RETROVIS ENTERPRISES LTD

General Engineering Works & Industrial Supplies

CATALOGUE

WELDING MACHINES

ARC WELDING MACHINES
Sizes: 200Amp-220v, 250A-220v, 315A-220v, 400A-415v, 500A-415v.

MIG WELDING MACHINES
250Amp-220v, 350A-380v, 500A-380v.

GAS LESS MIG WELDING MACHINE
250Amp-220v. (mig wire size 5kg)

TIG WELDING MACHINE
200A - 220v, 315A - 380v.

PLASMA CUTTER MACHINE
CUT-100A, CUT-160A

WELDING ACCESSORIES

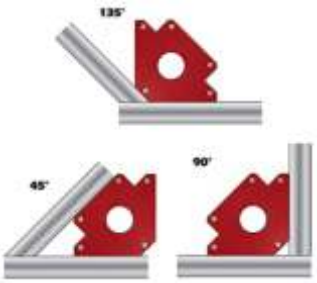
MIGTORCH
Sizes: 15AK, 24KD, 36KD
Contact Tip, Tip Holder, Diffuser
Conical Shroud

MIGTORCH PANASONIC
Sizes: 200A, 300A, 500A
Spray Nozzle, Tip Holder, Insulator
Diffuser, Contact Tip

PLASMA TORCH & ACCESSORIES

TIG TORCH
Tig Backcup, Ceramic, Collet
Collector Body, Tungsten

ELECTRODE HOLDER



MAGNETIC ELECTRODE HOLDER

EARTH CLAMP

Blow Torch

CO_2 Regulator

Argon Regulator

Cutting Torch local

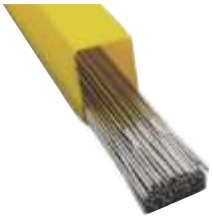
Cutting Torch Chinese

Acetylene Regulator

Oxygen Regulator

WELDING ACCESSORIES

GAS HOSE PIPE SINGLE & TWIN



Stainless steel
filler wire 1.6mm, 2.4mm

Aluminium fille wire
2.4mm, 3.0mm

Brass brazing rods
3.0mm

Copper filler wire
3.0mm

PICKLING PASTE

BRASS/ ALUMINUM
BRAZING FLUX

PLASMA CUTTING NOOZLE

FLASH BACK ARRESTOR

CUTTING NOZZLE
1/16 1/32 3/64 PNME
& ANME

SAFETY GEAR

CONSTRUCTION HELMET

REFLECTIVE VEST

MASKS

SAFETY SHOES

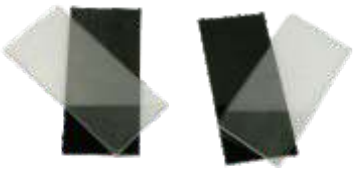
SAFETY HARNESS BELT

LIFTING BELT

HEAD SHIELD & HAND HELD SHIELD

AUTO DARKENING HEAD SHIELD

SAFETY GOGGLES & WELDING GOGGLES



WELDING GLASS CLEAR & DARK

WARNING TAPE

REFLECTIVE TAPE

GLOVES

RAIN COAT

OVERALL

CUTTING & GRINDING

CUTTING DISCS
4” 4.5” 5” 9”12” 14”16”

STAINLESS STEEL CUTTING DISCS
4” 4.5” 7” 9”

GRINDING DISCS
4” 4.5” 7” 9”

FLAP DISCS
4” 4.5” 7”

TCT BLADES
4.5” 6” 7” 9” 14” 16”

DIAMOND BLADES
4.5” 6” 7” 9” 14” 16”

DIAMOND GRINDING DISC
4” & 7”

POLISHING DISCS 4”
100#, 200#, 300#, 500#
1000#, 2000#, 3000#

CUP WIRE BRUSH TWISTED
3” 4” 5”

CUTTING TOOLS & DRILL BITS

WOOD HOLE CUTTER

METAL HOLE CUTTER

GLASS HOLE CUTTER

DIAMOND CORE BITS

DEMOLITION CHISELS

DRILL BITS FOR WALL

DRILL BITS FOR WOOD

DRILL BITS FOR METAL

ROTARY & DEMOLITION HAMMER CHISELS

POWER TOOLS

CUT OFF MACHINE 400MM

CUT OFF MACHINE 350MM

MITRE SAW 250MM

HYDRAULIC PIPE CLAMP

TILE CUTTER

GREASE BUCKET
12L, 16L, 40L

CHAIN HOIST MANUAL

ELECTRIC CHAIN HOIST

GASOLINE WATER PUMP

BATTERY CHARGER

BENCH DRILL

SUBMERSIBLE PUMP
WATER PUMP

POWER TOOLS

COMPRESSOR

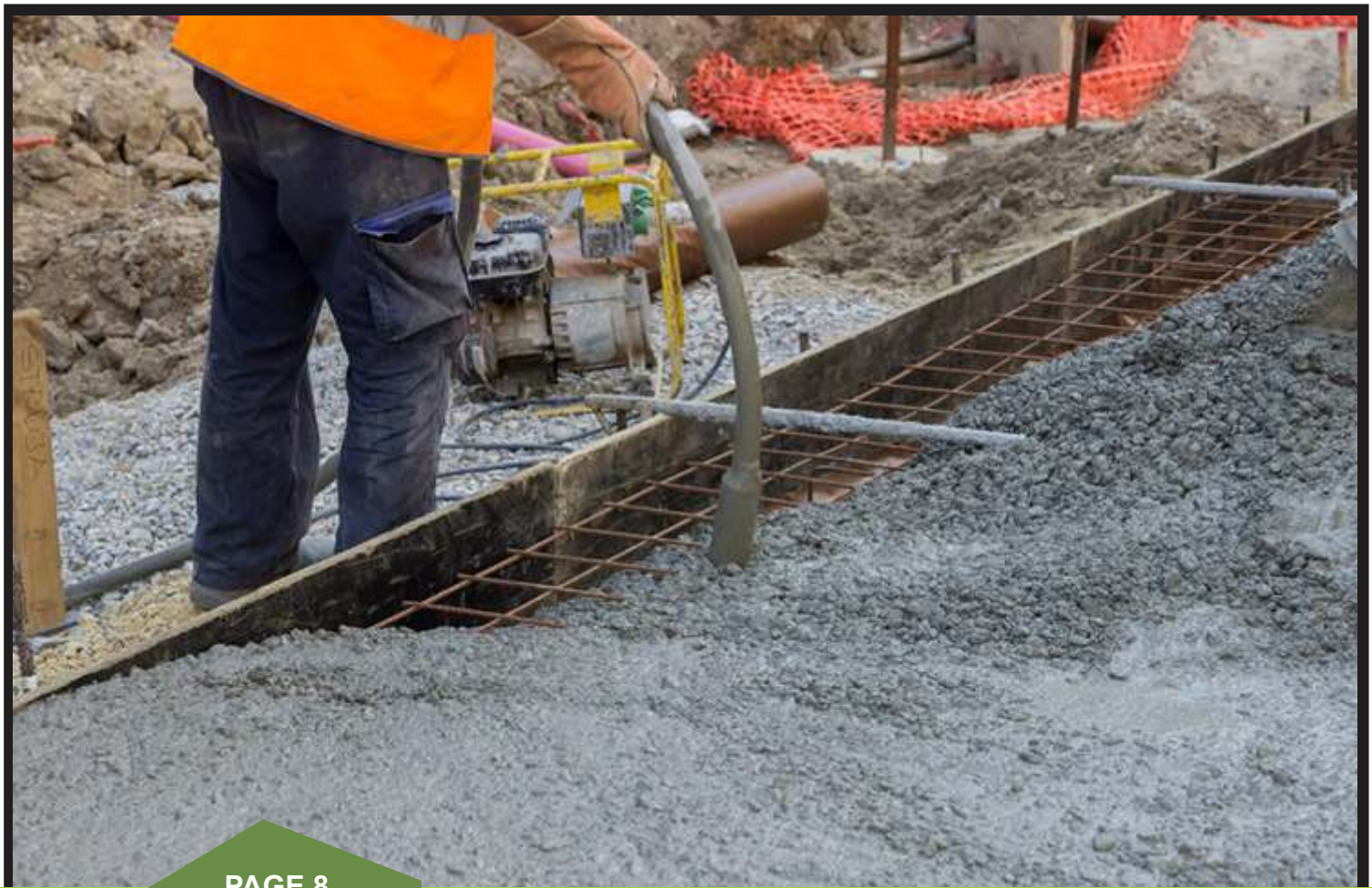
ELECTRIC CAR WASH MACHINE

VIBRATOR MOTOR

CONCRETE VIBRATOR

ELECTRIC VIBRATOR

BENCH VICE



POWER TOOLS

CORDLESS DRILL

CORDLESS IMPACT WRENCH

CORDLESS ANGLE GRINDER

ANGLE GRINDER

ELECTRIC DRILL

PNEUMATIC NAIL GUN

MARBLE CUTTER

CIRCULAR SAW

IMPACT ELECTRIC DRILL

DEMOLITION HAMMER

LASER LEVEL

AIR TOOLS

PNEUMATIC DEMOLITION HAMMER

PNEUMATIC WRENCH 1”

PNEUMATIC WRENCH 1/2”

PNEUMATIC DEMOLITION HAMMER PIPE

PNEUMATIC WRENCH PIPE

PNEUMATIC P U PIPE

PNEUMATIC NAIL GUN F30 & T50

PNEUMATIC NAIL GUN ST38 & ST 64

PNEUMATIC NAIL GUN 1013J

PNEUMATIC NAILS F20,F30,T38,T50

PNEUMATIC NAILS ST-25, ST-38, ST-50

PNEUMATIC NAILS 1013J, 422J

PU STRAIGHT & THREE WAY QUICK COUPLER

PU REDUCING PLASTIC QUICK COUPLER

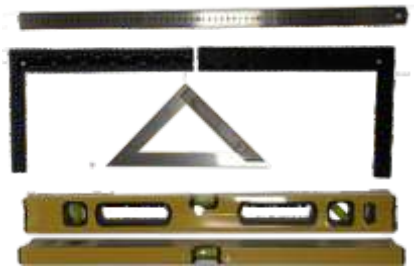
STEEL QUICK COUPLER

HARDWARE TOOLS

MOLDING PLATE

CONCRETE SLUMP CONE

MEASURING TAPES



SPIRIT LEVEL, STEEL RULE,
RIGHT ANGLED RULER & TRIANGLE

GALVANIZED THREAD RODS

DROP IN ANCHOR

RAWL BOLTS

CONTRACTION THREAD ROD

BUTTERFLY WASHER &
MOUNTING NUTS

F-CLAMP

ANTI-FALL SAFETY NET

GREEN SAFETY NET

GALVANIZED BINDING WIRE

MATTOCK

SHOVEL HEAD

HARDWARE TOOLS

108 CONSTRUCTION GLUE

SILICON & SAUSAGE GLUE

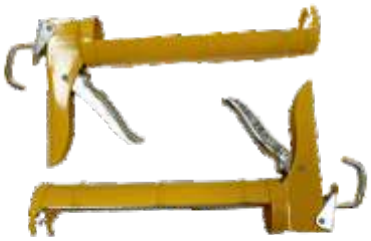
RUBBER PATCH

AB GLUE

GASKET CEMENT

TIRE CEMENT

SAUSAGE GLUE GUN



SILICON GUN

SCRAPPER

PAINT ROLLER 9”

PAINT BRUSH

SPRAY PAINT CAN

RIVETS GUN

TINSNIP

CHISEL

HARDWARE TOOLS

NYLON CASTER WHEEL

POLYURETHANE CASTER WHEEL

SCAFFOLDING WHEEL

WHEELBARROW WHEEL 12" & 14"

WHEELBARROW WHEEL 26''

WHEELBARROW

BOLT CUTTER

PIPE RANGE

PLIERS

CLIPPING TOOL

CIRCLIP PLIER

OPEN SPANNER SET

RING SPANNER SET

COMBINATION SPANNER SET

ALLEN KEY SET

HAND TOOLS & ELECTRICITY EQUIPMENTS

CLAW & SLEDGE HAMMER

SLEDGE HAMMER HEAD

WELDING & FITTERS HAMMER

AXE

TORQUE SPANNER

PENCIL & CHALK

1/2'' SOCKET SPANNER SET

3/4'' SOCKET SPANNER SET

RACHET SPANNER HANDLE

SOCKET SPANNER HANDLE

SOCKET SPANNER

1'' SOCKET SPANNER SET

FILTER WRENCH

POWER EXTENSION

WALL SOCKETS

RECHARGEABLE TOUCH

LED FLOOD LIGHT

MASKING, CELLO, INSULATING, ELECTRIC TAPES

ELECTRIC PLUGS

HEAD TOUCH

VALVES

INDUSTRIAL VALVES

Ball Valve

Butterfly Valve

Wafer Check Valve

Diaphragm Valve

Strainers

Knife Edge Gate & Pulp Valve

Gate, Globe, Check Valve-
(Cast Steel)

Gate, Globe, Check Valve
(Forged Carbon & SS)

Gate, Globe, Check Valve-
(Cast Iron)

Lined & Unlined
Non Return Valve

Dual Plate &
Non Slam Check Valve

Flush Bottom Valve

VALVES

DAIRY & PHARMA VALVES

3 Way Valve

Sandwich Butterfly Valve

Spray Ball

Sight Glass T.C. End Valve

Float Valve

3 Pcs Ball Valve

Triclover Clamp

TC Clamp

Safety Valve

Plug Valve

Guage Glass Valve

SMS Union

GAUGES

PRESSURE GAUGE

Bourdon Sensing

Diaphragm Sensing

Chemical Seal

Capsule Sensing

Solid Front

Special Pressure

Diaphragm Seal

Indicating Pressure Switch

TEMPERATURE GAUGE

Bi-metal Dial

Mercury in Steel Dial

Gas Filled Dial

Pointer Puller & Fixer

Mineral Insulated Thermocouples

M.I. Thickwall Thermocouples

N (Nicrosil-Nisil) Type Thermocouples

Indication Tempretare Switch

FLANGES

MS & SS FLANGES

Welding Neck Flange

Screwed Flange

Slip On Flange

Bild Flange

Socket Welding Flange

Lap Joint Flange

GASKETS

Ring Joint Gaskets

Metal Jacketed Gaskets

Rubber Gaskets

COUPLING

Quick Release Coupling

Camlock Coupling

Vitalulic Coupling

PIPES & PIPE FITTINGS

MS, SS, BRASS, COPPER, ALLUMINIUM

Elbow

Y Type Tee

Pipe Holder

Nuts

Cross Tee

Butt Weld Tee

INDUSTRIAL INSULATION

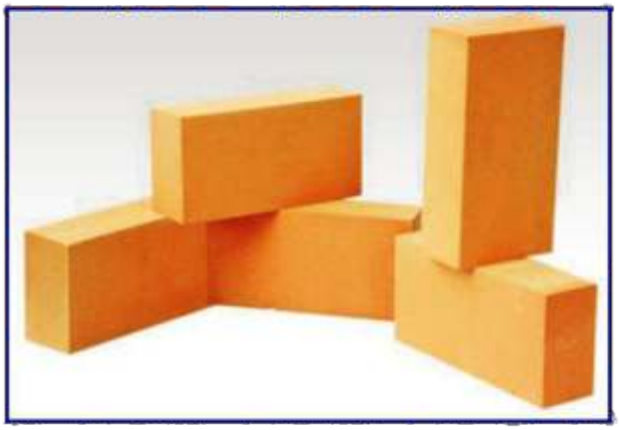
Rock Wool

Glass Wool

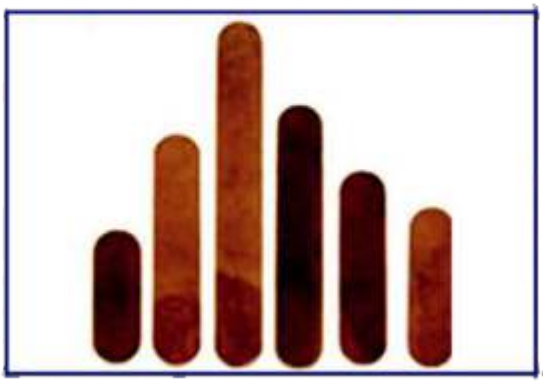
Loose Wool

Resin Blanket/Mattresses

Rigid Pipe Section



Fire Bricks



Mica

Glass Bonded Mica Insulator

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SWING TYPE WAFER CHECK VALVE

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CAST IRON BALL VALVE

ITEM CODE # SG - 106 PAGE-16

STAINLESS STEEL BALL VALVE (3PC. DESIGN)

ITEM CODE # SS - 804 PAGE-17

STAINLESS STEEL BALL VALVE (2PC. DESIGN)

ITEM CODE # SS - 802 PAGE-18

CAST STEEL GATE VALVE CLASS 150

ITEM CODE # CS - 201 PAGE-19

CAST STEEL GLOBE VALVE CLASS 150

ITEM CODE # CS - 202 PAGE-20

CAST STEEL PARALLEL SLIDE BLOW DOWN VALVE

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GUN METAL PARALLEL SLIDE BLOW DOWN VALVE

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GUN METAL GLOBE VALVE (UNION BONNET)

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GUN METAL GLOBE VALVE

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GUN METAL CHECK VALVE (UNION CAP)

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GUN METAL CHECK VALVE

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HORIZONTAL LIFT CHECK VALVE (FLANGED)

ITEM CODE # CI - 103 PAGE-27

GUN METAL SAFETY VALVE RELIEF VALVE

ITEM CODE # GM - 510 PAGE-28

STAINLESS STEEL STEAM TRAP

ITEM CODE # SS - 801

Features :

Inbuilt Strainer : Avoids Clogging
Screwed Female BSP Taper Ends / Socket Welded Ends
Hardened Disc To Withstand Continuous Water Hammering
All Stainless Steel Construction : Better Mechanical Properties
Seat Integral With Body : No Possibility Of Leakage From Joints

Operation :

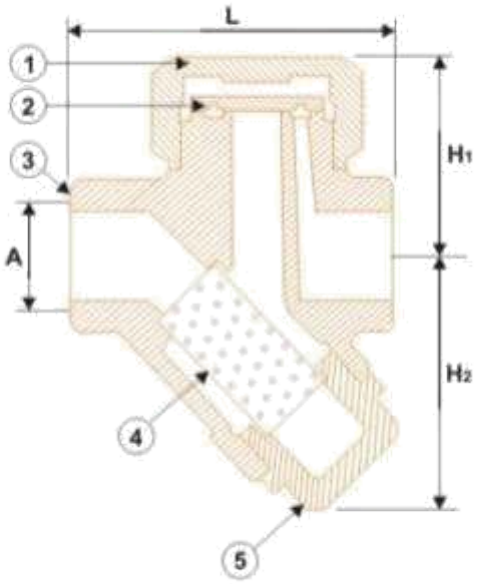
The steam trap works on the pressure difference, above and below the disc. Disc is rased from its seat due to incoming pressure. High velocity of flashing condensate create low pressure beneath the disc, at the same time pressure is build up in the chamber that force the disc on the seat. Now the condensates in the chamber decrease the pressure, when it is lower than the inlet pressure, the disc lifts. This cycle repeats again and again.

Materials of Construction

NAME OF PART	MATERIAL	STANDARD
(1) Top Cover	Cast Stainless Steel	ASTM-A 743 Gr. CA 40
(2) Disc	Cast Stainless Steel	ASTM-A 743 Gr. CA 40
(3) Body	Cast Stainless Steel	ASTM-A 743 Gr. CA 40
(4) Screen	Stainless Steel	AISI - 304
(5) Bottom Cover	Cast Stainless Steel	ASTM-A743 Gr. CA 40

Limiting Conditions : In accordance with ISO 6552

Body Design Conditions PN 63
Cold Hyd. Test Pressure 95 bar
PMA - Maximum Allowable Pressure 63 bar
PMO - Maximum Operating Pressure 42 bar
TMA - Maximum Allowable Temperature 400°C
TMO - Maximum Operating Temperature 255°C



Sizes / Dimensions

Sizes		Dimensions			
Inches	mm	A	L	H1	H2
1/2"	15	1/2" BSP	78	44	60
3/4"	20	3/4" BSP	78	44	60
1"	25	1" BSP	84	54	70
1.1/2"	40	1.1/2" BSP	108	70	88
2"	50	2" BSP	108	70	88

CAST IRON INVERTED BUCKET TYPE STEAM TRAP

ITEM CODE # CI - 112

Specification & Features:

Inverted Bucket Type Steam Trap with
Stainless Steel AISI 304 Bucket And
Renewable Stainless Steel Working Parts
Screwed Female Ends To BS 21 / NPT.

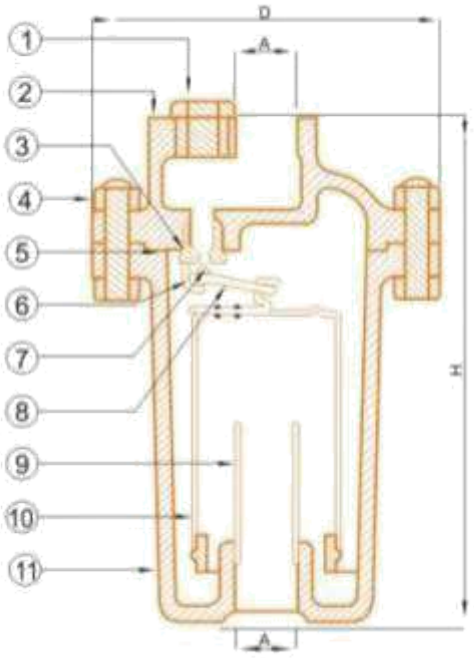
Materials of Construction

NAME OF PART	MATERIAL	STANDARD
(1) Plug	Bronze	BS : 1982 491K
(2) Cover	Cast Iron	BS 1561 GJL-250 (GG25)
(3) Valve Seat	Stainless Steel	ASTM A276 Type 410
(4) Fastners	Alloy Steel	---------
(5) Gasket	Non Asbestos Fiber	---------
(6) Hook	Stainless Steel	AISI 304
(7) Ball Seat	Stainless Steel	AISI 410
(8) Lever	Stainless Steel	AISI 304
(9) Pipe	G.I.	---------
(10) Bucket	Stainless Steel	AISI 304
(11) Body	Cast Iron	BS 1561 GJL-250 (GG25)

PMO - Maximum Operating Pressure 17.5 bar
TMA - Maximum Allowable Temperature 220°C

Sizes / Dimensions (mm)

Size		Dimensions (mm)		
Inches	mm	A	H	D
1/2"	15	½" BSP	168	142
3/4"	20	3/4" BSP	200	142
1"	25	1" BSP	268	186
1.1/2"	40	1.1/2" BSP	395	238
2"	50	2" BSP	452	286



BALL FLOAT STEAM TRAP (SCREWED)

ITEM CODE # SG - 403

Description :

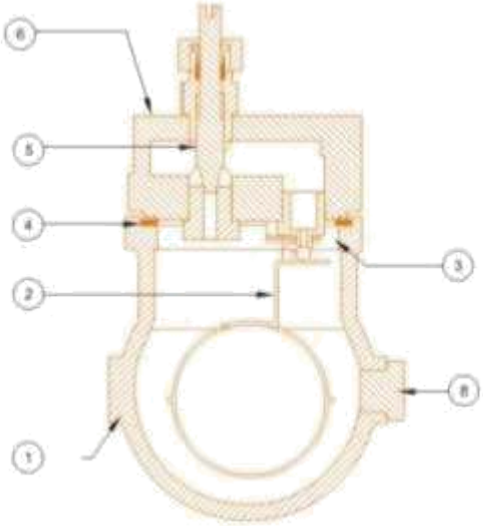
Ball Float Steam Trap is meant for timely removal of Condensate from the Pipe Line without compromising on the energy (steam) losses. It's a Mecanical Steam Trap which works on the principle of Difference between Densities of Steam and Condensate.

Features :

- Screwed Female Ends To BS 21 / NPT
- All Stainless Steel Working Parts
- With Steam Lock Release (SLR) Assembly
- Painted with Heat Resistant Paint (upto 400°C)
- Drain Plug provided for Removal of Impurities

Materials of Construction

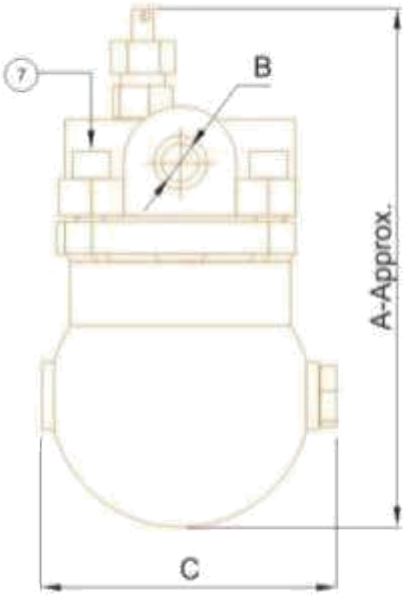
NAME OF PART	MATERIAL	STANDARD
(1) Body	D.I. / SGI	GGG-40
(2) Float Assembly	Stainless Steel	AISI 304
(3) Valve Seat	Stainless Steel	ASTM A276 Type 410
(4) Gasket		Non-Asbestos
(5) SLR Unit	Stainless Steel	AISI 304
(6) Cover	D.I. / SGI	GGG-40
(7) Fastners	Alloy Steel	ASTM 193 B7/A194 2H
(8) Drain Plug	Stainless Steel	ASTM A276 Type 304



Limiting Conditions : In accordance with ISO 6552

Body Design Conditions PN 16
Cold Hyd. Test Pressure 24 bar g
PMA - Maximum Allowable Pressure 16 bar
TMA - Maximum Allowable Temperature 250°C

Δ PMX - Max. Differential Pressure	
SG404-4.5	4.5 bar
SG404-10	10 bar
SG404-14	14 bar



Sizes / Dimensions (mm)

Size	Face to Face	A	B	C
DN 15	92	195	1/2" BSP	112
DN 20	92	195	3/4" BSP	112
DN 25	95	220	1" BSP	136

Application :

Ideally suited for Driers, Unit Heaters, Heat Exchangers and Injected Vessels etc.

BALL FLOAT STEAM TRAP (FLANGED)

ITEM CODE # SG - 404

Description :

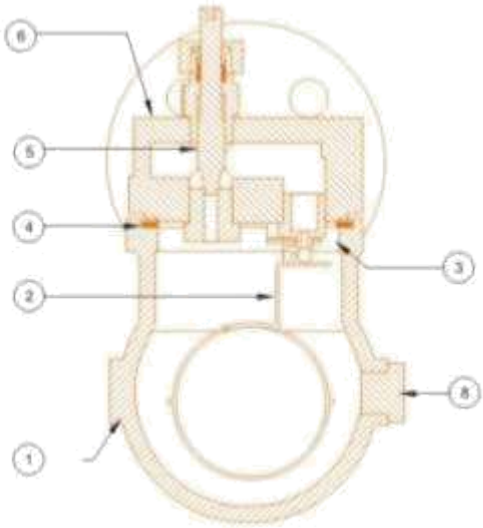
Ball Float Steam Trap is meant for timely removal of Condensate from the Pipe Line without compromising on the energy (steam) losses. It's a Mecanical Steam Trap which works on the principle of Difference between Densities of Steam and Condensate.

Features :

- Flanged Ends to PN 16 RF
- All Stainless Steel Working Parts
- With Steam Lock Release (SLR) Assembly
- Painted with Heat Resistant Paint (upto 400°C)
- Drain Plug provided for Removal of Impurities

Materials of Construction

	NAME OF PART	MATERIAL	STANDARD
(1)	Body	D.I. / SGI	GGG-40
(2)	Float Assembly	Stainless Steel	AISI 304
(3)	Valve Seat	Stainless Steel	ASTM A276 Type 410
(4)	Gasket		Non-Asbestos
(5)	SLR Unit	Stainless Steel	AISI 304
(6)	Cover	D.I. / SGI	GGG-40
(7)	Fastners	Alloy Steel	ASTM 193 B7/A194 2H
(8)	Drain Plug	Stainless Steel	ASTM A276 Type 304



Limiting Conditions : In accordance with ISO 6552

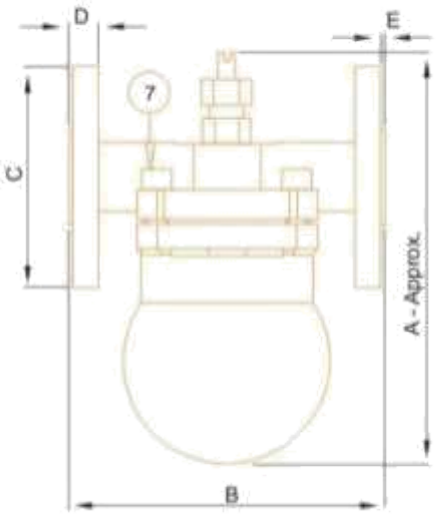
Body Design Conditions PN 16

Cold Hyd. Test Pressure 24 bar g

PMA - Maximum Allowable Pressure 16 bar

TMA - Maximum Allowable Temperature 250°C

Δ PMX - Max. Differential Pressure	
SG404-4.5	4.5 bar
SG404-10	10 bar
SG404-14	14 bar



Sizes / Dimensions (mm)

Size	A	B	C	D	E
DN 15	195	150	95	14	2
DN 20	195	150	105	16	2
DN 25	220	160	105	16	2

Application :

Ideally suited for Driers, Unit Heaters, Heat Exchangers and Injected Vessels etc.

GLOBE STEAM STOP VALVE
(FLANGED)

ITEM CODE # CI - 101

ITEM CODE # CI - 102

Specification & Features:

Confirming to BS : 5152
Flanged ends to DIN 2533 PN-16 RF upto 150mm sizes.
For sizes 200mm to 300mm PN-10 RF
Straight / Angel pattern, outside screw, yoke type, rising stem.
With Back Seat Arrangement, Hand wheel operated.
Renewable 13% Cr. Stainless Steel (AISI - 410) Working Parts.
Minimum pressure drop inside the body due to streamlined body design.

Pressure / Temperature ratings

Temperature °Celsius	-10° to +120°	150°	180°	200°	220°
Pressure bar	16	14.8	13.9	13	13
	10	9.2	8.5	8	8

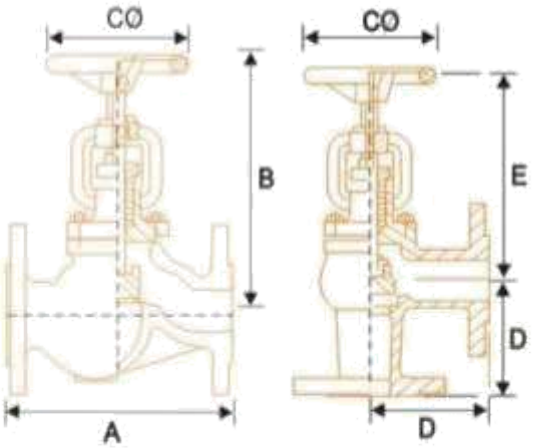
Materials of Construction

NAME OF PART	MATERIAL	STANDARD
Body, Bonnet & Gland	S.G. Iron / Cash Iron	DIN 1693 GGG40 / BS 1561 GJL - 200
Stem, Disc, Body Ring, Back Seat, Gland Bush	Stainless Steel	ASTM 276 Type 410
Handwheel	Pressed Steel	
Fastners	Alloy Steel	ASTM 193 B7 / A194 2H
Gasket	Non - Asbestos Fibre	
Gland Packing	Graphoil	
Yoke Bush	Stainless Steel	ASTM 582 Type 416

TEST PRESSURE (HYD.) - PN16 - BODY 24 BAR, SEAT 16 BAR.
PN10 - BODY 15 BAR, SEAT 10 BAR.

Sizes / Dimensions

Sizes		Dimensions (mm)				
Inches	mm	A	B	D	E	CØ
1/2	15	130	161	90	150	100
3/4	20	150	165	95	150	100
1	25	160	180	100	155	125
1-1/4	32	180	196	105	185	125
1-1/2	40	200	225	115	190	160
2	50	230	250	125	195	160
2-1/2	65	290	280	145	240	200
3	80	310	295	155	265	200
4	100	350	335	175	305	250
5	125	400	425	200	370	250
6	150	480	470	225	430	315
8	200	600	580	275	480	400
10	250	730	720	325	700	400
12	300	850	850	375	800	400



BELLOW SEAL GLOBE VALVE (FLANGED)

ITEM CODE # SG - 405

Features:

- Double Ply Bellows used for Longer Valve Life.
- Triple Safety for Zero Emission (1.Bellows, 2.Back Seat, 3.Gland Packing)
- OS&Y Type, Non-Rising Handwheel.
- Renewable 13% Cr. Stainless Steel (AISI 410) Working Parts.
- Min. Pressure Drop inside the body due to streamlined Body Condition.

Pressure / Temperature ratings

Temperature °Celsius	-10° to +120°	150°	180°	200°	220°
Pressure bar	16	14.8	13.9	13	13
	10	9.2	8.5	8	8

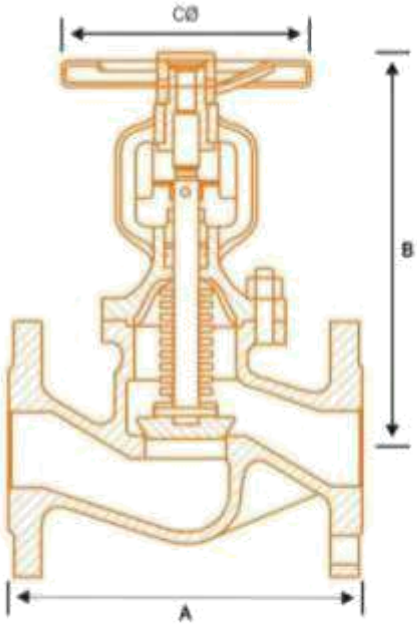
Materials of Construction

NAME OF PART	MATERIAL	STANDARD
Body, Bonnet, Stem Guide	S.G. Iron	DIN 1693 GGG40
Body Ring, Disc, Stem	Stainless Steel	ASTM 276 Type 410
Bellows	Stainless Steel	SS 316Ti
Yoke Sleeve	Stainless Steel	ASTM 582 Type 416
Fasteners	Alloy Steel	ASTM 193 B7 / A194 2H
Handwheel	Pressed Steel	
Gasket	Non Asbestos Fibre	
Gland Packing	Graphoil	

TEST PRESSURE (HYD.) - BODY 24 BAR, SEAT 16 BAR

Sizes / Dimensions (mm)

Size		Dimensions (mm)		
Inches	mm	A	B	C Ø
1/2"	15	130	190	120
3/4"	20	150	195	120
1"	25	160	210	140
1.1/4"	32	180	220	140
1.1/2"	40	200	255	160
2"	50	230	270	160
2.1/2"	65	290	345	240
3"	80	310	365	240
4"	100	350	395	240



Application :

Ideally suited for Petroleum, Rubber, Textile, Paper, Food Processing, Pharmaceutical Industries, Thermal Power Station etc.

S.G. IRON 'Y' - STRAINER
(SCREWED)

ITEM CODE # SG - 401

Specification & Features:

Screwed Female ends to BS: 21 / ISO: 7 / IS: 554
Stainless Steel (AISI - 304) or Brass perforated sheet screen is guided in body & cap.
Screwed Cap upto 2" & Bolted cover for 2.1/2" & 3" Sizes.
Fine Finish & Smooth Contours to minimize pressure drop in the strainer.
Large screening area makes the strainer efficient in performance.

Pressure / Temperature ratings

Temperature °Celsius	50°	125°	250°	350°
Pressure bar	25	25	20	14

Materials of Construction

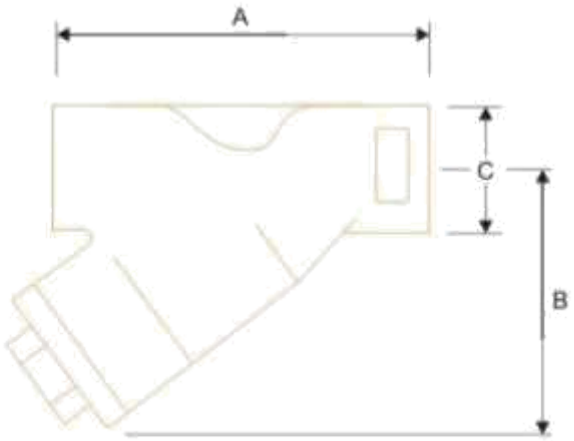
NAME OF PART	MATERIAL	STANDARD
Body & Cap	S.G. Iron	DIN 1693 GGG 40
Gasket	Non - Asbestos Fibre	
Screen	Stainless Steel	AISI-304
Fastners for 2 1/2" & 3"	Alloy Steel	ASTM 193 B7 / A194 2H

Limiting Conditions

Body Design Condition PN25
PMA - Maximum Allowable Pressure 25 bar
TMA - Maximum Allowable Temperature 350°C
Designed for a Maximum Cold Hydraulic Test Pressure of 38 bar.

Sizes / Dimensions

Sizes		Dimensions		
inches	mm	A	B	C
1/2"	15	79	55	32
3/4"	20	93	65	36
1"	25	110	78	48
1-1/4"	32	140	103	60
1-1/2"	40	153	115	65
2"	50	177	140	76
2-1/2"	65	230	177	94
3"	80	237	183	105



CAST IRON 'Y'- STRAINER
(FLANGED)

ITEM CODE # SG - 402

Specification & Features:

Flanged Ends To DIN 2533 PN 16 RF
Stainless Steel (AISI - 304) / Brass perforated sheet screen is guided in body & cover.
Drain plug is provided to remove the accumulated foreign particles.
Fine finish and smooth contours to minimize pressure drop in the strainer.
Large screening area makes the strainer efficient in performance.

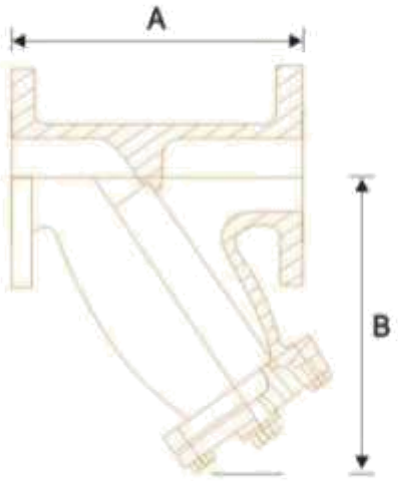
Pressure / Temperature ratings

Temperature °Celsius	20°	120°	200°	300°
Pressure bar	16	16	13	10

Materials of Construction

NAME OF PART	MATERIAL	STANDARD
Body & Cover	S.G. Iron	DIN 1693 GGG40
Drain Plug	S.G. Iron	DIN 1693 GGG40
Screen	Stainless Steel	AISI - 304
Gasket	Non - Asbestos Fibre	
Fastners	Alloy Steel	ASTM 193 B7 / A194 2H

Test Pressure (Hydraulic) - 21.1 kg/cm2g (300 Psig)
Working Pressure (Steam) 10.55kg/cm2g (150 Psig)



Sizes / Dimensions

Sizes		Dimensions	
Inches	mm	A	B
1	25	160	112
1-1/2	40	200	152
2	50	230	205
2-1/2	65	290	250
3	80	310	268
4	100	350	290

FORGED STEEL (A 105)
GATE VALVE CLASS-800 (REDUCED BORE)

Specification & Features:

Conforming To BS : 5352 / API 602 BSEN - 15761
Screwed female ends to BSP / NPT / Socket Welded Ends To ANSI B 16.11
Bolted bonnet, outside screw, yoke type, rising steam
Handwheel Operated, Sturdy in design & superb in quality.

Pressure / Temperature ratings

Temperature °Celsius	-29° +38°	93.5°	149°	204°	260°	316°	343°	371°	399°	427°	* 454°	* 482°	* 510°	* 538°
Pressure bar	136	124	121	117	110	101	99	98	93	76	49	32	19	10

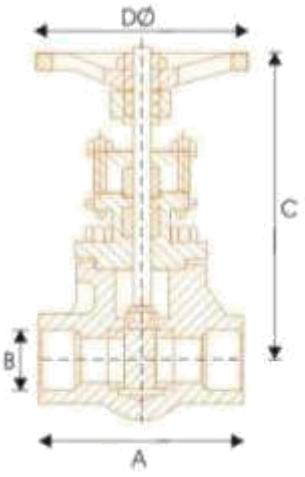
* Permissible but not recommended for prolonged usage above 427° celsius

Materials of Construction

NAME OF PART	MATERIAL	STANDARD
Body, Gland Flange & Bonnet	Forged Steel	ASTMA 105
Body Ring, Wedge	Stainless Steel	ASTM 276 Type 410
Stem, Gland Bush	Stainless Steel	ASTM 276 Type 410
Fastners	Alloy Steel	ASTM 193 B7 / A194 2H
Gasket	Spiral Wound S.S. 304 Graphite Filled	
Packing	Braided Graphite Yarn Containing Corrosion Inhibitor To Suit 400°C	
Hand Wheel	S.G. Iron	DIN 1693 GGG40

Sizes / Dimensions

Sizes		Dimensions			
Inches	mm	A	B	C	DØ
1/2	15	80	1/2	132	80
3/4	20	88	3/4	142	80
1	25	100	1	165	90
1-1/2	40	145	1-1/2	220	152
2	50	170	2	240	152



FORGED STEEL (A 105)
GLOBE VALVE CLASS-800 (REDUCED BORE)

Specification & Features:

Conforming To BS : 5352 / API 602 BSEN - 15761
Screwed female ends to BSP / NPT / Socket Welded Ends To ANSI B 16.11
Bolted bonnet, outside screw, yoke type, rising steam
Sturdy in design & superb in quality.
Handwheel operated.

ITEM CODE # FS - 302

Pressure / Temperature ratings

Temperature °Celsius	-29 +38°	93.5°	149°	204°	260°	316°	343°	371°	399°	427°	* 454°	* 482°	* 510°	* 538°
Pressure bar	136	124	121	117	110	101	99	98	93	76	49	32	19	10

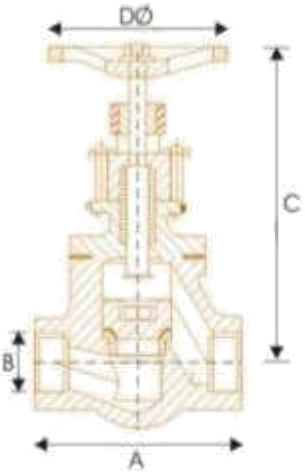
* Permissible but not recommended for prolonged usage above 427°celsius

Materials of Construction

NAME OF PART	MATERIAL	STANDARD
Body, Gland Flange & Bonnet	Forged Steel	ASTMA 105
Body Ring, Disc	Stainless Steel	ASTM 276 Type 410
Stem, Gland Bush	Stainless Steel	ASTM 276 Type 410
Fastners	Alloy Steel	ASTM 193 B7 / A194 2H
Gasket	Spiral Wound S.S. 304 Graphite Filled	
Packing	Braided Graphite Yarn Containing Corrosion Inhibitor To Suit 400°C	
Hand Wheel	S.G. Iron	DIN 1693 GGG40

Sizes / Dimensions

Sizes		Dimensions			
Inches	mm	A	B	C	DØ
1/2	15	80	1/2	140	80
3/4	20	88	3/4	150	80
1	25	100	1	170	90
1-1/2	40	145	1-1/2	240	152
2	50	170	2	275	152



FORGED STEEL (A 105) HORIZONTAL LIFT CHECK VALVE CLASS-800 (REDUCED BORE)

Specification & Features:

Conforming To BS : 5352 / API 602 BSEN - 15761
Screwed female ends to BSP / NPT
Socket Welded Ends To ANSI B 16.11
Bolted cover, Sturdy in design & superb in quality.

ITEM CODE # FS - 303

Pressure / Temperature ratings

Temperature °Celsius	-29° +38°	93.5°	149°	204°	260°	316°	343°	371°	399°	427°	* 454°	* 482°	* 510°	* 538°
Pressure bar	136	124	121	117	110	101	99	98	93	76	49	32	19	10

* Permissible but not recommended for prolonged usage above 427° celsius

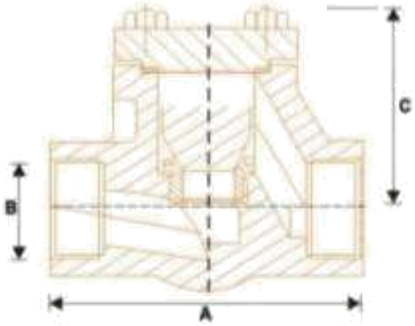
Materials of Construction

NAME OF PART	MATERIAL	STANDARD
Body & Cover	Forged Steel	ASTM A 105
Body Ring & Disc	Stainless Steel	ASTMA 182 F 6A
Gasket	Spiral Wound S.S. 304 Graphite Filled	
Fastners	Alloy Steel	ASTM 193 B7 / A194 2H

Test Pressure: Body: 207 Bar (Hyd.)
Seat: 152 Bar (Hyd.)

Sizes / Dimensions

Sizes		Dimensions		
Inches	mm	A	B	C
1/2	15	80	1/2	58
3/4	20	88	3/4	62
1	25	100	1	75
1-1/2	40	145	1-1/2	98
2	50	170	2	120



FORGED STEEL BALL VALVE CL-800

3 Pcs Design (Reduced Bore)

Specification & Features:

Design Ref. BS EN ISO 17292 (BS 5351)
Three Pcs Design, Reduced Bore, Blow Out Proof Stem, Floating Ball, PTFE Seats / Seals.
Quarter Turn Lever Operated.
Screwed Female Ends to BS 21 / ISO 7 / NPT
Socket Weld Ends to ANSI B16.11
Butt Weld Ends to ANSI B16.25
Ideally suited for bi-directional, on/off duties for general services within the Pressure / Temperature ratings of PTFE Seals.
Three-piece construction makes for easy inspection and maintenance without breaking or remaking the Pipline.

ITEM CODE # FS - 305

Materials of Construction

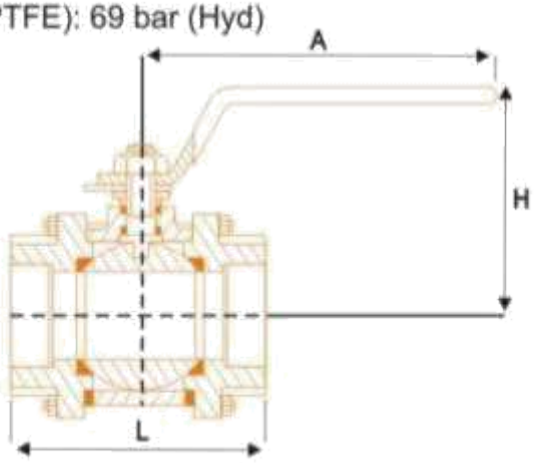
NAME OF PART	MATERIAL	STANDARD
Body	Forged Carbon Steel	ASTM A105
Body Connector	Forged Carbon Steel	ASTM A105
Ball	Stainless Steel	AISI 410 / 304 / 316
Stem	Stainless Steel	AISI 410 / 304 / 316
Gland Nut	Stainless Steel	AISI 304
Locking Nut	Stainless Steel	AISI 304
Studs & Nuts	Stainless Steel	AISI 304
Lever	Mild Steel	BS: 970
Body Seal*	PTFE	-
Seat*	PTFE	-
Stem Packing*	PTFE	-

* Other type of Gaskets such as GFT, CFT, PEEK etc. are also available on request.

TESTING : Standard EN 12266 – 1 (BS 6755 Part 1)
Body Test Pressure: 207 bar (Hyd.), Seat Test Pressure (PTFE): 69 bar (Hyd)

Sizes / Dimensions

SIZES		DIMENSIONS (mm)		
Inch	mm	L	H	A
1/2"	15	64	65	100
3/4"	20	75	70	125
1"	25	88	80	150
1.1/4"	32	105	90	165
1.1/2"	40	114	105	190
2"	50	130	110	190



BUTTERFLY VALVE (WAFER TYPE)

ITEM CODE # CI - 110

Specification & Features:

Design Ref.: BS 3952, API-609, IS: 13095
Mounting Flange according to ISO: 5211
Available in Clutch Type Handles.
Also Suitable for Actuator & Gear Mountings
100% Leak Tight Design
Compact Design to Facilitate Installation
No Part in Contact with Fluid Except Disc and Liner.

Materials of Construction

NAME OF PART	MATERIAL	STANDARD
Body	Cast Iron	BS 1561 GJL - 200
Disc	S.G. Iron / Stainless Steel	GGG 40 / CF8 / CF8M
Shaft	Stainless Steel	ASTM 276 TYPE 410
Lock Plate	Pressed Steel	
Handle & Lever	Pressed Steel	
Seat	Nitrile / EPDM / Silicon / Neoprene	
Bearing	Teflon	
Fastners	Alloy Steel	ASTM 193 B7 / A194 2H

Sizes / Dimensions

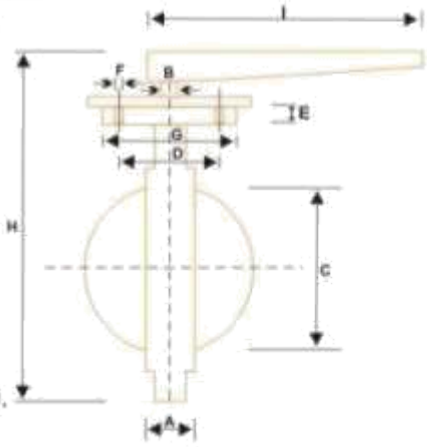
Sizes		Dimensions (mm)										
					Mounting Flange							
Inches	mm	A	B	C	D	E	F	G	H	I	J	K
1 1/2"	40	32	13	40	50	14	7	65	210	170	5	6
2"	50	42	13	51	50	17	7	65	230	170	6	7
2 1/2"	65	44	13	65	50	17	7	65	260	170	7	9
3"	80	44	15	81	50	17	7	65	270	195	10	13
4"	100	50	15	103	50	17	7	65	310	195	12	18
5"	125	56	19	125	70	17	9	90	335	320	20	31
6"	150	56	19	153	70	17	9	90	360	320	35	50
8"	200	60	19	201	70	19	9	90	440	320	65	88
10"	250	68	24	253	102	22	11	125	540	450	130	---
12"	300	78	24	300	102	22	11	125	580	450	235	---

Hydrostic Test Presure (Bar)

Series	Seat	Body
PN-10	10	15
PN-16	16	24

Suggested Operation
Upto 200 mm : Hand Lever
Over 200 mm : Gear

* J & K - Operational Torques (Nm) for PN 10 & PN 16 Valves under Static Conditions.
* Lower operational torques for lesser wear & tear and much enhanced life.



Applications

Paper & Pulp Industry, Waste & Effluent Treatment Plants, Water Treatment, Chemical & Sugar Industry, Fire Fighting, Drilling Rigs, Heating & Air Conditioning, Cooling Water Circulation, Compressed Air, Civil Constructions & numerous other applications.

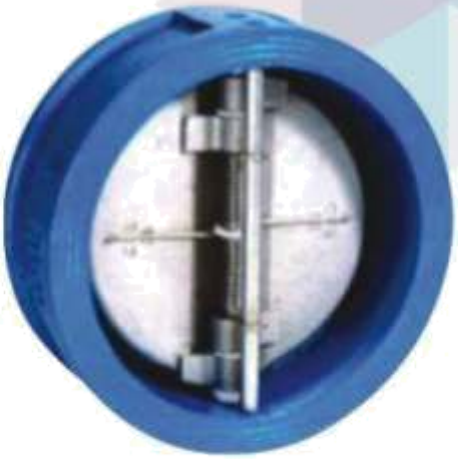
Note

For temperatures ranging above 150°C to 210°C SILICON RUBBER and temperatures below 5°C to -10°C special NITRILE RUBBER, recommended & provided.

DUAL PLATE CHECK VALVE

Features

- Light Weight thus easier handling and self supporting.
- More compact & structurally sound design.
- Low Pressure Drop and reduced Energy Loss irrespective of Pressure Ratings.
- Streamlined flow way.
- Efficient and Positive sealing under most flow & pressure conditions. Valve closes before flow reversal at zero velocity.
- Inherent Non-Slamming. No external device / attachments required.
- Water hammer almost non-existent.
- Long life and trouble free operation
- Interchangeable disc design.
- Bonded resilient seat.
- Body hard epoxy painted for better corrosion resistance.
- Disc - WCB (Powder Coated), CF8, CF8M
- Independent plate suspension
- Flexible installation
- Optimizes space utilization.



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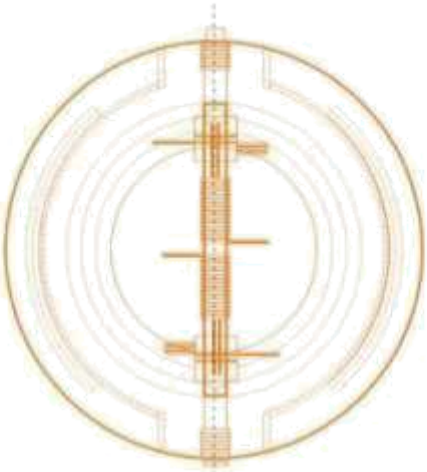
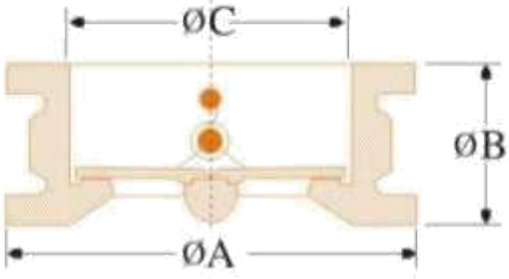




Materials of Construction

NAME OF PART	QTY.	MATERIAL
Body	1	Cast Iron / Cast Steel (WCB)
Disc	2	SGI, CF8, CF8M
Hinge Pin	1	Stainless Steel (AISI 304)
Stop Pin	1	Stainless Steel (AISI 304)
Spring	2	Stainless Steel
Retainer	4	EN-8, Stainless Steel
Body Bearing	2	Stainless Steel (AISI 304)
Plate Bearing	2	Stainless Steel (AISI 304)
Hook Bearing	1	Carbon Steel
Seat	1	Nitrile / EPDM
Seal Plug	4	Nitrile / EPDM

Dimensions :

Nominal size (inch)	2"	2.1/2"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	22"	24"
Nominal size (inch)	**50**	**65**	**80**	**100**	**125**	**150**	**200**	**250**	**300**	**350**	**400**	**450**	**500**	**550**	**600**
ø A (mm)	101	120	133	171	193	218	276	336	406	447	511	546	603	659	714
ø B (mm)	54	54	57	64	70	76	95	108	143	184	191	203	213	222	222
ø C (mm)	60	73	89	114	141	168	219	273	324	356	406	440	508	559	610

NOTE: Working Pressure upto 24 Bar Hyd

SWING TYPE WAFER CHECK VALVE

DOUBLE ADVANTAGE - BIGGER BORE & WIDER OPENING

Features :

- Light Weight
- Extremely Compact
- Economical
- Low Maintenance
- Easy Installation
- Tight Shut-off
- One Moving Part
- Interchangeable Disc Design
- Bonded Resilient Seat Option
- Radiography Clear Disc & Shaft Welding For Best Strength

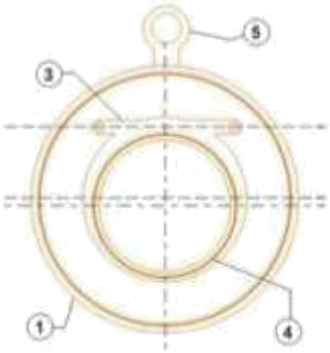
ITEM CODE # FS - 304

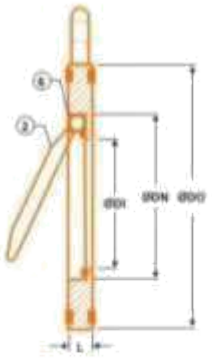
Materials of Construction :

S.No.	NAME OF PART	MATERIAL / STANDARD
1.	BODY	MS-IS:2062, CS-ASTM-A216 GRADE WCB, SS-ASTM-A351 CF-8/CF-8M
2.	DISC	MS-IS:2062, CS-ASTM-A216 GRADE WCB, SS-ASTM-A351 CF-8/CF-8M
3.	HINGE PIN	CARBON STEEL / STAINLESS STEEL
4.	'O' RING	NITRILE, NEOPRENE, EPDM, SILICON
5.	EYE BOLT	CARBON STEEL
6.	BUSH	BRASS

Sizes / Dimensions :

Nominal Size 'ØDN' (mm)	40	50	65	80	100	125	150	200	250	300
Inlet Bore 'ØDI' (mm)	24	34	45	57	78	100	122	163	204	240
Min. Out. Pipe Bore (mm)	40	50	65	78	100	125	150	200	250	300
Length 'L' (mm)	14	14	14	14	14	16	19	28	28	38
Outside Diameter 'ØDO' (mm)	84	97	110	130	160	192	216	273	336	384





Note :

Working temperatures 20°C to 200°C , Working Pressure upto 500 PSIG Hyd.

Suitability :

STEAM	WATER	OIL	AIR	GASES
	●	●		

CAST IRON BALL VALVE

ITEM CODE # SG - 106

ITEM CODE # SG - 109

Specification & Features:

Design Ref. BS: 5351
Screwed Female Ends to BS: 21 / ISO: 7 / IS: 554
Flanged Ends to BS: 10 Table D / E / F.
Full Bore, Blow out Proof Stem.

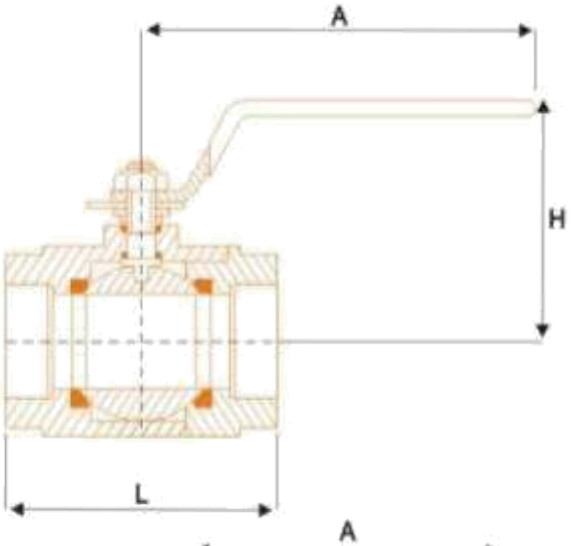
Pressure / Temperature ratings

Temperature Celsius	-10° to +100°	120°	140°	150°	160°	180°	200°
Pressure bar	16.0	16.0	14.9	14.4	13.7	13.4	12.8

Materials of Construction

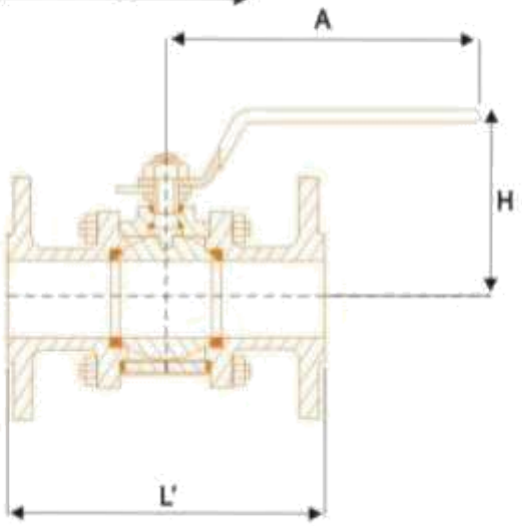
NAME OF PART	MATERIAL	STANDARD
Body	Cash Iron	BS 1561 GJL - 200
Stem, Ball	Stainless Steel	ASTM 276 TYPE 410
Lever, Lever Nut,	Mild Steel	BS : 970
Stopper, Gland Nut	Mild Steel	BS : 970
Gland Packing, Body seat Ring/Seal	P.T.F.E.	
Lever Sleeve	P.V.C.	

TEST PRESSURE (HYD.) - B.T.P.-500 Psig (35.16Kg/Cm 2g)
S.T.P.-300 Psig (21.1Kg/Cm 2g)



Sizes / Dimensions

Sizes		Dimensions (mm)			
Inches	mm	L	L'	H	A
1/2"	15	78	130	60	135
3/4"	20	86	130	66	155
1"	25	95	140	68	155
1-1/4"	32	115	165	105	165
1-1/2"	40	117	165	105	190
2"	50	138	203	120	190
2-1/2"	65	162	222	127	285
3"	80	184	241	140	285
4"	100	220	305	152	325
5"	125	--	268	220	610
6"	150	--	394	224	610
8"	200	--	457	660	914



Option

Flanged Ends to BS: 4504 PN 10 BS: 4504 PN 16 or ASME-B CL-150

STAINLESS STEEL BALL VALVE

3 Pcs Design (Screwed / Flanged)

ITEM CODE # SS - 803

ITEM CODE # SS - 804

Specification & Features:

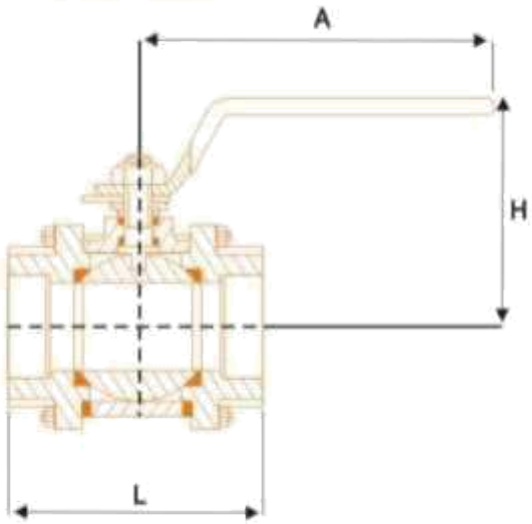
Design Ref. BS: 5351
Three Pcs Design, Full Bore, Blow Out Proof Stem,
Floating Ball, PTFE Seats / Seals.
Quarter Turn Lever Operated.
Screwed Female Ends to BS 21 / ISO 7
Flanged Ends to ASME B-16.5 CL-150.
Ideally suited for bi-directional, on/off duties for various process industries.
The stainless steel construction enables the valve to handle a wide range of corrosive media within Pressure / Temp. rating of PTFE Seals.

Materials of Construction

NAME OF PART	MATERIAL	STANDARD
Body	Stainless Steel	ASTM A351 Gr. CF8 / CF8M
Body Connector	Stainless Steel	ASTM A351 Gr. CF8 / CF8M
Ball	Stainless Steel	ASTM A351 Gr. CF8 / CF8M
Stem	Stainless Steel	AISI 304 / 316
Gland Nut	Stainless Steel	AISI 304
Locking Nut	Stainless Steel	AISI 304
Studs & Nuts	Stainless Steel	AISI 304
Lever	Stainless Steel	AISI 304 (PVC Coated)
Body Seal	PTFE	
Seat	PTFE	
Steam Packing	PTFE	

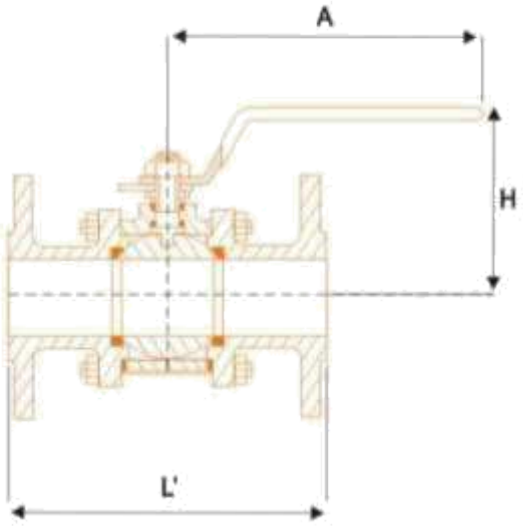
Testing : Standard EN 12266 – 1 (BS 6755 Part 1)

Description	Hydraulic	Steam
Test Pressure (bar)	69	10



Sizes / Dimensions

SIZES		DIMENSIONS (mm)			
Inch	mm	L	L'	H	A
1/2"	15	66	108	50	100
3/4"	20	77	118	60	125
1"	25	85	127	60	150
1.1/2"	40	118	165	95	190
2	50	132	178	100	190
2.1/2"	65	-	190	150	285
3"	80	-	203	170	285
4"	100	-	229	195	325



STAINLESS STEEL BALL VALVE

2 Pcs Design (Screwed)

ITEM CODE # SS - 802

Specification & Features:

Design Ref. BS: 5351
Two Pcs Design, Full Bore, Blow Out Proof Stem, Floating Ball, PTFE Seats / Seals.
Quarter Turn Lever Operated.
Screwed Female Ends to BS 21 / ISO 7
Ideally suited for bi-directional, on/off duties for various process industries.
The stainless steel construction enables the valve to handle a wide range of corrosive media within Pressure / Temperature rating of PTFE Seals.

Materials of Construction

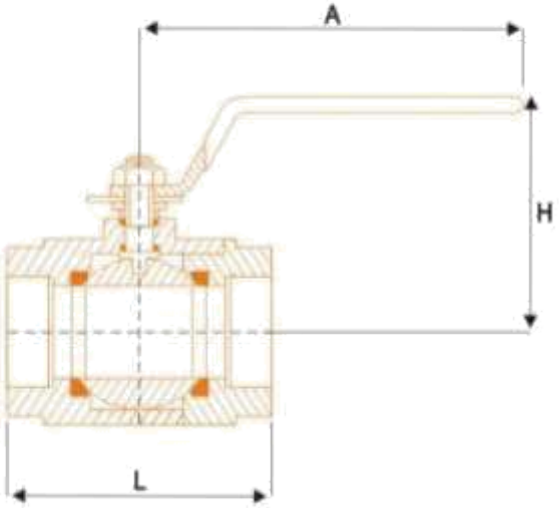
NAME OF PART	MATERIAL	STANDARD
Body	Stainless Steel	ASTM A351 Gr. CF8 / CF8M
Body Connector	Stainless Steel	ASTM A351 Gr. CF8 / CF8M
Ball	Stainless Steel	ASTM A351 Gr. CF8 / CF8M
Stem	Stainless Steel	AISI 304 / 316
Gland Nut	Stainless Steel	AISI 304
Locking Nut	Stainless Steel	AISI 304
Lever	Stainless Steel	AISI 304 (PVC Coated)
Body Seal	PTFE	
Seat	PTFE	
Steam Packing	PTFE	

Testing : Standard EN 12266 – 1 (BS 6755 Part 1)

Description	Hydraulic	Steam
Test Pressure (bar)	69	10

Sizes / Dimensions

SIZES		DIMENSIONS (mm)		
Inch	mm	L	H	A
1/4"	8	60	50	100
3/8"	10	60	50	100
1/2"	15	62	50	100
3/4"	20	73	60	125
1"	25	85	60	150
1.1/2"	40	105	95	190
2	50	125	100	190
2.1/2"	65	155	150	285
3"	80	180	170	285
4"	100	210	195	325



CAST STEEL (A 216 GR. WCB) GATE VALVE CLASS - 150

ITEM CODE # CS - 201

Specification & Features:

Conforming to BS : 1414 / ANSI B16.34 / API 600
Flanged ends to ANSI B16.5 CL-150 RF
Outside screw, yoke type, rising stem, bolted bonnet.
Renewable S.S 13% Cr. (AISI - 410) Working Parts.
Handwheel operated.

Pressure / Temperature ratings

in accordance with ANSI B16.34

Temperature °Celsius	-29° +38°	100°	150°	200°	250°	300°	350°	375°	400°	425°	450*	475*	500*	538*
Pressure bar	19.7	17.7	15.8	14.0	12.1	10.2	8.4	7.4	6.5	5.6	4.6	3.7	2.8	1.4

*Prolonged Temperatures above 425 celsius may result in deterioration of the carbon phase of carbon steel.

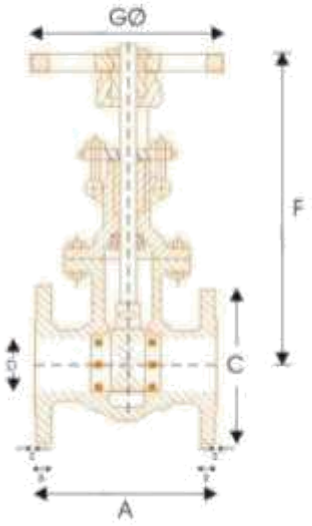
Materials of Construction

NAME OF PART	MATERIAL	STANDARD
Body, Disc, Bonnet & Gland Flange	Carbon Steel	ASTMA 216 Gr. WCB
Body Seat Ring & Wedge Facing	Stainless Steel	ASTM 276 TYPE 410
Back Seat Bush, Lock Bush, Gland & Stem	Stainless Steel	ASTM 276 TYPE 410
Eye Bolt & Nut	Carbon Steel	
Grease Nipple, Grub Screw & Sleeve Nut	Steel	
Gasket	Non - Asbestos Fibre	BS - 1832
Nut	H.T. Steel	ASTMA 194 Gr. 2H
Stud	Alloy Steel	ASTMA 193 Gr. B7
Gland Packing	Graphoil	
Sleeve	S.S./Nodular Iron	ASTM 276 TYPE 304 / ASTMA 439 D2

Test Pressure	Body	Seat
Hydraulic :	30 Bar	22 Bar
Air :	6.9 Bar	---

Sizes / Dimensions

Sizes		Dimensions						
Inches	mm	A	B	C	D	E	F	GØ
1-1/2	40	165	14.3	127	73	1.6	330	210
2	50	178	16	152	92	1.6	340	210
2-1/2	65	190	17.5	178	104.8	1.6	395	210
3	80	203	19	190	127	1.6	430	225
4	100	229	23.8	229	157.2	1.6	521	255
6	150	267	25.4	279	216	1.6	666	356
8	200	292	28.6	343	270	1.6	783	400



CAST STEEL (A 216 GR. WCB) GLOBE VALVE CLASS 150

ITEM CODE # CS - 202

Specification & Features:

Conforming to BS:1873 / ANSI B16.34
Outside Screw & Yoke Type, Bolted Bonnet, rising stem, S.S. Trim,
Plug Type Disk, Flanged Ends to ANSI B16.5 CL-150 R/F

Pressure / Temperature ratings

Temperature °Celsius	-29° +38°	100°	150°	200°	250°	300°	350°	375°	400°	425°	* 450°	* 475°	* 500°	* 538°
Pressure bar	19.7	17.7	15.8	14.0	12.1	10.2	8.4	7.4	6.5	5.6	4.6	3.7	2.8	1.4

* Prolonged temperature above 425 Celsius may result in deterioration of the carbon phase of carbon steel.

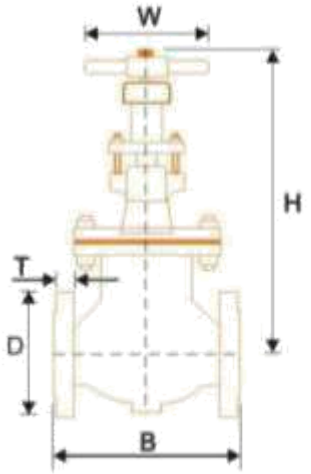
Materials of Construction

NAME OF PART	MATERIAL	STANDARD
Body, Bonnet	Carbon Steel	ASTM A 216 Gr. WCB
Seat Ring, Disc	C.S. with 13% Cr. S.S. Facing	
Spindle, Spindle Nut	Stainless Steel	ASTM 276 TYPE 410
Bonnet Bush, Gland		
Gland Flange	Carbon Steel / Forged Carbon Steel	ASTM A 216 Gr. WCB / A 105
Washer, Hand Wheel Nut,		
Gland Bolting		
Gasket	Non - Asbestos Fibre	BS-1832
Bonnet Stud	Alloy Steel	ASTM 194 Gr. B7
Bonnet Stud Nut	H.T. Steel	ASTM 194 Gr. 2H
Handwheel	Cast Iron	BS 1561 GJL - 200
Gland Packing	Graphoil	

Test Pressure	Body	Seat
Hydraulic :	30 Bar	22 Bar
Air :	6.9 Bar	---

Sizes / Dimensions

Sizes		Dimensions				
Inches	mm	B	D	T	H	W
1-1/2"	40	200	150	16	300	178
2"	50	230	165	18	316	203
2-1/2"	65	290	185	18	330	229
3"	80	310	200	20	365	254
4"	100	350	220	20	414	305
6"	150	480	285	22	505	354
8"	200	600	340	24	623	408



CAST STEEL PARALLEL SLIDE BLOW DOWN VALVE

ITEM CODE # CS - 203

Specification & Features:

Flanged Ends To BS - 10 Table 'J'.
It maintains fluid tightness and is easy in operation because of parallel sliding action of discs.
High quality lubricated gland packing.

Operation:

Spring keeps the disc in parallel position and disc removes any dust or deposits from the body rings. Hence low torque is required to operate the valve. Rack and Pinion arrangement enables to open / close in half turn.

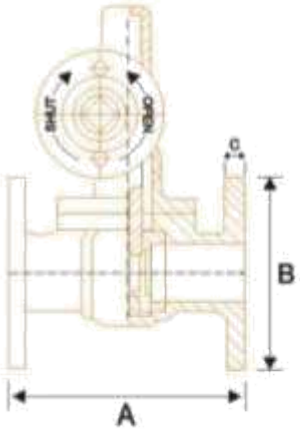
Materials of Construction

NAME OF PART	MATERIAL	STANDARD
Body & Bonnet	Cast Steel	ASTM A216 Gr. WCB
Rack & Pinion	Stainless Steel	ASTM 276 TYPE 410
Stuffing Box	Cast Steel	ASTM A216 Gr. WCB
Gland	Cast Steel	ASTM A216 Gr. WCB
Discs	Stainless Steel	ASTM 276 TYPE 410 + Stellite
Body Ring	Stainless Steel	ASTM 276 TYPE 410 + Stellite
Fastners	Alloy Steel	ASTM 193 B7 / A194 2H
Gasket	Steam Jointing	To Suit Service Conditions.
Spring	Spring Steel	EN-44 or Equivalent
Packing	Graphoil	
Key	Mild Steel	

Test Pressure (Hydraulic) - 700 Psig
Working Pressure (Steam) - 350 Psig
Maximum Service Temperature - 400°C

Sizes / Dimensions

Sizes		Dimensions		
Inches	mm	A	B	C
1	25	178	120.6	19.05
1-1/2	40	205	139.7	22.20
2	50	255	165.1	25.40
2-1/2	65	275	184.1	28.00



GUN METAL PARALLEL SLIDE BLOW DOWN VALVE

Specification & Features:

Flanged Ends To BS - 10 Table 'H'.
It maintains fluid tightness and is easy in operation because of parallel sliding action of discs.
High quality lubricated gland packing.

Operation:

Spring keeps the disc in parallel position and disc removes any dust or deposits from the body rings. Hence low torque is required to operate the valve. Rack and Pinion arrangement enables to open / close in half turn.

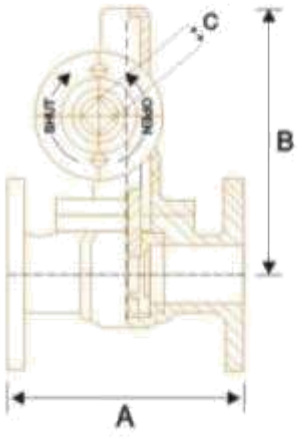
Materials of Construction

NAME OF PART	MATERIAL	STANDARD
Body & Bonnet	Bronze	BS: 1982 CC 491K
Rack & Pinion	Bronze	BS: 1982 CC 491K
Stuffing Box & Gland	Bronze	BS: 1982 CC 491K
Discs	Monel / Stainless Steel	ASTM 276 TYPE 410 + Stellite
Body Seat Ring	Monal / Stainless Steel	ASTM 276 TYPE 410 + Stellite
Fastners	Alloy Steel	ASTM 193 B7 / A194 2H
Gasket	Steam Jointing	IS : 2712 Gr. C
Spring	Spring Steel	EN-44 or Equivalent
Packing	Graphoil	
Key	Mild Steel	

Test Pressure (Hydraulic) - 35.15 kg/cm2g / 500 Psig / 34.5 Bar
Working Pressure (Steam) - 17.58 kg/cm2g / 250 Psig / 17.24 Bar

Sizes / Dimensions

Sizes		Dimensions		
Inches	mm	A	B	C
1	25	169	138	16
1-1/4	32	178	157	22
1-1/2	40	190	204	22
2	50	206	226	25.4
2-1/2	65	228	240	28.5
3	80	254	280	32



GUN METAL GLOBE VALVE
(UNION BONNET) SCREWED / FLANGED

ITEM CODE # GM - 502

ITEM CODE # GM - 503

Specification & Features:

Manufacture is to BS 5154/B PN 32
Screwed Female Ends to BS: 21 / ISO: 7 / IS: 554
Flanged Ends to BS: 10 Table 'F'
Inside Screwed, Rising Spindle with Back Seat Arrangement
S.S. Working Parts, Hand Wheel Operated.

Temperature °Celsius	-10° to +100°	120°	130°	140°	150°	160°	170°	180°	190°	198°
Pressure bar	32.0	28.3	26.5	24.6	22.8	21.0	19.2	17.4	15.5	14.0

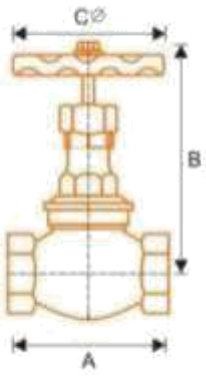
Materials of Construction

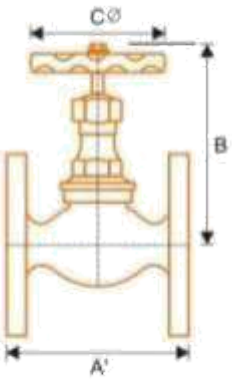
NAME OF PART	MATERIAL	STANDARD
Body, Bonnet & Gland	Bronze	BS: 1982 CC 491K
Disc Nut & Gland Nut	Bronze	BS: 1982 CC 491K
Stem, Disc & Body Seat Ring	Stainless Steel	ASTM 276 TYPE 410
Handwheel	Cast Iron	BS 1561 GJL - 200
Nut & Washer	Mild Steel	BS: 970
Gland Packing	Graphol	

Testing - Each Valve Individually Tested to BS 5154

Sizes / Dimensions

Sizes		Dimensions			
inches	mm	A	A'	B	C∅
1/4"	8	60	-	110	60
3/8"	10	60	-	110	60
1/2"	15	68	82	117	70
3/4"	20	84	96	132	80
1"	25	95	112	148	86
1-1/4"	32	106	119	176	102
1-1/2"	40	120	132	188	102
2"	50	146	157	216	127
2-1/2"	65	180	185	248	150
3"	80	200	213	270	170
4"	100	248	255	332	190





Option - Available with Teflon / Neoprene Seating, Suitable for Oil, Air & Gas applications.

GUN METAL GLOBE VALVE
SCREWED / FLANGED

ITEM CODE # GM - 506

ITEM CODE # GM - 507

Specification & Features:

Manufacture is to BS 5154/B PN 32 For sizes 1/2" to 2" and PN 25 for sizes 2-1/2" to 4"
Screwed Female Ends to BS: 21 / ISO: 7 / IS: 554
Flanged Ends to BS: 10 Table 'F'
Screwed in bonnet, Inside screw with S.S. working parts
Rising Stem with back seat arrangement, Hand Wheel operated.

Pressure / Temperature ratings

Temperature °Celsius		-10° to +100°	120°	150°	170°	180°	186°	190°	198°
Pressure bar	1/2" to 2"	32.0	28.3	22.8	19.2	17.4	16.2	15.5	14.0
	2-1/2" to 4"	25.0	21.8	16.5	12.8	11.3	10.5	---	---

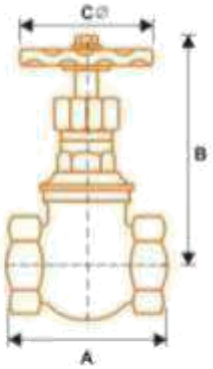
Materials of Construction

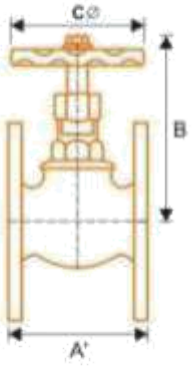
NAME OF PART	MATERIAL	STANDARD
Body, Bonnet	Bronze	BS: 1982 CC 491K
Gland, Gland Nut	Bronze	BS: 1982 CC 491K
Seat, Seat Ring, Spindle	Stainless Steel	ASTM 276 TYPE 410
Screw & Washer	Mild Steel	BS: 970
Hand Wheel	Cast Iron	BS 1561 GJL - 200
Gland Packing	Graphol	

Testing - Each Valve Individually Tested to BS 5154

Sizes / Dimensions

Sizes		Dimensions			
inches	mm	A	A'	B	CØ
1/2"	15	55	55	86	52
3/4"	20	67	64	103	59
1"	25	79	76	115	67
1-1/4"	32	88	83	122	73
1-1/2"	40	101	98	139	85
2"	50	123	110	161	85
2-1/2"	65	135	156	188	110
3"	80	156	162	196	133
4"	100	186	197	215	149





Option - Available with Teflon Seating for Oil & Air applications, Bronze working parts for water services. Angle Globe Valve also available.

GUN METAL HORIZANTAL LIFT CHECK VALVE (UNION CAP) SCREWED / FLANGED

Specification & Features:

Manufacture is to BS 5154/B PN 32
Screwed Female Ends to BS: 21 / ISO: 7 / IS: 554
Flanged Ends to BS: 10 Table 'F'
Guided Plug Type Disc, S.S. Working Parts.
Increased Lift to ensure full flow area.
Available with Teflon Seating also for air application.

ITEM CODE # GM - 504

ITEM CODE # GM - 505

Pressure / Temperature ratings

Temperature °Celsius	-10° to +100°	120°	130°	140°	150°	160°	170°	180°	190°	198°
Pressure bar	32.0	28.3	26.5	24.6	22.8	21.0	19.2	17.4	15.5	14.0

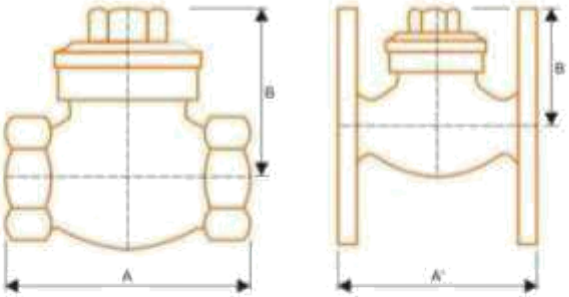
Materials of Construction

NAME OF PART	MATERIAL	STANDARD
Body & Bonnet	Bronze	BS: 1982 CC 491K
Body Seat Ring & Disc	Stainless Steel	ASTM 276 TYPE 410

Testing - Each Valve Individually Tested to BS 5154

Sizes / Dimensions

Sizes		Dimensions		
inches	mm	A	A'	B
1/4"	8	58	-	40
3/8"	10	58	-	43
1/2"	15	68	82	48
3/4"	20	84	96	50
1"	25	95	112	61
1-1/4"	32	106	119	72
1-1/2"	40	120	132	84
2"	50	146	157	93
2-1/2"	65	180	185	109
3"	80	200	213	121
4"	100	248	248	146



GUN METAL CHECK VALVE
SCREWED / FLANGED

Specification & Features:

Manufacture is to BS 5154/B PN 32for sizes 1/2" to 2"
and PN 25 for sizes 2 1/2" to 4"
Screwed Female Ends to BS: 21 / ISO: 7 / IS: 554
Flanged Ends to BS: 10 Table 'F'
Screwed in bonnet, Integral seat, Guided Plug type disc.

ITEM CODE # GM - 508

ITEM CODE # GM - 509

Pressure / Temperature ratings

Temperature °Celsius		-10° to +100°	120°	150°	170°	180°	186°	190°	198°
Pressure bar	1/2" to 2"	32.0	28.3	22.8	19.2	17.4	16.2	15.5	14.0
	2-1/2" to 4"	25.0	21.8	16.5	12.8	11.3	10.5	---	---

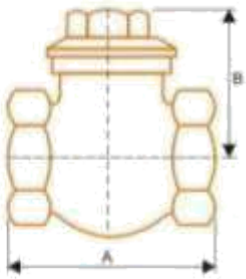
Materials of Construction

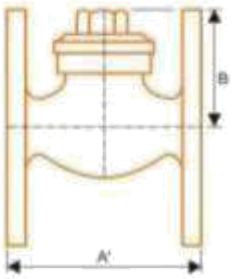
NAME OF PART	MATERIAL	STANDARD
Body & Bonnet	Bronze	BS: 1982 CC 491K
Disc, Seat Ring	Stainless Steel	ASTM 276 TYPE 410

Testing - Each Valve Individually Tested to BS 5154

Sizes / Dimensions

Sizes		Dimensions		
inches	mm	A	A'	B
1/2"	15	55	55	38
3/4"	20	67	64	44
1"	25	79	76	51
1-1/4"	32	88	83	52
1-1/2"	40	101	98	62
2"	50	123	110	77
2-1/2"	65	135	156	88
3"	80	156	162	93
4"	100	186	197	110





Option - Available with Teflon Seating for Oil & Air applications, Bronze working parts for water services.
Also available Swing Check Valve & Angle Check Valve.

HORIZONTAL LIFT CHECK VALVE (FLANGED)

ITEM CODE # CI - 103

ITEM CODE # CI - 104

Specification & Features:

Confirming to BS : 5153
Flanged ends to DIN 2533 PN-16 RF upto 150mm sizes.
For size 200mm PN-10 RF
Straight / Angel pattern, bolted cover, Full flow Area.
Renewable 13% Cr. Stainless Steel (AISI - 410) Working Parts.
Minimum pressure drop inside the body due to streamlined body design.

Pressure / Temperature ratings

Temperature °Celsius	-10° to +120°	150°	180°	200°	220°
Pressure bar	16	14.8	13.9	13	13
	10	9.2	8.5	8	8

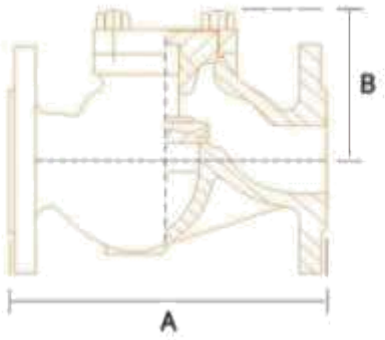
Materials of Construction

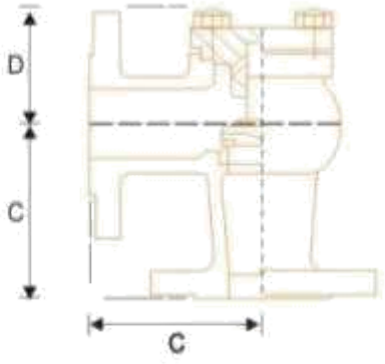
NAME OF PART	MATERIAL	STANDARD
Body, Cover & Disc	S.G. Iron / Cast Iron	DIN 1693 GGG40 / BS 1561 GJL - 200
Fastners	Alloy Steel	ASTM 193 B7 / A194 2H
Disc & Body Ring	Stainless Steel	ASTM 276 TYPE 410
Gasket	Non - Asbestos Fibre	

TEST PRESSURE (HYD.) - PN16 - BODY 24 BAR, SEAT 16 BAR.
PN10 - BODY 15 BAR, SEAT 10 BAR.

Sizes / Dimensions

Sizes		Dimensions (mm)			
Inches	mm	A	B	C	D
1/2	15	130	66	90	52
3/4	20	150	70	95	54
1	25	160	76	100	57
1-1/4	32	180	84	105	64
1-1/2	40	200	102	115	76
2	50	230	112	125	83
2-1/2	65	290	123	145	95
3	80	310	140	155	108
4	100	350	156	175	125
5	125	400	200	200	140
6	150	480	230	225	182
8	200	600	275	275	190





G.M. SAFETY VALVE / RELIEF VALVE

(Screwed Ends)

ITEM CODE # GM - 510 ITEM CODE # GM - 511

Specification & Features:

Straight Pattern, Open Discharge,
Screwed Male Threads at Inlet to BS 21.
Angle Pattern, Enclosed Discharge, Screwed Male Threads at Inlet and Screwed Female Ends at Outlet to BS 21.
These Valves start opening at the set pressure & open in direct proportion to the increase, in order of set pressure.
These should be installed nearer to the pressure vessel they protect. When installed, they should be one size smaller than the pipeline size.

Materials of Construction

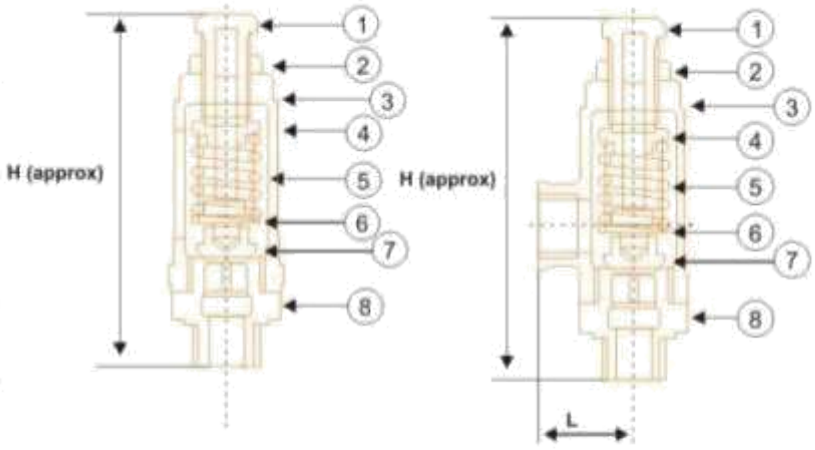
NAME OF PART	MATERIAL	STANDARD
1. Adjusting Screw	Bronze	BS: 1982 CC491K
2. Locking Nut	Brass	BS: EN 12165 Gr. W617N
3. Spring Chamber	Bronze	BS: 1982 CC491K
4. Spring Disc	Bronze	BS: 1982 CC491K
5. Spring	Carbon Steel	EN 44
6. Stem	HT Brass	BS: EN 12165 Gr. CW721R
7. Disc	Bronze	BS: 1982 CC491K
8. Body	Bronze	BS: 1982 CC491K

Testing :

Each Safety / Relief Valve is tested for Body and Seat Tightness at 300 Psig (Hyd.)

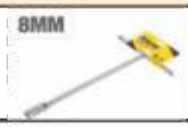
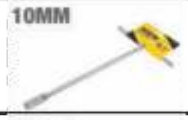
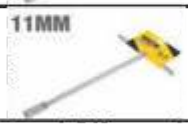
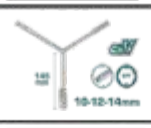
Sizes / Dimensions

SIZES		DIMENSIONS (mm)	
Inch	mm	H	L
1/2"	15	148	38
3/4"	20	160	39
1"	25	178	48
1.1/4"	32	180	50
1.1/2"	40	210	59
2"	50	255	59



Setting :

The Safety / Relief Valve is normally pre-set at 5 Bar but is adjustable from 2 Bar to 10 Bar. To set the pressure, connect the male inlet end of the valve to the supply system which is fitted with a pressure gauge. Unscrew the locking Nut. Set the Adjusting Screw with a spanner by turning clockwise to increase the pressure & anti-clockwise to decrease the pressure. Check the Gauge. Screw the Locking nut tightly.

Item Code	Item Name	Item Picture	Description	Size	Unit Price INCLUSIVE VAT
YY08ZU	T Type Wrench		1. Socket head material: 40Cr 2. T-handle material: Carbon steel 045 3. Torque capacity: 330NM 4. Chrome plated	8 MM	690.00
YY10ZU	T Type Wrench		1. Socket head material: 40Cr 2. T-handle material: Carbon steel 045 3. Torque force: 58.2NM 4. Chrome plated	10 MM	760.00
YY11ZU	T Type Wrench		1. Socket head material: 40Cr 2. T-handle material: Carbon steel 045 3. Torque force: 72.7NM 4. Chrome plated	11 MM	790.00
YY12ZU	T Type Wrench		1. Socket head material: 40Cr 2. T-handle material: Carbon steel 045 3. Torque capacity: 88.1NM 4. Chrome plated	12 MM	792.00
YY13ZU	T Type Wrench		1. Socket head material: 40Cr 2. T-handle material: Carbon steel 045 3. Torque capacity: 107NM 4. Chrome plated	13 MM	792.00
YY14ZU	T Type Wrench		1. Socket head material: 40Cr 2. T-handle material: Carbon steel 045 3. Torque capacity: 126NM 4. Chrome plated	14 MM	802.00
YY17ZU	T Type Wrench		1. Socket head material: 40Cr 2. T-handle material: Carbon steel 045 3. Torque capacity: 128NM 4. Chrome plated	17 MM	934.00
YY19ZU	T Type Wrench		1. Socket head material: 40Cr 2. T-handle material: Carbon steel 045 3. Torque capacity: 128NM 4. Chrome plated	19 MM	1,008.00
YYA10L	Y Type Wrench – Long		1. Socket material: 40Cr 2. Y-handle material: Carbon steel 045 3. Torque capacity: 8mm/58NM 9mm/65.4NM 10mm/58.1NM 4. Chrome plated	8 , 9 , 10 MM	1,044.00
YYA12L	Y Type Wrench – Long		1. Socket material: 40Cr 2. Y-handle material: Carbon steel 045 3. Torque capacity: 8mm/58NM 10mm/58.1NM 12mm/89.1NM 4. Chrome plated	8, 10, 12 MM	1,044.00
YYA13L	Y Type Wrench – Long		1. Socket material: 40Cr 2. Y-handle material: Carbon steel 045 3. Torque capacity: 10mm/58.1NM 11mm/72.7NM 13mm/107NM 4. Chrome plated	10, 11, 13MM	1,088.00
THYSW101214	Y-Type Socket Wrench		Size: 10-12-14mm Tools bar length: 145mm Socket material: Cr-V Surface: chrome-plated	10-12-14 MM	1,188.00
THYY101214l7	Y-Type Socket Wrench		Size: 10-12-14mm Tools bar length: 145mm Socket material: Cr-V Surface: chrome-plated	12-14-17 MM	1,200.00
YOZ006	Combination Spanner		1. Chrome vanadium steel 6D 2. Sand blast & chrome plated 3. Extra thick handle 4. ASME standard	6 MM	324.00
YOZ008	Combination Spanner		1. Chrome vanadium steel 6D 2. Sand blast & chrome plated 3. Extra thick handle 4. ASME standard	8 MM	348.00
YOZ010	Combination Spanner		1. Chrome vanadium steel 6D 2. Sand blast & chrome plated 3. Extra thick handle 4. ASME standard	10 MM	396.00

Item Code	Item Name	Item Picture	Description	Size	Unit Price INCLUSIVE VAT
YOZ011	Combination Spanner		1. Chrome vanadium steel 440 2. Sand blast & chrome plated 3. Extra thick handle 4. ASME standard	11 MM	492.00
YOZ012	Combination Spanner		1. Chrome vanadium steel 440 2. Sand blast & chrome plated 3. Extra thick handle 4. ASME standard	12 MM	648.00
YOZ013	Combination Spanner		1. Chrome vanadium steel 440 2. Sand blast & chrome plated 3. Extra thick handle 4. ASME standard	13 MM	588.00
YOZ014	Combination Spanner		1. Chrome vanadium steel 440 2. Sand blast & chrome plated 3. Extra thick handle 4. ASME standard	14 MM	684.00
YOZ015	Combination Spanner		1. Chrome vanadium steel 440 2. Sand blast & chrome plated 3. Extra thick handle 4. ASME standard	15 mm	756.00
YOZ016	Combination Spanner		1. Chrome vanadium steel 440 2. Sand blast & chrome plated 3. Extra thick handle 4. ASME standard	16 MM	780.00
YOZ017	Combination Spanner		1. Chrome vanadium steel 440 2. Sand blast & chrome plated 3. Extra thick handle 4. ASME standard	17 MM	948.00
YOZ018	Combination Spanner		1. Chrome vanadium steel 440 2. Sand blast & chrome plated 3. Extra thick handle 4. ASME standard	18 MM	1,020.00
YOZ019	Combination Spanner		1. Chrome vanadium steel 440 2. Sand blast & chrome plated 3. Extra thick handle 4. ASME standard	19 MM	1,086.00
YOZ020	Combination Spanner		1. Chrome vanadium steel 440 2. Sand blast & chrome plated 3. Extra thick handle 4. ASME standard	20 MM	1,140.00
YOZ021	Combination Spanner		1. Chrome vanadium steel 440 2. Sand blast & chrome plated 3. Extra thick handle 4. ASME standard	21 MM	1,404.00
YOZ022	Combination Spanner		1. Chrome vanadium steel 440 2. Sand blast & chrome plated 3. Extra thick handle 4. ASME standard	22 MM	1,428.00
YOZ023	Combination Spanner		1. Chrome vanadium steel 440 2. Sand blast & chrome plated 3. Extra thick handle 4. ASME standard	23 MM	1,668.00
YOZ024	Combination Spanner		1. Chrome vanadium steel 440 2. Sand blast & chrome plated 3. Extra thick handle 4. ASME standard	24 MM	1,848.00
YOZ027	Combination Spanner		1. Chrome vanadium steel 440 2. Sand blast & chrome plated 3. Extra thick handle 4. ASME standard	27 MM	2,148.00
YOZ030	Combination Spanner		1. Chrome vanadium steel 440 2. Sand blast & chrome plated 3. Extra thick handle 4. ASME standard	30 MM	2,640.00
YOZ032	Combination Spanner		1. Chrome vanadium steel 440 2. Sand blast & chrome plated 3. Extra thick handle 4. ASME standard	32 MM	2,880.00

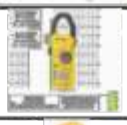
Item Code	Item Name	Item Picture	Description	Size	Unit Price INCLUSIVE VAT
PHWCJ17	Combination Spanner Highly Polished		Drilled Panel Spanner Diamond CRV Steel	17 mm	948.00
PHWCJ21	Combination Spanner Highly Polished		Drilled Panel Spanner Diamond CRV Steel	21 mm	1,392.00
PHWCJ22	Combination Spanner Highly Polished		Drilled Panel Spanner Diamond CRV Steel	22 mm	1,404.00
PHWCJ23	Combination Spanner Highly Polished		Drilled Panel Spanner Diamond CRV Steel	23 mm	1,644.00
PHWCJ27	Combination Spanner Highly Polished		Drilled Panel Spanner Diamond CRV Steel	27 mm	2,124.00
PHWCJ29	Combination Spanner Highly Polished		Drilled Panel Spanner Diamond CRV Steel	29 mm	2,388.00
PHWCJ30	Combination Spanner Highly Polished		Drilled Panel Spanner Diamond CRV Steel	30 mm	2,640.00
TCSPA101	Combination Spanner		Size:10mm Length:141mm Material:Cr-V Chrome plated,matt finish	10MM	432.00
TCSPA131	Combination Spanner		Size:13mm Length:170mm Material:Cr-V Chrome plated,matt finish	13 MM	600.00
TCSPA141	Combination Spanner		Size:14mm Length:189mm Material:Cr-V Chrome plated,matt finish Packed by paper card	14 MM	636.00
TCSPA151	Combination Spanner		Size:15mm Length:191mm Material:Cr-V Chrome plated,matt finish Packed by paper card	15 MM	720.00
TCSPA171	Combination Spanner		Size:17mm Length:211mm Material:Cr-V Chrome plated,matt finish Packed by paper card	17 MM	852.00
TCSPA191	Combination Spanner		Size:19mm Length:231mm Material:Cr-V Chrome plated,matt finish Packed by paper card	19 MM	924.00
TCSPA221	Combination Spanner		Size:22mm Length:262mm Material:Cr-V Chrome plated,matt finish Packed by paper card	22 MM	1,140.00
TCSPA241	Combination Spanner		Size:24mm Length:287mm Material:Cr-V Chrome plated,matt finish Packed by paper card	24 MM	1,476.00
TCSPA271	Combination Spanner		Size:27mm Length:322mm Material:Cr-V Chrome plated,matt finish Packed by paper card	27 MM	2,076.00
TCSPA321	Combination Spanner		Size:32mm Length:405mm Material:Cr-V Chrome plated,matt finish Packed by paper card	32 MM	2,640.00

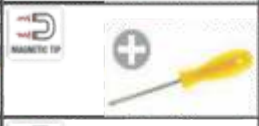
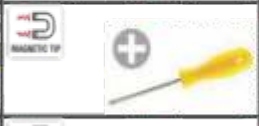
Item Code	Item Name	Item Picture	Description	Size	Unit Price INCLUSIVE VAT
YBZ067	Double Open End Spanner		1. Chrome vanadium steel 040 2. Sand blast & chrome plated 3. Extra thick handle 4. ASME standard	6 X 7 MM	373.00
YBZ089	Double Open End Spanner		1. Chrome vanadium steel 040 2. Sand blast & chrome plated 3. Extra thick handle 4. ASME standard	8 X 9 MM	444.00
YBZ181	Double Open End Spanner		1. Chrome vanadium steel 040 2. Sand blast & chrome plated 3. Extra thick handle 4. ASME standard	10 X 11 MM	480.00
YBZ123	Double Open End Spanner		1. Chrome vanadium steel 040 2. Sand blast & chrome plated 3. Extra thick handle 4. ASME standard	12 X 13 MM	576.00
YBZ145	Double Open End Spanner		1. Chrome vanadium steel 040 2. Sand blast & chrome plated 3. Extra thick handle 4. ASME standard	14 X 15 MM	636.00
YBZ167	Double Open End Spanner		1. Chrome vanadium steel 040 2. Sand blast & chrome plated 3. Extra thick handle 4. ASME standard	16 X 17 MM	768.00
YBZ189	Double Open End Spanner		1. Chrome vanadium steel 040 2. Sand blast & chrome plated 3. Extra thick handle 4. ASME standard	18 X 19 MM	912.00
YBZ202	Double Open End Spanner		1. Chrome vanadium steel 040 2. Sand blast & chrome plated 3. Extra thick handle 4. ASME standard	20 X 22 MM	1,020.00
YBZ212	Double Open End Spanner		1. Chrome vanadium steel 040 2. Sand blast & chrome plated 3. Extra thick handle 4. ASME standard	21 X 23 MM	1,344.00
YBZ242	Double Open End Spanner		1. Chrome vanadium steel 040 2. Sand blast & chrome plated 3. Extra thick handle 4. ASME standard	24 X 27 MM	1,428.00
YBZ262	Double Open End Spanner		1. Chrome vanadium steel 040 2. Sand blast & chrome plated 3. Extra thick handle 4. ASME standard	25 X 28 MM	1,608.00
YBZ303	Double Open End Spanner		1. Chrome vanadium steel 040 2. Sand blast & chrome plated 3. Extra thick handle 4. ASME standard	30 X 32 MM	2,232.00
YRZ089	Double Ring Spanner		1. Chrome vanadium steel 040 2. Sand blast & chrome plated 3. Extra thick handle 4. ASME standard	8 X 9 MM	576.00
YRZ101	Double Ring Spanner		1. Chrome vanadium steel 040 2. Sand blast & chrome plated 3. Extra thick handle 4. ASME standard	10 X 11 MM	636.00
YRZ123	Double Ring Spanner		1. Chrome vanadium steel 040 2. Sand blast & chrome plated 3. Extra thick handle 4. ASME standard	12 X 13 MM	792.00
YRZ145	Double Ring Spanner		1. Chrome vanadium steel 040 2. Sand blast & chrome plated 3. Extra thick handle 4. ASME standard	14 X 15 MM	924.00
YRZ167	Double Ring Spanner		1. Chrome vanadium steel 040 2. Sand blast & chrome plated 3. Extra thick handle 4. ASME standard	16 X 17 MM	1,128.00

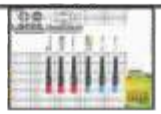
Item Code	Item Name	Item Picture	Description	Size	Unit Price INCLUSIVE VAT
YHZ189	Double Ring Spanner		1. Chrome vanadium steel 840 2. Sand blast & chrome plated 3. Extra thick handle 4. ASME standard	18 X 19 MM	1,188.00
YHZ202	Double Ring Spanner		1. Chrome vanadium steel 840 2. Sand blast & chrome plated 3. Extra thick handle 4. ASME standard	20 X 22 MM	1,428.00
YHZ212	Double Ring Spanner		1. Chrome vanadium steel 840 2. Sand blast & chrome plated 3. Extra thick handle 4. ASME standard	21 X 23 MM	1,668.00
YHZ242	Double Ring Spanner		1. Chrome vanadium steel 840 2. Sand blast & chrome plated 3. Extra thick handle 4. ASME standard	24 X 27 MM	1,980.00
YHZ252	Double Ring Spanner		1. Chrome vanadium steel 840 2. Sand blast & chrome plated 3. Extra thick handle 4. ASME standard	25 X 28 MM	2,148.00
YHZ300	Double Ring Spanner		1. Chrome vanadium steel 840 2. Sand blast & chrome plated 3. Extra thick handle 4. ASME standard	30 X 32 MM	2,640.00
YOR8SF	8 Pcs Ratchet Ring Spanners Set (Flex Head)		Size: 10,11,13,14,19mm Material: 48CR chrome plated and forged body Package:plastic hanger	Size: 10,11,13,14,19mm	8,040.00
YOR7SU	7 Pcs Combination Ratcheting Spanner Set		Size: 8,10,12,13,14,17,19mm Material: 48CR chrome plated and forged body Package:plastic hanger	Size: 8,10,12,13,14,17, 19mm	9,280.00
YOR8SF	8 Pcs Ratchet Ring Spanners Set (Flex Head)		8pcs /Set Size: 8, 10, 11, 12, 13, 14, 17, 19mm Material: 48CR Chrome plated and forged body Package: plastic hanger	Size: 8, 10, 11, 12, 13, 14, 17, 19mm	12,634.00
YRZ8S1	8 Pcs Double Ring Spanners Set		1. Chrome vanadium steel 840 2. Sand blast & chrome plated 3. Extra thick handle 4. ASME standard 5. Packed by plastic hanger	6-22MM	8,970.00
YOZ8S1	8 Pcs Combination Spanners Set		1. Chrome vanadium steel 840 2. Sand blast & chrome plated 3. Extra thick handle 4. ASME standard 5. Packed by plastic case	10,11,12, 13, 14, 17, 19, 22MM	6,340.00
PHWC708	8 Pcs Elliptical Raised Full Polish Set		Raised Panel Spanner Diamond CRV Steel	6, 8, 10, 12, 14, 15, 17, 19 mm	3,480.00
MK1108	Combination Spanner Highly Polished			6,8,10,12,14,17,19,22	4,620.00
MK1208	Open Ended Spanner			6x7,8x9,10x11,12x13, 14x15,16x17,18x19,20x22	4,440.00
MK1808	Ring Spanner			6x7,8x9,10x11,12x13, 14x15,16x17,18x19,20x22	5,360.00
THT1823121	12 Pcs Double Open End Spanner Set		12 pcs double open end spanners set Size:6-32mm 6x7mm,8x9mm,10x11mm,12x13mm, 14x15mm,16x17mm,18x19mm,20x22mm,21X23mm,2 4X27mm,25X28mm,30X32mm. Fine-polished Packed by canvas bag		9,480.00
YOZ12S1	12 Pcs Combination Spanners Set		Size: 6,7,8,9,10,11,12,13,14,17,19,22mm Material: 45carbon steel chrome plated and forged body Package: canvas bag	6, 7, 8, 9, 10, 11, 12, 13, 14, 17, 19, 22MM	8,700.00

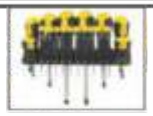
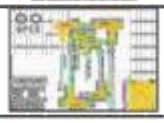
Item Code	Item Name	Item Picture	Description	Size	Unit Price INCLUSIVE VAT
YOZ14S1	14 Pcs Combination Spanners Set		1. Chrome vanadium steel 60 2. Sand blast & chrome plated 3. Nylon dipt handle 4. ASME standard 5. Packed in cloth bag	6, 7, 8, 9, 10, 11, 12, 13, 14, 17, 19, 21, 22, 24MM	12,680.00
ALU615	Combination Pliers		1. Drop forged from carbon steel 65 2. Heat treated & polished head 3. Bi-color soft TPR handle	6"	1,476.00
ALU715	Combination Pliers		1. Drop forged from carbon steel 65 2. Heat treated & polished head 3. Bi-color soft TPR handle	7"	1,688.00
ALU815	Combination Pliers		1. Drop forged from carbon steel 65 2. Heat treated & polished head 3. Bi-color soft TPR handle	8"	2,316.00
ALP615	Long Nose Pliers		1. Drop forged from carbon steel 65 2. Heat treated & polished head 3. Bi-color soft TPR handle	6"	1,308.00
ALP815	Long Nose Pliers		1. Drop forged from carbon steel 65 2. Heat treated & polished head 3. Bi-color soft TPR handle	8"	1,764.00
ALC615	Diagonal Cutting Nippers		1. Drop forged from carbon steel 65 2. Heat treated & polished head 3. Bi-color soft TPR handle	6"	1,872.00
ALC715	Diagonal Cutting Nippers		1. Drop forged from carbon steel 65 2. Heat treated & polished head 3. Bi-color soft TPR handle	7"	1,908.00
ALS315	3 Pcs Plier Set		1. Drop forged from carbon steel 65 2. Heat treated & polished head 3. Bi-color soft TPR handle 4. Packed by double blister	6" Long Nose 6" Diagonal Cutter 8" Combination Pliers	4,788.00
THT116606P	Combination Pliers		Size:6"/160mm Polish and nail-rust oil Two color handle	6"	1,032.00
ALU6D15	Combination Pliers		1. Drop forged from carbon steel 65 2. Heat treated & polished head 3. Bi-color soft PVC handle	6"	1,164.00
ALU7D15	Combination Pliers		1. Drop forged from carbon steel 65 2. Heat treated & polished head 3. Bi-color soft PVC handle 4. Packed by blister card	7"	1,284.00
PHPC107	Combination Pliers		1. Drop forged from Carbon Steel 045 2. Two color soft PVC Handle 3. Polished head. 4. Fully hardened	7"	1,260.00
THT110706P	Combination Pliers		Size: 7"/180mm Polish and nail-rust oil Two color handle	7"	1,044.00
ALU8D15	Combination Pliers		1. Drop forged from carbon steel 65 2. Heat treated & polished head 3. Bi-color soft PVC handle	8"	1,428.00
THT120606P	Long Nose Pliers		Size: 6"/160mm Polish and nail-rust oil Two color handle	6"	948.00
ALP6D15	Long Nose Pliers		1. Drop forged from carbon steel 65 2. Heat treated & polished head 3. Bi-color soft PVC handle	6"	1,032.00

Item Code	Item Name	Item Picture	Description	Size	Unit Price INCLUSIVE VAT
ALP8D15	Long Nose Pliers		1. Drop forged from carbon steel #45 2. Heat treated & polished head 3. Bi-color soft PVC handle	8"	1,500.00
ALC6D15	Diagonal Cutting Nippers		1. Drop forged from carbon steel #45 2. Heat treated & polished head 3. Bi-color soft PVC handle	6"	1,188.00
ALC7D15	Diagonal Cutting Nippers		1. Drop forged from carbon steel #45 2. Heat treated & polished head 3. Bi-color soft PVC handle	7"	1,880.00
THT130606P	Diagonal Cutting Pliers		Size: 6"160mm Polish and nail-rust oil Two color handle	6"	1,032.00
THT130706P	Diagonal Cutting Pliers		Size:7"180mm Polish and nail-rust oil Two color handle	7"	1,340.00
THT1776P	Heavy-Duty Diagonal Cutting Pliers		Size: 7"200mm Polish and nail-rust oil Two color handle	8"	1,428.00
THT1K0301	3 Pcs Pliers Set		Size: 8" Combination pliers 6" Long nose pliers 6" Diagonal cutting pliers Polish and nail-rust oil Two color handle	8" 6" 6"	3,120.00
AL3SD15	3 Pcs Plier Set		1. Drop forged from carbon steel #45 2. Heat treated & polished head 3. Bi-color soft PVC handle	6" Long Nose 6" Diagonal Cutter 8" Combination Pliers	3,420.00
THT2K0804S	3 Pcs High Leverage Pliers		8" High leverage combination pliers 7" High leverage diagonal cutting pliers 6" High leverage long nose pliers Cr-V,black finish and polish TPR three color handle Strong 3086 strength then normal pliers	8" 7" 6"	4,704.00
ALV206	Bent Nose Pliers		1. Drop forged from carbon steel #45 2. Heat treated & polished head 3. Bi-color soft PVC handle 4. Packed by blister card	6"	1,068.00
YAX018	18 Pcs Hex & Torx Wrench Set		1. Chrome vanadium 4150 2. Heat treated 3. Chrome plated 4. Packed by plastic box	18 PCS	3,480.00
YAX020	20 Pcs Hex & Torx Wrench Set		1. Chrome vanadium 4150 2. Heat treated 3. Chrome plated 4. with a canvas bag 4. Packed by double blister	20 PCS	4,680.00
DEC902	9 Pcs Torx Wrench Set - Medium		1. Chrome vanadium 4150 2. Heat treated 3. Chrome plated 4. with a plastic case 4. Packed by double blister	T10, T15, T20, T25, T27, T30, T40, T45, T50	1,908.00
DEC903	9 Pcs Torx Wrench Set- Long		1. Chrome vanadium 4150 2. Heat treated 3. Chrome plated 4. with a plastic case 4. Packed by double blister	T10, T15, T20, T25, T27, T30, T40, T45, T50	2,148.00
YAA901	9 Pcs Ball Point Hex Wrench Set - Short		1. Chrome vanadium 4150 2. Heat treated 3. Chrome plated 4. with a plastic case 4. Packed by double blister	1.5MM, 2MM, 2.5MM, 3MM, 4MM, 5MM, 6MM, 8MM, 10MM	1,620.00
YAA902	9 Pcs Ball Point Hex Wrench Set - Medium		1. Chrome vanadium 4150 2. Heat treated 3. Chrome plated 4. with a plastic case 4. Packed by double blister	1.5MM, 2MM, 2.5MM, 3MM, 4MM, 5MM, 6MM, 8MM, 10MM	1,908.00
YAA903	9 Pcs Ball Point Hex Wrench Set- Long		1. Chrome vanadium 4150 2. Heat treated 3. Chrome plated 4. with a plastic case 4. Packed by double blister	1.5MM, 2MM, 2.5MM, 3MM, 4MM, 5MM, 6MM, 8MM, 10MM	2,088.00

Item Code	Item Name	Item Picture	Description	Size	Unit Price INCLUSIVE VAT
YA901U	9 Pcs Flat Head Hex Wrench Set - Short		1. Chrome vanadium 6150 2. Heat treated 3. Chrome plated 4. with a plastic case 4. Packed by double blister	1.5MM, 2MM, 2.5MM, 3MM, 4MM, 5MM, 6MM, 8MM, 10	1,320.00
YA902U	9 Pcs Flat Head Hex Wrench Set - Medium		1. Chrome vanadium 6150 2. Heat treated 3. Chrome plated 4. with a plastic case 4. Packed by double blister	1.5MM, 2MM, 2.5MM, 3MM, 4MM, 5MM, 6MM, 8MM, 10	1,668.00
YA903U	9 Pcs Flat Head Hex Wrench Set - Long		1. Chrome vanadium 6150 2. Heat treated 3. Chrome plated 4. with a plastic case 4. Packed by double blister	1.5MM, 2MM, 2.5MM, 3MM, 4MM, 5MM, 6MM, 8MM, 10	1,908.00
YA701U	7 Pcs Flat Head Hex Wrench Set - Short		1. Chrome vanadium 6150 2. Heat treated 3. Chrome plated 4. with a plastic case 5. Packed by double blister	1.5MM, 2MM, 2.5MM, 3MM, 4MM, 5MM, 6MM	876.00
YAA10U	10 Pcs Set Hex Key		1.Carbon steel S45 2. Packed by blister card	1.5MM, 2MM, 2.5MM, 3MM, 4MM, 5MM,5.5MM, 6MM, 8MM, 10	828.00
YAS901	8 Pcs Folding Hex Wrench Set		1. Chrome vanadium 6150 2. Heat treated 3. Chrome plated 4. fitted by iron case 4. Packed by double blister	2.5MM, 3.0MM, 4.0MM, 5.0MM, 6.0MM, 7.0MM, 8.0MM, 10.0MM	1,068.00
YXS901	8 Pcs Folding Torx Wrench Set		1. Chrome vanadium 6150 2. Heat treated 3. Chrome plated 4. fitted by iron case 4. Packed by double blister	T10, T15, T20, T25, T27, T30, T40, T45	1,116.00
YAS902	8 Pcs Folding Hex Wrench Set - Plastic Shell		1. Chrome vanadium 6150 2. Heat treated 3. Chrome plated 4. fitted by iron case with TPR cover 4. Packed by double blister	2MM, 2.5MM, 3MM, 4MM, 5MM, 6MM, 7MM, 8MM	1,140.00
YXS702	7 Pcs Folding Torx Wrench Set - Plastic Shell		1. Chrome vanadium 6150 2. Heat treated 3. Chrome plated 4. fitted by iron case with TPR cover 4. Packed by double blister	T10, T15, T20, T25, T27, T30, T40	1,428.00
TSD3288	Digital Multi-Purpose Clamp Meters		Maximum Ac Voltage 600 V Maximum Dc Voltage 600 V Max Dc Amperage 600 A Resistance: 0-200 Kn Packed By Color Box And Knit Master Carton		5,880.00
TSD306	Mini Digital Multi-Meters		1. Low Battery Indication 2. Overload Protection 3. 3-1/2 Digit Lcd , Maximum Reading "1999" 4. Safety Guide 600V Cat 5. Packed By Blister Card.	-	5,400.00
TSD486	Digital Multi-Purpose Clamp Meters		1. Low Battery Indication 2. Overload Protection 3. Data Retention 4. Packed By Color Box.	-	8,400.00
TSD838B	Digital Multi-Meter		Maximum Ac Voltage 1000 V Maximum Dc Voltage 750 V Max Dc Amperage 10 A Resistance: 0-2000 Kn 3-4/2 Digit Lcd , Maximum Reading "1999"		3,120.00
THT5110915	Snap-Off Blade Knife		Blade Size:9mm*80mm With 1 pcs blade(THT519004) Auto-Lock Length:155mm With flat push button	9 MM X 90 MM	192.00
THT51001	Snap-Off Blade Knife		Blade Size:18x100mm With 1 pcs blade（THT519112） Length:192mm With flat push button	18 MM X 100 MM	216.00
CE1301A	Utility Knife - Aluminum Body		1. Material: ABS case with TPR 2. Zinc alloy body 3. With 3 pcs 0.6mm thick blade 4. Packed by blister card	18MM	1,800.00
CE1305	Snap-Off Knife		1. ABS case with TPR 2. Includes 1pc 0.5 mm thick blade 3. With self-locking mechanism 4. Packed by blister card	12"	540.00

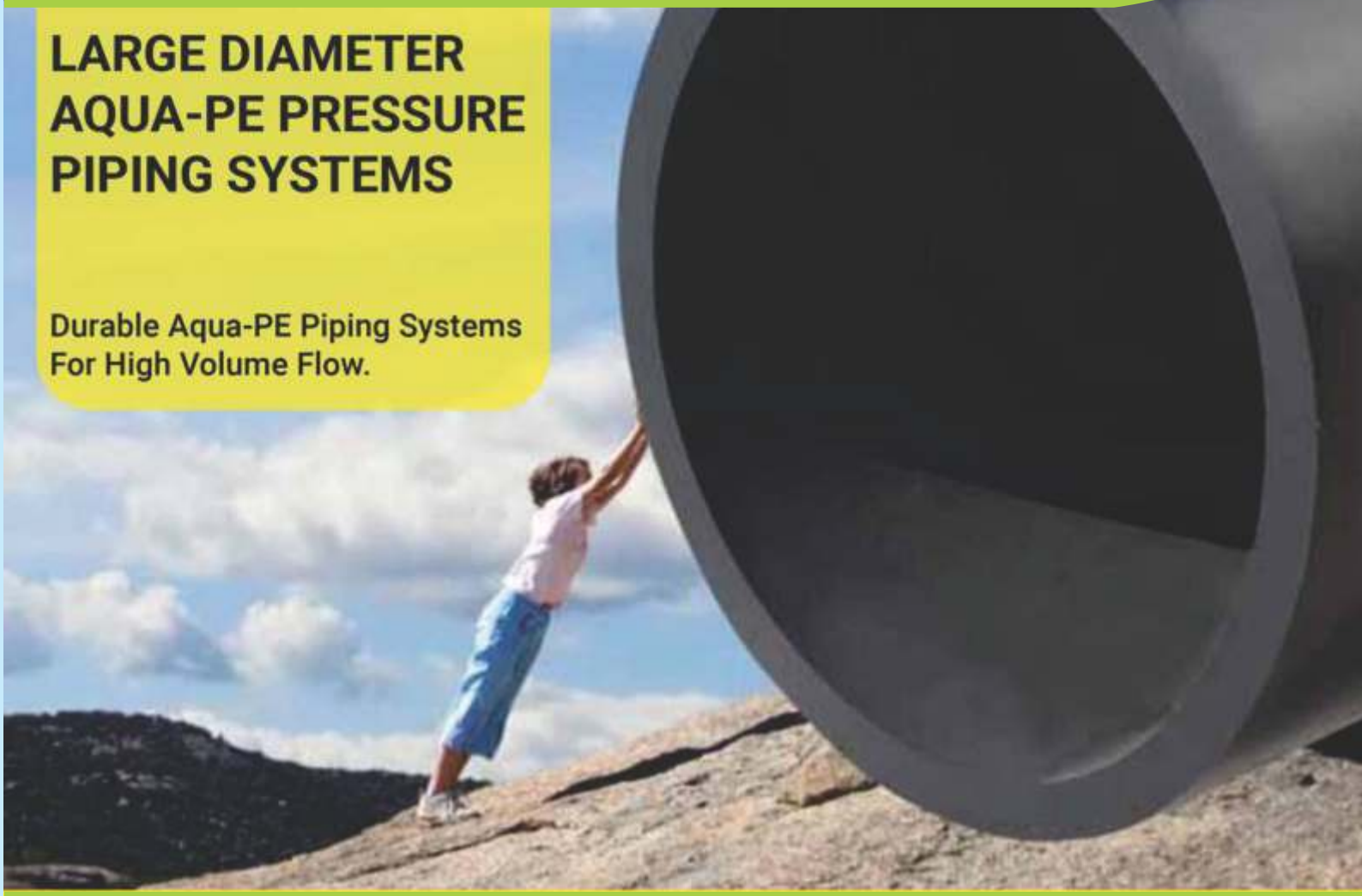
Item Code	Item Name	Item Picture	Description	Size	Unit Price INCLUSIVE VAT
CEA35U	Utility Knife With Three Blades		1. Material: ABS case with TPR 2. Includes 3pcs 0.3 mm thick blade 3. With self-locking mechanism 4. Packed by blister card	18MM	396.00
CE1303P	Folding Utility Knife		1. Zinc alloy with TPR grip handle 2. With 1pcs 0.6mm blade 3. Packed by blister card	18MM	1,848.00
THT15246	Automatic Wire Stripper		3 in 1 multi-function Stripping,cutting and crimping Stripping wires range:18AWG-24AWG(0.2-0mm²) Cutting functionsuppr and alu wires Crimping function Crimp the insulated terminals 0.5-6mm² (20-32 AWG);	Crimp the non-insulated terminals: 0.5-6mm² (4-22 AWG); Crimp the ignition terminals: 7-5mm² Durable and comfortable handle Packed by sliding card	4,068.00
DEM204	Phillips Screwdriver		1. Blade material: 40Cr 2. Heat treated & chrome plated 3. Tips with magnetic 4. PP handle 5. DIN standard 6. Packed by PP hanger	PH1 X 80	264.00
DEM205	Phillips Screwdriver		1. Blade material: 40Cr 2. Heat treated & chrome plated 3. Tips with magnetic 4. PP handle 5. DIN standard 6. Packed by PP hanger	PH2 X 125	276.00
DEM206	Phillips Screwdriver		1. Blade material: 40Cr 2. Heat treated & chrome plated 3. Tips with magnetic 4. PP handle 5. DIN standard 6. Packed by PP hanger	PH2 X 150	384.00
DEM201	Phillips Screwdriver		1. Blade material: 40Cr 2. Heat treated & chrome plated 3. Tips with magnetic 4. PP handle 5. DIN standard 6. Packed by PP hanger	PH2 X 200	420.00
DEM203	Phillips Screwdriver		1. Blade material: 40Cr 2. Heat treated & chrome plated 3. Tips with magnetic 4. PP handle 5. DIN standard 6. Packed by PP hanger	PH2 X 300	468.00
DEM208	Phillips Screwdriver		1. Blade material: 40Cr 2. Heat treated & chrome plated 3. Tips with magnetic 4. PP handle 5. DIN standard 6. Packed by PP hanger	PH3 X 200	468.00
DEM210	Phillips Screwdriver		1. Blade material: 40Cr 2. Heat treated & chrome plated 3. Tips with magnetic 4. PP handle 5. DIN standard 6. Packed by PP hanger	PH3 X 250	504.00
DEM184	Flat Screwdriver		1. Blade material: 40Cr 2. Heat treated & chrome plated 3. Tips with magnetic 4. PP handle 5. DIN standard 6. Packed by PP hanger	5 x 100 mm	276.00
DEM185	Flat Screwdriver		1. Blade material: 40Cr 2. Heat treated & chrome plated 3. Tips with magnetic 4. PP handle 5. DIN standard 6. Packed by PP hanger	6 X 125 mm	312.00
DEM186	Flat Screwdriver		1. Blade material: 40Cr 2. Heat treated & chrome plated 3. Tips with magnetic 4. PP handle 5. DIN standard 6. Packed by PP hanger	6 x 150 mm	336.00
DEM806U	Flat Screwdriver		1. Blade material: 40Cr 2. Heat treated & chrome plated 3. Tips with magnetic 4. PP handle	Shank size:6 1pc SL4x4"(100mm) 1pc SL5.5x6"(150mm) 1pc SL6.5x4"(100mm) 1pc SL6.5x6"(150mm) Shank size:6 1pc PH1X100mm 1pc PH2X150mm	1,188.00
DEM618	Flat Screwdriver - Tpr Handle		1. Blade material: Cro6170 2. Heat treated & chrome plated 3. Block tip with magnetic 4. TPR + PP soft handle 5. DIN standard 6. Packed by color label	6 X 200 MM	468.00
DEM202	Phillips Screwdriver - Tpr Handle		1. Blade material: Cro6170 2. Heat treated & chrome plated 3. Block tip with magnetic 4. TPR + PP soft handle 5. DIN standard 6. Packed by color label	PH2 X 38 MM	396.00
DEM624	Phillips Screwdriver - Tpr Handle		1. Blade material: Cro6170 2. Heat treated & chrome plated 3. Block tip with magnetic 4. TPR + PP soft handle 5. DIN standard 6. Packed by color label	PH2 X 100 MM	198.00

Item Code	Item Name	Item Picture	Description	Size	Unit Price INCLUSIVE VAT
DEM625	Phillips Screwdriver - Tpr Handle		1. Blade material: Crv0150 2. Heat treated & chrome plated 3. Block tip with magnetic 4. TPR + PP soft handle 5. DIN standard 6. Packed by water label	PH2 X 125 MM	438.00
DEM626	Phillips Screwdriver - Tpr Handle		1. Blade material: Crv0150 2. Heat treated & chrome plated 3. Block tip with magnetic 4. TPR + PP soft handle 5. DIN standard 6. Packed by water label	PH2 X 150 MM	468.00
DEM06J	6 Pcs Screwdriver Set		1. Blade material: Crv0150 2. Heat treated & chrome plated 3. Block tip with magnetic 4. TPR + PP soft handle	Shank size: 1pc SL4x4"(100mm) 1pc SL5.5x6"(150mm) 1pc SL6.5x4"(100mm) 1pc SL6.5x6"(150mm) 1pc PH1X100mm 1pc PH2X150mm	2,760.00
DES06J	6 Pcs Electrician Screwdriver Set		1. Blade material: Crv 6150 2. Tip with magnetic 3. TPR + PP soft handle 4. 1000V VDE certification 5. Packed by double blister	1.0X3.5X125MM, 0.8X4.0X100M, 0.4X2.5X75MM, PH0X60MM, PH1X80MM, PH2X100MM	3,420.00
DEP06J	6 Pcs Precision Screwdriver Set		1. Blade material: Crv0150 2. Heat treated & chrome plated 3. Block tip with magnetic 4. TPR + PP soft handle		1,080.00
RLU602	6 Pcs Precision Screwdriver Set		1. Blade material: Carbon steel S45 2. Heat treated 3. Chrome plated 4. PP handle 5. Packed by blister card	PH0X40MM, PH0X60MM, PH0X80MM,2.0X40MM, 2.5X80MM, 3.0X100MM	948.00
DEP06S	6 Pcs Torx Screwdriver Set		1. Blade material: Crv0150 2. Heat treated & chrome plated 3. Block tip with magnetic 4. TPR + PP soft handle 5. with a plastic case 6. Packed by blister card	T5, T6, T7, T8, T9, T10	1,728.00
TPHSK0401	4 Pcs Pick & Hook Set		4 Pcs Hook & Pick Set Include: Product List:2Pcs Full Hook, 1Pcs 45-degree, 1Pcs 90-degree, 1Pcs Straight Pick,	Packed by plastic box. Used in Oil Seal, O Ring, Radiator Hoses, Can be used as Cotter Pin Puller.	1,152.00
DET21P	2 Pcs Screwdriver Set		1. Blade material: Crv0150 2. Heat treated & chrome plated 3. Block tip with magnetic 4. PVC handle 5. DIN standard 6. Packed by plastic hanger	6 X 38 MM PH2 X 38MM	438.00
DEM02T	Interchangeable Screwdriver		1. Blade material: Crv0150 2. Heat treated & chrome plated 3. TPR + PP soft handle 4. DIN standard 5. Packed by water label		498.00
DEG104	Go-Through Screwdriver		1. Blade material: 40Cr 2. Heat treated & chrome plated 3. Block tip with magnetic 4. PP handle with sticking cap 5. DIN standard 6. Packed by label	4 X 100 MM	360.00
DEG106	Go-Through Screwdriver		1. Blade material: 40Cr 2. Heat treated & chrome plated 3. Block tip with magnetic 4. PP handle with sticking cap 5. DIN standard 6. Packed by label	6 X 150 MM	396.00
DEG204	Go-Through Screwdriver		1. Blade material: 40Cr 2. Heat treated & chrome plated 3. Block tip with magnetic 4. PP handle with sticking cap	PH2 X 100 MM	396.00
DEG206	Go-Through Screwdriver		1. Blade material: 40Cr 2. Heat treated & chrome plated 3. Block tip with magnetic 4. PP handle with sticking cap	PH2 X 150 MM	498.00
DEG208	Go-Through Screwdriver		1. Blade material: 40Cr 2. Heat treated & chrome plated 3. Block tip with magnetic 4. PP handle with sticking cap	PH2 X 200 MM	624.00
DEG210	Go-Through Screwdriver		1. Blade material: 40Cr 2. Heat treated & chrome plated 3. Block tip with magnetic 4. PP handle with sticking cap	PH2X250MM	672.00
DEG6AU	6 Pcs Go-Through Screwdriver Set		1. Blade material: 40Cr 2. Heat treated & chrome plated 3. Block tip with magnetic 4. PP handle with sticking cap 5. DIN standard 6. Packed by double blister	3X75MM, 4X100MM, 5X150MM PH1X75MM, PH2X100MM, PH2X150MM	1,680.00

Item Code	Item Name	Item Picture	Description	Size	Unit Price INCLUSIVE VAT
DEG12AU	12 Pcs Go-Through Screwdriver Set		1. Blade material: 4Cr 2. Heat treated & chrome plated 3. Black tip with magnetic 4. PP handle with sticking cap 5. DIN standard 6. Packed by double blister	3X75MM, 4X100MM, 5X150MM, 6X100MM, 6X150MM, 8X200MM PH0X75MM, PH2X38MM, PH1X75MM, PH2X100MM, PH3X150MM, PH3X200MM	4,068.00
DEM818	18 Pcs Screwdriver Set		1. Blade material: Cr-v150 2. Heat treated & chrome plated 3. Black tip with magnetic 4. TPR + PP soft handle 5. DIN standard 6. Packed by plastic frame & double blister	PH1X75; PH2X100; PH2X38; PH3X150 2. 30 PC precision bits:1.5X50; 2X50; 2.5X50; 3X50; PH000X50; PH00X50; PH0X50; T6X50; T8X50; T10X50;	3,640.00
DEM858	58 Pcs Multipurpose Screwdriver Set		1. Bits material: Cr-v S2 2. Socket material: Carbon steel S45 3. Heat treated 4. DIN standard 5. Packed by double blister 1pcs metal handle	T10, T15, T20, T25, T27, T30, T40 2mm, PZ0, PZ1, PZ1, PZ2, PZ2, PZ3, PZ3 Sockets-Dudv: 5mm, 6mm, 7mm, 8mm, 9mm, 10mm, 11mm, 3/16",	5,640.00
DEP684	6 Pcs T Handle Torx Screwdriver Set		1. Blade material: 6150Cr-v 2. Heat treated 3. Chrome plated 4. PP T-type handle 5. Packed by double blister	T20, T15, T20, T25, T30, T40	3,348.00
DEP683	6 Pcs Torx Screwdriver Set		1. Blade material: Carbon steel S45 2. Heat treated 3. Chrome plated 4. PVC handle 5. Packed by blister card	T20, T15, T20, T25, T27, T30	1,908.00
DAD20U	20 Pcs Sockets Set		1. 10pcs 1/2" DR. Sockets: E4-E5-T1-13-15-17-19-21-24-27-30-32mm 2. 1PC-1/2"DR. 72 teeth quick socket handle 3. 1PC-1/2"DR. extension bar 5. Material: S45V/S8	8 MM - 32 MM 1/2" Drive	11,400.00
TUP12U	12 Pcs Ratchet Handle With Sockets Set		1. Made from chrome vanadium steel. 2. Heat treated & chrome plated 3. DIN Standard. 4. Packed by plastic hanger Sockets:10/11/12/13/14/15/17/19/21/24MM Ratchet ring spanner 3/8";	10MM - 24MM 1/2" Drive	7,680.00
TUP13U	13 Pcs Ratchet Handle With Sockets Set		1. Made from chrome vanadium steel. 2. Heat treated & chrome plated 3. DIN Standard. 4. Packed by plastic hanger Sockets:4/5/6/7/8/9/10/11/12/13/14MM; Ratchet ring spanner 1/4";	4MM - 14MM 1/4" Drive	4,680.00
DAD21	21 Pcs Socket Set			1. Made carbon steel 045 2. Heat treated & chrome plated 3. Packed by blowing box.	41,400.00
DAD46U	46 Pcs Sockets Set			Made carbon steel 045 2. Heat treated & chrome plated 3. Packed by blowing box.	20,440.80
DAD408U	108 Pcs Sockets Set			Made carbon steel 045 2. Heat treated & chrome plated 3. Packed by blowing box.	34,680.00

LARGE DIAMETER AQUA-PE PRESSURE PIPING SYSTEMS

Durable Aqua-PE Piping Systems
For High Volume Flow.



Innovation in Aqua-PE piping systems for water, cable ducts and other applications.

2.1.3 AQUA-PE PRESSURE PIPES

For water supply: **ENV12201, ISOV4427**

	SDR 33	SDR 26	SDR 21	SDR 17	SDR 13.6	SDR 11	SDR 9	SDR 7.4
	S 16.0	S 12.5	S 10.0	S 8.0	S 6.3	S 5.0	S 4.0	S 3.2
SN (kN/m²)	SN 2.0	SN 4.0	SN 6.0	SN 16	SN 32	SN 64	SN 80	SN 128
PE 80 (c=1.6) MOP (bar)	**PN 3.2**	**PN 4**	**PN 5**	**PN 6***	**PN 8**	**PN 10**	**PN 12.5**	**PN 16**
PE 80 (c=1.25) MOP (bar)	PN 4	PN 5	PN 6*	PN 8	PN 10	PN 12.5	PN 16	PN 20
PE 100 (c=1.25) MOP (bar)	PN 5	PN 6*	PN 8	PN 10	PN 12.5	PN 16	PN 20	PN 25
Nominal Outside Diameter								
dv (mm)	en (mm)	en (mm)	en (mm)	en (mm)	en (mm)	en (mm)	en (mm)	en (mm)
16	-	-	-	-	-	-	2.0	2.3
20	-	-	-	-	-	2.0	2.3	3.0
25	-	-	-	-	2.0	2.3	3.0	3.5
32	-	-	-	2.0	2.4	3.0	3.6	4.4
40	-	-	2.0	2.4	3.0	3.7	4.5	5.5
50	-	2.0	2.4	3.0	3.7	4.6	5.6	6.9
63	-	2.5	3.0	3.8	4.7	5.8	7.1	8.6
75	-	2.9	3.6	4.5	5.6	6.8	8.4	10.3
90	-	3.5	4.3	5.4	6.7	8.2	10.1	12.3
110	-	4.2	5.3	6.6	8.1	10.0	12.3	15.1
125	-	4.8	6.0	7.4	9.2	11.4	14.0	17.1
140	-	5.4	6.7	8.3	10.3	12.7	15.7	19.1
160	-	6.2	7.7	9.5	11.8	14.6	17.9	21.9
180	-	6.9	8.6	10.7	13.3	16.4	20.1	24.6
200	-	7.7	9.6	11.9	14.7	18.2	22.4	27.4
225	-	8.6	10.8	13.4	16.6	20.5	25.2	30.8
250	-	9.6	11.9	14.8	18.4	22.7	27.9	34.2
280	-	10.7	13.4	16.6	20.6	25.4	31.3	38.3
315	9.7	12.1	15.0	18.7	23.2	28.6	35.2	43.1
355	10.9	13.6	16.9	21.1	26.1	32.2	39.7	48.5
400	12.3	15.3	19.1	23.7	29.4	36.3	44.7	54.7
450	13.8	17.2	21.5	26.7	33.1	40.9	50.3	61.5
500	15.3	19.1	23.9	29.7	36.8	45.4	55.8	68.2
560	17.2	21.4	26.7	33.2	41.2	50.8	62.5	-
630	19.3	24.1	30.0	37.4	46.3	57.2	70.3	-
710	21.8	27.2	33.9	42.1	52.2	64.5	79.3	-
800	24.5	30.6	38.1	47.4	58.8	72.6	89.3	-
900	27.6	34.4	42.9	53.3	-	-	-	-
1000	30.6	38.2	47.7	59.3	-	-	-	-
1200	36.7	45.9	57.2	70.6	-	-	-	-
1400	42.9	53.2	-	-	-	-	-	-
1600	49.0	61.2	-	-	-	-	-	-

The calculated value for PE 80 pipes is 6.3. bar and for PE 100 pipes 6.4 bar

Definitions:

d_n	mm	nominal outside diameter
en	mm	nominal wall thickness
SN	kN/m²	ring stiffness
MOP	bar	max. operating pressure

Definitions:

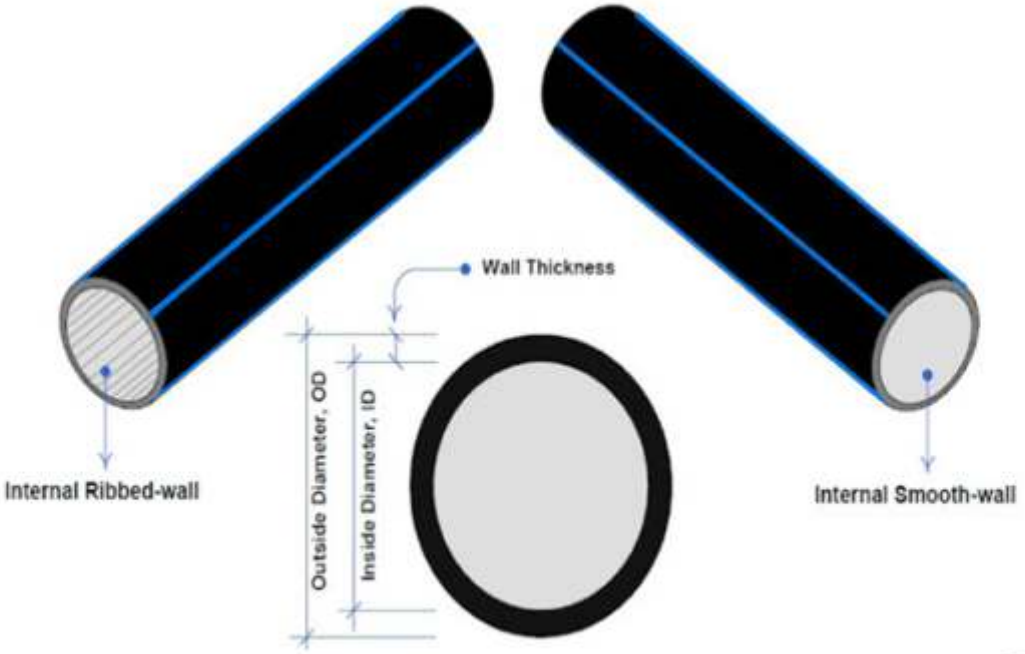
PN	bar	nominal pressure
c		overall service coefficient
SDR		standard dimension ratio dn/en
S		pipe series

2.1.4 HIGH DENSITY POLYETHLENE (HDPE) CONDUIT / DUCT

HDPE duct is designed for the installation and protection of cables. It provides a channel for the cables to be installed into empty or occupied duct structures using jetting, blowing or pulling installation methods.

Features

- Manufactured from P3408 pressure resin rated at 3300 PSI.
- Sizes: 10mm, 12mm, and 16mm.
- Low sliding friction to aid in the pulling and jetting of micro-Gard and micro-cables.
- High tensile strength material for longer pulling distances.
- Variety of colors / stripes for identification - paralleling available.
- Sequential marked footage.
- Pre-installed pull line available (10 mm and larger).
- UV-formulated material for outside storage.
- Complete line of fittings and accessories.



Telecommunication, Electrical, and Power Utility
Solutions: Smooth Wall Ribbed Wall Listed HDPE Aerial Corrugated Toneable Accessories.

2.1.5 MATERIAL PROPERTIES & COMPATIBILITY

Materials

Polyethlene systems in both PE 80 and PE 100 (Excel). The numbers relate to the MRS (Minimum Required Strength) values of the material.

PE80 - This is a term used to denote the polyethlene material which has been widely used for gas, water and industrial applications for many years.

PE100 - This is a term used to denote high performance polyethlene, and is a higher density material than PE80 and demonstrates exceptional resistance to rapid crack propagation as well as to long-term stress cracking.

Moreover, the higher performance of **PE100** permits thinner pipe walls than PE80 for the same operating pressure. It therefore uses less polymer and provides for a larger bore and increased flow capacity for a given nominal pipe size. This can result in significant cost savings at certain sizes and pressure ratings.

PE80 and PE100 are not recommended for continous pressure operation at temperatures above 60°C for liquids, including sewerage and industrial effluents, or 30°C for gaseous fluids. PE100 (Excel) has advantages over PE80 at low temperatures, since it is extremely crack resistant down to -30°C.

Property	Method Of Test	Units	PE80	PE100
Melt flow rate 2.16 Kg load	BS2782, ISO 1133	g/10min	0.2	< 0.15
5 Kg load	BS2782, ISO 1133	g/10min	1.0	< 0.5
Density (Mean Values)	BS3412, ISO 1872	Kg/m³	yellow 940, blue 943, black 950	orange 951, blue 951, black 957
Tensile strength at yield	BS2782, ISO R527	MPa	18	23
Elongation at break	BS2782, ISO R527	%	> 600	> 600
Flexural Modulus	BS2782, ISO R527	MPa	700	1000
Vicat softening point	BS2782	°C	116	124
Brittleness temperature	ASTM D746, ISO 9784	°C	< -70	< -100
Linear thermal expansio	ASTM D696	°C	1.5×10^{-4}	1.3×10^{-4}
Thermal conductivity	BS874, DIN 52612	W/m°K	0.4	0.4

Standard Dimensional Ratio (SDR)

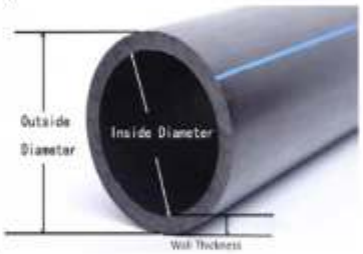
One of the items of information contained on both pipe and fittings is the standard dimensional ratio.

In all but the smallest sizes of PE pipe (<25mm) the ratio between wall thickness and outside diameter remains constant for a given pressure rating of the pipe. This relationship, called the standard dimensional ratio or SDR, can be expressed as an equation:

SDR=nominal (minimum) outside diameter / minimum wall thickness

Example:

SDR 11 = 180/16.4



Expansion and Contraction

The average coefficients of linear thermal expansion between 20°C and 60°C for PE80 (1.3 x 10-4 °C-1) and PE100 (1.5 x 10-4 °C1) are approximately ten times greater than for metal. Allowance must be made for this when designing polyethlene pipeline installations where significant temperature variation is expected (eg. above ground). If the above length change is restated as 8mm for PE80 and 9mm for PE100 per 6 meter pipe length per 10°C of temperature change, the magnitude of potential thermal movement can be better appreciated. In above-ground installations the natural flexibility of the pipe, coupled with judicious sitting of anchor and support brackets, will conviniently accomodate expansion and contraction at changes of direction, etc. In installations where fully end-load bearing joints are used, the compressive or tensile forces setup in the pipeline due to contraint of thermal movement will not detract from long-term performance, but the effects of these forces on pipe support, ancillary equipment and so on, must be considered and allowance made.

The potential for thermal movement is a particular issue where a (fully end-load bearing) PE system is connected to any non end-load bearing mechanically jointed system. It is essential that such transitions are securely anchored, to obviate the risk of any joints in the mechanically jointed system separating.

It is also prudent to allow a newly installed pipeline time to conform to ambient temperature before end connections are made.

Support

Recommendations for maximum support spacing are given in the table below. They are based on a mid-spam deflection of 6.5mm when the pipe is full of water and assume a long term flexural modulus of 200MPa at an ambient temperature of 20°C. Pipe clips used for anchorage and support should have flat, non-abrasive contact faces, or be lined with rubber sheeting, and should not be over-tightened. The width of support brackets and hangers should normally be either 100mm or half the nominal pipe bore diameter, whichever is the greater.

Pipe Bending Radii For PE

The minimum bend radius for GPS PE pipes is 15 times the pipe OD under optimum conditions (ie. warm ambient temperature and thick-wall/low SDR pipe). A more typical safe bending radius for SDR11 and SDR17 pipes is 25 times, increasing to 35 times the pipe OD in very cold weather. For thin-walled SDR26 and SDR33 pipes, these values should be increased by 50%. Electrofusion or mechanical joints and fittings should not normally be incorporated in sections of pipework which are to be bent. Instead a formed bend or elbow should be welded into the pipeline in order to prevent excessive stress. In the case of pipe supplied in coils or drums, the above bend radius values apply only if pipe is bent in the same direction as it was previously coiled.

Insulation

Polythlene is a good insulator and will help prevent freezing of liquid pipe contents to an appreciable extent. Even if freezing does occur, the pipe will not fail since it can safely expand to accomodate increased volume. Nonetheless, the pipeline system may still need to be protected against freezing temperatures to prevent flow restriction.

Abrasion Resistance Of Polyethlene

PE has significant advantages over other pipe materials where internal resistance to abrasion is required - for example if the pipe is intended for transporting abrasive media such as particulate slurry. This resistance to abrasion, combined with flexibility, ruggedness and immunity from corrosion, makes PE ideal where traditional pipe materials would be unsuitable. Abrasion resistance depends on slurry characteristics and flow parameters, but is predictable in many cases. Polyethlene pipe has been used successifully for pumped abrasive media such as fly ash, China clay slurry and various industrial effluents.

In addition, it has been proven that, during installation, the abrasive elements of typical soils and backfills make a negligible impression on PE pipe. However in the unlikely event of a notch or groove being cut into the external surface by more than 10 percent of the wall thickness, the pipe section should be rejected.

Chemical Resistance - General

Polyethlene material is renowned for its good resistance to chemical attack. The degree of resistance to a specific chemical will depend on concentration, temperature and working pressure, each of which will afeect the long term life of any system. Polyethlene does not rot, rust, pit, corrode or lose wall thickness through chemical or electrical reaction with the surrounding soil. Polyethlene does not normally support the growth of, nor is affected by, algae, bacteria or fungi.

In broad terms the most common harmful chemicals can be grouped into oxidisers, cracking agents and certain solvents.

Chemical Resistance - Special Cases

Special care is required in industrial applications where effluents contain particular chemicals. Under certain conditions of pressure and temperature, the chemicals listed hereunder may be detrimental or permeate the pipe wall and taint water supplies.

- **Oils:** animal, vegetable or minerals such as petrol, cresote, turpentine and silicone fluids.
- **Organic solvents:** petrol and diesel; amylacetate and other esters; acetaldehyde; benzene and its compounds; carbon disulphide; carbon tetrachloride; ethers and turpenes; coal tar.
- **Halogens:** Fluorine; chlorine; bromine in high conentrations.
- **Acids:** Glacial acetic acid; chlorosulphonic acid; cresylic acid; chromic acid; nitric acid (over 25%); phosphoric acid (over 50%) and sulphuric acid (over 70%).

.5 MATERIAL PROPERTIES & COMPATIBILITY

Above Ground Pipework Maximum Support Spacing (metres)

Pipe	SDR11	SDR17	SDR26
32	0.9	-	-
63	1.1	-	-
90	1.3	1.2	-
110	1.5	1.3	-
125	1.6	1.4	-
160	1.8	1.6	1.5
180	1.9	1.7	1.6
200	2.0	1.8	1.7
225	2.1	1.9	1.8
250	2.2	2.0	1.9
280	2.3	2.1	2.0
315	2.5	2.3	2.1
355	2.6	2.4	2.2
400	2.8	2.5	2.3
450	2.9	2.7	2.5
500	3.1	2.8	2.6
560	3.3	3.0	2.8
630	3.5	3.2	2.9
710	-	3.4	3.1
800	-	3.6	3.3
900	-	3.8	3.5
1000	-	4.0	3.7

Note: Figures are for horizontal support spacings; and may be doubled for vertical support spacings.

2.1.6 CHEMICAL RESISTANCE OF HIGH DENSITY POLYETHLENE PIPE REAGENTS A THROUGH Z

S - Satisfactory
U - Unsatisfactory
M - Marginal
N - Not Known

All concentrations are 100% unless noted otherwise. On reagents marked marginal, chemical attack will be recognized by a loss of physical properties of the pipe which may require a change in design factors.

Reagent	70 deg. F (21 deg, C)	140 deg. F (60 deg. C)	Reagent	70 deg. F (21 deg, C)	140 deg. F (60 deg. C)
Acetic Acid 1-10%	S	S	Borax Cold Sat'd	S	S
Acetic Acid 10-60%	S	M	Boric Acid Dilute	S	S
Acetic Acid 80-100%	S	M	Boric Acid Conc.	S	S
Acetone	M	U	Bromic Acid 10%	S	S
Acrylic Emulsions	S	S	Bromine Liquid 100%	M	U
Aluminium Chloride-Dilute	S	S	Butanediol 10%	S	S
Aluminium Chloride Conc.	S	S	Butanediol 60%	S	S
Aluminium Fluoride Conc.	S	S	Butanediol 100%	S	S
Aluminium Sulfate Conc.	S	S	Butyl Alcohol 100%	S	S
Alums (All Types) Conc.	S	S	Calcium Bisulfide	S	S
Ammonia 100% Dry Gas	S	S	Calcium Carbonate Sat'd	S	S
Ammonium Carbonate	S	S	Calcium Chlorate Sat'd	S	S
Ammonium Chloride Sat'd	S	S	Calcium Chloride Sat'd	S	S
Ammonium Fluoride 20%	S	S	Calcium Hydroxide	S	S
Ammonium Hydroxide 0.8S S.G.	S	S	Calcium Hypochloride	S	S
Ammonium Metaphosphate Sat'd	S	S	Calcium Hypochlorite RRGH	S	S
Ammonium Nitrate Sat'd	S	S	Calcium Nitrate 50%	S	S
Ammonium Persulfate Sat'd	S	S	Calcium Sulfate	S	S
Ammonium Sulfate Sat'd	S	S	Camphor Oil	N	U
Ammonium Sulfide Sat'd	S	S	Carbon Dioxide 100% Dry	S	S
Ammonium Thiocyanate Sat'd	S	S	Carbon Dioxide 100% Wet	S	S
Amyl Acetate	M	U	Carbon Dioxide Cold Sat'd	S	S
Amyl Alcohol 100%	S	S	Carbon Disulfide	N	U
Amyl Chloride 100%	N	U	Carbon Monoxide	S	S
Aniline 100%	S	N	Carbon Tetrachloride	M	U
Antimony Chloride	S	S	Carbonic Acid	S	S
Aqua Regia	U	U	Castor Oil Conc.	S	S
Barium Carbonate Sat'd	S	S	Chlorine Dry Gas 100%	S	M
Barium Chloride	S	S	Chlorine Moist Gas	M	U
Barium Hydroxide	S	S	Chlorine Liquid	M	U
Barium Sulfate Sat'd	S	S	Chlorobenzene	M	U
Barium Sulfide Sat'd	S	S	Chloroform	M	U
Beer	S	S	Chlorosulfonic Acid 100%	M	U
Benzene	M	U	Chrome Alum Sat'd	S	S
Benzene Suffonic Acid	S	S	Chromic Acid 20%	S	S
Bismuch Carbonate Sat'd	S	S	Chromic Acid Upto 50%	S	S
Bleach Lye 10%	S	S	Chromic Acid and Sulphuric Acid	S	M
Black Liqour	S	S	Cider	S	S

2.1.6 CHEMICAL RESISTANCE OF HIGH DENSITY POLYETHLENE PIPE REAGENTS A THROUGH Z

S - Satisfactory
U - Unsatisfactory
M - Marginal
N - Not Known

All concentrations are 100% unless noted otherwise. On reagents marked marginal, chemical attack will be recognized by a loss of physical properties of the pipe which may require a change in design factors.

Reagent	70 deg. F (21 deg, C)	140 deg. F (60 deg. C)	Reagent	70 deg. F (21 deg, C)	140 deg. F (60 deg. C)
Citric Acid Sat'd	S	S	Ferrous Sulfate	S	S
Coconut Oil Alcohols	S	S	Fish Solubles	S	S
Cola Concentrates	S	S	Fluorobic Acid	S	S
Copper Chloride Sat'd	S	S	Fluorine	S	U
Copper Cyanide Sat'd	S	S	Fluosilicic Acid 32%	S	S
Copper Fluoride 2%	S	S	Fluosilicic Acid Conc.	S	S
Copper Nitrate Sat'd	S	S	Formaldehyde 40%	S	N
Copper Sulfate Dilute	S	S	Formic Acid 0-20%	S	S
Copper Sulfate Sat'd	S	S	Formic Acid 20-50%	S	S
Cotton Seed Oil	S	S	Formic Acid 100%	S	S
Crude Oil	S	M	Fructose Sat'd	S	S
Cuprous Chloride Sat'd	S	S	Fruit Pulp	S	S
Cychohexanol	S	S	Fuel Oil	S	U
Cyclohexanone	M	U	Furfural 100%	M	U
Detergents Synthetic	S	S	Furfuryl Alcohol	M	U
Developers, Photographic	S	S	Gallic Acid Sat'd	S	S
Dextrin Sat'd	S	S	Gas Liquids	S	M
Dextrose Sat'd	S	S	Gasoline	M	U
Dibutylphthalate	S	M	Gin	S	U
Disodium Phosphate	S	S	Glucose	S	S
Diazo Salts	S	S	Glycerine	S	S
Diethylene Glycol	S	S	Glycol	S	S
Diglycolic Acid	S	S	Glycolic Acid 30%	S	S
Dimethylamine	M	U	Grape Sugar Sat'd Aq.	S	S
Emulsions, Photographic	S	S	Hexanol, Tert.	S	S
Ethyl Acetate 100%	M	U	Hydrobromic Acid 50i/0	S	S
Ethyl Alcohol 100%	S	S	Hydrocyanic Acid sat'd	S	S
Ethyl Alcohol 35%	S	S	Hydrochloric Acid 10%	S	S
Ethyl Butyrate	M	U	Hydrochloric Acid 30%	S	S
Ethyl Chloride	M	U	Hydrochloric Acid 35%	S	S
Ethyl Ether	U	U	Hydrochloric Acid Conc.	S	S
Ethyl Chloride	U	U	Hydrofluoric Acid 40%	S	S
Ethyl Chlorohydrin	U	U	Hydrofluoric Acid 60%	S	S
Ethyl Dichloride	M	U	Hydrofluoric Acid 75%	S	S
Ethylene Glycol	S	S	Hydrogen 100%	S	S
Ferric Chloride Sat'd	S	S	Hydrogen Bromide 10%	S	S
Ferric Nitrate Sat'd	S	S	Hydrogen Chloride Gas Dry	S	S
Ferrous Chloride Sat'd	S	S	Hydrogen Peroxide 30%	S	S

2.1.6 CHEMICAL RESISTANCE OF HIGH DENSITY POLYETHLENE PIPE REAGENTS A THROUGH Z

S - Satisfactory
U - Unsatisfactory
M - Marginal
N - Not Known

All concentrations are 100% unless noted otherwise. On reagents marked marginal, chemical attack will be recognized by a loss of physical properties of the pipe which may require a change in design factors.

Reagent	70 deg. F (21 deg, C)	140 deg. F (60 deg. C)	Reagent	70 deg. F (21 deg, C)	140 deg. F (60 deg. C)
Hydrogen Peroxide 90%	S	M	Nitric Acid 95-98%	U	U
Hydrogen Phosphide 100%	S	S	Nitrobenzene 100%	U	U
Hydroquinone	S	S	Octyl Cresol	S	U
Hydrogen Sulfide	S	S	Oils and Fats	S	M
Hypochlorus Acid Conc.	S	S	Oleic Acid Conc.	S	U
Inks	S	S	Oleum Conc.	U	U
Lodine (Alc. Sol.) Conc.	S	U	Orange Extract	S	S
Lactic Acid 10%	S	S	Oxalic Acid Sat'd	S	S
Lactic Acid 90i/0	S	S	Oxalic Acid Dilute	S	S
Latex	S	S	Ozone 100%	S	U
Lead Acetate Sat'd	S	S	Perchlonc Acid 10%	S	S
Lube Oil	S	M	Petroleum Ether	U	U
Magnesium Carbonate Sat'd	S	S	Phenol 90%	U	U
Magnesium Chloride Sat'd	S	S	Phosphoric Acid Upto 30%	S	S
Magnesium Hydroxide Sat'd	S	S	Phosphoric Acid Over 30%	S	S
Magnesium Nitrate Sat'd	S	S	Phosphoric Acid 90%	S	S
Magnesium Sulfate Sat'd	S	S	Phosphorous (Yellow) 100%	S	N
Mercuric Chloride Sat'd	S	S	Phosphorous Pentoxide 100%	S	N
Mercuric Cyanide Sat'd	S	S	Photographic Solutions	S	S
Mercurous Nitrate Sat'd	S	S	**Pickling Baths**		
Mercury	S	S	• Sulfuric Acid	S	S
Methyl Alcohol 100%	S	S	• Hydrochloric Acid	S	S
Methyl Bromide	M	U	• Sulfuric-Nitric	S	U
Methyl Chloride	M	U	**Plating Baths**		
Methyl Ethyl Ketone 100%	M	U	• Brass	S	S
Methylsulfuric Acid	S	S	• Cadmium	S	S
Methylene Chloride 100%	M	U	• Chromium	N	N
Milk	S	S	• Copper	S	S
Mineral Oils	S	U	• Gold	S	S
Molasses Comm.	S	S	• Indium	S	S
Nickel Chloride Sat'd	S	S	• Lead	S	S
Nickel Nitrate Conc.	S	S	• Nickel	S	S
Nickel Sulfate Sat'd.	S	S	• Rhodium	S	S
Nicotine Dilute	S	S	• Silver	S	S
Nicotinic Acid	S	S	• Tin	S	S
Nitric Acid 0-30%	S	S	• Zinc	S	S
Nitric Acid 30-50%	S	M	Potassium Bicarbonate Sat'd	S	S
Nitric Acid 70%	S	M	Potassium Borate 1%	S	S

2.1.6 CHEMICAL RESISTANCE OF HIGH DENSITY POLYETHLENE PIPE REAGENTS A THROUGH Z

S - Satisfactory
U - Unsatisfactory
M - Marginal
N - Not Known

All concentrations are 100% unless noted otherwise. On reagents marked marginal, chemical attack will be recognized by a loss of physical properties of the pipe which may require a change in design factors.

Reagent	70 deg. F (21 deg, C)	140 deg. F (60 deg. C)	Reagent	S70 deg. F (21 deg, C)	140 deg. F (60 deg. C)
Potassium 10%	S	S	Sodium Bromide Dilute Sol.	S	S
Potassium Bromide Sat'd	S	S	Sodium Carbonate Con.	S	S
Potassium Carbonate	S	S	Sodium Carbonate	S	S
Potassium Chlorate Sat'd	S	S	Sodium Chlorate Sat'd	S	S
Potassium Chloride Sat'd	S	S	Sodium Chloride Sat'd	S	S
Potassium Chromate 40%	S	S	Sodium Cyanide	S	S
Potassium Cyanide Sat'd	S	S	Sodium Dichromate Sat'd	S	S
Potassium Dichromate 40%	S	S	Sodium Ferncyanide	S	S
Potassium Ferri/Ferro Cyanide Sat'd	S	S	Sodium Ferrocyanide Sat'd	S	S
Potassium Fluoride	S	S	Sodium Fluoride Sat'd	S	S
Potassium Hydroxide 20%	S	S	Sodium Hydroxide Conc.	S	S
Potassium Hydroxide Conc.	S	S	Sodium Hypochlorite	S	S
Potassium Nitrate Sat'd	S	S	Sodium Nitrate	S	S
Potassium Perborate Sat'd	S	S	Sodium Sulfate	S	S
Potassium Perchlorate 10%	S	S	Sodium Sulfide 25%	S	S
Potassium Sulfate Conc.	S	S	Sodium Sulfide Sat'd Sol	S	S
Potassium Sulfide Conc.	S	S	Sodium Sulfite Sat'd	S	S
Potassium Sulfite Conc.	S	S	Stannous Chloride Sat'd	S	S
Potassium Persulfate Sat'd	S	S	Stannic Chloride Sat'd	S	S
Propargyl Alcohol	S	S	Starch Solution Saud	S	S
Propyl Alcohol	S	S	Steanc Acid 100%	S	S
Propylene Dichloride 100%	U	U	Sulfuric Acid 0-50%	S	S
Propylene Glycol	S	S	Sulfuric Acid 70%	S	M
Rayon Coagulating Bath	S	S	Sulfuric Acid 80%	S	U
Sea Water	S	S	Sulfuric Acid 96%	M	U
Selenic Acid	S	S	Sulfuric Acid 98%	M	U
Shortening	S	S	Sulfuric Acid, Fuming	U	U
Silicic Acid	S	S	Sulfurous Acid	S	S
Silver Nitrate Sol.	S	S	Tallow	S	M
Soap Solution Any Conc'n	S	S	Tannic Acid 10%	S	S
Sodium Acetate Sat'd	S	S	Tanning Extracts Comm.	S	S
Sodium Benzoate 35%	S	S	Tartaric Acid Sat'd	N	N
Sodium Bicarbonate Sat'd	S	S	Tetrahydrofurane	N	U
Sodium Bisulfite Sat'd	S	S	Titanium Tetrachloride Sat'd	N	U
Sodium Bisulfite Sat'd	S	S	Toluene	M	U
Sodium Borate	S	S	Transformer Oil	S	M

2.1.6 CHEMICAL RESISTANCE OF HIGH DENSITY POLYETHLENE PIPE REAGENTS A THROUGH Z

S - Satisfactory
U - Unsatisfactory
M - Marginal
N - Not Known

Reagent	70 deg. F (21 deg, C)	140 deg. F (60 deg. C)
Trisodium Phosphate sat'd	S	S
Trichloro ethylene	U	U
Urea Uo to 30%	S	S
Urine	S	S
Vinegar Comm.	S	S
Vanilla Extract	S	S
Wetting Agents	S	S
Whiskey	S	N
Wines	S	S
Xylene	M	U
Yeast	S	S
Zinc Chloride Sat'd	S	S
Zinc Sulfate Sat'd	S	S

All concentrations are 100% unless noted otherwise. On reagents marked marginal, chemical attack will be recognized by a loss of physical properties of the pipe which may require a change in design factors.

Jointing PE to PE By Fusion

PE pipes of different SDRs.

Butt-Welding Technology

Butt-welding should only be used for jointing pipes of the same SDR value.

Electro-Fusion Technology

Electro fusion fittings are able to weld pipes having differing wall thickness (SDRs). They are available in choice of 10bar or 16bar (water) and 5.5bar or 7bar (gas) rating. Care should be taken to ensure that the pressure rating of the fittings is equal to or greater than that of the pipe.

SDR applications are marked on individual fittings. However, for the more unusual SDRs, specific advice should be sought from our technical support department.

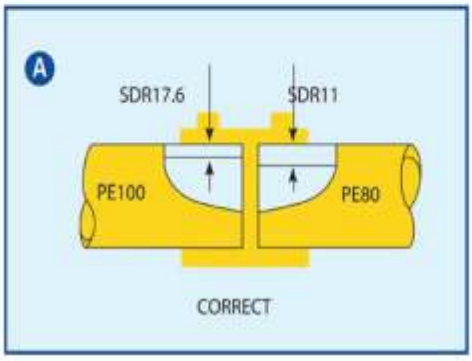
Jointing Different Types Of PE

Any medium density PE80 can be joined to any other medium density PE80 either by butt-welding or electrofusion. Different pipe producers may have alternative suppliers of preffered PE80 grades, but these are all intended to be joined by identical techniques. Similarly different grades of PE100 can be joined together in like fashion. Butt-welding different pipe materials - for example PE80 to PE100 - is not recommended on site (see below).

Material And SDR Compatibility Summary

(a) Dissimilar materials and dissimilar wall thickness can be jointed by electrofusion. NB. The maximum working Pressure should not exceed the lower value for the two pipes.

See Figure A.

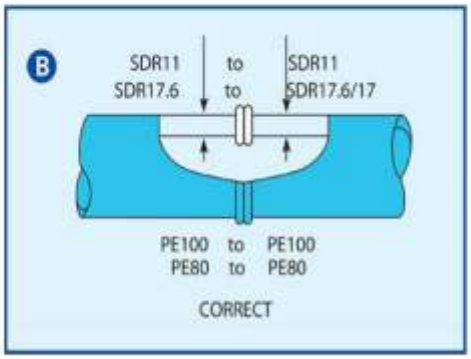


2.1.6 CHEMICAL RESISTANCE OF HIGH DENSITY POLYETHLENE PIPE REAGENTS A THROUGH Z

(b) Similar materials and/or wall thickness may be jointed by butt-fusion or electrofusion.

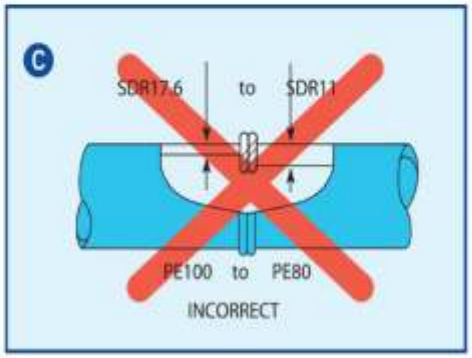
NB: SDR17 may be butt-fused to SDR17.6.

See Figure B.



(c) Dissimilar wall thickness must not be jointed on-site using butt-fusion. NB: PE80 should only be butt-fused to PE100 (Excel) under closely controlled factory conditions.

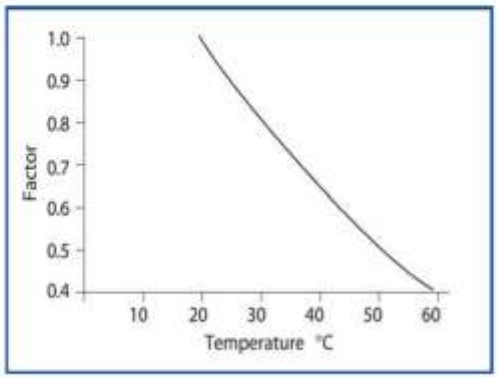
See Figure C.



2.1.7 PRESSURE RATINGS AND FLOW CHARACTERISTICS

Various ISO/CEN working groups have considered the design factors that should be used to determine the maximum operating pressure of polyethlene water and gas systems. These factors will account for any additional loadings or environmental conditions, eg. elevated temperature or exceptionally poor ground conditions.

The graph below shows the reduction factor which should be applied to the recommended maximum continous working pressure at 20°C to obtain appropriate working pressure for elevated temperatures.



Reduction factor vs Temperature

The reduction graph has been calculated to give normal factors of safety after 50 years. It refers only to the conveyance of fluids to which the pipe material is completely resistant.

Surge and Fatigue in PE80 and PE100 Pipes

The two phenomena of surge and fatigue may be treated separately, since they describe different potential effects on the pipe material.

Surge

For systems where extreme transient conditions are unlikely, it may be safely assumed that the peak surge pressure will never have a value more than twice the rated steady state pressure. Occassional surge pressures of upto this value will not harm even low toughness PE pipes that have been rated for the steady state of the system pressure.

Fatigue

Fatigue is associated with repeated transient pressure variations occuring over an extended period of time. The fatigue resistance of PE pipes depends on the toughness of the material used, as well as on the magnitude of the pressure variations. Data from numerous laboratory and field test programmes have resulted in the table below (see also the Notes) which can be used to re-rate PE pipes according to material toughness and the predicted frequency excursions in the system:

2.1.7 PRESSURE RATINGS AND FLOW CHARACTERISTICS

PIPE OD (Pipes for insertion lining applications)	SDR11				SDR17.6 (GAS)/SDR17 (WATER)		SDR17	SDR21	SDR27
	PE80		PE100		PE80		PE100	PE100	PE100
	GAS	WATER	GAS	WATER	GAS	WATER	WATER	WATER	WATER
20 mm	5.5	12.5	-	-	-	-	-	-	-
25 mm	5.5	12.5	-	-	-	-	-	-	-
32 mm	5.5	12.5	-	-	-	-	-	-	-
50 mm	5.5	12.5	-	-	-	-	-	-	-
63 mm	5.5	12.5	7.0	16.0	3.0	8.0	-	-	-
90 mm	5.5	12.5	7.0	16.0	3.0	8.0	10.0	-	-
110 mm	-	12.5	-	16.0	3.0	8.0	10.0	-	-
125 mm	5.1	12.5	7.0	16.0	3.0	8.0	10.0	-	-
160 mm	5.1	12.5	-	16.0	3.0	8.0	10.0	8.0	6.0
180 mm	4.1	12.5	7.0	16.0	3.0	8.0	10.0	8.0	6.0
213 mm*	-	-	-	-	-	-	-	-	-
225 mm	-	12.5	-	16.0	-	8.0	10.0	8.0	6.0
250 mm	4.0	12.5	7.0	16.0	3.0	8.0	10.0	8.0	6.0
268 mm*	-	-	-	-	-	-	-	-	-
280 mm	-	12.5	-	16.0	-	8.0	10.0	8.0	6.0
315 mm	3.4	12.5	7.0	16.0	2.7	8.0	10.0	8.0	6.0
355 mm	3.1	12.5	7.0	16.0	2.5	8.0	10.0	8.0	6.0
400 mm	-	12.5	7.0	16.0	2.3	8.0	10.0	8.0	6.0
450 mm	-	12.5	7.0	16.0	2.2	8.0	10.0	8.0	6.0
469 mm*	-	-	-	-	-	-	-	-	-
500 mm	-	12.5	7.0	16.0	2.1	8.0	10.0	8.0	6.0
560 mm	-	-	7.0	16.0	2.0	-	10.0	8.0	6.0
630 mm	-	-	7.0	16.0	1.8	-	10.0	8.0	6.0
710 mm	-	-	-	16.0	-	-	10.0	8.0	6.0
800 mm	-	-	-	-	-	-	10.0	8.0	6.0
900 mm	-	-	-	-	-	-	10.0	8.0	6.0
1000 mm	-	-	-	-	-	-	10.0	8.0	6.0

- *Doshi can usually offer SDRs other than those shown in the table, Eg. for close fit lining applications.*
- *There maybe a requirement to de-rate mitred bends for water applications.*
- *PE80 water pipelines 355mm and greater in diameter should be de-rated if significant amounts of air are present - See UK water industries ING-4-32-18 March 2018.*
- *PE80 gas pipe pressure must be further de-rated for temperatures below 0 degrees Celcius.*
- *The values in the above table do not address any other safety-related issues associated with pipeline design.*

Daily No. of Pressure Transients	Low Toughness PE80 & 100 Re-rating factor	High Toughness PE80 & 100 Re-rating factor
4	1.1	0.5
24	1.5	0.5
48	1.7	0.5
120	2.0	0.5
240	2.3	0.5
1200	3.0	0.5

2.1.7 PRESSURE RATINGS AND FLOW CHARACTERISTICS

Notes:

- The predicted pressure variation range for the system must be multiplied by the factors given in the table in order to establish the pipe PN necessary to avoid the risk of fatigue damage.
- GPS PE80 and PE100 pipes are able to resist a wall stress of 4.6MPa at 80°C for 1,000 hours in the EN 13479 Notched Pipe Test without any stress crack growth, and therefore need no re-rating for fatigue irrespective of the frequency of the surge events (as reflected in the final column).

NB: The pipe PN must always be atleast equal to the maximum steady state pressure of the system, and the pipe must be structurally adequate for the given burial conditions.

Example

A PE100 system operating at a steady state pressure of 5bar is expected to experience cyclic transient pressure variations between 0bar and 16bar 1200 times per day. From the table, a pipe pressure rating PN of atleast 8 bar should be specified [i.e 16 (=the pressure variation in bar) X 0.5 (=the re-rating factor)].

2.1.8 PRESSURE LOSSES AND FLOWS IN POLYETHLENE WATER PIPES

Flow Calculations for water:

Pressure drop due to friction can be determined for practical purposes using a flow nomogram. The GPS nomogram is based on the Colebrook White formula for water at 10°C using a hydraulic roughness factor K for new pipework of 0.003mm.

The pressure drop at a given flow rate can be determined as follows:

1. Obtain the internal bore diameter of the pipe to be used by referring to the dimensions tables.
2. Mark the diameter on a scale A.
3. Mark the required flow rate on scale B.
4. Draw a straight line connecting the points on scales A and B and extend the line to cross scales C and D.
5. The velocity of flow in metres per second is determined from the intersection with scale C.
6. The friction head loss in metres per 100 metres of pipe can then be read off scale D.

Fittings

The calculation of pressure drop in fittings is more complex, but calculations can be made for equivalent lengths of straight pipe using the **Formula E = Fxd** where:

E = equivalent pipe length (metres)
F = fittings constant (See below)
d = fitting internal diameter (mm)

To calculate the total pressure drop in the system, the equivalent straight pipe lengths for fittings is then added to the total straight pipe length to obtain the total drop.

Fittings Constant

Fitting	F
90° Elbow	0.030
45° Elbow	0.015
90° Tee - Straight through	0.020
90° Tee - Side branch	0.075
90° Long Radius Bend (4D)	0.020
45° Bend Long Radius Bend	0.010
Reducer (d/D = 3/4)	0.007

NOTE: for sizes not covered by the nomogram, please contact Doshi technical Support Team.

2.1.9 PRESSURE TESTING - WATER

Water Mains

The traditional testing procedures used for most pipeline materials throughout the Water Supply Industry is given in BSI CP 312:Part 3:1973: Section 10.

These procedures, which are generally satisfactory for linear elastic materials, are not suitable, without modified analysis procedures, for visco elastic materials such as Polyethlene.

Pipe made from such visco elastic exhibit creep and stress relaxation. When a polyethlene pipeline is sealed off under a test pressure there will be a reduction in pressure (pressure decay), EVEN in a leak free system, due to the visco elastic (creep) response of the material. This pressure decay is non-linear in an unconstrained pipe.

A pressure test procedure has been developed by WRc to enable interpretation of the effects of creep and stress relaxation.

For PE pipe systems the test pressures should always be a maximum of 1.5 times the rated pressure of the lowest rated component and/or 20bar maximum if any mechanical fittings are present. With this is upto 10bar, and 1.5 times the mean working pressure of the system for pipes rated at 12.5 bar and above.

Pressure Test

On reaching the test pressure, and satisfying the conditions for minimal air entrapment, the pipeline is isolated and the pressure allowed to decay. The pressure loading time (t1) to achieve test pressure is used as a reference. The natural pressure decay readings at predetermined times (multiples of t1) are recorded.

A correction of t1 is then used to calculate ratios (N), the values of which indicated either the soundness of the main or the presence of an unacceptable leak. As the pressure decay is of exponential form the use of logarithms is necessary when comparing readings but the use of a pocket calculator is all that is require for 'on site' calculations.

PE pipes should be tested in reasonable lengths appropriate to the pipe diameter, pressurising pump capacity, and the prevailing site conditions. Pipelines longer than 1000 metres may require testing in sections. The pipeline should not initially be subjected to any pressure when filling from the mains supply or from standing heads, as this may affect the test result. Polyethlene pipelines must not be pressure tested unless the wall temperature is kept to below 30°C; this includes open trench situations. To enable a precise analysis of the pressure test data, pressure transducers with a logging facility and display should be used. The detailed procedure is as follows:

Note: This represents a slight modification of the procedure detailed in the first printing of the WRc Manual for Polyethlene Pipe Systems for Water Supply - 1986.

Take a first reading of pressure P_1 at t_1, where t_1 is equal to the pressure loading time; t_L.

Note $t_1c = t_1$ corrected $= t_1 + 0.4t_L$

Take a second reading of pressure P2, at a decay time of approximately $7t_L$ this is time t_2.

Note $t_2c = t_2$ corrected $= t_2 + 0.4t_L$

$$\text{Calculate } N_1 = \frac{\log P_1 - \log P_2}{\log t_2c - \text{Log} t_1c}$$

The ratio for N_2 should be:
a) 0.08 to 0.10 for pipes without soil constraint.
b) 0.04 to 0.05 for pipes with compacted backfill.

The sensitivity of the test can be increased by extending the value of t_3. If at any stage during this pressure test an unacceptable leak is indicated, it is advisable to check all mechanical fittings before visually inspecting the welded joints. Any defect in the installation revealed by the test should, of course, be rectified and the test repeated.

On completion of a test sequence the remaining pressure should be released slowly until the pipeline is under its pre-test conditions. In the event of further test being required on the pipeline, such a test should NOT be attempted before sufficient time has elapsed for the pipeline to recover from the previously imposed conditions. This recovery time will depend upon individual circumstance but a period equivalent to 5 times the previous test period may be taken as a guide.

2.1.9 PRESSURE TESTING - WATER

Commissioning

The commissioning of new or repaired supply and distribution mains is normally carried out in the following sequence:

- Cleaning and/or swabbing of the main.
- Filling and sterilisation.
- Flushing and/or neutralisation.
- Refilling the main.
- Bacteriological sampling.
- Acceptance certification.
- Introduction and/or returning of the main into service.

The sequence for PE should include these basic procedures but may be adapted to meet particular conditions (eg. pre-chlorination of sliplined mains). In all cases the procedures must comply with the reuirement of the local water undertaking.

Service pipes should be tested with the ferrule connected to the main but before the cutter taps into the main. After being tested, all service pipes must be subjected to a final disinfection process before being introduced into the water supply system. Guidance is given in the water UK publication, "Principles of water supply hygiene and technical guidance notes". The water utility should be consulted with regard to their disinfection policy for service connections.

Special attention should be paid to the proper sterilisation of those services laid to hospitals and renaldialysis machine.

2.2.1 HEALTHY AND SAFETY

Our polyethlene products have been installed and used safely in large volumes over many years.

All PE80 and PE100 pipe systems contain trace quantities of process residues and may also contain other materials such as pigments, antioxidants and UV stabilisers.

Chemically unreactive, PE is regarded as being biologically inert, though some pipe materials contain low levels of additives which may be toxic.

Ingestion

Ingestion of PE should be avoided. Some pipe materials contain additives which are harmful if swallowed. Materials specified for purposes other than carrying water may contain pigments which are not suitable for use with potable water.

Inhalation

PE does not release harmful fumes at ambient temperature. The threshold limit value for PE dust is 10mg/m3 (8-hourtiem - weighted average in the working environment), but the generation of such levels when working with PE pipe and/or fittings is extremely unlikely.

Physical Contact

PE is not onsidered to be a skin irritant. Where PE dust is generated by cutting or machining pipe or fittings, powder particles of PE dust may cause eye irritation by abrasion.

Fire Characteristics

When PE is heated in air, melting will occur at 120°C-135°C and decomposition will commence at approximately 300°C. Above this temperature PE will pyrolise oxidatively to produce carbon dioxide, carbon monoxide, water and various hydrocarbons. These gases may ignite and provide heat which may accelerate the pyrolysis of more PE in the vicinity. In burning, molten droplets of material maybe released which could ignite adjacent inflammable materials. Actual cooling conditions in a real fire will be influenced by many factors such as location and oxygen availability, which will determine the progress and combustion products of the fire.

Combustion of PE may release toxic materials. Avoid inhalation of smoke or fumes. Also do not allow PE dust to acccumulate, since there maybe a risk in exceptional circumstances of dust explosion, and consider carefully the sitting of potential heat sources such as electrical equipment.

Incase of fire with PE80 or PE100, any fire extinguisher may be used. Powder extinguishers are very effective in quenching flames, Water sprays are especially effective in rapid cooling and damping down a fire since the selection of fire extinguishers eg. proximity of live electrical equipment.

3.0 Large Diameter Aqua-HDPE Pressure Piping Systtems

3.1.1 APPLICATIONS & SOLUTIONS

Unique System

Especially in the field of large diameter pipes ease of installation and cost efficiently are important factors. Long life time as well as the suitability of HDPE for the transport of many media are excellent features for piping systems and pipelines.

PE piping systems are proven in smaller dimensions upto <800mm for more than 50 years and various studies have clearly shown that HDPE systems are suitable for life time of >100 years.

Another benefit compared to other materials is the corrosion resistance. Costly and maintenance intensive corrosion protection measures are not required for this piping system in PE100.

Applications

Large diameter Aqua-PE piping systems are applied onshore and outshore for:

- Pipelines to transport potable, salt and process water.
- Sewage systems for industrial and municipal waste-water.
- Mining pipes to transport slurries and water.
- Intake and outfall pipes.
- (e.g for sea water desalination and power plants.
- Underground firefighting pipelines.
- Cooling water pipes.
- Pressure pipes in power plants.
- Pipelines for irrigation.
- Tank construction.

Complete Solutions

Retrovis Enterprises Ltd. offers complete range of large diameter pipes, fittings and suitable joining techniques to construct pipelines and piping systems. The standard and customized fittings are designed and according to state of the art standards and fullfill the necessary performance requirements.

Retrovis Enterprises Ltd. experience in fitting production as well as welding technology is a key advantage to providing the highest quality solutions for the construction of large diameter pipelines.

Retrovis Enterprises Ltd. gives us the capability to produce all components on site, cost effective and environmentally friendly construction of large pipelines.

Mobility / Logistics

Since the very beginning the new developed large diameter PE pipes were designed also for mobile setup with optimized site assembly and transportation requirement:

- The large diameter pipes can be shipped on site in a truck or containers.
- Significant reduced transportation cost and hassle.
- No risk of damaging the pipe during transportation.

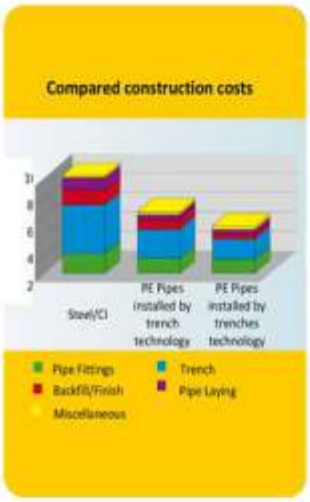
Earthquake pipe failure statistics

MATERIAL	LENGTH (KM)	FAILURES (KM)
PVC (Water)	99.95	0.80
Asbestos Cement (Water)	221.90	0.95
Galvanized Steel (Water)	3.81	0.52
Cast Iron (Water)	1.03	0.97
Polyethlene(Gas)	115.13	0.00

3.1.2 CONSTRUCTION OF PIPELINES

Offshore Installation

The large diameter Aqua-PE pipes are produced in the maximum length which can be handled at site. The welding can be done outside the trench in order to minimize the size of the trenches.



Relining

Large diameter Aqua-PE pipes are excellent suitable for rehabilitation of damaged pipelines by various methods such as: rolldown relining, sewage lining, close fit lining (sub-lining) and slip lining. This method enables fast and durable repair of existing piping sysytems in urban as well as industrial areas.

3.1.3 JOINING TECHNOLOGY

Doshi provides the Butt Fusion Technology proven for many years in the field and do offer many advantages.

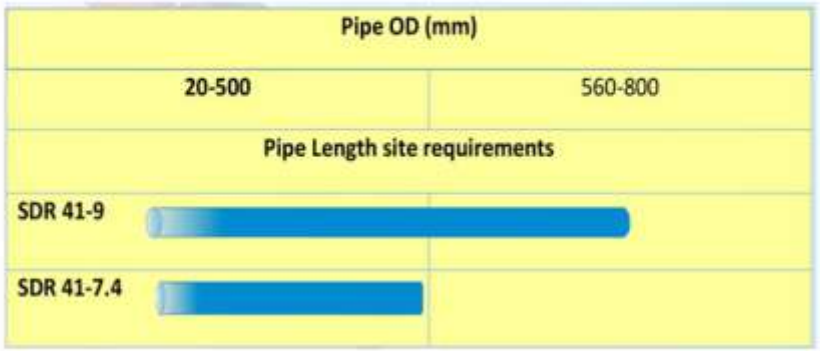
- 100% leak proof Joint.
- Welding joints are as strong as the pipe itself.
- Longitudinally force locked joint.
- High mechanical strength.

Heated Tool Butt Welding

The two pipe components are clamped in the welding machine and the pipe end are planned. The welding area is heated up with the heating element and then joined together with a defined welding pressure. This process ensures high quality joints with excellent reproducibility also under site conditions.

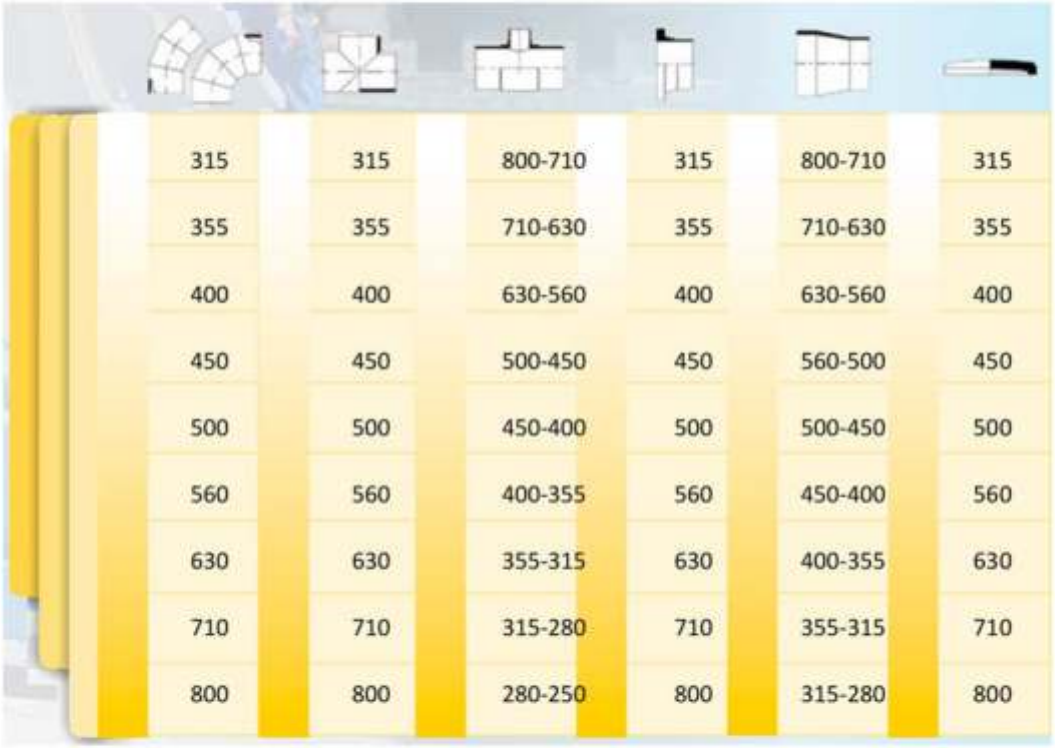
3.0 Large Diameter Aqua-HDPE Pressure Piping Systtems

3.1.4 SUPPLY PROGRAMME - PE100 PIPES



SDR	Maximum component operating pressure (bar)
41.0	4.0
33.0	5.0
26.0	6.3
17.0	10.0
13.6	12.7
11.0	16.0
9.0	20.0
7.4	25.0

3.1.5 SUPPLY PROGRAMME - PE100 FITTINGS



315	315	800-710	315	800-710	315
355	355	710-630	355	710-630	355
400	400	630-560	400	630-560	400
450	450	500-450	450	560-500	450
500	500	450-400	500	500-450	500
560	560	400-355	560	450-400	560
630	630	355-315	630	400-355	630
710	710	315-280	710	355-315	710
800	800	280-250	800	315-280	800

Aqua-PE

Unique and innovative solutions in polyethylene for natural gas, portable water, sewage and industrial piping systems.

- Easy & Fast.
- Safe & Tough.
- Pressure Resistant.
- High Durabilty.

Aqua-Safe

Concrete Protective Liners

- High Flexibilty.
- Excellent Abrasion Resistance.
- Good Chemical Resistance.

The Old Way Vs The New Way

THE CHOICE IS CLEAR

A highly specialized PE plastic that solves for common failure modes of legacy pipe type.

MIG WELDING MACHINES
250Amp-220v, 350A-380v, 500A-380v.

High Performance Tools

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General Engineering Works & Industrial Supplies

P.O Box 59202-00100 Highway Mall, Mombasa Road
Mobile: +254 716 947 862
Email: info.retrovisltd@gmail.com