Lankhorst|Ropes
OFFSHORE DIVISION

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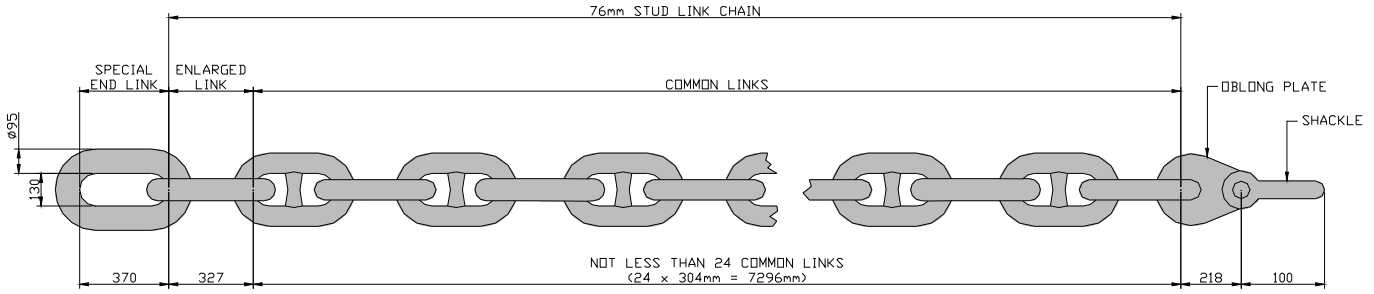
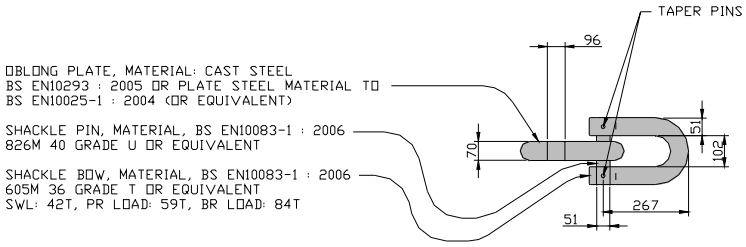
CHAFE CHAIN B – OCIMF 4th Edition, 2007



Chain manufactured, tested and inspected in accordance with IACS W22.

Grade per IACS W22 – R3
Safe Working Load: 200 Tonnes
Minimum Break Load: 497.8 Tonnes

The number and size of chains used should be determined by the terminal operator after an analysis of the maximum mooring load. If necessary, weak links or quick release devices should be incorporated into the mooring system.



Offspring International Ltd
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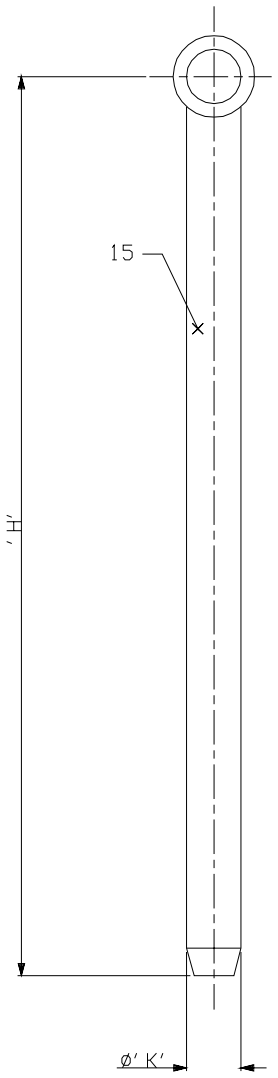
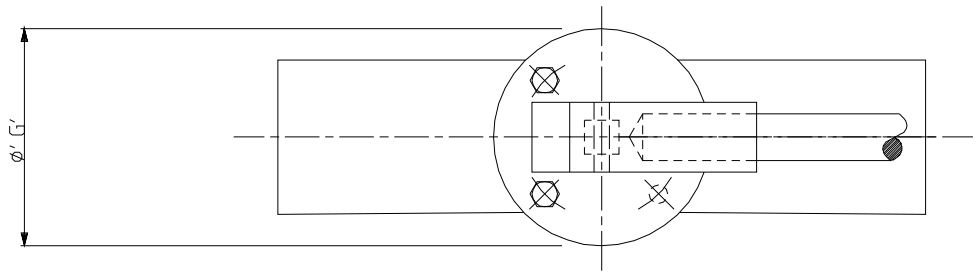
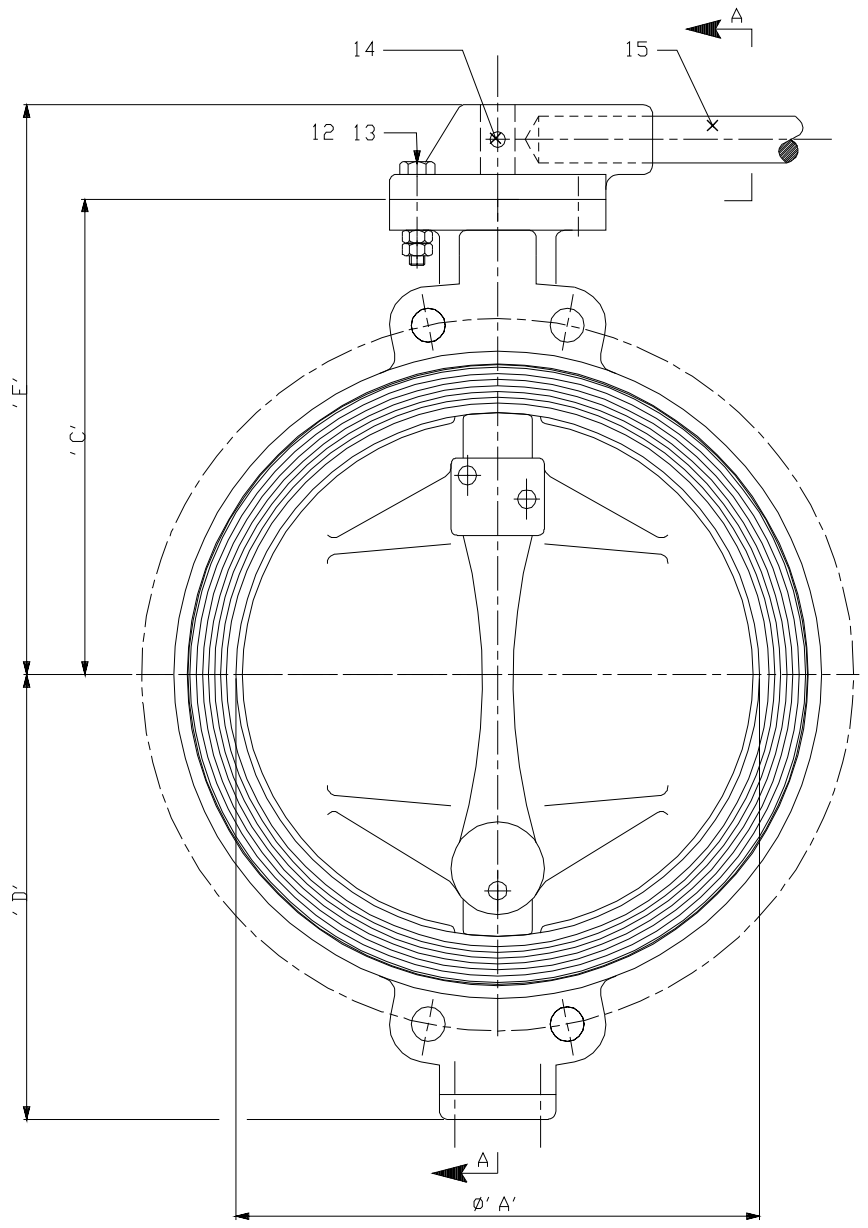
Email: mail@offspringinternational.com / Web: www.offspringinternational.com

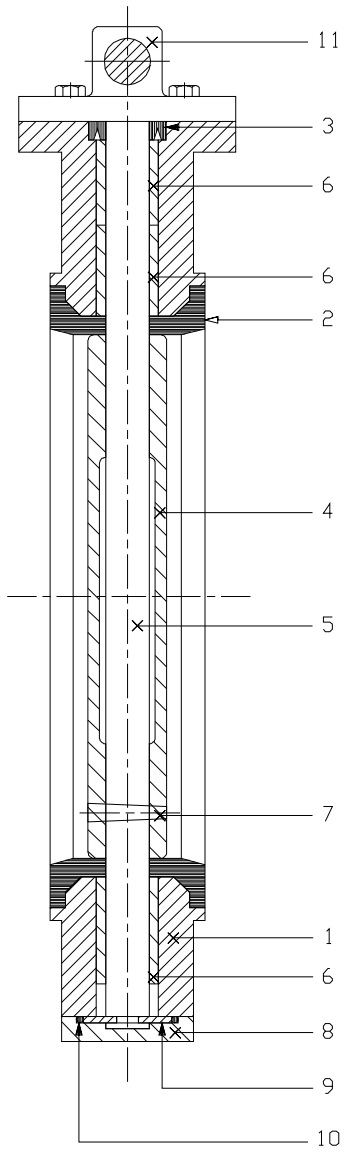
World-wide Sales Agents for Deep Water Mooring and Single Point Mooring

DO NOT SCALE

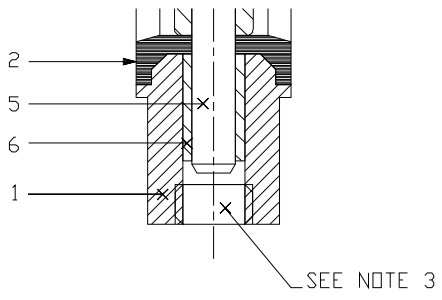




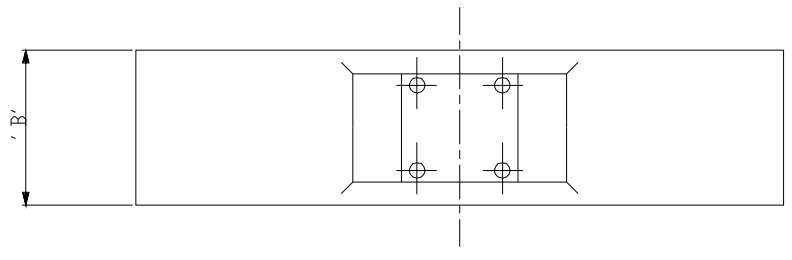




SECTION ON A-A



PART SECTION ON A-A
FOR SIZES 12" AND SMALLER ONLY



NOM. SIZE INS. (mm)	Ø'A'	'B'	'C'	'D'	'E'	ØG	'H'	ØK
24" (600)	580	154	470	460	580	200	1800	50
20" (500)	480	127	420	405	530	200	1800	40
16" (400)	385	102	360	350	420	155	1000	30
12" (300)	297	78	310	245	370	155	750	25
10" (250)	250	68	270	205	330	155	750	25
8" (200)	200	60	220	175	260	105	400	20
6" (150)	150	56	195	145	235	105	400	20

PARTS LIST

ITEM	DESCRIPTION	MATERIAL	QTY.
1	BODY	CAST STEEL ASTM A216 WCB	1
2	BODY LINER	BUNA-N	1
3	SHAFT SEAL U-RING	NITRILE RUBBER	1
4	DISC	AL. BRONZE BS 1400 AB2	1
5	SHAFT	MONEL K-500	1
6	BUSH	BRONZE ASTM B145 4A	2
7	TAPER PIN DIN 1	MONEL K-500	3
8	COVER PLATE	STEEL ST37	1
9	THRUST PLATE	BRONZE ASTM B145 4A	1
10	'O' RING	NITRILE RUBBER	1
11	LOCKING CAP	AL. BRONZE BS 1400 AB2	1
12	HEX. HD. BOLT DIN 933	AL. BRONZE BS 1400 AB2	2
13	HEX NUT DIN 934	AL. BRONZE BS 1400 AB2	4
14	TAPER PIN DIN 1	MONEL K-500	1
15	LEVER	AL. BRONZE BS 1400 AB2	1

NOTES
1. DESIGN CONFORMS TO BS 5155.
2. POSITIVE LOCKING PROVIDED AT OPEN/SHUT POSITIONS.
3. FOR SIZES 12" AND SMALLER ITEMS 8, 9 & 10 ARE REPLACED BY THREADED BRASS PLUG, ITEM 7 IS REDUCED TO 2 OFF AND VALVE DISC AND BODY STEM SLIGHTLY MODIFIED.
4. ITEMS 11, 12, 13 AND 15 FOR 20" AND 24" NOMINAL SIZE MAY BE SUPPLIED IN OTHER MATERIALS SUBJECT TO AVAILABILITY.
5. ALL DRILLINGS TO CONFORM TO ASA 150.
6. VALVE LINING TO BE VULCANISED TO VALVE BODY AND FORMS INTEGRAL VALVE FACE GASKET. VALVE BODY LINER VULCANISED UNDER 32 BAR PRESSURE.
7. METALWORK TO HAVE EPOXY PAINT FINISH.
8. FINAL PRESSURE TEST AGAINST CLOSED DISC IS TO 3 BAR.
9. EQUIPMENT TO BE SUPPLIED C/W CERTIFICATE OF CONFORMITY AND PRESSURE TEST CERTIFICATE.

ISSUE	REVISION	DATE	CHKD	APPD
H	REDRAWN ON CAD	7-10-92		

DUNLOP OIL AND MARINE
TECHNICAL SERVICES DEPARTMENT

BUTTERFLY VALVE
WATER TYPE WITH LEVER
ACTUATION/LOCKING SYSTEM

DRAWN Keith. J. Mumby
CHECKED
APPROVED

A1 | 7-10-92 | DRG NO. DP5081/H

SCALE NTS | DIMENSIONS MM | ISSUE H

10 ANCILLARY EQUIPMENT

Refer to Dunlop Offshore Hose Manual "Ancillary Equipment" section for the range of ancillary equipment supplied by Dunlop for use within loading hose strings.

Guidelines for use and maintenance of the major supply items are as follows:

GASKETS

Storage

- store flat in cool, clean, dry atmosphere away from direct sunlight

Installation

- use each gasket once only - use a new gasket if re-making a joint;
- carry carefully - avoid bending, face damage and contamination;
- ensure flange faces are clean and undamaged;
- do not use jointing compounds or release agents;
- carefully align and centralise gasket with flanges;
- ensure gasket is not pinched or damaged during joint tightening

Maintenance

- check flange joints for leaks in routine hose string inspection

BOLTING

Storage

- retain in boxed packaging in dry location until needed;

Installation

- use each bolt set once only;
- hand run nuts onto stud thread evenly either side of flanged joint;
- tighten to pre-established torque value using cross-tightening pattern (see section 5.3)
- check effect of lubricant (if used) on recommended torque value
- do not lubricate PTFE coated bolts;

Maintenance

- check condition and tightness during routine hose string inspection

CHAIN ASSEMBLIES

Storage

- store on wooden pallets in clean, dry atmosphere;

Installation

- ensure intended use is within chain assembly components' working load limits;
- check condition before bringing into service;
- ensure safety bolts, split pins, and connector links are secure as appropriate;

Maintenance

- check component security before any service lift;
- check for corrosion and wear at regular intervals;
- ***adhere to any specific legislation applying***

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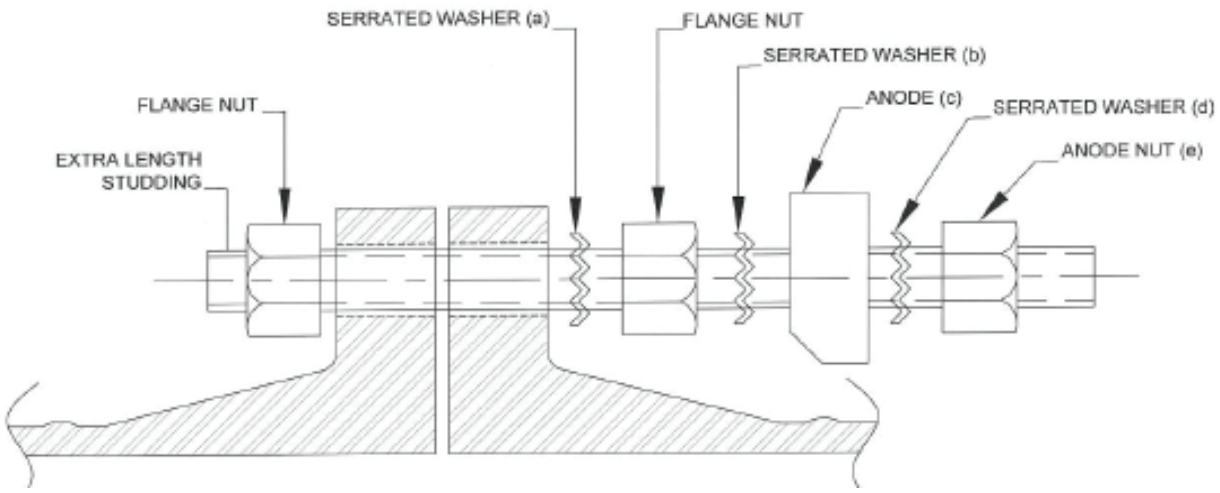
DUNLOP OIL & MARINE

ANCILLARY DATA SHEET

HOSE FLANGE ANODE



The hose flange Zinc anode is a bolt on type which can be easily replaced in situ without the need for welding.

The anodes are slotted to accept ASME B16.5 flange bolting clearances, and as such will not protrude above the flange rim.

Replacement does not require the flange bolts to be removed thus ensuring integrity of the gasket and joint.

Anodes can be supplied either with new delivery or for use with hoses already in the field, and aluminium is another available option.

Hose flanges are hot dipped galvanised (HDG) as standard, and further epoxy coatings can be applied over the HDG at client request.

ANODE SIZES

Type	N.B.	Class
DP1/1	4″	150
DP1/2	4″	300
DP1/3	6″	150
DP1/4	6″	300
DP1/5	8″	150
DP2/1	8″	300
DP2/2	10″	150
DP2/3	12″	150
DP2/4	10″	300
DP2/5	16″	150
DP3/1	12″	300
DP3/2	20″	150
DP3/3	16″	300
DP3/4	20″	300
DP3/5	24″	150
DP4/1	24″	300

ANCILLARY DATA SHEET

HOSE LINE MARKER BEACON

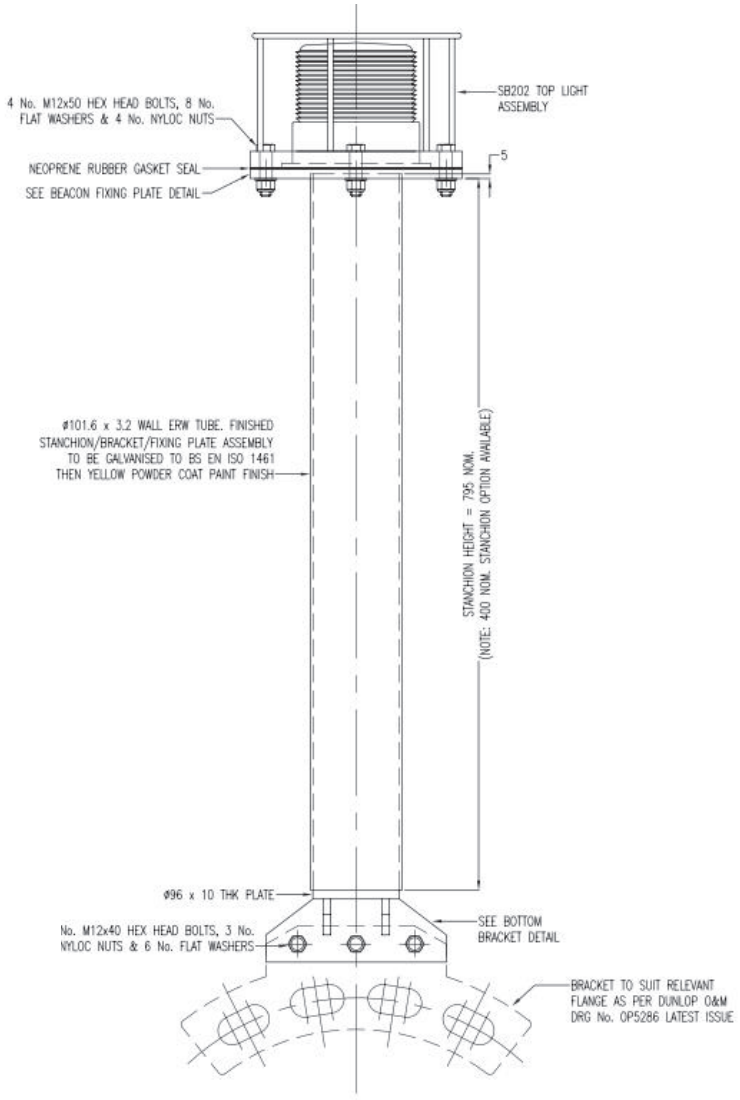
The Hose Line Marker Beacon is a navigational aid for the marking of floating hose strings during the hours of darkness or in poor visibility.

The top light comprises a LED flasher unit, lens, stanchion mounting plate and stainless steel cage.

The encoder electronics incorporates a “sun-switch” circuit for automatic light activation in low light conditions.

The unit is solar powered.

Stainless steel bolting and rubber gasket seal the top light to the stanchion, preventing water ingress.



Main characteristics of the standard SB202 beacon are:

- White Flash, 0.2seconds ON / 4.8 seconds OFF
- Acrylic lens
- 2 nautical miles range

Variations to the standard SB202 beacon include:

- Shorter stanchion (may be preferred for small bore hose)
- Red/amber/green/blue colour
- Alternative flash characters (per client requirement)
- Increased range

Continental CONTITECH

Fluid Technology

DUNLOP OIL & MARINE

Specified Materials Purchasing Specification

PUR/Issue: 883 – Issue 1
Date of Issue: 24.09.2014
DOM Material Code: Ancillary
Material Name: Butterfly Valve

Internal Authorisation

Originator	H & S	Technical	QA	Laboratory
N/A	C Allen	P Staton	S Cornthwaite	N/A
Date:	Date: 24-9-14	Date:	24.9.14	Date:

Description
Rubber lined, concentric wafer butterfly valve for marine service

Valve Design	
Valve Interface	ASME CL300 or CL150 Flange Drillings to ASME B16.5
Bore Sizes	DN100, DN150, DN200, DN250, DN300, DN400, DN500
Fabrication Codes	BS EN 593, API609 (Cat A), ASME B16.34
Top Flange (Lever Interface)	ISO 5211
Face to Face Dimensions	API 609 Table 2
Material Certification	EN 10204 – 3.1
Location Holes	CL150 Drilled Through, CL300 Drilled and Tapped
Operating Conditions	
Operating Pressure	≤21bar open, 4bar closed
Max. Flow Velocity (liquid)	≤9m/s
Operating Temperature	Min. -29°C, Max.82°C
Medium(s)	Crude Oil, Petrochemicals & Seawater
Aromatic content	≤50%
H2S content	≤100ppm
Operation	Hand Operated Only at Zero Gauge Pressure Condition
Valve Components	
Body	Carbon Steel ASTM A216 WCB 'OR' S355J2+N
Disc	Aluminium Bronze B148 C95500
Shaft	Monel K500
Shaft Packing	Buna N
Body Liner/Seat	Vulcanised Nitrile (Buna N)
Fasteners	AISI 316L
Bearings/Bushes	Bronze

Valve Operation
Valve shall be operated by means of removable hand lever. Operating lever shall be in accordance with BS EN 593, API 609 & MSS SP-91. The valve shall be capable of positive lock off in the fully open and fully closed position i.e. disc shall be prevented from swinging through 360°; if additional components are required to sustain

and maintain positive lock off these shall be removable and provided by the valve manufacturer. Lever mechanism shall be capable of indicating the disc position. Hand lever materials to AISI 316L. Maximum weight of hand lever operating assembly 15kg.

Valve Marking

Valves to be marked in accordance with MSS-SP-25.

Corrosion Protection

Corrosion protection shall be provided in accordance with BS EN 593. Environment as identified as per BS EN 593, Annex C is C5-M & IM2.

Corrosion protection may be provided to carbon steel parts by means of glass flake epoxy coating system which is suitable for offshore environments. Coating thickness of corrosion system shall be minimum 300µm. Testing and test procedures for the coating system are the responsibility of the valve manufacturer. Colour Black.

Test requirements

Body Shell Test (Valve in open position) to 21bar,
Seat Test(Valve in fully closed position) to 4bar

Pressure testing and leak test methodology shall be in accordance with API 598 and ASME B16.34. Body test pressure duration and seat test pressure shall be in accordance with API 598. Visual examination shall be conducted in accordance with MSS-SP-55.

Manufacturer shall confirm ease of butterfly valve operation by conducting opening and closing functionality test.

Quality Assurance Requirements

A certification pack consisting of a Cert of Conformity/Test Certificate/Material Certificates must precede or accompany the delivery. If preceding the delivery, e-mail to quality@fluid.contitech.co.uk .

The Certificate of Conformity must state compliance to this PUR specification and provide traceability to the metallic materials used in the construction of the body, stem and disc by reference to the cast number and mill certificate numbers. Stockholder certificates must be included in the pack if requested on the Purchase Order.

The Certificate of Conformity must show all test specifications, test pressures and test results or, alternatively, testing details can be provided on a separate test certificate.

All suppliers of metallic materials must have an ISO 9001:2008 certificate, issued by an accredited certification body recognized in the EC.

Copies of all concessions, agreed in writing with Dunlop, must be included in the certification pack.

Health & Safety Requirements:

Materials to be supplied in accordance with REACH Regulations EC 1907/2006. Safety Data Sheets (SDS) must be supplied before first time delivery.

Other Requirements

The PUR reference and issue number MUST be specified on all paperwork including delivery notes.

Valves are to be supplied with Installation Manuals.

Disclaimer:

Dunlop Oil and Marine reserves the right to inspect and/or test incoming materials and reject them if they fall outside the requirements laid out above. Materials that are not used for a period of more than 3 years will be subject to the re-evaluation and approval process as laid out in DUNLOP OIL & MARINE Company Operating Procedures.

IRP FIRE & SAFETY LTD.
A member of the IRP Group of Companies
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Tel: (868) 674-0693/0694/3632
Fax: (868) 674-0736 · www.irpltd.com

DUNLOP BUTTERFLY VALVES

Dunlop Type BFV 519
Water Type Lever Actuated Butterfly Valve
Size: 16-inch

BUTTERFLY VALVES

(Standard supply lever operated, rubber lined wafer type)

Storage

- store on wooden pallets in a cool, dry, dark place;
- open the valve to approx. 10° (long term);
- treat rubber liner with talcum powder or silicone spray (long term);
- use hardboard or plastic protectors to rubber lined faces;

Installation

- remove residual talc etc. with damp cloth;
- ensure disc is fully closed or towards the closed position within the protection of the valve body;
- fit valve with shaft horizontal such that the lower half of the disc will move in the direction of flow during opening (if operationally practicable);
- support valve; offer up to adjacent equipment flange using valve body bolt location holes to assist alignment and centralisation, ensuring no damage to rubber lined faces;
- ***do not use separate gaskets with the rubber lined valve faces;***
- ensure bolting has sufficient extra length to account for valve body width;
- insert bolts, hand tighten nuts, and check free movement of disc;
- ensure valve is in partial or fully open position and fully tighten bolts;
- return valve to fully closed position and lock

Operation

- to ***open*** valve: remove locking bolts, insert lever into housing, turn actuator housing through 90 degrees in correct direction and lock open;
- ***close*** valve back through same 90 degree quadrant;

Maintenance

- act of dismantling valve from the line may damage rubber faces - take care;
- shaft, disc and bearings can be replaced, but the need to do so suggests an underlying operational problem;
- the lining is not replaceable;
- make good surface coating damage with a marine grade epoxy paint system or similar

Typical butterfly valve

The standard supply lever operated, rubber lined, wafer butterfly design is for ease of handling and operation offshore at the tanker end of a loading hose string where usual service is just to retain product in the hose string between loadings.

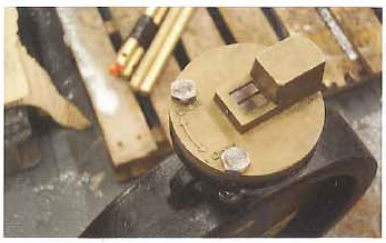
It is designed to seal against approximately 3 bar internal pressure only.

Other valve configurations—double flanged, gearbox actuator for pressure service etc. are available.

OPEN/CLOSE Direction and Locking

The valve actuator housing and valve body top flange include bolt sets and bolting holes for positive locking of the disc in open and closed positions. The disc is only meant to operate over one quadrant of the potential full turning circle defined by the two possible alignment positions of the bolting holes.

Do not attempt to send the disc beyond its normally closed position since it may subsequently be unable to be freed and possibly result in rubber lining damage.



Continental
The Future in Motion

Dock Hoses

For onshore installations

DUNLOP OIL & MARINE

Industrial Fluid Systems

ContiTech

Dunlop Oil & Marine

Dunlop Oil & Marine, part of Continental AG, has an unrivalled track record in the supply of oil and marine hoses to the global oil and gas industry.

Our ability to recognise and respond to changing market, operational and customer requirements has led to us being responsible for most of the major innovations and developments in hose technology throughout our 60 year history. Dunlop Oil & Marine became the first hose manufacturer in the world to qualify its entire offshore product range to the new GMPHOM 2009 industry standard.

From supplying a complete dock hose range to developing the world's first single point mooring and double carcass hoses, Dunlop Oil & Marine are proud to lead the way in both onshore and offshore hose technology.

Our full product range includes:

- GMPHOM 2009 hoses
- API 17K offshore offloading hoses
- High pressure hoses
- Industrial & hydraulic hose assemblies
- Ship-to-Ship hoses
- LPG offshore hoses
- LNG hoses
- Roof tank drain hoses
- Oxygen hoses
- Hose management services

Dock hose range includes:

- Suction and discharge hoses with built in fittings for crude and refined oil products and petrochemicals
- Lifeline long length delivery, suction and discharge hoses for use with swaged or clamped couplings
- LPG dock transfer hoses
- Suction and discharge hoses for product transfers where high chemical resistance is required
- Bitumen and asphalt hoses

Dock Hose Product Range

Page	Product	Standards	Max WP	End Fitting
5	Dunlop Type C231/C233 - Lightweight Discharge Hose	EN 1765	10/15 bar	Built-in
6	Dunlop Type C282/C283 - Standard Duty Suction and Discharge Hose	EN 1765	10/15 bar	Built-in
7	Dunlop Type 284/286/288 - Heavy Duty Suction and Discharge Hose	EN 1765	10/14/15 bar	Built-in
8	Dunlop Type 252 - High Pressure Suction and Discharge Hose	Exceeding EN 1765	21 bar	Built-in
10	Dunlop Type 255 - High Pressure Softwall Discharge Hose	Exceeding EN 1765	21 bar	Built-in
11	Dunlop Type 263/264 - Rough Bore Suction and Discharge Hose	EN 1765	15/21 bar	Built-in
13	Dunlop Lifeline Type 241 - Long Length Oil Suction and Discharge Hose	Lifeline (Dunlop Standard)	17 bar	Swaged/ Clamped
14	Dunlop Lifeline Type 243 - Standard Duty Suction and Discharge Hose	Lifeline (Dunlop Standard)	17 bar	Swaged/ Clamped
15	Dunlop LPG Type 321 - LPG Dock Suction and Discharge Hose	EN 1762	25 bar	Built-in
16	Dunlop LPG Type 321M - LPG Submarine Suction and Discharge Hose	BS 4089	27.5 bar	Built-in
18	Dunlop Type 288M - Heavy Duty Submarine Suction and Discharge Hose	BS 1435	15 bar	Built-in
19	Dunlop Type 341X - XLPE Chemical Suction & Discharge Hose	(Dunlop Internal Standard)	14 bar	Built-in
20	Dunlop Type 383B/383V - PetroChemical Dock Hose	(Generally to) EN 1765	15 bar	Built-in
22	Dunlop Type 352V - High Pressure Suction and Discharge Hose	Exceeding EN 1765	21 bar	Built-in
23	Dunlop Type 388V - High Pressure Suction and Discharge Hose	EN 1765	15 bar	Built-in
25	Dunlop Type 332 - Bitumen, Hot Tar and Asphalt Hose (+175°C)	EN 13482	15 bar	Built-in

Dunlop Type C231/C233
- Lightweight Discharge Hose

Fully complying with BS EN 1765: 2004 Type L10/L15

Application

Lightweight, flexible hoses offering easy handling. Generally used at dockside and jetty locations where the working conditions call for a lightweight, flexible hose.

Working/Burst Pressure (L10) (L15)	**10/40 bar (Dunlop Type C231) 15/60 bar (Dunlop Type C233)**
Operating Temperature	-20°C to +82°C
Electrical Continuity	Electrically continuous or discontinuous as required
Maximum lengths	40m (up to 8" internal diameter) 12m (above 8" internal diameter)

Construction

Lining	Synthetic rubber compound for petroleum products with an aromatic content up to 50%
Main reinforcement	Multiple plies of high tenacity polyester cord designed for a combination of high strength and resistance to fatigue. Each layer is fully encapsulated in rubber to prevent abrasion with adjacent layers
Holding ply	Textile reinforcement to increase adhesion between hose body and cover
Cover	Weathering and abrasion resistant rubber compound
Fittings	Built-in steel nipples with flanges to suit customer requirements

Technical Design Data

ID		OD		Body Weight		End Weight	MBR
Types C231 & C233		Type C231	Type C233	Type C231	Type C233	All	All
inch	**mm**	**mm**	**mm**	**kg/m**	**kg/m**	**kg/hose**	**m**
2	51	67	68	2.4	2.5	11	0.30
3	76	93	93	2.7	2.8	14	0.45
4	102	120	120	3.9	4.1	18	0.60
5	127	146	147	6.2	6.4	29	0.70
6	152	174	174	5.8	7.0	46	0.90
8	203	224	228	11.2	12.0	67	1.20
10	254	280	280	17.0	15.1	96	1.50
12	305	328	331	18.0	18.8	122	1.90

Hoses manufactured in Europe

Dunlop Type C282/C283
- Standard Duty Suction and Discharge Hose

Fully complying with BS EN 1765: 2004 Type S10/S15

Application

Lightweight, flexible hoses offering easy handling. Generally used at dockside and jetty locations.

Similar hose type also available with other lining for transfer of different chemicals. See type 383V/B for more information on page 20.

Working/Burst Pressure (S10) (S15)	**10/40 bar (Dunlop Type C282) 15/60 bar (Dunlop Type C283)**
Operating Temperature	-20°C to +82°C
Electrical Continuity	Electrically continuous or discontinuous as required
Maximum lengths	40m (up to 8" internal diameter) 12m (above 8" internal diameter)

Construction

Lining	Synthetic rubber compound for petroleum products with an aromatic content up to 50%
Main reinforcement	Multiple plies of high tenacity polyester cord designed for a combination of high strength and resistance to fatigue. Each layer is fully encapsulated in rubber to prevent abrasion with adjacent layers
Embed wire	Helical steel wire to resist collapse and crush loads
Holding ply	Textile reinforcement to increase adhesion between hose body and cover
Cover	Weathering and abrasion resistant rubber compound
Fittings	Built-in steel nipples with flanges or couplings to suit customer requirements

Technical Design Data

ID		OD		Body Weight		End Weight	MBR
Type C282 & C283		Type C282	Type C283	Type C282	Type C283	All	All
inch	**mm**	**mm**	**mm**	**kg/m**	**kg/m**	**kg/hose**	**m**
2	51	75	78	3.5	3.6	11	0.35
3	76	100	103	4.0	5.1	14	0.45
4	102	126	129	6.1	6.8	18	0.60
5	127	154	156	8.9	9.1	29	0.70
6	152	180	184	11.0	11.9	46	0.85
8	203	236	238	16.5	17.3	67	1.10
10	254	288	290	26.2	27.1	96	1.35
12	305	341	344	31.0	37.3	122	1.60

Hoses manufactured in Europe

Dunlop Type 284/286/288
- Heavy Duty Suction and Discharge Hose

Fully complying with BS EN 1765: 2004 Type S10/S15

Application

Generally used for medium to heavy duty service at dockside and jetty locations where the working conditions demand a robust construction to accommodate rougher handling, higher working pressures and flow rates.

*288 available with other linings for transfer of different chemicals. See Dunlop Type 388V for more information on page 23.

Working/Burst Pressure (S10) **(S15)**	**10/40 bar (Dunlop Type 284)** *** 14/56 bar (Dunlop Type 286)** **15/60 bar (Dunlop Type 288)**
Operating Temperature	-20°C to +82°C
Electrical Continuity	Electrically continuous or discontinuous as required
Maximum lengths	15m

* Additional to EN 1765 standard

Construction

Lining	Synthetic rubber compound for petroleum products with an aromatic content up to 60%
Main reinforcement	Multiple plies of high tenacity rayon cord designed for a combination of high strength and resistance to fatigue. Each layer is fully encapsulated in rubber to prevent abrasion with adjacent layers
Embed wire	Two helical steel wires to resist collapse and crush loads
Holding ply	Textile reinforcement to increase adhesion between hose body and cover
Cover	Weathering and abrasion resistant rubber compound
Fittings	Built-in steel nipples with flanges to suit customer requirements

Technical Design Data

ID		OD			Body Weight			End Weight	MBR	Maximum Working Tensile Load		
Types 284, 286 & 288		Type 284	Type 286	Type 288	Type 284	Type 286	Type 288	All	All	Type 284	Type 286	Type 288
inch	**mm**	**mm**	**mm**	**mm**	**kg/m**	**kg/m**	**kg/m**	**kg/hose**	**kg/hose**	**Tonnes**	**Tonnes**	**Tonnes**
2	51	85	85	85	5.1	5.1	5.1	11	0.30	1.6	1.7	1.7
2.5	64	98	98	98	6.1	6.1	6.1	14	0.38	1.6	1.5	1.5
3	76	111	111	111	7.0	7.3	7.3	18	0.46	1.5	1.8	1.8
4	102	139	137	137	9.4	9.4	9.7	29	0.60	2.9	2.0	2.0
6	152	192	193	198	16.6	17.8	19.8	46	0.90	3.7	5.2	5.0
8	203	249	251	251	24.3	25.8	25.8	67	1.20	6.2	5.8	5.8
10	254	303	303	303	34.5	35.9	35.9	96	1.50	6.3	8.0	8.0
12	305	362	362	362	49.8	49.8	49.8	122	1.80	7.3	7.8	7.8

Hoses manufactured in the United Kingdom
CE branded hoses showing full compliance with European Pressure Equipment Directive PED 97/23/EC

Dunlop Type 252
- High Pressure Suction and Discharge Hose

Exceeding BS EN 1765: 2004

Application

Recommended for service on docks, jetties, tankers, etc., where the working conditions call for strength and robustness combined with flexibility and high pressure requirements.

Type 252 hoses are prototyped to the requirements of BS EN 1765: 2004, but for higher working pressures than specified in BS EN 1765.

*252 available with other linings for transfer of different chemicals. See Dunlop Type 352V for more information on page 22.

Working/Burst Pressure	**21/84 bar (Dunlop Type 252)**
Operating Temperature	-20°C to +82°C
Electrical Continuity	Electrically continuous or discontinuous as required
Maximum lengths	15m

Construction

Lining	Synthetic rubber compound for petroleum products with an aromatic content up to 60%
Main reinforcement	Multiple plies of wire cord designed for a combination of high strength and resistance to fatigue. Each layer is fully encapsulated in rubber to prevent abrasion with adjacent layers
Embed wire	Helical steel wire to resist collapse and crush loads
Holding ply	Textile reinforcement to increase adhesion between hose body and cover
Cover	Weathering and abrasion resistant rubber compound
Fittings	Built-in steel nipples with flanges or couplings to suit customer requirements

Technical Design Data

ID		OD	Body Weight	End Weight	MBR	Maximum Working Tensile Load
inch	**mm**	**mm**	**kg/m**	**kg/hose**	**m**	**Tonnes**
3	76	112	9.5	18	0.46	1.2
4	102	137	12.1	29	0.60	2.0
6	152	192	19.3	46	0.90	3.2
8	203	244	27.5	67	1.20	3.9
10	254	306	44.5	96	1.50	4.7
12	305	357	57.3	122	1.80	5.3

Hoses manufactured in the United Kingdom
CE branded hoses showing full compliance with European Pressure Equipment Directive PED 97/23/EC

Dunlop Type 255
- High Pressure Softwall Discharge Hose

Exceeding BS EN 1765: 2004

Application

High pressure smooth bore oil discharge hoses are recommended for service on docks, jetties, tankers, etc. Generally used on hose handling rigs, rather than being manually handled.

Type 255 hoses are exceeding the requirements of BS EN 1765: 2004, which has replaced BS 1435: Part 1: 1987, however provides the additional protection of 10:1 safety factor.

Working/Burst Pressure	**21/210 bar (Dunlop Type 255)**
Operating Temperature	-20°C to +82°C
Electrical Continuity	Electrically continuous or discontinuous as required
Maximum lengths	15m

Construction

Lining	Synthetic rubber compound for petroleum products with an aromatic content up to 60%
Main reinforcement	Multiple plies of wire cord designed for a combination of high strength and resistance to fatigue. Each layer is fully encapsulated in rubber to prevent abrasion with adjacent layers
Holding ply	Textile reinforcement to increase adhesion between hose body and cover
Cover	Weathering and abrasion resistant rubber compound
Fittings	Built-in steel nipples with flanges or couplings to suit customer requirements

Technical Design Data

ID		OD	Body Weight	End Weight	MBR	Maximum Working Tensile Load
inch	mm	mm	kg/m	kg/hose	m	Tonnes
3	76	114	11	18	0.46	1.2
4	102	134	14	29	0.60	2.0
6	152	190	19	46	0.90	3.2
8	203	253	35	67	1.20	3.9
10	254	304	44	96	1.50	4.7
12	305	365	66	122	1.80	5.3

Hoses manufactured in the United Kingdom
CE branded hoses showing full compliance with European Pressure Equipment Directive PED 97/23/EC

Dunlop Type 263/264
- Rough Bore Suction and Discharge Hose

Fully complying with BS EN 1765: 2004 Type R15

Application

Generally used for medium to heavy duty service at dockside and jetty locations where the working conditions demand a robust construction to accommodate rougher handling, higher working pressures and flow rates.

Type 264 hoses are prototyped to the requirements of BS EN1765: 2004 but for higher working pressures than specified in BS EN1765.

Working/Burst Pressure (R15)	**15/60 bar (Dunlop Type 263) 21/84 bar (Dunlop Type 264)**
Operating Temperature	-20°C to +82°C
Electrical Continuity	Hoses can only be supplied electrically continuous
Maximum lengths	15m

Construction

Lining	An oil resistant nitrile based rubber compound for petroleum products with an aromatic content up to 50%, reinforced with a nylon breaker fabric that supports the lining between the turns of the wire
Main reinforcement	Multiple plies of high tenacity rayon cord designed for a combination of high strength and resistance to fatigue. Each layer is fully encapsulated in rubber to prevent abrasion with adjacent layers
Embed wire	A high tensile steel wire helix is included to prevent collapse and aid crush resistance. Surrounded by filler rubber to prevent abrasion against the adjacent cord layers
Holding ply	Nylon breaker plies to hold in place the helical steel wire and ensure greater adhesion between cover and body components
Cover	Weathering and abrasion resistant rubber compound
Fittings	Built-in steel nipples with flanges to suit customer requirements
Internal Wire	To aid strength and resist delamination, a wire is semi-embedded into the lining to provide a relatively smooth surface

Technical Design Data

ID		**OD**		**Body Weight**		**End Weight**	**MBR**	**Maximum Working Tensile Load**	
Type 263 & 264		Type 263	Type 264	Type 263	Type 264	All	All	Type 263	Type 264
inch	**mm**	**mm**	**mm**	**kg/m**	**kg/m**	**kg/hose**	**m**	**Tonnes**	**Tonnes**
3	76	116	125	6.0	9.9	35	0.46	3.1	3.8
4	102	144	150	8.7	12.4	48	0.60	3.9	5.9
6	152	201	204	14.6	19.3	59	0.90	11.5	6.1
8	203	261	267	23.6	33.7	72	1.20	14.8	19.7
10	254	312	323	28.5	44.4	109	1.50	17.5	16.6
12	305	358	375	30.1	54.1	112	1.80	15.9	15.1

Hoses manufactured in the United Kingdom
CE branded hoses showing full compliance with European Pressure Equipment Directive PED 97/23/EC

Dunlop Lifeline Type 241
- Long Length Oil Delivery Hose

Application

Lightweight, flexible long length soft wall and discharge hose for dockside and jetty bunkering. Generally manufactured in long lengths that are then cut to the required length before the fittings are attached.

Working/Burst Pressure	**17/51 bar (Dunlop Type 241)**
Operating Temperature	-20°C to +82°C
Electrical Continuity	Electrically continuous or discontinuous as required
Maximum lengths	40m

Construction

Lining	Synthetic rubber compound for petroleum products with an aromatic content up to 60%
Main reinforcement	Multiple plies of high tenacity rayon cord designed for a combination of high strength and resistance to fatigue. Each layer is fully encapsulated in rubber to prevent abrasion with adjacent layers
Cover	Weathering and abrasion resistant rubber compound
Fittings	Swaged-in or Clamp-on fittings with flanges or couplings to suit customer requirements

Technical Design Data

ID		OD	Body Weight	End Weight	MBR
inch	**mm**	**mm**	**kg/m**	**kg/hose**	**m**
2	51	71	2.3	8	0.30
2.5	64	83	2.8	13	0.38
3	76	96	3.3	15	0.46
4	102	121	4.2	23	0.60
5	127	152	6.6	28	0.76
6	152	177	7.8	37	0.90
8	203	228	10.2	58	1.20
10	254	291	19.2	100	1.50

Hoses manufactured in the United Kingdom
CE branded hoses showing full compliance with European Pressure Equipment Directive PED 97/23/EC

Dunlop Lifeline Type 243
- Standard Duty Suction and Discharge Hose

Application

Lightweight, flexible long length suction and discharge hoses offering easy handling. Used at dockside and jetty locations. Generally manufactured in long lengths that are then cut to the required length before the fittings are attached.

Working/Burst Pressure	**17/51 bar (Dunlop Type 243)**
Operating Temperature	-20°C to +82°C
Electrical Continuity	Electrically continuous or discontinuous as required
Maximum lengths	40m

Construction

Lining	Synthetic rubber compound for petroleum products with an aromatic content up to 60%
Main reinforcement	Multiple plies of high tenacity rayon cord designed for a combination of high strength and resistance to fatigue. Each layer is fully encapsulated in rubber to prevent abrasion with adjacent layers
Embed wire	Helical steel wire to resist collapse and cush loads
Holding ply	Textile reinforcement to increase adhesion between hose body and cover
Cover	Weathering and abrasion resistant rubber compound
Fittings	Swaged-in or Clamp-on fittings with flanges or couplings to suit customer requirements

Technical Design Data

ID		OD	Body Weight	End Weight	MBR
inch	**mm**	**mm**	**kg/m**	**kg/hose**	**m**
2	51	78	3.8	8	0.30
2.5	64	88	4.2	13	0.38
3	76	103	5.4	15	0.46
4	102	129	7.3	23	0.60
5	127	155	9.7	28	0.76
6	152	182	12.5	37	0.90
8	203	243	21.6	58	1.20
10	254	294	30	100	1.50

Hoses manufactured in the United Kingdom
CE branded hoses showing full compliance with European Pressure Equipment Directive PED 97/23/EC

Dunlop LPG Type 321
- LPG Dock Suction and Discharge Hose

Fully complying with BS EN 1762: 2003 Type SD

Application

Designed for long life and durability in dockside service transporting LPG at temperatures down to -30°C.

Also available in variant to meet standard BS 4089 Type 3 (-20°C minimum operating temperature).

Working/Burst Pressure	**25/100 bar (Dunlop Type 321)**
Operating Temperature	-30°C to +70°C
Electrical Continuity	Electrically continuous or discontinuous as required
Maximum lengths	15m

Construction

Lining	Synthetic rubber compound for LPG service
Bleeder cords	All Polymer products allow gas to permeate through them. This hose includes bleeder cords so that any trapped gas can safely vent out of the hose.
Main reinforcement	Multiple plies of high tenacity rayon cord designed for a combination of high strength and resistance to fatigue. Each layer is fully encapsulated in rubber to prevent abrasion with adjacent layers
Embed wire	Helical stainless steel wire to resist collapse and crush loads
Holding ply	Textile reinforcement to increase adhesion between hose body and cover
Cover	Weathering and abrasion resistant rubber compound
Fittings	Built-in low temperature steel nipples with flanges to suit customer requirements

Technical Design Data

ID		OD	Body Weight	End Weight	MBR	Maximum Working Tensile Load
inch	mm	mm	kg/m	kg/hose	m	Tonnes
2	51	88	5.8	11	0.30	1.8
3	76	117	9.1	18	0.46	3.2
4	102	146	13.6	29	0.60	5.3
6	152	208	26.2	46	0.90	9..9
8	203	263	36.2	67	1.20	18.1
10	254	320	50.8	96	1.50	25.4
12	305	376	67.5	122	1.80	27.3

Hoses manufactured in the United Kingdom
CE branded hoses showing full compliance with European Pressure Equipment Directive PED 97/23/EC

Dunlop LPG Type 321M
- LPG Submarine Suction and Discharge Hose

Fully complying with BS 4089: 1989 Type 3

Application

Designed for long life and durability in marine service transporting LPG at temperatures down to -20°C. The cover material has high abrasion resistance and is designed for prolonged seawater submergence.

Also available in variant to meet standard EN 1762: 2003 Type SD (-30°C minimum operating temperature). Rough Bore design Type 324 also available.

Working/Burst Pressure	**27.5/137.5 bar (Dunlop Type 321M)**
Operating Temperature	-20°C to +45°C
Electrical Continuity	Electrically continuous or discontinuous as required
Maximum lengths	15m

Construction

Lining	Synthetic rubber compound for LPG service
Bleeder cords	All Polymer products allow gas to permeate through them. This hose includes bleeder cords so that any trapped gas can safely vent out of the hose ends
Main reinforcement	Multiple plies of high tenacity rayon cord designed for a combination of high strength and resistance to fatigue. Each layer is fully encapsulated in rubber to prevent abrasion with adjacent layers. Construction includes specially compounded layers when required to ensure negative buoyancy
Embed wire	One or more helical steel wires to resist collapse and crush loads
Holding ply	Textile reinforcement to increase adhesion between hose body and cover
Cover	Extra thick weathering and abrasion resistant rubber compound for marine service
Fittings	Built-in steel nipples with flanges to suit customer requirements

Technical Design Data

ID		OD	Body Weight	End Weight	MBR	Maximum Working Tensile Load
inch	mm	mm	kg/m	kg/hose	m	Tonnes
2	51	101	8.6	11	0.30	1.6
3	76	131	14.5	18	0.46	3.0
4	102	160	21.6	29	0.60	4.7
6	152	221	39.3	46	0.90	8.6
8	203	290	70.0	67	1.20	16.7
10	254	344	95.9	96	1.50	23.1
12	305	412	137.6	122	1.80	20.2
14	356	471	160.0	136	2.10	45.3

Hoses manufactured in the United Kingdom
CE branded hoses showing full compliance with European Pressure Equipment Directive PED 97/23/EC

Dunlop Type 288M
- Heavy Duty Submarine Suction and Discharge Hose

Fully complying with BS 1435: 1975 Type M15

Application

Designed for submarine applications, for example at CBM terminals, with a robust construction for heavy duty service.

The cover material has a high abrasion resistance and is designed for prolonged seawater submergence.

Working/Burst Pressure	**15/75 bar (Dunlop Type 288M)**
Operating Temperature	-20°C to +82°C
Electrical Continuity	Electrically continuous or discontinuous as required
Maximum lengths	15m

Construction

Lining	Synthetic rubber compound for petroleum products with an aromatic content up to 60%
Main reinforcement	Multiple plies of high tenacity rayon cord designed for a combination of high strength and resistance to fatigue. Each layer is fully encapsulated in rubber to prevent abrasion with adjacent layers
Embed wire	Two helical steel wires to resist collapse and crush loads
Holding ply	Textile reinforcement to increase adhesion between hose body and cover
Cover	Weathering and abrasion resistant rubber compound
Fittings	Built-in steel nipples with flanges to suit customer requirements

Technical Design Data

ID		OD	Body Weight	End Weight	MBR	Maximum Working Tensile Load
inch	mm	mm	kg/m	kg/hose	m	Tonnes
2	51	92	6.5	11	0.30	1.7
2.5	64	106	7.8	14	0.38	1.5
3	76	118	9.1	18	0.46	1.8
4	102	144	11.8	29	0.60	2.0
5	127	177	17.2	38	0.76	3.1
6	152	206	22.5	46	0.90	5.0
8	203	257	29.7	67	1.20	5.8
10	254	313	40.6	96	1.50	8.0
12	305	365	52.7	122	1.80	7.8

Hoses manufactured in the United Kingdom
CE branded hoses showing full compliance with European Pressure Equipment Directive PED 97/23/EC

Dunlop Type 341X
- XLPE Chemical Suction & Discharge Hose

Application

Lightweight, flexible chemical suction and discharge hose with extremely high chemical resistance. The use of cross-linked polyethylene (XLPE) for the lining allows the hose to handle some 90% of all industrial chemicals.

Working/Burst Pressure	**14/56 bar (Dunlop Type 341X)**
Operating Temperature	-20°C to +60°C
Electrical Continuity	Electrically continuous or discontinuous as required
Maximum lengths	40m (up to 8" internal diameter) 12m (above 8" internal diameter)

Construction

Lining	Main XLPE lining
Main reinforcement	Multiple plies of high tenacity rayon cord designed for a combination of high strength and resistance to fatigue. Each layer is fully encapsulated in rubber to prevent abrasion with adjacent layers
Embed wire	Helical steel wire to resist collapse and cush loads
Holding ply	Textile reinforcement to increase adhesion between hose body and cover
Cover	Weathering and abrasion resistant rubber compound
Fittings	Swaged-on stems and ferrules with flanges to suit customer requirements

Technical Design Data

ID		OD	Body Weight	End Weight	MBR	Maximum Working Tensile Load
inch	mm	mm	kg/m	kg/hose	m	Tonnes
2	51	83	4.6	8	0.40	1.1
2.5	64	96	5.4	13	0.50	1.0
3	76	109	6.4	15	0.60	1.1
4	102	134	8.4	23	0.80	1.2
5	127	162	11.7	28	1.00	3.0
6	152	188	14.4	37	1.20	3.3
8	203	244	22.4	58	1.60	6.3
10	254	296	29.9	100	2.00	7..5
12	305	355	41.9	155	2.40	9.8

Hoses manufactured in the United Kingdom
CE branded hoses showing full compliance with European Pressure Equipment Directive PED 97/23/EC

Dunlop Type 383B/383V
- PetroChemical Dock Hose

Generally complying with BS EN 1765: 2004 - Type S15

Application

Lightweight, flexible hoses offering easy handling for transfering industrial chemicals. Generally used at dockside and jetty locations.

The lining options allow for transfer of different industrial chemicals.

Working/Burst Pressure (S15)	**15/60 bar (Dunlop Type 383B/383V)**
Operating Temperature	-20°C to +70°C (383B) -20°C to +100°C (383V)
Electrical Continuity	Electrically continuous or discontinuous as required
Maximum lengths	15m

Construction

Lining	**(383B)** Synthetic rubber compound (Chlorobutyl) suitable for industrial chemical applications. **(383V)** Viton rubber compound for petroleum products with an aromatic content up to 100% and many industrial chemicals
Main reinforcement	Multiple plies of high tenacity rayon cord designed for a combination of high strength and resistance to fatigue. Each layer is fully encapsulated in rubber to prevent abrasion with adjacent layers
Embed wire	Helical steel wire to resist collapse and crush loads
Holding ply	Textile reinforcement to increase adhesion between hose body and cover
Cover	Weathering and abrasion resistant rubber compound
Fittings	Built-in steel nipples with flanges to suit customer requirements

Technical Design Data

ID		OD		Body Weight		End Weight	MBR	Maximum Working Tensile Load	
Type 383B & 383V		Type 383B	Type 383V	Type 383B	Type 383V	All	All	Type 383B	Type 383V
inch	**mm**	**mm**	**mm**	**kg/m**	**kg/m**	**kg/hose**	**m**	**Tonnes**	**Tonnes**
2	51	76	85	3.8	5.4	11	0.30	1.3	1.1
2.5	64	89	97	4.6	6.4	14	0.38	1.2	1.0
3	76	102	111	5.7	7.8	18	0.46	1.7	1.6
4	102	127	136	7.4	10.0	29	0.60	1.4	1.4
5	127	155	163	10.3	13.0	38	0.76	2.7	2.4
6	152	187	195	15.7	18.8	46	0.90	3.5	3.4
8	203	243	252	24.8	28.2	67	1.20	8.2	6.7
10	254	294	303	31.1	36.6	96	1.50	7.6	7.4
12	305	350	360	40.9	47.0	122	1.80	6.4	6.3

Hoses manufactured in the United Kingdom
CE branded hoses showing full compliance with European Pressure Equipment Directive PED 97/23/EC

Dunlop Type 352V
- High Pressure Suction and Discharge Hose

Exceeding BS EN 1765: 2004 - Type S15

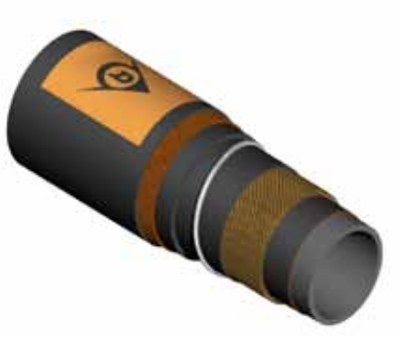
Application

Recommended for service on docks, jetties and tankers where the working conditions call for strength and robustness combined with flexibility. The Viton rubber compound offers resistance to 100% aromatics and many industrial chemicals. Generally used on hose handling rigs, rather than being manually handled.

*Hose equivalent also available with butyl lining - Type 352B.

Working/Burst Pressure	**21/84 bar (Dunlop Type 352V)**
Operating Temperature	* -20°C to +150°C
Electrical Continuity	Electrically continuous or discontinuous as required
Maximum lengths	12m

* High temperature limit for non-continuous service only



Construction

Lining	Synthetic Viton rubber compound for petroleum products with an aromatic content up to 100%
Main reinforcement	Multiple plies of wire cord designed for a combination of high strength and resistance to fatigue. Each layer is fully encapsulated in rubber to prevent abrasion with adjacent layers
Embed wire	Helical steel wire to resist collapse and crush loads
Holding ply	Textile reinforcement to increase adhesion between hose body and cover
Cover	Weathering and abrasion resistant rubber compound
Fittings	Built-in steel nipples with flanges or couplings to suit customer requirements

Technical Design Data

ID		OD	Body Weight	End Weight	MBR	Maximum Working Tensile Load
inch	**mm**	**mm**	**kg/m**	**kg/hose**	**m**	**Tonnes**
3	51	119	12.1	18	0.46	1.4
4	102	145	15.3	29	0.60	1.9
6	152	199	23.9	46	0.90	3.8
8	203	252	33.3	67	1.20	3.8
10	254	313	51.8	96	1.50	4.7
12	304	364	65.9	122	1.80	5.3

Hoses manufactured in the United Kingdom
CE branded hoses showing full compliance with European Pressure Equipment Directive PED 97/23/EC

Dunlop Type 388V
- High Pressure Suction and Discharge Hose

Generally complying with BS EN 1765: 2004 - Type S15

Application

Generally used for medium to heavy duty service on docks, jetties and tankers where the working conditions call for strength and robustness combined with flexibility. The Viton rubber compound offers resistance to 100% aromatics and many industrial chemicals. Generally used on hose handling rigs, rather than being manually handled.

*Hose equivalent also available with butyl lining - Type 388B.

Working/Burst Pressure	**15/60 bar (Dunlop Type 388V)**
Operating Temperature	* -20°C to +150°C
Electrical Continuity	Electrically continuous or discontinuous as required
Maximum lengths	12m

* High temperature limit for non-continuous service only

Construction

Lining	Synthetic Viton rubber compound for petroleum products with an aromatic content up to 100%
Main reinforcement	Multiple plies of high tenacity rayon cord designed for a combination of high strength and resistance to fatigue. Each layer is fully encapsulated in rubber to prevent abrasion with adjacent layers
Embed wire	Helical steel wires to resist collapse and crush loads
Holding ply	Textile reinforcement to increase adhesion between hose body and cover
Cover	Weathering and abrasion resistant rubber compound
Fittings	Built-in steel nipples with flanges or couplings to suit customer requirements

Technical Design Data

ID		OD	Body Weight	End Weight	MBR	Maximum Working Tensile Load
inch	mm	mm	kg/m	kg/hose	m	Tonnes
2	51	93	7.0	11	0.30	1.6
2.5	64	106	8.3	14	0.38	1.5
3	76	119	9.8	18	0.46	1.7
4	102	144	12.9	29	0.60	1.9
5	127	172	16.5	38	0.76	3.0
6	152	206	24.7	46	0.90	4.9
8	203	260	32.1	67	1.20	5.8
10	254	312	44.0	96	1.50	7.9
12	304	371	59.3	122	1.80	7.7

Hoses manufactured in the United Kingdom
CE branded hoses showing full compliance with European Pressure Equipment Directive PED 97/23/EC

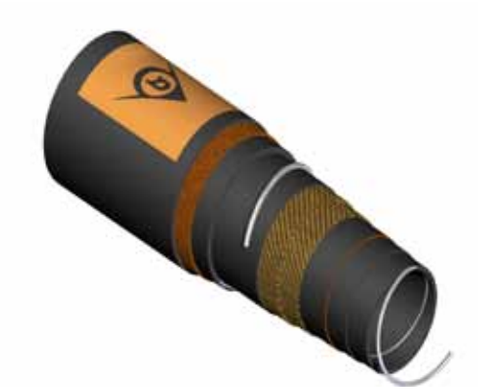
Dunlop Type 332
- Bitumen, Hot Tar and Asphalt Hose (+175°C)

Fully complying with BS EN 13482: 2001 Type 2 RB

Application

Rough bore bitumen hoses are generally used for heavy duty service at dockside and jetty locations where the working conditions demand a robust construction to accommodate rougher handling, high working pressures and flow rates.

Working/Burst Pressure	**15/90 bar (Dunlop Type 332)**
Operating Temperature	+175°C
Electrical Continuity	Hoses can only be supplied electrically continuous
Maximum lengths	15m



Construction

Lining	A synthetic rubber compound, reinforced with a rayon fabric that supports the lining, and including additional heat resistant ceramic fabric layers
Main reinforcement	Multiple plies of wire cord (4"-10") / rayon cord (3") designed for a combination of high strength and resistance to fatigue and temperature. Each layer is fully encapsulated in rubber to prevent abrasion with adjacent layers
Embed wire	A high tensile steel wire helix is included to prevent collapse and aid crush resistance. Surrounded by filler rubber to prevent abrasion against the adjacent cord layers
Holding ply	Multiple plies of high tenacity rayon cord designed for a combination of high strength and resistance to fatigue, to hold the helical steel wire in place and ensure greater adhesion between cover and body components
Internal wire	To aid strength and resist delamination, a galvanised steel wire is semi-embedded into the lining to provide a relatively smooth surface
Cover	Weathering and abrasion resistant rubber compound
Fittings	Built-in mild steel nipples with flanges to suit customer requirements

Technical Design Data

ID		OD	Body Weight	End Weight	MBR	Maximum Working Tensile Load
inch	mm	mm	kg/m	kg/hose	m	Tonnes
4	102	159	24.4	25	0.60	7
6	152	211	36.2	46	0.90	14
8	203	264	50.1	67	1.20	17
10*	254	319	71.5	95	1.50	24

*Bore size of 10" supplied generally complying with BS EN 13482.

Hoses manufactured in the United Kingdom
CE branded hoses showing full compliance with European Pressure Equipment Directive PED 97/23/EC

Quality

Dunlop Oil & Marine's commitment to quality is based on continuously improving products that we consider to be market leading in our field and which exceed the requirements of the marine hose industry.

Part of the ContiTech division of Continental AG, we recognise that our customers require high value for money, quality and reliability - particularly important in the environmentally conscious industry we operate in. Our 60 years of industry expertise, combined with our commitment to quality, has allowed us to be the first in our industry to achieve APIQ1 status in addition to our ISO accreditations. In meeting APIQ1 we are demonstrating to our customers that our quality systems are aligned and meet the specific and more stringent requirements of the oil industry.

Additionally we are proud to confirm that since 2004 all of our hoses manufactured in our United Kingdom plant have been branded with the CE mark, demonstrating our full compliance to the European Pressure Equipment Directive PED 97/23/EC.

We have developed a culture that is committed to providing a high quality product and service to our customers. Our customer focus is demonstrated by our Continuous Excellence Initiative (CEI) project, which year after year sets new challenges for our organisation and is aimed at improving our services, quality and reliability of our products and of course creating an environment in which our employees are proud to work in.

ContiTech

Industrial Fluid Systems

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United Kingdom
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Email: dunlop.sales@fluid.contitech.co.uk

www.dunlop-oil-marine.co.uk

The ContiTech division of the Continental Corporation is a development partner and original equipment supplier to numerous industries for high-quality functional parts, components and systems. With its know how in rubber and plastics technology, ContiTech contributes significantly to industrial progress and mobility that is safe, comfortable and eco-friendly.

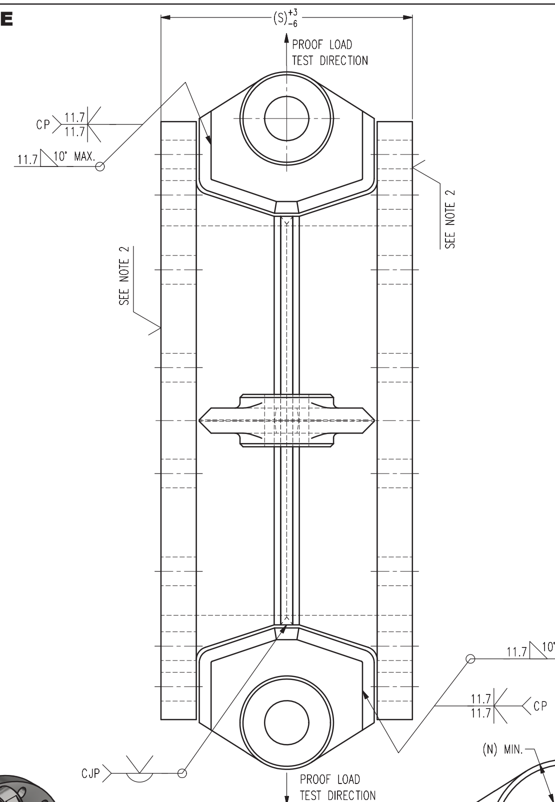
Learn more about the contents of this brochure.

DO NOT SCALE

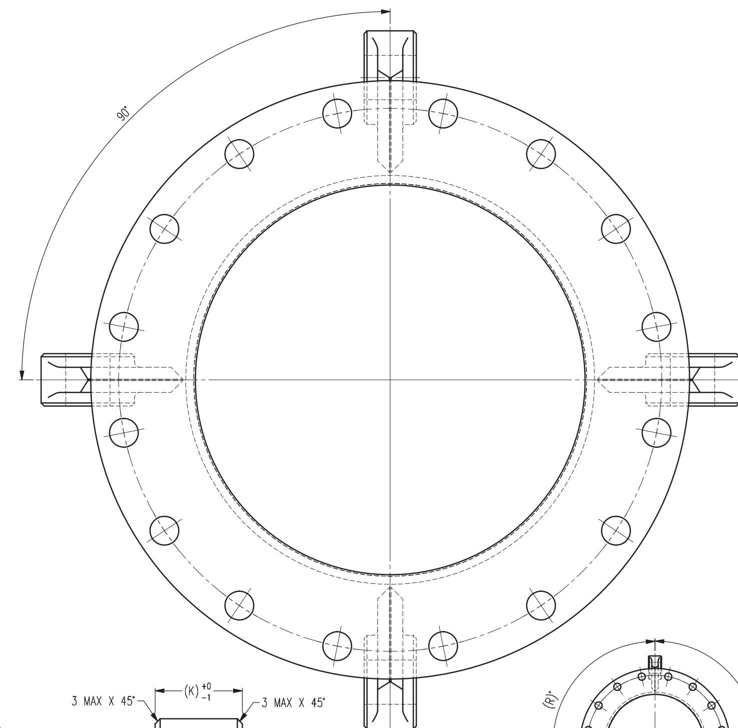
IF IN DOUBT ASK

NOTES

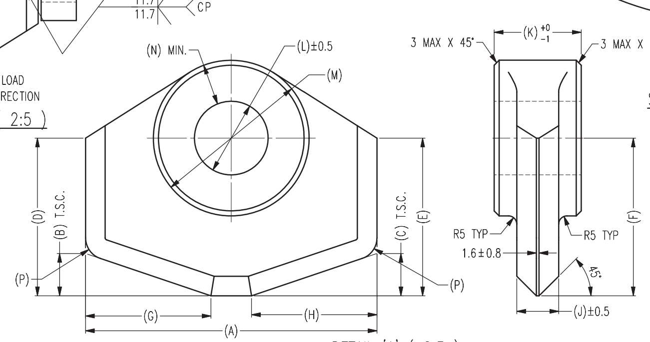
1. FLANGES, DIMENSIONS AND TOLERANCES AND MARKINGS TO BE IN ACCORDANCE WITH ASME B16.5. FLANGES TO BE SCHED. STD. FLANGE MATERIAL TO BE ASTM A105N WITH A MAXIMUM CARBON CONTENT OF 0.25%.
2. FLANGE FACES TO HAVE A SERRATED SPIRAL OR SERRATED CONCENTRIC FINISH AS SPECIFIED IN BS EN 1759-1.
3. FLANGES TO BE JOINED BACK TO BACK IN A PARALLEL AND CONCENTRIC MANNER WITH BOLT HOLES IN-LINE OR IN THE CASE OF A TRANSITION SPOOL PIECE, EQUI-SPACED OVER CENTRE LINE. WELDING PROCEDURES AND QUALIFICATIONS TO BE IN ACCORDANCE WITH ASME IX.
4. CIRCUMFERENTIAL BUTT WELD TO BE 100% RADIOGRAPHED AFTER ANY MACHINING. QUALITY AND DEFINITION OF RADIOGRAPHS TO BE IN ACCORDANCE WITH BS EN 1435 CLASS A. RADIOGRAPHS WILL SHOW A DENSITY OF 2 TO 3 AND A SENSITIVITY IN ACCORDANCE WITH BS EN 1435 TABLE B1 USING A WIRE IMAGE QUALITY INDICATOR TO EN 462-1. WELD ACCEPTANCE CRITERIA TO API 1104.
5. LUG MATERIAL TO BE BS EN 10025 S355JR WITH A MINIMUM UTS OF 500 N/mm^2 AND A MAXIMUM CARBON CONTENT OF 0.23%. LUGS TO BE MANUFACTURED FROM A SINGLE PIECE OF PLATE OF APPROPRIATE THICKNESS TO ELIMINATE ANY CORROSION TRAP. WELD ON BOSSES ARE NOT PERMITTED.
6. THE DEFAULT LUG CONFIGURATION IS FOUR LUGS AS SHOWN. ANY VARIATION IN LIFTING LUG CONFIGURATION TO BE STATED ON THE PURCHASE ORDER AS QANTITY AND ANGLE OF SEPARATION. TYPICAL VARIATIONS AS FOLLOWS:
 - 1 No. LUG
 - 2 No. LUGS 180° SEPARATION
 - 2 No. LUGS 90° SEPARATION
 - 3 No. LUGS SEPARATED AS SHOWN IN DETAIL 'B' AND SPECIFIED IN THE TABLE (NON TRANSITION SPOOLS ONLY)
7. LIFTING LUGS TO BE PROFILED TO SUIT WN FLANGE HUB TAPERS AND POSITIONED AS SHOWN TO BISECT ADJACENT BOLT HOLES.
8. LUG TO BE ATTACHED TO FLANGES BY FULL PENETRATION COMPLETE SEAL WELDING. WELDING PROCEDURES AND QUALIFICATIONS TO BE IN ACCORDANCE WITH ASME IX. WELD COMPLETELY OVER BUTT WELD.
9. FOLLOWING WELDING OF LUGS TO FITTING, EACH LUG TO BE SUBJECTED TO THE APPROPRIATE LOAD IN A RADIAL DIRECTION PARALLEL TO THE FLANGE FACE (DIRECTION SHOWN) FOR A PERIOD OF TWO MINUTES WITHOUT FAILURE OR PERMANENT DEFORMATION OF THE LUG OR FLANGES.
10. AFTER PROOF TESTING EACH LUG TO BE STAMPED WITH THE APPROPRIATE S.W.L. E.G. '20T S.W.L.'
11. AFTER PROOF TESTING, LUG WELDS TO BE 100% WET MAGNETIC PARTICLE INSPECTED IN ACCORDANCE WITH ASME V ARTICLE 7 WITH ACCEPTANCE TO ASME VIII APPENDIX 6.
12. FINISHED METALWORK TO BE HYDROSTATICALLY TESTED FOR 10 MINUTES TO:
 - 28.5 BAR (CLASS 150 & CLASS 150-300 TRANSITION)
 - 31.5 BAR (CLASS 300)
 ALTERNATIVE TEST PRESSURES MAY BE SPECIFIED BY PURCHASE ORDER
13. FINISHED METALWORK TO BE HOT DIP GALVANISED TO BS EN ISO 1461 WITH A MINIMUM AVERAGE COATING WEIGHT OF 610 g/m^2 (THIS EQUATES TO A THICKNESS OF 85 MICRONS). ANY VARIATION IN COATING TO BE SPECIFIED ON THE PURCHASE ORDER. ALL COATING TO REMAIN IN BORE UNLESS SPECIFIED OTHERWISE ON THE PURCHASE ORDER.
14. FLANGE RIM TO BE STAMPED WITH THE FOLLOWING:
 - MANUFACTURERS UNIQUE SERIAL/CERTIFICATE No.
 - FLANGE CAST/HEAT No.
15. FINISHED ITEM TO BE SUPPLIED WITH A CERTIFICATE OF CONFORMITY CONTAINING THE FOLLOWING:
 - UNIQUE SERIAL/CERTIFICATE No.
 - DOM PURCHASE ORDER No.
 - DOM SALES ORDER No.
 - ALL APPLICABLE DRAWING No/ISSUE
 - DESCRIPTION OF MATERIALS USED AND APPLICABLE CAST No's
 - WELD PROCEDURE(S) AND WELDER IDENTITIES.
 - BUTT WELD RADIOGRAPHIC STATEMENT.
 - LUG WELD MPI REPORT/STATEMENT
 - LUG MPI OPERATOR IDENTITY AND QUALIFICATION LEVEL.
 - LUG PROOF LOAD TEST REPORT/STATEMENT
16. FINISHED ITEM TO BE SUPPLIED WITH FOLLOWING DOCUMENTATION:.
 - ALL RADIOGRAPHS REFERENCING SERIAL/CERTIFICATE No.
 - ALL MATERIAL CERTIFICATION TO BS EN 10204 3.1
17. GENERAL TOLERANCE +2.5mm -0mm UNLESS STATED OTHERWISE
18. ALL BURRS AND SHARP EDGES TO BE REMOVED.
19. ADDITIONAL DOCUMENTATION OR NDT MAY BE SPECIFIED BY ORDER.



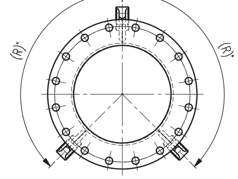
FRONT ELEVATION (2:5)



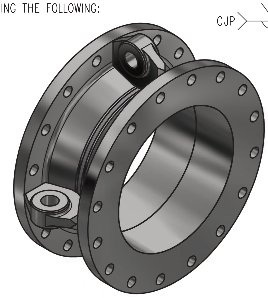
SIDE ELEVATION (2:5)



DETAIL 'A' (2:3)
LIFTING LUG



DETAIL 'B' (1 : 10)
3 LUG ANGULAR SEPARATION


3D ISOMETRIC VIEW (1 : 6)

N.B.	CLASS FLG 1	CLASS FLG 2	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(J)	(K)	(L)	(M)	(N)	(P)	(R)	SWL (kN)	PROOF LOAD (kN)	MBL (kN)	(S)
4	150	150	99	11	11	58	58	58	43	43	25	25	24	52	14	13	135	40	100	200	150
4	150	300	101	11	16	58	71	71	43	43	25	25	24	52	14	13	N/A	40	100	200	159
4	300	300	102	16	16	71	71	71	43	43	25	25	24	52	14	13	135	40	100	200	168
6	150	150	120	12	12	56	56	56	53	53	25	25	24	52	14	13	135	40	100	200	174
6	150	300	119	12	19	56	76	76	53	52	25	25	24	52	14	13	N/A	40	100	200	184
6	300	300	118	19	19	76	76	76	52	52	25	25	24	52	14	13	120	40	100	200	194
8	150	150	140	13	13	63	63	63	62	62	25	25	27	60	16.5	13	135	50	125	250	200
8	150	300	137	13	20	63	81	81	62	60	25	25	27	60	16.5	13	N/A	50	125	250	210
8	300	300	135	20	20	81	81	81	60	60	25	25	27	60	16.5	13	120	50	125	250	220
10	150	150	137	16	16	66	66	66	60	60	25	37	30	64	17	13	120	70	175	350	200
10	150	300	135	16	24	66	86	86	60	58	25	37	30	64	17	13	N/A	70	175	350	216
10	300	300	134	24	24	86	86	86	58	58	25	37	30	64	17	13	135	70	175	350	232
12	150	150	160	21	21	81	81	81	68	68	25	44	37	75	19	13	120	100	250	500	226
12	150	300	157	21	26	81	98	98	68	68	25	44	37	75	19	13	N/A	100	250	500	242
12	300	300	153	26	26	98	98	98	68	68	25	44	37	75	19	13	135	100	250	500	258
16	150	150	174	25	25	94	94	94	75	75	25	52	44	93	24.5	13	135	150	375	750	250
16	150	300	172	25	38	94	119	119	75	76	25	52	44	93	24.5	13	N/A	150	375	750	269
16	300	300	171	38	38	119	119	119	76	76	25	52	44	93	24.5	13	126	150	375	750	288
20	150	150	197	26	26	96	96	96	89	89	25	64	52	105	26.5	13	126	200	500	1000	286
20	150	300	192	26	40	96	131	131	89	86	25	64	52	105	26.5	13	N/A	200	500	1000	303
20	300	300	187	40	40	131	131	131	86	86	25	64	52	105	26.5	13	120	200	500	1000	320

REV	DESCRIPTION	DATE	ORIGINATOR	CHECKED	TECH AUTH.
A	AMENDED: TO INCLUDE 4" N.B.	12/11/15	A. THAIN	C.R. JAMES	P.A. LAWRENCE
ORIG	ORIGINAL ISSUE	25/09/12	A. THAIN	C.R. JAMES	P. STATON

Continental CONTITECH

DUNLOP OIL & MARINE

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Tel: +44 (0)1472 359281
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Cert No: 4000491

DRAWING TITLE:

4" - 20" N.B. LIFTING SPOOL PIECE TO GMPHOM 2009

SCALE: 2:5, 2:3, 1:10, 1:6

DIM'S: mm

PROJ:

DRAWING No. **OP5418**

REV: **A**

CAD FILE: A1: OP5418A.idw

Continental CONTITECH

DUNLOP OIL & MARINE

ANCILLARY DATA SHEET

LIGHT WEIGHT BLIND FLANGE

Light weight blind flanges are typically used to seal the bore of the camlock coupling immediately after disconnection from the manifold. It is to protect the 'O' ring seals and prevent marine growth or corrosion within the bore of the coupling, and to prevent seepage of product should the butterfly valve be passing.

They are not designed for pressure testing or lifting and are marked accordingly.

Type 'A' is shown and has a periphery machined to suit a camlock type coupling. Gaskets are not required when used on these couplings; however four bolts are commonly used for security.

Type 'B' is a plain disc with drillings for direct connection to a spool piece but cannot be used on a camlock coupling. On connection to a spool piece on the end of a rail hose, a gasket and full bolting will be required

(Heavy test blinds can be supplied for hydrostatic testing purposes if required)

Both styles of blinds can be supplied to fit all bore sizes and flange classes, up to 24"nb.

Manufactured from BS EN 10025 S275JR alloy steel and supplied with HDG as standard.

PICK-UP AND SNUBBING CHAINS

Alloy Steel

Alloy steel chain is used on the pick-up assembly of the Barbell rail hose. This type of chain offers significant weight savings over conventional stud link chain, being of a much higher strength. This enables the use of smaller size chains for a given safe working load.

Two lengths of chain are used, one as a snubbing chain and the other as a pick-up chain.

SNUBBING CHAIN

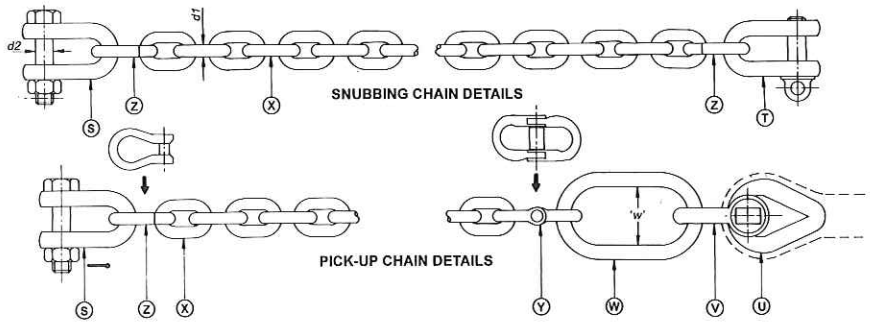
This is attached at each end of the hose via an alloy 'D' shackle to the integral lugs on the rail hose flange when not in use. Its function is to support the weight of the hoses out of water when the rail hose is attached to the tanker manifold.It is usually 5ft. (1.5m) longer than the Rail hose length. It is important that the weight of the hoses out of water is not transmitted to the tanker manifold and the snubbing chain performs this function. It is fitted with Two alloy 'D' shackles, one with a type 'A' pin on the tanker end and the other with a type'E' pin on the outboard end.

Type 'A' pin has a threaded eye-bolt and facilitates easier connection/disconnection. Type 'E' pin has a hexagonal stud bolt and nut with a split pin for a more permanent connection.

PICK-UP CHAIN

This is a short length of chain attached to the top integral lifting lug via an alloy 'D' shackle with a hexagon stud pin and nut with split pin. The free end of the chain has a large master link connected to it. The pick-up buoy or marker buoy rope eye is connected to this master link via a large bow shackle.

The ship's lifting gear is hooked into the master link and the hose lifted to the manifold via the pick-up chain.



KEY			
S	Alloy 'D' shackle to US Federal spec. RRC 271 bolt type.	W	Grade 80 - Alloy steel master link
T	Alloy 'D' shackle to US Federal spec. RRC 271 screw pin type.	X	Grade 80 - Alloy steel short link chain
U	Hard eye rope thimble from marker buoy line (Separate supply)	Y	Grade 80 - Alloy steel component connector
V	High tensile large bow shackle to BS 3032 type A pin (9.5 T. s.w.l.)	Z	Grade 80 - Alloy steel coupling link

Hose Bore Size in	Hose Bore Size mm	Snubbing Chain Total Assembly Weight in Air for 10.7m Chain length (kg)	Pick-up Chain Total Assembly Weight in Air for 2m Chain length (kg)	Proof load 2 x S.W.L. (5 : 1) (tonne)
6	150	46	24	8.6
8/10	200/250	67	31	12.8
12	300	106	41	20.0
16	400	133	53	24.8
20	500	187	72	32.0

Hose Bore Size in	Hose Bore Size mm	Chain (X)				Shackles (S & T)			Master Link (W)		
		Dia.(mm) d1	S.W.L.(Tonne) 4 : 1	S.W.L.(Tonne) 5 : 1	Weight (kg/m)	Pin Dia. (mm) d2	S.W.L.(Tonne) 6 : 1	S.W.L.(Tonne) 5 : 1	Dims. (mm) l x w x d3	S.W.L.(Tonne) 4 :1	S.W.L.(Tonne) 5 : 1
6	150	13	5.4	4.3	3.8	25	6.5	7.8	210x110x22	7.2	5.8
8/10	200/250	16	8.0	6.4	5.7	25	6.5	7.8	210x110x28	14.3	11.4
12	300	20	12.5	10.0	9.0	29	8.5	10.2	210x110x28	14.3	11.4
16	400	22	15.5	12.4	10.9	35	12.0	14.4	270x140x32	17.1	13.7
20	500	26	20.0	16.0	15.2	38	13.5	16.2	270x140x38	28.1	22.5

This information and all dimensions, weights etc., are nominally correct at the time of publication, but Dunlop Ltd., Oil & Marine reserves the right to modify data and design without notice.

June 1994. Dunlop Oil & Marine.(ISO 9001 approved)

Saflote Hose Range.

Double carcass anti-pollution floating hoses.

The Dunlop Oil & Marine double carcass anti-pollution hose design has a primary carcass surrounded by a secondary carcass - a hose within a hose. The primary carcass functions independently from the secondary carcass, therefore in the unlikely event that the primary carcass fails, the secondary carcass will remain intact. Having been unstressed prior to failure, the secondary carcass has all the required strength and containment capabilities to take over until change out or replacement. The benefit of this being that it will contain the oil and prevent oil spillage and associated environmental damage.

In case of primary carcass failure, whether due to a leak or burst, our Saflote secondary carcass will contain this leak, allowing operations to be continued in a safe manner. The secondary carcass will then provide a signal of failure by its expansion. At the hose centre, we have restricted expansion over a distance of 1m, allowing the hose geometry (after expansion) to be entirely different.

Why choose the Saflote hose?

- Unrivalled track record
- Even after long and arduous service, the secondary carcass can still contain a primary carcass burst or leak
- Robust and maintenance free warning system, which provides clear evidence of primary carcass failure
- Proven technology
- The system is not affected by marine growth

Dunlop Oil & Marine Saflote hose range

The design concept of our Saflote hoses is an evolution of the original design invented in the 1970s. Primary and secondary carcasses are manufactured and inspected independently of one another. The linings in both carcasses are the same, providing identical resistance to the product passing through the hose. The reinforcement in the secondary carcass is Nylon, and different from the primary carcass, provides great fatigue resistance.

Of course in full compliance with GMPHOM 2009, all our Saflote hoses are branded 'Double Carcass'.

Below is our standard product range, there are many other hose variations available. Get in touch to find out more.

Type 541: Super Samson end reinforced hose

For connection to surface pipework in single point moorings or other oil transfer installations such as CALM first off buoy position or FPSO offtake connection.

- Min. reserve buoyancy 5% as standard
- Supplied electrically continuous as standard

Type 542: Mainline hose

The 542 mainline hose type forms the principal component of the double carcass hose string.

- Min. reserve buoyancy 20%
- Supplied electrically continuous as standard

Type 543: Taper hose

Usual applications are to connect large bore mainline hose sections to smaller bore tail sections, or to provide a flexible reducing element close to rigid pipe work.

- Min. reserve buoyancy 20%
- Supplied electrically continuous as standard

Type 544: Tail hose

The type 544 hose is specially designed to improve handling at the tanker end of a double carcass hose string.

- Min. reserve buoyancy 20%
- Supplied electrically discontinuous as standard

Type 545X: Barbell rail hose

The over-the-rail connection hose for conventional mid-ship loading though a double carcass hose string. Specially designed to have greater flexibility and lower bend radius.

- Min. reserve buoyancy 20% (inc. allowance for end gear weight)
- Can be supplied electrically discontinuous or continuous, depending on your requirements
- Supplied with integral lifting lugs as standard

CBS -CHAIN SUPPORTING BUOY

FLOATEX CBS-CHAIN SUPPORTING BUOY have been designed to withstand the severe operating conditions associated with offshore operations.To achieve these characteristics the inner buoyancy core is realized applying spiral bending sheets of expanded cross-linked polyethylene.The full closed-cell expanded Polyethylene used, guarantees the unsinkability of the buoy, also in case of accidental serious damages occurred during operations.The outer Polyurethane skin provides the necessary abrasion and ultra-violet rays resistance to the buoy.

Standard outer colour is marine orange, but if requested, buoys can be manufactured in different colours.

Core: Cylindrical body of expanded closed-cell polyethylene foam, density 40-45 Kg/m³.The layers of expanded polyethylene are heat sealed to reach the necessary buoy volume. Expanded polyethylene (EPE) has excellent energy absorption and high strength properties. It is a flexible and lightweight material, environmentaly-friendly, which can be recycled easily, 100% non-toxic. EPE provide outstanding energy absorption characteristics, weight to strength ratio, high thermal resistance and resistant to water, oils and most chemicals. The material can withstand multiple impacts without significant damage.

Skin: Outer cover with 8 mm thickness of elastomer polyurethane foam ORANGE colour.The elastomer polyurethane is the result of a chemical reaction between isocyanate and polyol, 100% made and tested before production by our R&D laboratory.The elastomer polyurethane ensures excellent protection against abrasion, impacts and ultra-violet rays.Moreover ensures an excellent adhesion with the PE and steel.

Steel part: The buoy is complete with a passing through steel tie rod, one steel plate and stiffeners at both ends, one marine swivel at both ends **SWL 17 Ton** for the connection with the chain.The swivels are locked with the tie-rod through a couple of nuts at both ends.The metal parts are sandblasted, galvanized and painted with marine grade polyurethane paint.

FLOATEX s.r.l.
Via Cave,12- 25050-Provaglio d'Iseo (Bs) Italy
Tel +39 030 9823255 - -Fax +39 030 9823599
e-mail: info@floatex.com

ED. 2016

CYLINDRICAL SUPPORTING BUOYS						
TYPE	Nett. buoyancy (Kg)	Weight (Kg)	Diam. (mm)	Length (mm)	L.O.A. (mm)	S.W.L. ⊥ (ton)
CBS-1.5	150	86	650	750	1290	17
CBS-2	200	92	700	800	1340	17
CBS-2.5	250	96	740	850	1390	17
CBS-3	300	102	780	900	1440	17
CBS-4	400	122	900	920	1460	17
CBS-5	500	130	920	1000	1540	17
CBS-6	600	150	1000	1000	1540	17
CBS-7	700	185	1000	1200	1750	17
CBS-10	1000	213	1100	1350	1900	17
CBS-12	1200	254	1220	1350	1900	17
CBS-16	1600	280	1300	1470	2020	17
CBS-18	1800	330	1420	1470	2020	17
CBS-20	2000	315	1330	1700	2250	17
CBS-22	2200	360	1420	1700	2250	17
CBS-25	2500	410	1500	1700	2250	17
CBS-27	2700	435	1550	1700	2250	17
CBS-27 LONG	2700	430	1450	2000	2550	17
CBS-30	3000	480	1580	1850	2400	17
CBS-32	3200	490	1610	1850	2400	17
CBS-35	3500	515	1700	1850	2400	17
CBS-36	3600	520	1730	1850	2400	17
CBS-38	3800	530	1760	1850	2400	17
CBS-40	4000	545	1730	2000	2550	17
CBS-45	4500	585	1850	2000	2550	17
CBS-50	5000	655	1950	2000	2550	17

FLOATEX

www.tidelandsignal.com
www.floatex.com

TIDELAND

Marine Breakaway Coupling Service Options

MBC 4

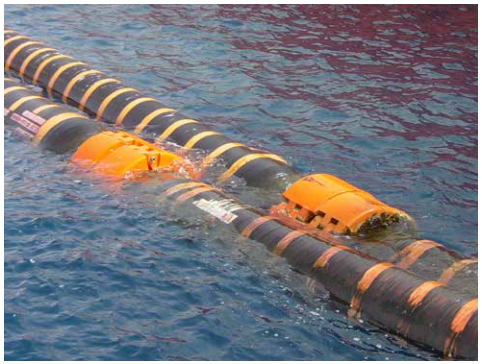
Four flexible options for:
Service • Resetting • Repair

Gall Thomson
proven technology

The most reliable and efficient Marine Breakaway Couplings in the world

4 flexible options to get your MBC back in service

When your Marine Breakaway Coupling activates, requires a service or repair, Gall Thomson MBC4 flexible response options are designed to protect MBC integrity and keep maximum oil uptime for your operations.



With Approved Service Centres and visits by GTAC approved Engineers, Gall Thomson offers regional support that takes into account local operational and logistical circumstances.

Designed to meet the needs of your operations		
Option 1	**In-field Service by your engineer** No frames or complicated equipment required	✔
Option 2	**Gall Thomson Engineer visit** GTAC and Gall Thomson Warranty	✔
Option 3	**Return to Gall Thomson UK Technology Centre** GTAC and Gall Thomson Warranty	✔
Option 4	**Gall Thomson Approved Service Centre** Local support with GTAC and Gall Thomson Warranty	✔

Gall Thomson Approved Certification (GTAC)

GTAC provides the reassurance that the MBC is serviced and certified to the approved standard.

Gall Thomson
GTAC
CERTIFIED

Advantages of GTAC

- GTAC approved engineers conduct and confirm the quality of work.
- Recognised standard of service history is logged.
- GTAC approved material and parts.
- Quality control procedures to ISO 9001 Quality Certification.
- Component replacement procedure for refurbishment project.
- Upgrade to current design where appropriate.
- Application of final stage anti-corrosion protection.
- The same rigorous test procedures as used during manufacture.
- Recommendation report regarding usage and handling.
- Integrity of the MBC is maintained.

Option 1 - In-field service

No need for bulky or complicated equipment

Work can be carried out of by one of your engineers. Spares Kits are available from Gall Thomson along with the Gall Thomson Refurbishment/ Resetting Manual.

Suitable for servicing, resetting and simple repairs.

Advantages: No specialist equipment or awkward frames are required.

Option 2 - Gall Thomson Engineer visit

GTAC approved engineer on site

A certified Engineer from Gall Thomson will visit your site and conduct the resetting and servicing of your MBC.

GTAC Engineers can also inspect MBCs and offer operational advice.

Suitable for servicing, resetting and simple repairs.

Advantages: Gall Thomson Warranty and GTAC.

Option 3 - Return to Gall Thomson UK Technology Centre

Factory facilities and expertise

The Marine Breakaway Coupling is fully inspected by GTAC Approved engineers and pressure tested with new vital components at the Gall Thomson UK Technology Centre.

The advantages of choosing this option is the extensive test facilities available and factory upgrade offered where applicable.

Suitable for servicing, resetting, simple to complex repairs and design upgrade.

Advantages: Gall Thomson Warranty and GTAC.

Gall Thomson engineers undertaking inspection procedures at the UK Technology Centre.

Extensive test facilities at the Gall Thomson UK Technology Centre.

Option 4 - Gall Thomson Approved Service Centres

Local support around the world

Gall Thomson MBC Approved Service Centres are strategically placed around the World to deliver close and efficient support.

These Service Centres offer the facilities and Gall Thomson trained engineers required to complete the required work.

Suitable for servicing, resetting and simple to complex repairs.

Advantages: Gall Thomson Warranty and GTAC.

The local expertise and in-country support offered by these Service Centres minimises downtime and simplifies logistics.

Service Centres

- India
- South America
- Caribbean
- South East Asia
- North America
- Middle East
- Australasia
- Europe

Benefits

- Minimum downtime
- In-country support
- Simplified logistics
- Local expertise
- Integrity of MBC
- Lower shipping costs
- Reduced export/reimport procedures

Preventative maintenance programmes also available

Also see the Gall Thomson MBC refurbishment and repair brochure for further information.

Approved Regional Service Centres strategically located around the world

Approved Regional Service Centres

The Gall Thomson range

Petal Valve Marine Breakaway Couplings
Flip-Flap Valve Marine Breakaway Couplings
Underbuoy Breakaway Couplings
Welin Camlock Couplings
Global support and Aftersales Care

Gall Thomson
proven technology

Gall Thomson Environmental Ltd
Technology Centre, Suffling Road
Great Yarmouth, Norfolk, NR30 3QP
United Kingdom

bsi. ISO 9001 Quality Management
FM 588505

bsi. ISO 14001 Environmental Management
EMS 588506

Queen's Award for Technological Achievement

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GSE1610D

A Signum Technology company

Lankhorst|Ropes
OFFSHORE DIVISION

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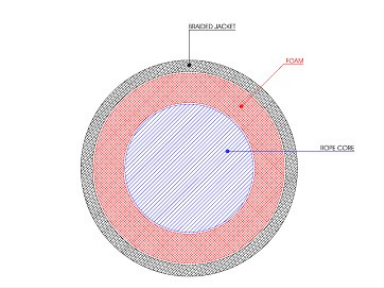
INTEGRAL FLOTATION BUOYANCY SYSTEM

It has been reported by operators using mooring hawsers with conventional lace-on floats, that during the lifetime of the hawser the floats tend to suffer damage and can be ripped away from the rope. This can be costly to the operator having to secure replacement floats and organise maintenance crews to replace damaged / missing floats. Our Integral Flotation Buoyancy System overcomes these issues, and in addition offers many other operational benefits.

Mooring hawsers incorporating our Integral Flotation Buoyancy System are wrapped in closed cell buoyancy foam, ensuring sufficient reserve buoyancy is calculated into the construction to support the hawser in sea-water.



Cross-Sectional Diagram of
Integral Flotation Buoyancy System

This is covered with an over braided jacket. Additionally this can be polyurethane elastomer coated to enhance abrasion characteristics of the assembly yet further.

Benefits of Integral Flotation

- Integral Flotation system does not need to be replaced / maintained during the hawser lifetime, eliminating the need for spare floats and expensive maintenance crews.
- The construction of the Integral Flotation system enhances the abrasion resistance of the hawser to external mechanical damage, ie. Floating hose flanges.
- At CALM buoys where the hawsers maybe left floating the water between offtakes, the Integral Flotation system reduces the amount the rope will flex with the wave action. This reduces internal yarn-on-yarn abrasion damage and can help to increase retirement programmes.
- Ropes left floating the water between offtakes are subject to ‘water wash’ through the rope, which over time will remove the unique marine finishes applied to modern day synthetic fibres to reduce abrasion / fatigue damage internally. The Integral Flotation system with polyurethane elastomer coating restricts water wash.

OIL
Offspring International Ltd
Unit 8, Castle Court, Castlegate Way, Dudley, West Midlands, DY1 4RH. UK
Tel: +44 1384 453880 / Fax: +44 1384 453888
Email: mail@offspringinternational.com / Web: www.offspringinternational.com

World-wide Sales Agents for Deep Water Mooring and Single Point Mooring

FIBRE ROPES

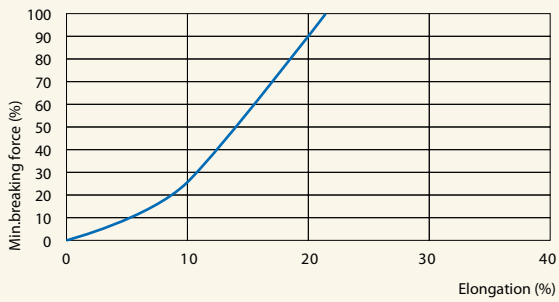
TIPTO-EIGHT®

The well known high-performance mooring rope. Its strength, abrasion resistance and energy absorption ensure a long life-time and economical purchase. The small diameter and low weight make the handling on board easier.
As Tipto-Eight® is floating the risk of getting the rope into the ship and tug propeller is minimal, avoiding costly downtime.

SPECIFIC GRAVITY	• 0,93	CONSTRUCTION	• 8-strand plaited
UV-RESISTANCE	• very good	TCLL VALUE	• 70,7%
ABRASION RESISTANCE	• very good	COLOUR	• yellow
CHEMICAL RESISTANCE	• good	MARKER YARN	• orange
ELONGATION	• see graph	WATERABSORPTION	• 0%
MELTING POINT	• approx. 135°C		

Art.number	Circ. (inches)	Diameter (mm)	Weight (kg/100m)	MBF (kN)
111.693	5	40	75,6	269
111.721	5 1/2	44	92,4	321
111.695	6	48	109	378
111.737	6 1/2	52	128	441
111.697	7	56	149	508
111.698	7 1/2	60	171	578
111.699	8	64	194	651
111.700	8 1/2	68	220	731
111.701	9	72	246	814
111.703	10	80	305	992
111.735	11	88	369	1180
111.705	12	96	438	1400
111.741	13	104	515	1620
111.743	14	112	596	1870
111.691	15	120	686	2130
111.744	16	128	779	2410
111.746	17	136	880	2710
111.739	18	144	987	3030

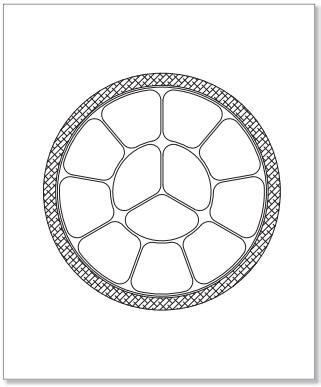
Diameter, weight and MBF (as well as other mechanical and physical properties) are determined according ISO 2307:2005



OFFSHORE DIVISION

HAWSER DATA - GAMA 98® (PARALLEL STRAND) CONSTRUCTION

Rope in which components are laid parallel to each other within an outer braided jacket (also called circular braided). The jacket is non-load bearing.

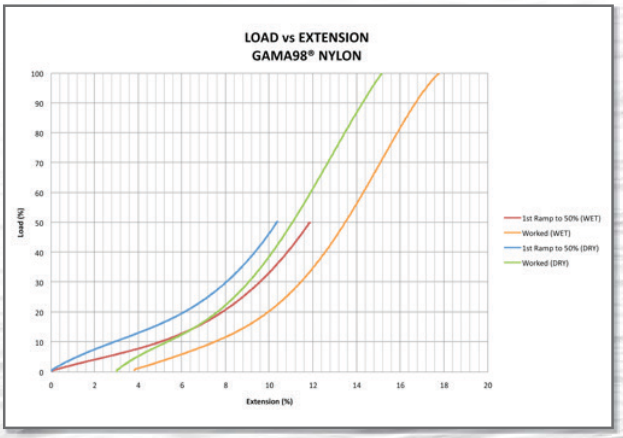


Material: NYLON
Construction: The GAMA 98® ropes are made from high efficiency sub-rope cores laid parallel within an outer braided jacket. Each sub-rope is computer monitored during manufacture to ensure all sub-ropes have equal tension and length. The GAMA 98® has become the industry standard for FPSO/FSO offtake mooring hawser arrangements.

Manufactured, inspected and supplied in accordance with the OCIMF 2000 "Guidelines for the Purchasing & Testing of SPM Hawsers"

GAMA 98® Nylon				
Dia mm	Size Inch	Weight kg/100m	NDBS kN	NDBS Tonne
80	10	400	1802	184
88	11	480	2172	221
96	12	570	2574	262
104	13	670	3010	307
112	14	760	3480	355
120	15	900	3982	406
128	16	1020	4518	461
136	17	1150	5086	518
144	18	1270	5688	580
152	19	1430	6322	644
160	20	1560	6989	712
168	21	1720	7688	784

Other sizes are available on request



These data are for guidance purposes only and are subject to change without prior notice