

DUAL PLATE CHECK VALVES

INNOVATION IN THE PIPELINE



GOODWIN[®]
INTERNATIONAL LTD

www.checkvalves.co.uk

Goodwin International is the market leader in the design and manufacture of Dual Plate Check Valves for use in the world's hydrocarbon, energy and process industries. With a track record of supply spanning over 30 years, Goodwin has developed an enviable reputation for quality and reliability of product at internationally competitive prices.

Based in the United Kingdom, Goodwin sells internationally exporting to over 50 countries. Through its network of agents and distributors, with some US\$ 7,500,000 of inventory in 16 stocking locations worldwide, Goodwin offers outstanding support to its customers listed amongst whom are many of the world's end users, including oil majors and national oil companies, and national and international engineering contractors.

Goodwin Dual Plate Check Valves

6 Different Body Styles

Wafer (BR)
Flanged (BFR)
Solid Lug (BSR)
Buttweld end (BWR)
Buttweld end with access (BWA)
Hub-ended (BHR)

Sizes

2" - 144" (50mm - 3600mm)

Pressure Classes

ASME 150 - 2500
API 2000 - 20000
PN 10 - PN 400

Materials

Ductile and Ni-Resist[®] Irons; Carbon Steels; Stainless Steels; Duplex and Super Duplex Stainless Steels; Aluminium Bronzes; High Nickel Alloys; Titanium.

Features

Designed, manufactured, assembled and tested in accordance with Quality Assurance System accredited by BSI to BS EN ISO 9001.

Certifiable in compliance with European Pressure Directive (PED) 97/23/EC and/or ATEX Directive 94/9/EC to meet customer requirements when specified.

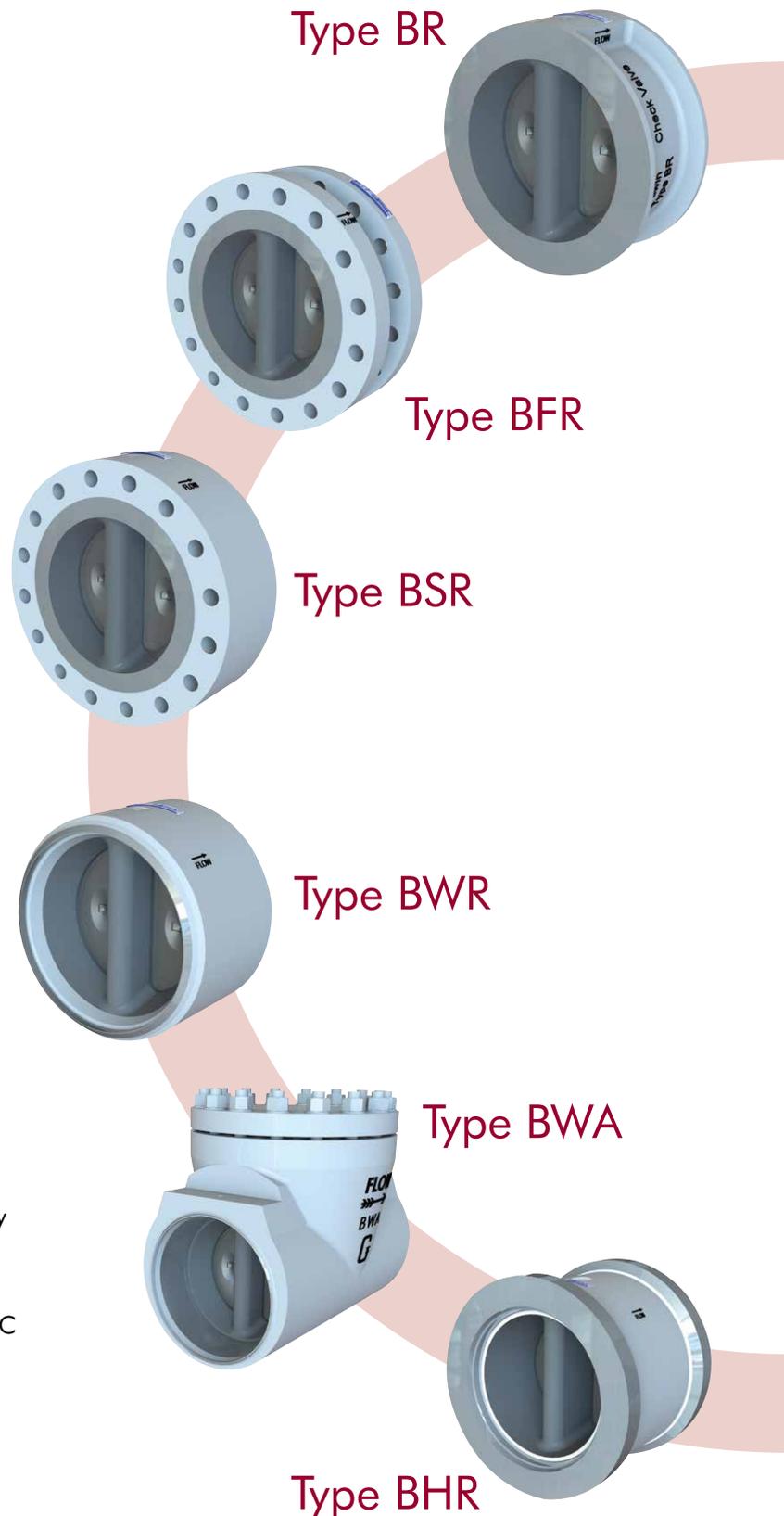
Designed and tested to API 594.

All bodies and plates certified to BS EN 10204 3.1 as a minimum.

Retainerless design as standard.

No screwed body plugs - no leakpath to atmosphere - no fugitive emissions.

Firetested design. Firetest approved and certified to API 6FA, API 6FD and BS EN ISO 10497.

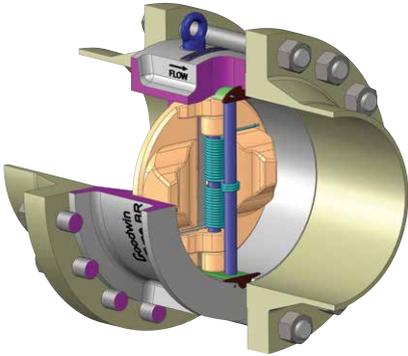


Major Project Successes

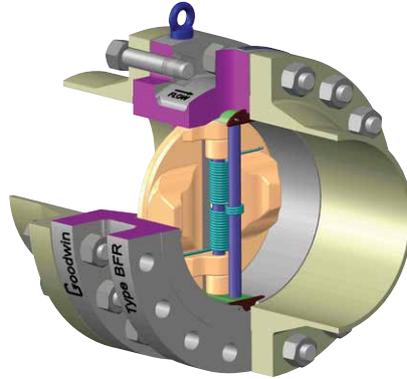
PROJECT NAME	MARKET SECTOR	LOCATION	CUSTOMER	ENGINEERING CONTRACTOR	YEAR
Singapore Hydro-Desulphur	Refinery	Singapore	ExxonMobil Chemical Asia Pacific	JGC	2011
Algerian Oman Fertiliser	Fertilizer	Algeria	Algeria Oman Fertiliser Co.	MHI	2011
Yanbu Export Refinery	Refinery	Saudi Arabia	Saudi Aramco	SKEC	2011
Al Khafji Ratawi Water Injection	Gas	Saudi Arabia	Khafji Joint Operations	J Ray McDermott	2011
Goliat FPSO	Oil	Norway	Eni Norge	HHI	2011
Borouge 3 Polyolefins Units	Petchem	Ruwais, UAE	Borouge	SEC	2011
Deen Dayal Wellhead Platform	Gas	India	Gujarat State Petroleum Corp	L & T	2011
Jasmine	Gas	North Sea, UK	ConocoPhillips	Worley Parsons	2011
Barzan Onshore	Gas	Qatar	Rasgas	JGC	2012
BP Quad 204 Topsides and Hull	Oil	North Sea, UK	BP	HHI	2012
BP Quad 204 Turret	Oil	North Sea, UK	BP	SBM	2012
Majnoon Oil Field Development	Oil	Iraq	Shell Iraq Pet. Dev.BV	Petrofac	2012
Satah Full Field Development	Oil	Abu Dhabi, UAE	ZADCO	Technip & NPCC	2012
Tangshan LNG	LNG	China	CNPC	HQC	2012
Montrose BLP	Oil	North Sea, UK	Talisman Sinopec Energy (UK)	CB&I	2012
Hebron GBS Topsides	Oil	Newfoundland	ExxonMobil	Worley Parsons	2012
Valemon	Gas	Norway	Statoil	SHI	2012
Queensland Curtis	LNG	Australia	BG / Origin	Bechtel	2012
Ichthys CPF Topsides & Hull	Gas	Australia	Inpex	SHI	2012
Ichthys FPSO Topsides & Hull	Gas	Australia	Inpex	DSME	2013
Prelude FLNG	FLNG	Australia	Shell	Technip-Samsung	2013
Prelude FLNG - Turret	FLNG	Australia	Shell	SBM	2013
Hejre Dev. Platform	Oil	Denmark	Dong Energy	Technip	2013
Wheatstone LNG	LNG	Australia	Chevron	Bechtel	2013
Wasit Gas Dev. Programme	Gas	Saudi Arabia	Saudi Aramco	SKEC	2013
Petronas LNG Train 9	LNG	Malaysia	Petronas	JGC	2013
Upper Zakum 750K Project	Oil & Gas	Abu Dhabi	ZADCO	NPCC/Technip	2013
Cygnus Alpha Platform	Gas	UK	GDF Gas De France	AMEC	2013
Moho Nord TLP & FPU	Oil	Congo	Total	HHI	2013
Shah Deniz Phase II	Gas	Azerbaijan	BP	KBR	2013
Martin Linge	Oil & Gas	UK/Norway	Total	Technip	2013
Nyhamna Onshore Facilities	Gas	Norway	Shell	Kvaerner Stord AS	2013
West Qurna	Oil	Iraq	ExxonMobil	Fluor Daniel	2013
Jazan Refinery	Refinery	Saudi Arabia	Saudi Aramco	JGC	2014
Ivar Aasen Field Development pdQ	Oil	Norway	Det Norske	SMOE	2014
Longford Gas Conditioning Plant	Gas	Australia	Esso	CB&I	2014
Cladhan Topsides modifications	Oil	UK	TAQA Bratani	AMEC	2014
Stampede	Oil	GoM, USA	Hess	Mustang	2014
Rizhao to Yizheng Oil Pipeline	Pipeline	China	Sinopec	East Pipeline Design Inst.	2014
Zakum Oil Lines Replacement (ZKOL)	Gas	Abu Dhabi, UAE	Adma Opco	NPCC	2014
Shaybah CPF	Gas	Saudi Arabia	Aramco	Samsung Engineering	2014
Umm Wu'al Ammonia Plant	Chemical	Saudi Arabia	Ma'aden	Daelim	2014
CO2 Injection Plants	Oil	Abu Dhabi, UAE	ADCO	Alsa	2014
Incahuasa	Gas	Bolivia	Total	Tecna	2015
Tuz Golu UGS	Gas	Turkey	Botas	China Tianchen Eng. Corp.	2015
Yamal LNG	LNG	Russia	Novatek / Total / CNPC	TMSI	2015
Egina FPSO Topsides and Hull	Oil	Nigeria	Total	SHI	2015

Installation Between End Connections

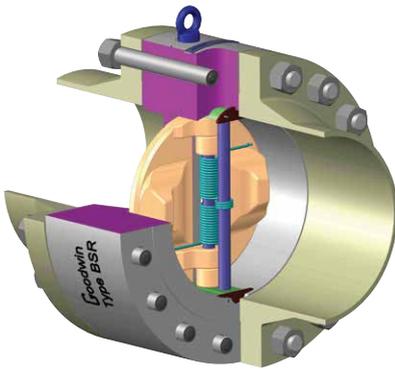
Type BR
Wafer



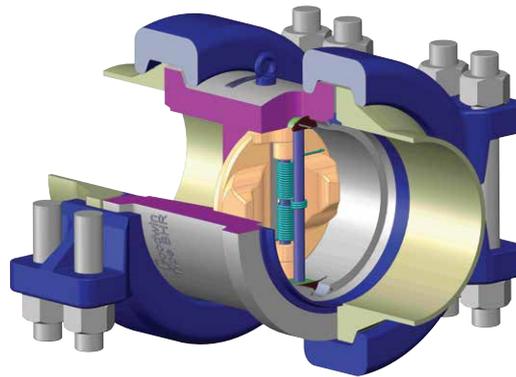
Type BFR
Flanged



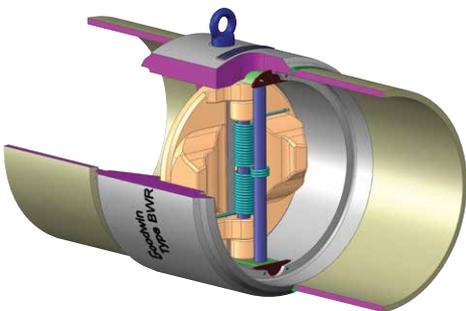
Type BSR
Solid Lug



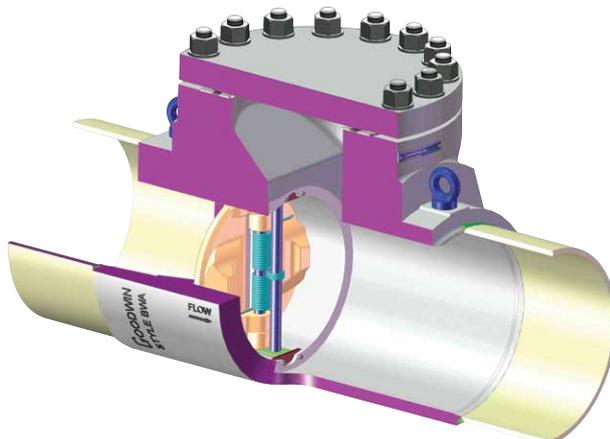
Type BHR
Hub Ended



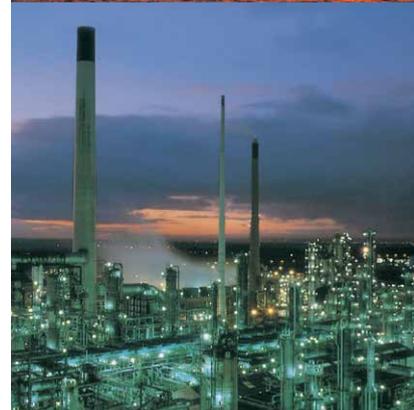
Type BWR
Buttweld End



Type BWA
Buttweld End with access



BR, BFR & BSR face-to-face dimensions to API 594.
BH & BHR face-to-face dimensions to manufacturer's standard.
BWR & BWA face-to-face dimensions to manufacturer's standard.



Facilities & Resources

Goodwin's Check Valve manufacturing facilities in Stoke-on-Trent, England, comprises of a Steel and Super Nickel alloy foundry (Goodwin Steel Castings) and a well equipped CNC machine shop with full design, fabrication, inspection and test facilities (Goodwin International).

The ISO 9001 foundry specialises in producing high integrity, pressure vessel castings from a few kilos to 18,000 kg in weight. The materials cast by the foundry include ductile and Ni-Resist® irons, carbon and low alloy steels, stainless steels, duplex stainless steels and super nickel alloys such as Hastelloy® and Alloy 625. Goodwin's ability to produce the special alloys is enhanced by its in-house 10 tonne AOD refining furnace.

The design, machine and assembly shops cover some 24,500m² and are equipped with 42 modern CNC machine tools that are the core of the production and are supplemented by many conventional machine tools.

The test facilities include six hydraulic hydrostatic test rigs, the largest of which has a 2500 tonne hydraulic ram, and two pneumatic test rigs. Cryogenic testing is also carried out on site where valves are cooled by liquid nitrogen at -196°C and leak tested with helium gas.

Valve design is carried out using 3D CAD and is verified on computers utilising finite element analysis and Flow Simulation programs. Both the foundry and the design, machining, assembly and test facilities are audited and accredited to BS EN ISO 9001.

Extensive in-house testing and laboratory facilities are available including:-

- Hydrostatic Pressure Testing (25000psig/1725barg)
- High Pressure Gas Testing (15000psig/1035barg)
- Low Temperature (-46°C) and Cryogenic Temperature (-196°C) Pressure Testing
- High Temperature Pressure Testing to 550°C
- Helium Leak Testing (Mass Spectrometer)
- Tensile / Bend / Impact / Hardness / Testing
- Corrosion Testing
- Metallography
- Magnetic Particle
- Dye Penetrant
- Ultrasonic Examination
- Radiography
- Chemical Analysis
- Alloy Verification / Positive Material Identification (PMI)
- Feritscope Verification
- CMM Measurement
- Laser Measurement



DUAL PLATE CHECK VALVES



FM 00343



EMS 600979



OHS 600980



IMR 613512



594-0005 6D-1034



Certificate No.
CE 55079



Registered
Supplier No. 42851

Engineering Contractors

AIBEL
AIR LIQUIDE
AIR PRODUCTS
ALSA
AKER SOLUTIONS
ALLIANCE
AMEC
ATLANATICO SUL

BANTREL
BECHTEL
BLACK & VEATCH
BOC

CB & I LUMMUS
CCC
CHIYODA
CLOUGH
COLT ENGINEERING
CTCI

DAELIM
DAEWOO
DEGREMONT
DODSAL
DOOSAN

EIL
ENPPI
ENTREPOSE

FLUOR
FOSTER WHEELER
GEC ALSTOM
GROOTINT
GS ENGINEERING

HAMWORTHY WARTSILLA
HANWHA
HITACHI ZOSEN
HYUNDAI

I V OIL & GAS
ICA FLUOR
IDE
IHC GUSTO

JACOBS
JGC
JP KENNY

KAWASAKI
KBR
KEPPEL FELS
KT KINETICS
KVAERNER STORD

LARSON & TOUBRO
LINDE
LITWIN
LURGI

MACCHI
McDERMOTT
MITSUI
MITSUBISHI
MMHE
MODEC
NIPPON STEEL
NPCC

PT TRIPATRA
PENANG SHIPBUILDING
PETROFAC
PETROJET
PROSERMAT
PT GUNANUSA
PUNJ LLOYD

QUIP

RANHILL WORLEY
ROSENBERG

SAIPEM
SAKHNEFTGAZ ENGINEERING
SAMSUNG
SBM
SEC
SEMBAWANG ENGINEERING
SHAW
SIME DARBY
SIME SEMBAWANG

SK ENGINEERING
SMOE
SNC LAVALIN
SOFEC
SOFRESID
STANTEC
STOLT OFFSHORE
SUMITOMO

TARGET E & C
TECHINT
TECHNIP
TECNICAS REUNIDAS
TECPETROL
THAI NIPPON STEEL
THYSSEN KRUPP UHDE
TOYO ENGINEERING
TRI OCEAN

UHDE SHEDDEN
UNIVERSAL PEGASUS

VEOLIA

WEIR WESTGARTH
WILBROS
WOOD GROUP PSN
WOOD GROUP MUSTANG
WORLEY PARSONS

End Users

ADCO
ADMA OPCO
ADNOC
ADWEA
AGIP
AIOC
AIR LIQUIDE
ALSTOM
AMERADA HESS
ANADARKO
APACHE
ARABIAN CHLOR VINYL

BAPETCO
BASF
BG
BHP
BOROUGE
BOTAS
BP

CHEVRON
CNOOC
CNPC
CNRL
CON EDISON
CONOCOPHILLIPS
CTOC

DOLPHIN ENERGY
DONG ENERGY
DOW CHEMICAL
DUKE POWER
DUPONT
EASTMAN CHEMICALS
ECOPETROL

EGAT
EGPC
EMEPMI
ENAGAS
ENBRIDGE
ENCANA
ENI
EXXON NEFTEGAS
EXXONMOBIL

FORMOSA

GAIL
GASCO
GASPROM
GAZ DE FRANCE
GDF SUEZ
GE
GENREF
GORO NICKEL

HESS CORP
HUSKY OIL

IMPERIAL OIL
INPEX
IOCL
IPCL

JUPC

KNPC
KOC
KOGAS
LASMO
MA'ADEN
MAERSK

MARATHON
METHANEX
MEW (OMAN)
MEW (KUWAIT)
MINERA ESCONDIDA
MURPHY OIL

NCPOC
NLNG
NNPC
NOVA CHEMICALS

OCCIDENTAL
OMV
ONGC
ORIGIN ENERGY
ORYX
OSX

PDO
PDVSA
PEARL OIL
PEMEX
PERTAMINA
PETROBRAS
PETROCHINA
PETRONAS
PETROVIETNAM
POSCO
PTT
PTTEP

QAFAC
QAFCO
QAPCO
QLGC (QATARGAS)

QP
QVC

RASGAS
RELIANCE
REPSOL

SABIC
SAKHALIN ENERGY
SANTOS
SASOL
SAUDI ARAMCO

SAUDI METHANOL
SEC
SEGAS
SHELL
SINOPEC
SK CORP
SONATRACH
STATOIL
SUNCOR
SYNCRUDE

TAKREER
TALISMAN
TAQA BRATANI
TENGIZCHEVROIL
THAI OLEFINS
TOTAL
TRANSCANADA
TURKISH PETROLEUM

WOODSIDE

YPF

ZADCO

Industries Served

On & Offshore Oil & Gas Production
Refinery
Petrochemical
Chemical
Fertilizer
Gas Plant
GTL
LNG
Onshore LNG Plants

FLNG
FPSO
Liquid Gases
Terminals
Pipeline
Power
Desalination
Water

Typical Applications

Pump discharge
Compressor discharge
Compressor suction
Heat Exchangers
Reactors
Separators
Vessels

High / low pressure
High / low temperature
Cryogenic
Erosive
Corrosive
Flammable
Toxic

Chemicals
Petrochemicals
Hydrocarbons
Gases
Liquids
Steam
Seawater

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