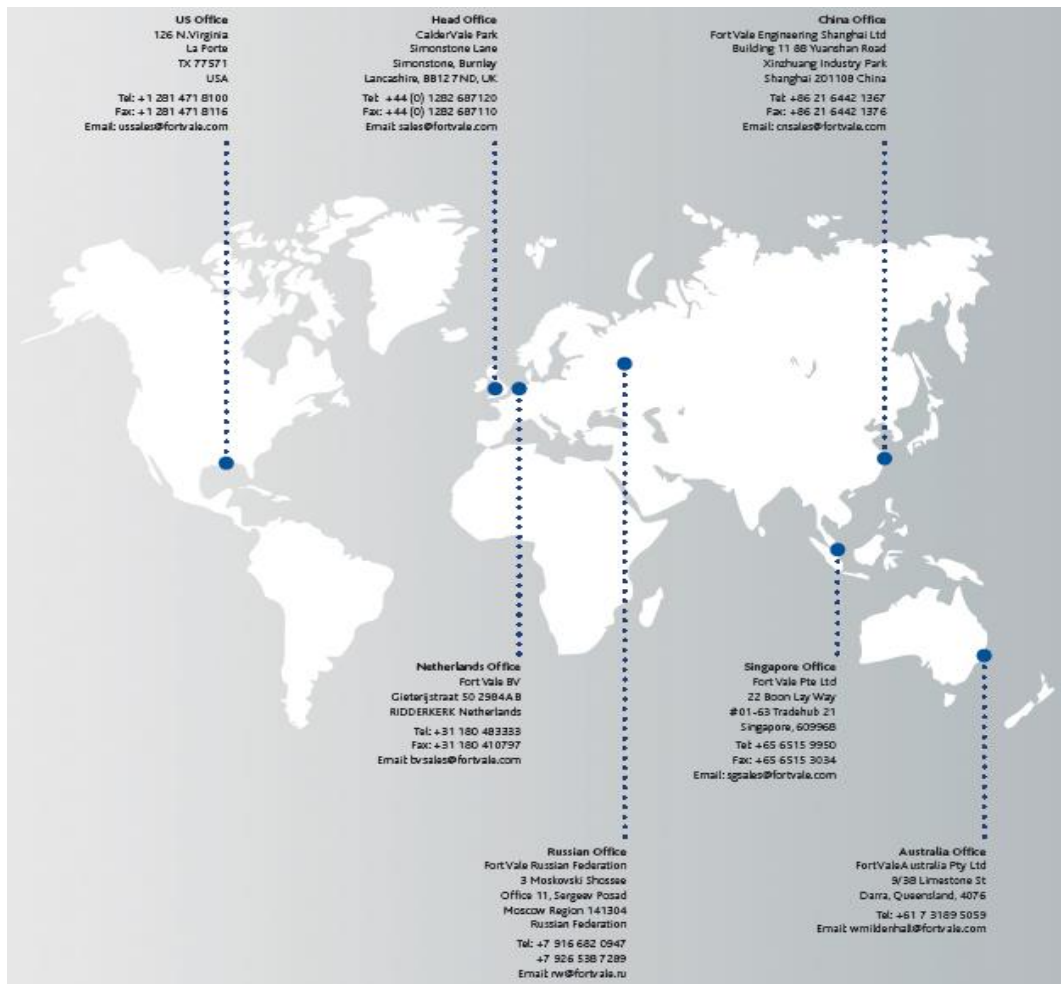
450/6020

- Advantages

1. Lower weight
Fort Vale – 10.3Kg
Leading competitor – 11.7Kg
2. Single piece main body
3. Internally energised seal assembly



Global Coverage for OEM Spares



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