VMFLEX

AUTOMAÇÃO E MANUTENÇÃO INDUSTRIAL
HIDRÁULICA | PNEUMÁTICA | ELETRÓNICA

MANGUEIRAS INDUSTRIAIS

INDUSTRIAL HOSES
MANGUERAS INDUSTRIALES

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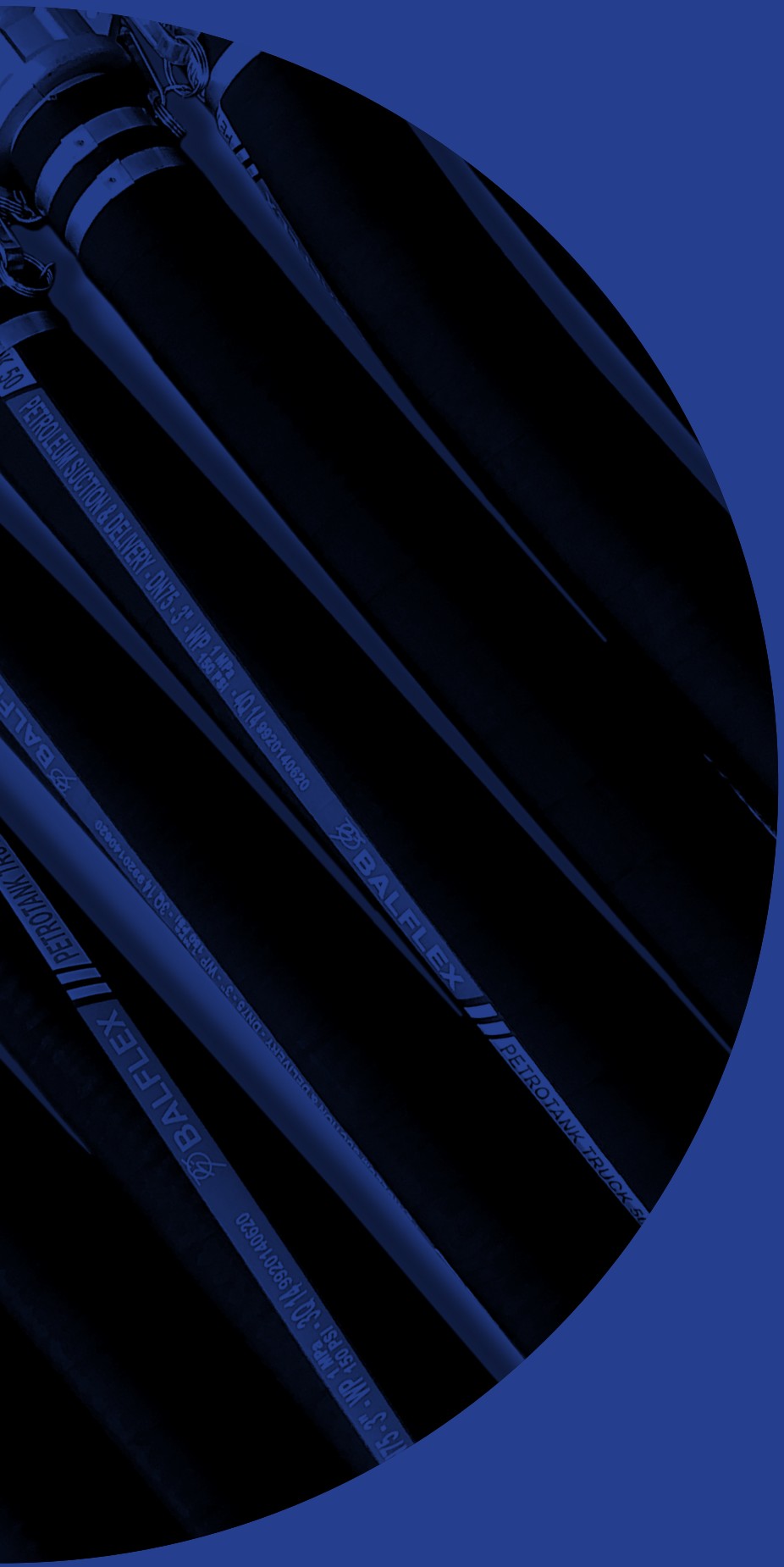
AENOR ER Empresa Certificada ISO 9001

CERTIFIED IQNet MANAGEMENT SYSTEM

PME líder '17



AIRMASTER AIR & WATER

BALDRILL MINE AIR & WATER

BALDRILL MINE AIR & WATER BLACK

PETROTANK 50 S & D

PETRO OILTANK 50

AUTOTANK S & D

OILTANK

ACQUATANK S & D

ACQUA

SANDBLAST

DRY CEMENT DELIVERY

CONCRETE BETON LIGHT

CONCRETE EXTRAFLEX

SUPERSTEAM RED

LPG DELIVERY HOSE

XLPE ACID-SOLVENT & CHEMICAL S & D

UHMWPE ACID-SOLVENT & CHEMICAL S & D

FUEL PUMP

FUEL PUMP STEEL

SINGLE WELDING

SINGLE WELDING BLUE

TWIN WELDING

HYDRAULIC BRAKE SAE J1401

Balflex®

Industrial Hoses

Balflex® Industrial Hoses are produced to Balflex® specifications and according to international standards, covering a wide variety of applications, with best chosen high quality grade polymers, with synthetic fibers or steel wire reinforcements, for a wide range of fluids and temperatures.

Balflex® optimized the production of these hoses and their compatibility with a wide range of connectors, in order to assure the highest performance and the most extensive range of applications.

The Balflex® industrial hose program includes:

- Long lenght textile Industrial Hoses
- Mandrel built Industrial Hoses
- Steel wire Industrial Hoses
- High pressure steel spiral Waterbast Hoses

General Guidelines

Balflex® industrial hoses are designed with different safety factors (the ratio relating minimum burst pressure and recommended working pressure), according to the relevant in the application field. Working pressure and nominal diameter are always branded on the hose, except on hoses with external steel braid. Industrial hoses are designed for a variety of fluids and granulates applications with different temperature ranges. Special rubber compounds and lining materials allow exceeding ambient temperatures.

The following catalogue pages list the compatibility of the hose for different applications, working and minimum burst pressure, diameters, minimum bend radius and working temperature range. For additional data please consult our technical department.

Selection, assembly and installation of industrial hoses should follow Balflex® recommendations and the applicable field standards. Industrial hose assemblies should always be inspected and hydrostatically tested before installation. All systems where new hoses have been installed should be tested against leakage and malfunction in an appropriate area.

Installations that not comply with an adequate geometry of the hose assembly may reduce significantly the life of the hose. Likewise, the use of wrongly dimensioned hoses or application in a system whose working characteristics exceed the hose specifications may shorten drastically the hose life.

The failure of an industrial hose assembly may be dangerous and expose people and property to irreversible damage. Among other occurrences that must be prevented are the high velocity and high temperature projection of conveyed fluid or granulate, the projection of couplings and it's parts, the whipping of unrestrained hose, spillage or combustion of the fluid or granulate and electrical shocks through contact with electrical sources.

AIRMASTER AIR & WATER

Exceeds ISO 2398 / BS 5118 type 2 - 10.1232

Air & Water 2.0MPa / 300PSI (100% rubber hose)

#	inch	mm	mm	MPa	PSI	MPa	PSI	MIN BEND RAD mm
10.1232.04	1/4"	6,0	13,0	**2,0**	300	**6,0**	900	60
10.1232.05	5/16"	8,0	15,0	**2,0**	300	**6,0**	900	80
10.1232.06	3/8"	10,0	16,0	**2,0**	300	**6,0**	900	100
10.1232.08	1/2"	13,0	21,0	**2,0**	300	**6,0**	900	125
10.1232.10	5/8"	16,0	26,0	**2,0**	300	**6,0**	900	160
10.1232.12	3/4"	19,0	29,0	**2,0**	300	**6,0**	900	190
10.1232.16	1"	25,0	36,0	**2,0**	300	**6,0**	900	254

INNER TUBE: :seamless air and water resistant synthetic rubber
REINFORCEMENT: 1 high resistance synthetic fiber braid

OUTER TUBE: black, weather and abrasion resistant synthetic rubber
SAFETY FACTOR: 3: 1

APPLICATION: heavy works on mining, construction, steel plants, quarries and air compressors

TEMPERATURE RANGE: - 40ºC (- 40ºF) + 100ºC (+ 212ºF)

BALFLEX AIRMASTER - 1/4" - 6 X 13 mm - WP 2 MPa / 300 PSI - BS EN ISO 2398

Balflex®

BALDRILL MINE AIR & WATER

According to BS 5118-20 / Rigid rubber heavy mandrel hose for delivery of Air and Water 2.0MPa / 300PSI – 10.1233

Reinforced with several high resistance synthetic fiber braids

#	inch	mm	mm	MPa	PSI	MPa	PSI	MIN BEND RAD mm
10.1233.04	1/4"	6,0	14,0	**2,0**	290	**6,0**	870	60
10.1233.05	5/16"	8,0	17,0	**2,0**	290	**6,0**	870	80
10.1233.06	3/8"	10,0	19,0	**2,0**	290	**6,0**	870	100
10.1233.08	1/2"	13,0	21,0	**2,0**	290	**6,0**	870	125
10.1233.10	5/8"	16,0	26,0	**2,0**	290	**6,0**	870	160
10.1233.12	3/4"	19,0	30,0	**2,0**	290	**6,0**	870	190
10.1233.16	1"	25,0	36,0	**2,0**	290	**6,0**	870	254
10.1233.20	1.1/4"	31,8	44,0	**2,0**	290	**6,0**	870	320
10.1233.24	1.1/2"	38,1	50,0	**2,0**	290	**6,0**	870	380
10.1233.32	2"	50,8	65,0	**2,0**	290	**6,0**	870	510
10.1233.40	2.1/2"	63,5	79,0	**2,0**	290	**6,0**	870	635
10.1233.48	3"	76,2	92,0	**2,0**	290	**6,0**	870	762
10.1233.64	4"	101,6	118,0	**2,0**	290	**6,0**	870	1016
10.1233.96	6"	152,4	170,0	**2,0**	290	**6,0**	870	1524

INNER TUBE: seamless air and water resistant synthetic rubber
REINFORCEMENT: several high resistance synthetic fiber braids

OUTER TUBE: yellow, weather and abrasion resistant synthetic rubber
SAFETY FACTOR: 3: 1

APPLICATION: heavy works on mining, construction, steel plants, perforation and quarries

TEMPERATURE RANGE: - 35ºC (- 31ºF) + 85ºC (+ 185ºF)

BALFLEX / BALDRILL MINE AIR & WATER - DN6 - 1/4" - BS EN ISO 2398 - WP 2 MPa 300 PSI - Flame Resistant - MSHA IC-252/00

BALDRILL MINE AIR & WATER BLACK

According to BS 5118-20 / Rigid rubber heavy mandrel hose for delivery of Air and Water 2.0MPa / 300PSI – 10.1233.B

Reinforced with several high resistance synthetic fiber braids

#	inch	mm	mm	MPa	PSI	MPa	PSI	MIN BEND RAD mm
10.1233.04B	1/4"	6,0	14,0	**2,0**	290	**6,0**	870	60
10.1233.05B	5/16"	8,0	17,0	**2,0**	290	**6,0**	870	80
10.1233.06B	3/8"	10,0	19,0	**2,0**	290	**6,0**	870	100
10.1233.08B	1/2"	13,0	21,0	**2,0**	290	**6,0**	870	125
10.1233.10B	5/8"	16,0	26,0	**2,0**	290	**6,0**	870	160
10.1233.12B	3/4"	19,0	29,0	**2,0**	290	**6,0**	870	190
10.1233.16B	1"	25,0	36,0	**2,0**	290	**6,0**	870	254
10.1233.20B	1.1/4"	31,8	43,0	**2,0**	290	**6,0**	870	320
10.1233.24B	1.1/2"	38,1	50,0	**2,0**	290	**6,0**	870	380
10.1233.32B	2"	50,8	64,0	**2,0**	290	**6,0**	870	510
10.1233.40B	2.1/2"	63,5	77,0	**2,0**	290	**6,0**	870	635
10.1233.48B	3"	76,2	90,0	**2,0**	290	**6,0**	870	762
10.1233.64B	4"	101,6	118,0	**2,0**	290	**6,0**	870	1016
10.1233.96B	6"	152,4	175,0	**2,0**	290	**6,0**	870	1524

INNER TUBE: seamless air and water resistant synthetic rubber
REINFORCEMENT: several high resistance synthetic fiber braids

OUTER TUBE: black, weather and abrasion resistant synthetic rubber
SAFETY FACTOR: 3: 1

APPLICATION: heavy works on mining, construction, steel plants, perforation and quarries

TEMPERATURE RANGE: - 35ºC (- 31ºF) + 85ºC (+ 185ºF)

BALFLEX / BALDRILL MINE AIR & WATER - DN6 - 1/4" - BS EN ISO 2398 - WP 2 MPa 300 PSI - Flame Resistant - MSHA IC-252/00

Balflex®

PETROTANK 50 S & D

Rigid rubber mandrel PETROTANK TRUCK hose for suction and delivery of Petroleum, Gasoline, Oil and Fuel – 10.1245

Reinforced with several high resistance synthetic fiber braids with steel helix and antistatic copper line with aromatic content up to 50%

#	inch	SAE Dash	mm	mm	MPa	PSI	MPa	PSI	MIN BEND RAD mm	KG kg/m
10.1245.025	1"	-16	25,4	35,0	**1,0**	150	**3,0**	450	144	0,71
10.1245.032	1.1/4"	-20	31,8	42,0	**1,0**	150	**3,0**	450	178	0,96
10.1245.040	1.1/2"	-24	38,1	48,0	**1,0**	150	**3,0**	450	208	1,24
10.1245.050	2"	-32	50,8	62,0	**1,0**	150	**3,0**	450	298	1,7
10.1245.063	2.1/2"	-40	63,5	75,0	**1,0**	150	**3,0**	450	381	2,36
10.1245.075	3"	-48	76,2	90,0	**1,0**	150	**3,0**	450	477	3,11
10.1245.100	4"	-64	101,6	117,0	**1,0**	150	**3,0**	450	655	3,97
10.1245.125	5"	-80	127,0	143,0	**1,0**	150	**3,0**	450	572	7,76
10.1245.150	6"	-96	152,4	168,0	**1,0**	150	**3,0**	450	760	8,95
10.1245.200	8"	-128	203,0	225,0	**1,0**	150	**3,0**	450	1015	13,43

INNER TUBE: synthetic smooth elastomer compound resistant to mineral oil products and fuel mixtures with aromatic content up to 50%, with antistatic characteristics
REINFORCEMENT: high tensile synthetic textile cords, steel helix, one crossing antistatic wire

OUTER TUBE: black, high oil, weather, heat, abrasion and ozone resistant blend of synthetic elastomer compound
SAFETY FACTOR: 3: 1

APPLICATION: tank truck hose for transport, suction & delivery, of mineral oil products and fuel mixtures with aromatic content up to 50%.

TEMPERATURE RANGE: - 40ºC (- 40ºF) + 100ºC (+ 212ºF)

BALFLEX /// PETROTANK TRUCK 50 PETROLEUM SUCTION & DELIVERY - DN75 - 3" - WP 1 MPa 150 PSI - DATE

PETRO OILTANK 50

PETROTANK TRUCK 50 S & D PETROLEUM – 10.1249.

Rigid rubber mandrel OILTANK TRUCK hose for delivery of Petroleum, Gasoline, Oil and Fuel

#	inch	SAE Dash	mm	mm	MPa	PSI	MPa	PSI	MIN BEND RAD mm	KG kg/m
10.1249.025	1"	-16	25,4	35,0	**1,0**	150	**3,0**	450	272	0,71
10.1249.032	1.1/4"	-20	31,8	42,0	**1,0**	150	**3,0**	450	330	0,96
10.1249.040	1.1/2"	-24	38,1	48,0	**1,0**	150	**3,0**	450	397	1,24
10.1249.050	2"	-32	50,8	62,0	**1,0**	150	**3,0**	450	510	1,7
10.1249.063	2.1/2"	-40	63,5	75,0	**1,0**	150	**3,0**	450	652	2,36
10.1249.075	3"	-48	76,2	90,0	**1,0**	150	**3,0**	450	812	3,11
10.1249.100	4"	-64	101,6	117,0	**1,0**	150	**3,0**	450	1100	3,97
10.1249.125	5"	-80	127,0	143,0	**1,0**	150	**3,0**	450	1270	7,76
10.1249.150	6"	-96	152,4	168,0	**1,0**	150	**3,0**	450	1524	8,95

INNER TUBE: synthetic smooth elastomer compound resistant to mineral oil products and fuel mixtures with aromatic content up to 50%, with antistatic characteristics
REINFORCEMENT: high tensile synthetic textile cords, one crossing antistatic wire

OUTER TUBE: black, high oil, weather, heat, abrasion and ozone resistant blend of synthetic elastomer compound
SAFETY FACTOR: 3: 1

APPLICATION: tank truck hose for transport, delivery, of mineral oil products and fuel mixtures with aromatic content up to 50%.

TEMPERATURE RANGE: - 40ºC (- 40ºF) + 100ºC (+ 212ºF)

AUTOTANK S & D

Rigid rubber mandrel TANK TRUCK hose for suction and delivery of Petroleum, Gasoline, Oil and Fuel 1.0MPa / 150PSI - 10.1236

Reinforced with several high resistance synthetic fiber braids with steel helix and antistatic copper line

#	inch	mm	mm	MPa	PSI	MPa	PSI	MIN BEND RAD mm
10.1236.020	3/4"	19,0	30,0	**1,0**	145	**3,0**	435	136
10.1236.025	1"	25,4	36,0	**1,0**	145	**3,0**	435	152
10.1236.028	1.1/8"	27,8	39,0	**1,0**	145	**3,0**	435	171
10.1236.032	1.1/4"	31,8	43,0	**1,0**	145	**3,0**	435	192
10.1236.040	1.1/2"	38,1	49,0	**1,0**	145	**3,0**	435	228
10.1236.045	1.3/4"	44,9	56,0	**1,0**	145	**3,0**	435	372
10.1236.050	2"	50,8	63,0	**1,0**	145	**3,0**	435	306
10.1236.055	2.1/4"	56,0	70,0	**1,0**	145	**3,0**	435	321
10.1236.063	2.1/2"	63,5	76,0	**1,0**	145	**3,0**	435	381
10.1236.075	3"	76,2	89,0	**1,0**	145	**3,0**	435	457
10.1236.090	3.1/2"	88,9	105,0	**1,0**	145	**3,0**	435	540
10.1236.100	4"	102,0	117,0	**1,0**	145	**3,0**	435	610
10.1236.125	5"	127,0	148,0	**1,0**	145	**3,0**	435	762
10.1236.150	6"	152,0	170,0	**1,0**	145	**3,0**	435	915

INNER TUBE: synthetic rubber resistant to oil, gasoline, diesel and fuels with up to 40% aromatic content, with antistatic characteristics

REINFORCEMENT: several high resistance synthetic fiber braids with a steel helix
OUTER TUBE: black, oil, weather and abrasion resistant synthetic rubber, with antistatic copper line

SAFETY FACTOR: 3: 1
APPLICATION: suction and delivery of oil, gasoline, diesel and fuels

TEMPERATURE RANGE: - 40ºC (- 40ºF) + 100ºC (+ 212ºF)

BALFLEX AUTOTANK TANK TRUCK - FUEL & OIL SUCTION & DELIVERY - DN25 - 1" - WP 1 MPa 150 PSI

OILTANK

Rigid rubber mandrel TANK TRUCK hose for delivery of Petroleum, Gasoline, Oil and Fuel 1.0MPa / 150PSI - 10.1238

Reinforced with several high resistance synthetic fiber braids and antistatic copper line

#	inch	mm	mm	MPa	PSI	MPa	PSI	MIN BEND RAD mm
10.1238.025	1"	25,0	35,0	**1,0**	145	**3,0**	435	254
10.1238.032	1.1/4"	31,8	43,0	**1,0**	145	**3,0**	435	320
10.1238.040	1.1/2"	38,1	48,0	**1,0**	145	**3,0**	435	380
10.1238.050	2"	50,8	61,0	**1,0**	145	**3,0**	435	510
10.1238.063	2.1/2"	63,5	75,0	**1,0**	145	**3,0**	435	635
10.1238.075	3"	76,2	88,0	**1,0**	145	**3,0**	435	762
10.1238.090	3.1/2"	88,9	106,0	**1,0**	145	**3,0**	435	900
10.1238.100	4"	101,6	115,0	**1,0**	145	**3,0**	435	1016
10.1238.125	5"	127,0	140,0	**1,0**	145	**3,0**	435	1270
10.1238.150	6"	152,4	168,0	**1,0**	145	**3,0**	435	1524

INNER TUBE: synthetic rubber resistant to oil, gasoline, diesel and fuels with up to 40% aromatic content, with antistatic characteristics

REINFORCEMENT: several high resistance synthetic fiber braids with a steel helix
OUTER TUBE: black, oil, weather and abrasion resistant synthetic rubber, with antistatic copper line

SAFETY FACTOR: 3: 1
APPLICATION: suction and delivery of oil, gasoline, diesel and fuels

TEMPERATURE RANGE: - 40ºC (- 40ºF) + 100ºC (+ 212ºF)

Balflex®

ACQUATANK S & D

Rigid rubber mandrel hose for suction and delivery of Air and Water 1.0MPa /150PSI – 10.1237

Reinforced with several high resistance synthetic fiber braids and steel helix

#	inch	mm	mm	MPa	PSI	MPa	PSI	MIN BEND RAD mm
10.1237.025	1"	25,4	35,0	**1,0**	145	**3,0**	435	152
10.1237.028	1.1/8"	28,6	38,0	**1,0**	145	**3,0**	435	175
10.1237.032	1.1/4"	31,8	42,0	**1,0**	145	**3,0**	435	192
10.1237.040	1.1/2"	38,1	48,0	**1,0**	145	**3,0**	435	228
10.1237.045	1.3/4"	45,0	55,0	**1,0**	145	**3,0**	435	267
10.1237.050	2"	50,8	62,0	**1,0**	145	**3,0**	435	306
10.1237.055	2.1/4"	55,0	71,0	**1,0**	145	**3,0**	435	342
10.1237.060	2.3/8"	60,0	72,0	**1,0**	145	**3,0**	435	370
10.1237.063	2.1/2"	63,5	75,0	**1,0**	145	**3,0**	435	381
10.1237.075	3"	76,2	89,0	**1,0**	145	**3,0**	435	457
10.1237.080	3.1/8"	80,0	92,0	**1,0**	145	**3,0**	435	505
10.1237.090	3.1/2"	88,9	106,0	**1,0**	145	**3,0**	435	540
10.1237.100	4"	101,6	115,0	**1,0**	145	**3,0**	435	610
10.1237.125	5"	127,0	144,0	**1,0**	145	**3,0**	435	762
10.1237.150	6"	152,4	167,0	**1,0**	145	**3,0**	435	915

INNER TUBE: seamless air and water resistant synthetic rubber
REINFORCEMENT: several high resistance synthetic fiber braids and steel helix

OUTER TUBE: black, weather and abrasion resistant synthetic rubber
SAFETY FACTOR: 3: 1

APPLICATION: suction and delivery of water in construction, mining, steel plants and agriculture

TEMPERATURE RANGE: - 35ºC (- 31ºF) + 85ºC (+ 185ºF)

ACQUA

Rigid rubber mandrel hose for delivery of Air and Water 1.0MPa / 150PSI – 10.1235

Reinforced with several high resistance synthetic fiber braids

#	inch	mm	mm	MPa	PSI	MPa	PSI	MIN BEND RAD mm
10.1235.025	1"	25,4	34,0	**1,0**	145	**3,0**	435	254
10.1235.028	1.1/8"	28,6	38,0	**1,0**	145	**3,0**	435	300
10.1235.032	1.1/4"	31,8	42,0	**1,0**	145	**3,0**	435	320
10.1235.040	1.1/2"	38,1	48,0	**1,0**	145	**3,0**	435	380
10.1235.045	1.3/4"	45,0	54,0	**1,0**	145	**3,0**	435	445
10.1235.050	2"	50,8	60,0	**1,0**	145	**3,0**	435	510
10.1235.055	2.1/4"	55,0	71,0	**1,0**	145	**3,0**	435	590
10.1235.063	2.1/2"	63,5	75,0	**1,0**	145	**3,0**	435	635
10.1235.075	3"	76,2	88,0	**1,0**	145	**3,0**	435	762
10.1235.090	3.1/2"	88,9	106,0	**1,0**	145	**3,0**	435	900
10.1235.100	4"	101,6	115,0	**1,0**	145	**3,0**	435	1016
10.1235.125	5"	127,0	140,0	**1,0**	145	**3,0**	435	1270
10.1235.150	6"	152,4	165,0	**1,0**	145	**3,0**	435	1524

INNER TUBE: seamless air and water resistant synthetic rubber
REINFORCEMENT: several high resistance synthetic fiber braids

OUTER TUBE: black, weather and abrasion resistant synthetic rubber
SAFETY FACTOR: 3: 1

APPLICATION: for conveying water in construction, mining, steel plants and agriculture

TEMPERATURE RANGE: - 35ºC (- 31ºF) + 85ºC (+ 185ºF)

SANDBLAST

Rigid rubber mandrel hose for Sandblasting / Gravel 1.2MPa / 175PSI – 10.1240

Reinforced with several high resistance synthetic fiber braids and antistatic copper line

#	inch	mm	mm	MPa	PSI	MPa	PSI	MIN BEND RAD mm
10.1240.12	1/2"	12,7	27,0	**1,2**	174	**3,6**	522	130
10.1240.20	3/4"	19,0	33,0	**1,2**	174	**3,6**	522	230
10.1240.25	1"	25,4	39,0	**1,2**	174	**3,6**	522	254
10.1240.32	1.1/4"	31,8	48,0	**1,2**	174	**3,6**	522	320
10.1240.40	1.1/2"	38,1	56,0	**1,2**	174	**3,6**	522	380
10.1240.50	2"	51,0	69,0	**1,2**	174	**3,6**	522	510

INNER TUBE: seamless synthetic rubber high abrasion resistant to sand with antistatic characteristics; abrasion acc. DIN 53516: approx. 65 mm3

REINFORCEMENT: several high resistance synthetic fiber braids
OUTER TUBE: black, weather and abrasion resistant synthetic rubber, with antistatic copper line

SAFETY FACTOR: 3: 1
APPLICATION: sandblasting

TEMPERATURE RANGE: - 40ºC (- 40ºF) + 100ºC (+ 212ºF)

DRY CEMENT DELIVERY

According to EN ISO 3861 / ISO 4649. – 10.1241

Dry bulk materials and dry powder cement delivery hose. Reinforced with several high resistance synthetic fiber braids with antistatic copper line

#	inch	mm	mm	MPa	PSI	MPa	PSI	MIN BEND RAD mm
10.1241.050	2"	50,8	65,00	**1,0**	145	**3**	435	510
10.1241.063	2.1/2"	63,5	77,00	**1,0**	145	**3**	435	635
10.1241.075	3"	76,0	90,0	**1,0**	145	**3**	435	762
10.1241.090	3.1/2"	90,0	104,0	**1,0**	145	**3**	435	900
10.1241.100	4"	101,0	116,00	**1,0**	145	**3**	435	1016
10.1241.125	5"	127,0	144,00	**1,0**	145	**3**	435	1270
10.1241.150	6"	152,0	168,00	**1,0**	145	**3**	435	1524
10.1241.200	8"	203,0	221,00	**1,0**	145	**3**	435	2032

INNER TUBE: seamless synthetic rubber resistant to abrasion
REINFORCEMENT: high tensile textile cords

OUTER TUBE: black, weather and abrasion resistant synthetic rubber with antistatic copper line
SAFETY FACTOR: 3: 1

APPLICATION: discharge of dry bulk materials, sand, gravel, and dry powder cement

TEMPERATURE RANGE: - 40ºC (- 40ºF) + 100ºC (+ 212ºF)

CONCRETE BETON LIGHT

4.0MPa / 580PSI / 40bar Working Pressure / Abrasion loss value: Acc DIN 53516 < 65 mm3 – 10.1246

Hose for Placement of Concrete / Beton to the Casting Locations

#	inch	mm	mm	MPa	PSI	MPa	PSI	MIN BEND RAD mm
10.1246.040	1.1/2"	38,0	54,0	**4,0**	580	**10,5**	1523	75
10.1246.050	2"	50,8	68,00	**4,0**	580	**10,5**	1523	100
10.1246.063	2.1/2"	63,5	83,50	**4,0**	580	**10,5**	1523	125
10.1246.075	3"	76,0	100,00	**4,0**	580	**10,5**	1523	150
10.1246.100	4"	101,0	126,00	**4,0**	580	**10,5**	1523	200

INNER TUBE: seamless special synthetic rubber resistant to abrasion
REINFORCEMENT: 4 plies of high tensile textile cords

OUTER TUBE: black, weather and abrasion resistant pin-pricked synthetic rubber
SAFETY FACTOR: 2.3: 1

APPLICATION: placement of concrete to the casting locations

TEMPERATURE RANGE: - 40ºC (- 40ºF) + 70ºC (+ 158ºF)

BALFLEX / CONCRETE BETON LIGHT DN38 - 1.1/2" - WP 4 MPa 580 PSI

CONCRETE EXTRAFLEX

Abrasion loss value: Acc DIN 53516 < 65 mm3 – 10.1248

Hose for Placement of Concrete / Beton to the Casting Locations

#	inch	mm	mm	MPa	PSI	MPa	PSI	MIN BEND RAD mm
10.1248.050	2"	50,8	72,00	**8,5**	1233	**20,0**	2900	100
10.1248.063	2.1/2"	63,5	86,30	**8,5**	1233	**20,0**	2900	125
10.1248.075	3"	76,0	99,60	**8,5**	1233	**20,0**	2900	150
10.1248.100	4"	101,0	126,00	**8,5**	1233	**20,0**	2900	200
10.1248.125	5"	127,0	153,30	**8,5**	1233	**20,0**	2900	250
10.1248.150	6"	152,0	184,0	**8,5**	1233	**20,0**	2900	300

INNER TUBE: seamless special synthetic rubber resistant to abrasion
REINFORCEMENT: 6 plies of high tensile textile cords

OUTER TUBE: black, weather and abrasion resistant pin-pricked synthetic rubber
SAFETY FACTOR: 2.3: 1

APPLICATION: placement of concrete to the casting locations

TEMPERATURE RANGE: - 40ºC (- 40ºF) + 70ºC (+ 158ºF)

BALFLEX / CONCRETE BETON EXTRAFLEX DN51 - 2" - WP 8.5 MPa 1232 PSI

SUPERSTEAM RED

1.7 MPa / 250PSI W.P. 17.0 Mpa / 2500PSI B.P. – 10.1260.R

Saturated Steam steel braid hose + 208ºC (+ 406ºF)

#	inch	mm	mm	MPa	PSI	MPa	PSI	MIN BEND RAD mm
10.1260.08	1/2"	12,7	24,00	**1,7**	247	**17,0**	2465	180
10.1260.12	3/4"	19,0	33,00	**1,7**	247	**17,0**	2465	240
10.1260.16	1"	25,4	39,00	**1,7**	247	**17,0**	2465	300
10.1260.20	1.1/4"	31,8	47,00	**1,7**	247	**17,0**	2465	400
10.1260.24	1.1/2"	38,1	53,0	**1,7**	247	**17,0**	2465	500
10.1260.32	2"	50,8	68,00	**1,7**	247	**17,0**	2465	650

INNER TUBE: black, heat resistance synthetic rubber
REINFORCEMENT: high tensile steel wire braids

OUTER TUBE: red, heat, weather and abrasion resistant synthetic rubber
SAFETY FACTOR: 10: 1

APPLICATION: super heated steam services in chemical plants, steel mills, refineries, shipyards

TEMPERATURE RANGE: - 40ºC (- 40ºF) + 208ºC (+ 406ºF)

BALFLEX SUPERSTEAM 208ºC / 406ºF - DN12 - 1/2" - WP 1.7 MPa 250 PSI

LPG DELIVERY HOSE

LPG 2.5MPa / 350PSI hose – 10.1214.

Liquefied Petroleum Gas delivery hose, long length.

#	inch	mm	mm	MPa	PSI	MPa	PSI	MIN BEND RAD mm
10.1214.04	1/4"	6,0	15,0	**2,5**	363	**12,5**	1813	100
10.1214.05	5/16"	8,0	16,0	**2,5**	363	**12,5**	1813	114
10.1214.06	3/8"	9,5	19,0	**2,5**	363	**12,5**	1813	127
10.1214.08	1/2"	12,7	23,00	**2,5**	363	**12,5**	1813	178
10.1214.12	3/4"	19,0	31,00	**2,5**	363	**12,5**	1813	240
10.1214.16	1"	25,4	38,00	**2,5**	363	**12,5**	1813	300
10.1214.20	1.1/4"	32,0	45,00	**2,5**	363	**12,5**	1813	419
10.1214.24	1.1/2"	38,0	52,00	**2,5**	363	**12,5**	1813	500
10.1214.32	2"	50,8	67,00	**2,5**	363	**12,5**	1813	630

INNER TUBE: seamless synthetic rubber resistant to LPG
REINFORCEMENT: 1 high resistance synthetic fiber braid

OUTER TUBE: black, smooth, weather and abrasion resistant synthetic rubber
SAFETY FACTOR: 3: 1

APPLICATION: LPG (Liquefied Petroleum Gas)

TEMPERATURE RANGE: - 30ºC (- 22ºF) + 100ºC (+ 212ºF)

BALFLEX LPG / GPL DIN EN 1762 - 1/4" - MAX WP 2.5 MPa 350 PSI

XLPE ACID-SOLVENT & CHEMICAL S & D

Corrosive Chemicals and Solvents Translucent XLPE (Cross Linked Polyethylene) 1.7MPa / 250PSI W.P. S & D hose – 10.1270

Reinforced with several high resistance synthetic fiber braids with steel helix and antistatic copper line

#	inch	mm	mm	MPa	PSI	MPa	PSI	MIN BEND RAD mm
10.1270.020	3/4"	19,0	32,0	**1,7**	247	**5,1**	740	136
10.1270.025	1"	25,0	38,0	**1,7**	247	**5,1**	740	152
10.1270.032	1.1/4"	31,8	46,0	**1,7**	247	**5,1**	740	192
10.1270.040	1.1/2"	38,1	52,0	**1,7**	247	**5,1**	740	228
10.1270.050	2"	50,8	65,0	**1,7**	247	**5,1**	740	306
10.1270.063	2.1/2"	63,5	78,0	**1,7**	247	**5,1**	740	381
10.1270.075	3"	76,2	92,0	**1,7**	247	**5,1**	740	457
10.1270.100	4"	101,6	119,0	**1,7**	247	**5,1**	740	610

INNER TUBE: corrosive acid-solvents and chemicals translucent XLPE (cross linked polyethylene)
REINFORCEMENT: several high resistance synthetic fiber braids with a steel helix

OUTER TUBE: green, weather and abrasion resistant synthetic rubber, with antistatic copper line
SAFETY FACTOR: 3: 1

APPLICATION: suction and delivery of strong acids, corrosive chemicals, high aromatic solvents. Suitable for 90% of existing chemicals

TEMPERATURE RANGE: - 30ºC (- 22ºF) + 65ºC (+ 150ºF)

Balflex®

UHMWPE ACID-SOLVENT & CHEMICAL S & D

Chemicals and Acid-Solvent Translucent UHMWPE (Ultra High Molecular Weight Polyethylene) 1.7MPa / 250PSI W.P. S & D hose – 10.1275

Reinforced with several high resistance synthetic fiber braids with steel helix and antistatic copper line

#	inch	mm	mm	MPa	PSI	MPa	PSI	MIN BEND RAD mm
10.1275.020	3/4"	19,0	32,0	**1,7**	247	**5,1**	740	136
10.1275.025	1"	25,0	38,0	**1,7**	247	**5,1**	740	152
10.1275.032	1.1/4"	31,8	46,0	**1,7**	247	**5,1**	740	192
10.1275.040	1.1/2"	38,1	52,0	**1,7**	247	**5,1**	740	228
10.1275.050	2"	50,8	65,0	**1,7**	247	**5,1**	740	306
10.1275.063	2.1/2"	63,5	78,0	**1,7**	247	**5,1**	740	381
10.1275.075	3"	76,2	92,0	**1,7**	247	**5,1**	740	457
10.1275.100	4"	101,6	119,0	**1,7**	247	**5,1**	740	610

INNER TUBE: corrosive acid-solvents and chemicals translucent UHMWPE (ultra high molecular weight polyethylene)
REINFORCEMENT: several high resistance synthetic fiber braids with a steel helix

OUTER TUBE: blue, weather and abrasion resistant synthetic rubber, with antistatic copper line
SAFETY FACTOR: 3: 1

APPLICATION: suction and delivery of strong acids, corrosive chemicals, high aromatic solvents. Suitable for 98% of existing chemicals

TEMPERATURE RANGE: - 40ºC (- 40ºF) + 80ºC (+ 176ºF)

FUEL PUMP

EN 1360 – 1 / ISO 7840 - 1 — 10.1221

Fuel dispensing hose polyester braid

#	inch	mm	mm	MPa	PSI	MPa	PSI	MIN BEND RAD mm
10.1221.10	5/8"	16,0	26,0	**1,6**	232	**4,8**	696	80
10.1221.12	3/4"	19,0	30,0	**1,6**	232	**4,8**	696	100
10.1221.16	1"	25,4	37,0	**1,6**	232	**4,8**	696	150

INNER TUBE: petrol, gasoline and fuel seamless resistant synthetic rubber
REINFORCEMENT: high tensile polyester braid and antistatic copper line

OUTER TUBE: oil, weather, ozone, abrasion resistant synthetic rubber
SAFETY FACTOR: 3: 1

APPLICATION: dispensing of fuel, gasoline, ethanol, unleaded petrol and diesel oil

TEMPERATURE RANGE: - 40ºC (- 40ºF) + 120ºC (+ 248ºF)
COUPLINGS: reusable or crimped Balflex® FUEL PUMP coupling serie

BALFLEX / FUEL PUMP EN 1360 - DN16 - 5/8" - WP 1.6 MPa 232 PSI - R < 1MΩ - DATE

FUEL PUMP STEEL

According to EN 1360 – 3 / ISO 7840 - 3 — 10.1222

Fuel dispensing hose steel braid

#	inch	mm	mm	MPa	PSI	MPa	PSI	MIN BEND RAD mm
10.1222.10	5/8"	16,0	25,4	**1,8**	261	**5,4**	783	80
10.1222.12	3/4"	19,0	28,7	**1,8**	261	**5,4**	783	100
10.1222.16	1"	25,4	35,1	**1,8**	261	**5,4**	783	150

INNER TUBE: petrol, gasoline and fuel seamless resistant synthetic rubber
REINFORCEMENT: high tensile steel braid

OUTER TUBE: oil, weather, ozone, abrasion resistant synthetic rubber
SAFETY FACTOR: 3: 1

APPLICATION: dispensing of fuel, gasoline, ethanol, unleaded petrol and diesel oil

TEMPERATURE RANGE: - 40ºC (- 40ºF) + 120ºC (+ 248ºF)
COUPLINGS: reusable or crimped Balflex® FUEL PUMP coupling serie

BALFLEX / FUEL PUMP EN 1360 - DN16 - 5/8" - STEEL - WP 1.8 MPa 260 PSI - R < 1MΩ - DATE

SINGLE WELDING

According to ISO 3821 class B / DIN EN 559 / RMA / CGA IP-7 grade R – 10.1227

Oxygen and Acetylene 2.0MPa / 300PSI (100% rubber hose)

#	inch	mm	mm	MPa	PSI	MPa	PSI	mm
				MPa				MIN BEND RAD
10.1227.04A	1/4"	6,4	13,8	**2,0**	300	**6,0**	900	60
10.1227.05A	5/16"	8,0	15,5	**2,0**	300	**6,0**	900	80
10.1227.06A	3/8"	9,5	17,0	**2,0**	300	**6,0**	900	100

INNER TUBE: seamless oxygen or acetylene resistant synthetic rubber
REINFORCEMENT: 1 high resistance synthetic fiber braid

OUTER TUBE: red, green or blue, weather and abrasion resistant synthetic rubber

SAFETY FACTOR: 3: 1
APPLICATION: welding equipments

TEMPERATURE RANGE: - 35ºC (- 31ºF) + 100ºC (+ 212ºF)

BALFLEX WELDING - DN6 - 1/4" - ISO 3821-B / EN 559 - WARNING ACETYLENE ONLY - WP 2 MPa / 300 PSI - DATE

SINGLE WELDING BLUE

According to ISO 3821 class B / DIN EN 559 / RMA / CGA IP-7 grade R – 10.1229

Oxygen and Acetylene 2.0MPa / 300PSI (100% rubber hose)

#	inch	mm	mm	MPa	PSI	MPa	PSI	mm
				MPa				MIN BEND RAD
10.1229.04	1/4"	6,4	13,8	**2,0**	300	**6,0**	900	60
10.1229.05	5/16"	8,0	15,5	**2,0**	300	**6,0**	900	80
10.1229.06	3/8"	9,5	17,0	**2,0**	300	**6,0**	900	100

INNER TUBE: seamless oxygen or acetylene resistant synthetic rubber
REINFORCEMENT: 1 high resistance synthetic fiber braid

OUTER TUBE: red, green or blue, weather and abrasion resistant synthetic rubber

SAFETY FACTOR: 3: 1
APPLICATION: welding equipments

TEMPERATURE RANGE: - 35ºC (- 31ºF) + 100ºC (+ 212ºF)

BALFLEX WELDING - DN6 - 1/4" - ISO 3821-B / EN 559 - OXYGEN - WP 2 MPa / 300 PSI - DATE

TWIN WELDING

According to ISO 3821 class B / DIN EN 559 / RMA / CGA IP-7 grade R – 10.1230

Oxygen and Acetylene 2.0MPa / 300PSI (100% rubber hose)

#	inch	mm	mm	MPa	PSI	MPa	PSI	MIN BEND RAD mm
10.1230.04	1/4"	6,4	13,8	**2,0**	300	**6,0**	900	60
10.1230.05	5/16"	8,0	15,5	**2,0**	300	**6,0**	900	80
10.1230.06	3/8"	9,5	17,0	**2,0**	300	**6,0**	900	100

INNER TUBE: seamless oxygen or acetylene resistant synthetic rubber
REINFORCEMENT: 1 high resistance synthetic fiber braid

OUTER TUBE: red and blue, weather and abrasion resistant synthetic rubber

SAFETY FACTOR: 3: 1
APPLICATION: welding equipments

TEMPERATURE RANGE: - 35ºC (- 31ºF) + 100ºC (+ 212ºF)

BALFLEX WELDING - DN6 - 1/4" - ISO 3821-B / EN 559 - OXYGEN - WP 2 MPa / 300 PSI - DATE

BALFLEX WELDING - DN6 - 1/4" - ISO 3821-B / EN 559 - WARNING ACETYLENE ONLY - WP 2 MPa / 300 PSI - DATE

HYDRAULIC BRAKE SAE J1401

According to SAE J 1401 — 10.1050.02

Sae J 1401 hydraulic brake hose 1/8"

#	inch	SAE Dash	mm	mm	MPa	PSI	MPa	PSI	MIN BEND RAD mm	KG kg/m
10.1050.02	1/8"	-3	3,2	10,5	**20,0**	2900	**60,0**	8700	102	0,091

INNER TUBE: seamless, brake fluid resistant special compound synthetic rubber
REINFORCEMENT: 2 high tensile synthetic textile braids

OUTER TUBE: black, oil, weather and abrasion resistant synthetic rubber
SAFETY FACTOR: 3: 1

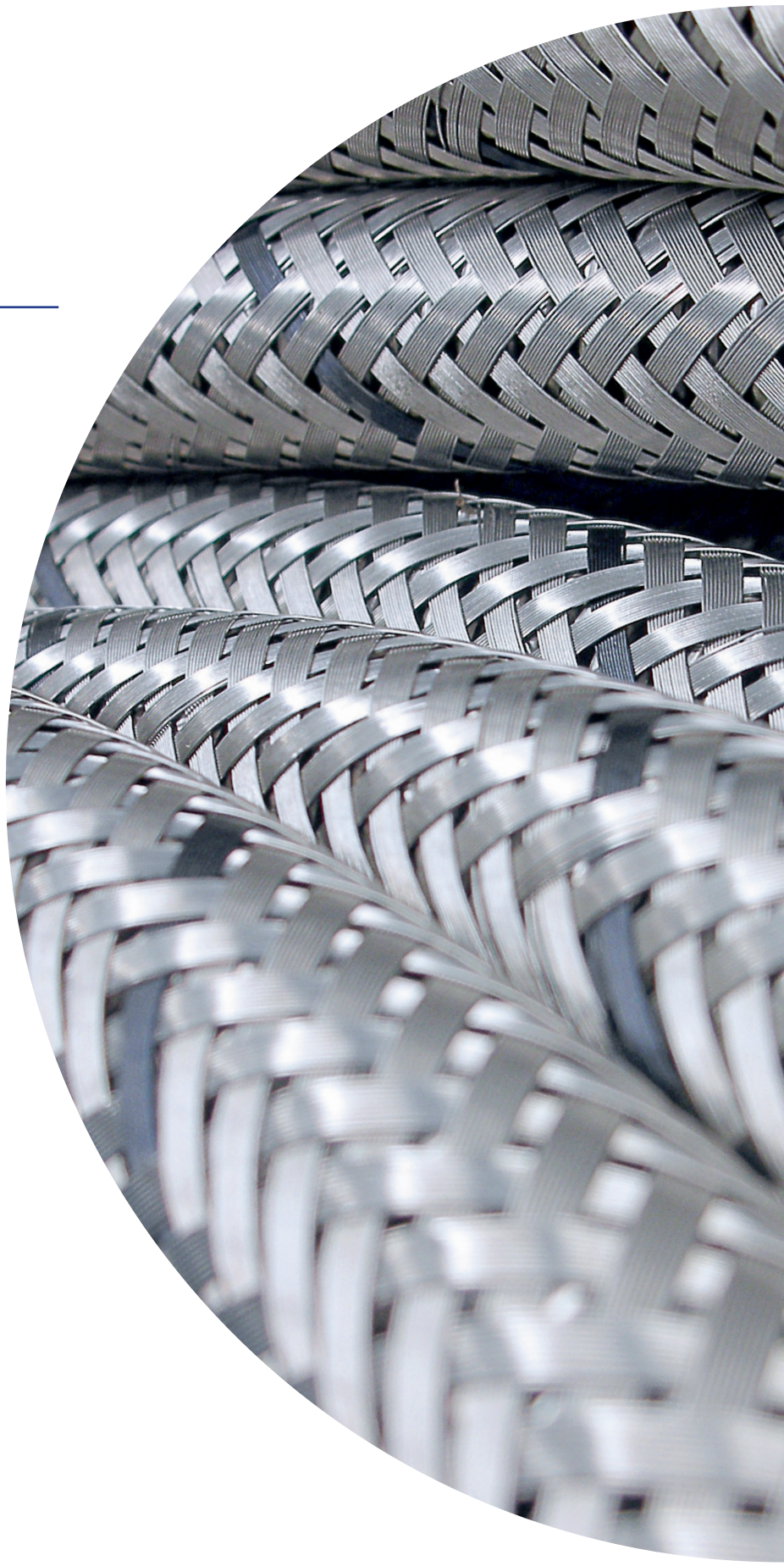
APPLICATION: hydraulic brake lines for automobiles

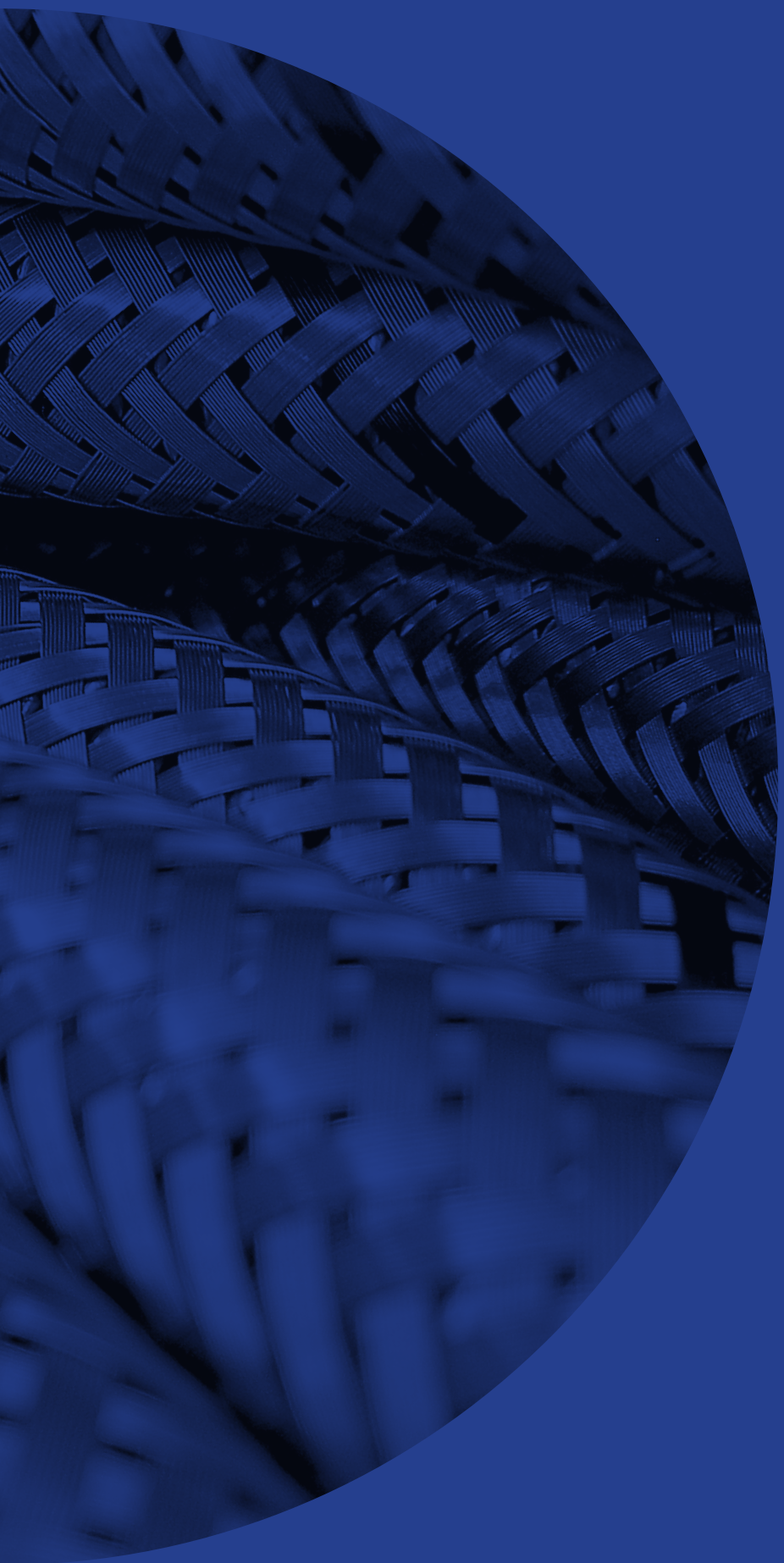
TEMPERATURE RANGE: - 40ºC (- 40ºF) + 100ºC (+ 212ºF)

HYDRAULIC BRAKE SAE J1401 - 1/8" - DOT - 20 MPa / 2900 PSI - DATE

Balflex®

Inox Hoses





pag. 114 **BALINOX 321 UNBRAIDED**

pag. 115 **BALINOX 321+BRAID 304**

pag. 116 **BALINOX 321+DOUBLE BRAID 304**

pag. 117 **BALINOX 316 UNBRAIDED**

pag. 118 **BALINOX 316+BRAID 304**

pag. 119 **BALINOX 316+DOUBLE BRAID 304**

pag. 120 **BRAID 304**

pag. 121 **EXHAUST TUBE**

pag. 122 **WELDING RINGS**

Balinox

Balinox is the corrugated stainless steel hose range by Balflex®. Balinox stainless steel hoses are produced to Balflex® specifications and to ISO 10380 type 2 standards. It covers a wide variety of low to very high-pressure applications, in different grades of stainless steel, with different construction methods of the inner tube and of the reinforcement braid.

Stainless steel hoses facilitate relative movement of the parts to be connected, adapt to thermal expansion, resist to high pressure and offer good corrosion resistance to a wide range of fluids.

Balflex® optimized the production of these hoses in order to assure the highest performance and the most extensive range of applications. The Balinox range of stainless steel hoses offer a very wide variety of materials and construction solutions in order to suit the particular problems to be addressed.

The Balinox range of metal hoses in this catalogue includes:

- **Balinox 10.5211.** - Wide pitch annular corrugated stainless steel AISI 321 hose with one braid AISI 304
- **Balinox 10.5161.** - Wide pitch annular corrugated stainless steel AISI 316L hose with one braid AISI 304
- **Balinox 10.5104.** - Wide pitch annular corrugated stainless steel AISI 304 hose with one braid AISI 304

General Guidelines

Normally, the following aspects should be considered when choosing a stainless steel hose:

- the chemical reactivity of the product to be conveyed by the hose;
- the temperature of the product to be conveyed;
- the pressure of the product to be conveyed;
- the kind of flow of the product to be conveyed (pulsation or high velocity);
- the geometry of the parts to be connected and the degree of movement required, the bend radius and unsupported lengths;
- the environmental conditions.

1. Suitability of corrugated metal hose assemblies

Corrugated metal hose assemblies are basically suitable for the transport of critical fluids under pressure and temperature. The required flexibility of the corrugated hose generally results in a wall thickness considerably smaller than that of all other parts of the system in which they are installed. Therefore, increasing the wall thickness of the hose to prevent damages caused by corrosion is not reasonable and it becomes essential to select a suitable material for the flexible element which is sufficiently resistant against all corrosive media that may occur during the entire lifetime. In many cases, the hose has to be manufactured out of a material with even higher corrosion resistance than those of the system parts it is connected to.

In addition, possible corrosive environmental effects must be considered. The material selection must take into account all possible kinds of corrosion, especially pitting corrosion, intergranular corrosion, crevice corrosion and stress corrosion cracking (SCC).

2. Selection of a suitable material

The material for the corrugated hose is to be selected according the specific aggressiveness of the operating fluid or of the surrounding atmosphere.

Recommendations for the selection of materials are given under *www.euroqualiflex.com*.

3. Prevention of corrosive effects during operation of the plant

Any uncertainties concerning the exact composition of the working fluid, differing operating states, and other peripheral service conditions may additionally increase the danger of corrosion and have to be taken into account.

4. Responsibility of the hose manufacture

The responsibility of the hose manufacturer covers the functional design of the hose assembly according to the given information, as pressures, temperatures, movements, kind of application and additional loadings, and also the material concerning its formability and weldability.

In addition,BALFLEX techn staff contribute their wide scope of experience when assisting the user in selecting a suitable material for the special application. But, with regard to the influences of the actual operating situation given (see point 3) only the user can take full responsibility for the selected material. The advice of the hose manufacturer can only be given without obligation, i.e. without any liability for the material to be properly selected.

Selection of the hose

Chemical reactivity

Balinox Stainless Steel hose is supplied in the following grades:

- AISI 321
- AISI 316

The different grades have different chemical resistance to the fluids or gases to be conveyed. **AISI 321** grade suits most applications; **AISI 316** is used for more demanding applications. The Chemical Resistance Chart shows the suitability of the two grades in terms of corrosion resistance to the most common products to be conveyed.

The corrosion resistance of the end fittings should also be considered at this point. **AISI 321** can be used with stainless steel, carbon steel and copper based alloys fittings, which offer a wide variety of corrosion and mechanical resistance. Carbon steel fittings should not be welded on **AISI 316** hose; normally **AISI 316** applications require also stainless steel fittings.

Pulsating and high velocity flows

Pulsating flows, such as exhaust of alternating machines or discharge controlled by fast operating valves, can force the assembly into vibration, which causes premature failure of the assembly. High velocity flows (5 m/s for liquids, 10 m/s for saturated vapor and 50 m/s for gases) can also force the corrugations into vibration.

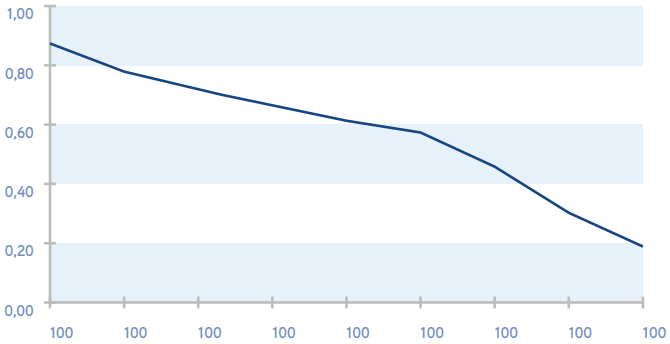
Vibrations can be avoided through the use of an adequate interlocked flexible internal liner, that smoothes the flow. Double-walled inner tube also reduces vibration hazard.

Temperature

The different grades allow different maximum working temperatures. The maximum working temperature is of 800°C (1472°F) for the **AISI 321** and **AISI 316** grades, and of 450°C for the **AISI 304** grade. Brass fittings and galvanizing allow a maximum working temperature of 220°C (428°F).

High working temperatures and alternation of high and low temperatures accelerate corrosion and imply a decrease in life expectancy of the hose. Chart 1 recommends a de-rating factor for pressure rating and bend radius as a function of working temperature. Please consult for more information.

Chart 1: Temperature de-rating factor for working pressure:



NOTE: Enter the working temperature in °C (°F) in the horizontal axis and read the de-rating factor on the vertical axis. Apply this factor to the maximum working pressure of the hose rated for ambient temperature to obtain the actual working pressure at the project temperature. Likewise apply the inverse coefficient to the minimum bend radius.

Pressure

The construction type of the hose influences mainly it's mechanical resistance and flexibility. The corrugated inner tube allows for flexibility and tightness. The external braid or braids allow for increased pressure resistance. **Balinox®** hoses are supplied standard with none, one or two braids of **AISI 304**. Other braids or external sleeves may be supplied and fit into the assemblies. Double-walled hoses allow higher working pressures while maintaining high flexibility.

Installation geometry

The construction type of the hose influences mainly it's mechanical resistance and flexibility. Balinox® Stainless Steel hose is supplied in the following construction variations:

- annular or helical corrugated
- narrow or wide pitch
- single or double walled
- unbraided or braided
- unlined or lined

The flexibility of the hose is limited. The minimum bend radius of the hose is a very important parameter for hose selection. Installation should always take into consideration the need to respect the minimum bend radius of the hose. The static minimum bend radius is the minimum bend radius that can be achieved once, at installation, for connection of static parts. The dynamic minimum bend radius is the minimum flexure radius that shall be considered for a constant motion.

The determination of the length of the hose should allow for thermal expansion and for the minimum bend radius necessary for the motion and offset of the assembly. Flexing must be always limited to one plane.

The catalogue pages list the minimum bend radius of the standard **Balinox®** hoses. For other construction variations please consult. Table 2 gives equations for calculation of hose lengths for different common situations.

Care should be given to fluid and hose weight on unsupported lengths of hose and its effect on bending the hose beyond the minimum bend radius. Hose support should be used in order to restrain the hose at the inferior horizontal axis level.

Environmental conditions

Abrasion can damage the external braid and thus reduce sharply the pressure resistance of the hose. External abrasion, mechanical shock or external exposure to extreme temperatures and aggressive media should be considered when choosing external braid, sleeves or other protection elements. A larger diameter metal or rubber hose may be fit on the outside, as well as insulating braided sleeves.

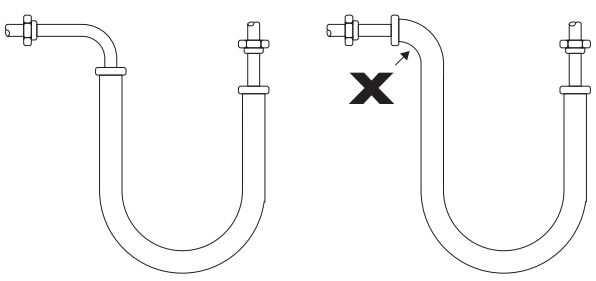
Assembly, Installation and Servicing

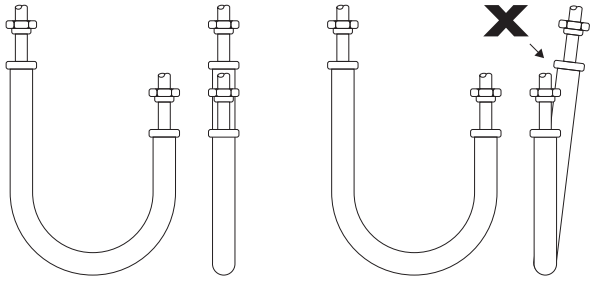
All hoses should be handled and installed without twisting or torsion (see examples below). The twisting of the hose causes shear stress and significantly reduces service life. To avoid the possibility of applying torsion when tightening fittings, free swiveling connections should be used at both ends.

Braid damage significantly reduces pressure resistance. Visual inspection of the outer braid should be made. Braids that show wire cuts should be proportionally pressure underrated.

Stainless steel hoses should be hydrostatically tested before installation at 150% of working pressure for 1 minute.

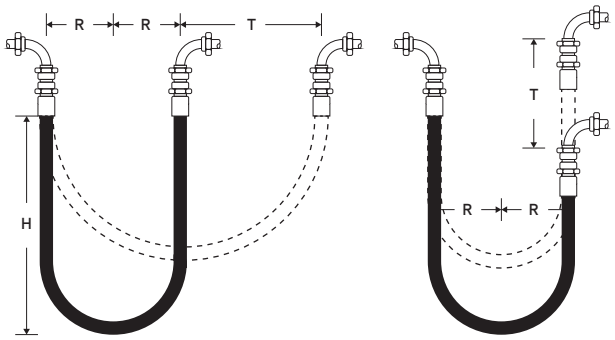
Some applications require special cleaning procedures like degreasing, washing and drying. Care should be taken to use non-aggressive solvents. The same applies when servicing the equipment to which the hose were assembled.





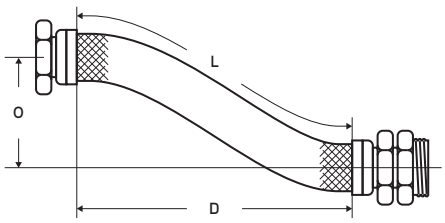
Equations for calculation of hose lengths

1 Equation for calculation of hose length in an installation with a 180° loop and travel length in the same plane:



L = X + π R + 1/2 T
H = 1/2 (L - π R) + R

2 Equation for calculation of hose length in an off-set static installation:



L = X + 2,86 Rs arccos (1 - O / 2Rs)
D = 2,86 Rs sin (L / 2,86 Rs)

3 Equation for calculation of hose length in an off-set dynamic installation:

L = X + 4,42 R arccos (1 - O / 2R)
D = 4,42 R sin (L/ 4,42 R)

in which
L = Developed length of the hose
X = constant (see table 2.4) for the straight length needed at the end of the hose
R = radius of the half loop (≥ dynamic minimum bend radius)
Rs = static minimum bend radius
T = travel distance of the moving end of the hose
O = Off-set of the two ends of the hose
D = Distance between hose ends

4 Table for determination of the straight length needed at the end of the hose:

DN	6	10	16	19	25	31	39	50
X (mm)	50	75	100	125	150	175	200	250

Stainless Steel Chemical Resistance Chart

🟢 Recommended 🟡 Recommended with Restrictions 🔴 Not Recommended

Fluids	SS GRADE	
	AISI 316L	AISI 321
Acetic acid all concentrations, 20°C	🟢	🟢
Acetic acid all concentrations, boiling	🟡	🔴
Acetic anhydride	🟢	🟢
Acetone	🟢	🟢
Acetyl chloride	🟡	🟡
Acetylene	🟢	🟢
Air	🟢	🟢
Aluminium acetate	🟢	🟢
Aluminium chloride, 10%, quiescent	🔴	🔴
Aluminium chloride, 25%, quiescent	🟢	🟢
Aluminium hydroxide	🟢	🟢
Aluminium sulfate all concentrations, 20°C	🟢	🟢
Aluminium sulfate, boiling	🟢	🟡
Ammonia, anhydrous	🟢	🟢
Ammonia, anhydrous hot gas	🔴	🔴
Ammonia, liquor	🟢	🟢
Ammonium bromide	🟢	🟡
Ammonium carbonate, 1% - 5%	🟢	🟢
Ammonium chloride, 1% - 10%	🟢	🟢
Ammonium chloride, higher concentrations	🟢	🟡
Ammonium bicarbonate, hot	🟢	🟢
Ammonium hydroxide all concentrations	🟢	🟢
Ammonium monophosfate	🟢	🟢
Ammonium nitrate, boiling	🟢	🟢
Ammonium oxalate, 5%	🟢	🟢
Ammonium perchlorate 10%, boiling	🟢	🟢
Ammonium persulfate, 5%	🟢	🟢
Ammonium phosphate, 5%	🟢	🟢
Ammonium sulfate, 1% - 5%	🟢	🟡
Ammonium sulfate, 10%	🟢	🟢
Ammonium sulfite, 20°C, boiling	🟢	🟢
Amyl acetate, amyl chloride	🟢	🟢

Fluids	SS GRADE	
	AISI 316L	AISI 321
Aniline	🟢	🟢
Argon, liquid	🟢	🟢
Barium carbonate	🟢	🟢
Barium hydroxide	🟢	🟢
Barium nitrate	🟢	🟢
Barium sulfate	🟢	🟢
Barium sulfide	🟢	🟢
Benzene, 20°C or hot	🟢	🟢
Benzoic acid	🟢	🟢
Boric acid,	🟢	🟢
Borax, 5%	🟢	🟢
Butane	🟢	🟢
Butyl acetate	🟢	🟢
Butyric acid	🟢	🟢
Calcium carbonate	🟢	🟢
Calcium chlorate	🟢	🟢
Calcium chloride	🟢	🟢
Calcium hypochlorite, 2%	🟢	🟢
Calcium hydroxide, 10% - 20%	🟢	🟢
Calcium sulfate, saturated	🟢	🟢
Carbonated water	🟢	🟢
Carbonic acid, saturated solution	🟢	🟢
Carbon dioxide	🟢	🟢
Carbon disulfide	🟢	🟢
Carbon tetrachloride	🟢	🟢
Carbon tetrachloride, commercial + 1% water	🔴	🔴
Cellulose	🟢	🟢
Chloracetic acid	🔴	🔴
Chlorine gas	🔴	🔴
Chlorinated water, saturated	🟢	🟢
Chloroform	🟢	🟢
Chromium plating bath	🟢	🟢

Fluids	SS GRADE	
	AISI 316L	AISI 321
Chloroethane	🟢	🟢
Citric acid, still	🟢	🟢
Citric acid, boiling	🟢	🟡
Copper acetate	🟢	🟢
Copper carbonate	🟢	🟢
Copper cyanide	🟢	🟢
Copper nitrate	🟢	🟢
Copper sulfate	🟢	🟢
Creosote	🟢	🟢
Cyanogen gas	🟢	🟢
Cichloroethane	🟢	🟢
Diethyl ether	🟢	🟢
Ethylene glycol	🟢	🟢
Ethanol, 20°C and boiling	🟢	🟢
Ethyl acetate concentrated solution	🟢	🟢
Ethylene chloride	🟢	🟢
Fluorine, gas, moist	🔴	🔴
Formaldehyde, 40%	🟢	🟢
Formic acid	🟢	🟡
Furfural	🟢	🟢
Gglue solution (acid)	🟢	🟡
Glycerine	🟢	🟢
Hydrochloric acid	🔴	🔴
Hydrocyanic acid	🟢	🟢
Hydrofluoric acid	🔴	🔴
Hydrogen peroxide	🟢	🟡
Hydrogen sulfide, dry	🟢	🟢
Hydrogen sulfide, wet	🟢	🟡
Iodoform	🟢	🟢
Iron 2 chloride	🟢	🔴
Iron 3 chloride, 1%, 20°C	🟢	🟡
Iron 3 chloride, 1%, boiling	🔴	🔴
Iron 3 hydroxide	🟢	🟢
Iron 3 nitrate	🟢	🟢
Iron 2 sulfate	🟢	🟢
Kerosene	🟢	🟢

Fluids	SS GRADE	
	AISI 316L	AISI 321
Lactic acid, 1%	🟢	🟢
Lactic acid, 5% and more, 20°C	🟢	🟢
Lactic acid, 5% and more, boiling	🟢	🟡
Lead diacetate, 5%	🟢	🟢
Linseed oil	🟢	🟢
Magnesium chloride quiescent, 20°C	🟢	🟢
Magnesium chloride quiescent, hot	🟡	🔴
Magnesium sulfate	🟢	🟢
Mercury	🟢	🟢
Methane, liquid	🟢	🟢
Methanol, boiling	🟡	🔴
Naphtha	🟢	🟢
Naphthalene sulphonic acid	🟢	🟢
Nickel chloride solution	🟢	🟢
Nickel sulfate	🟢	🟢
Nitre cake	🟢	🟡
nitric acid 5%, 50%, 70%, boiling	🟢	🟢
nitric acid, 65%, 20°C	🟢	🟢
nitric acid, 65%, boiling	🟡	🟡
nitric acid, concentrated, 20°C	🟢	🟢
Nitric acid, concentrated, boiling	🔴	🔴
Nitrogen, liquid	🟢	🟢
Oil, crude	🟢	🟢
Oil, vegetable, mineral	🟢	🟢
Oleic acid	🟢	🟢
Oxalic acid, 20°C	🟢	🟢
Oxalic acid, boiling	🔴	🔴
Oxygen, liquid	🟢	🟢
Paraffin, hot	🟢	🟢
Petrol	🟢	🟢
Petroleum ether	🟢	🟢
Phenol	🟢	🟢
Phosphoric acid, 1%, 5%	🟢	🟢
Phosphoric acid, 10%, quiescent	🟢	🔴
Phosphoric acid, 80%	🔴	🔴
Potassium bromide	🟢	🟡

Fluids	SS GRADE	
	AISI 316L	AISI 321
Potassium carbonate	🟢	🟢
Potassium chlorate	🟢	🟢
Potassium chloride	🟢	🟢
Potassium chromium sulfate, 5%	🟢	🟢
Potassium cyanide	🟢	🟢
Potassium bichromate	🟢	🟢
Potassium ferricyanide	🟢	🟢
Potassium oxalate	🟢	🟢
Potassium hydroxide, 5%, 27%	🟢	🟢
Potassium hypochlorite	🟡	🟡
Potassium nitrate	🟢	🟢
Potassium permanganate, 5%	🟢	🟢
Potassium sulfate	🔴	🔴
Potassium sulphite	🟢	🟢
Propane	🟢	🟡
Sea water	🟡	🔴
Silver bromide	🟢	🟡
Silver nitrate	🟢	🟢
Sodium acetate	🟢	🟢
Sodium carbonate, 5%, 50%	🟢	🟢
Sodium chloride, saturated, 20°C	🟢	🟢
Sodium chloride saturated, boiling	🟢	🟡
Sodium cyanide	🟢	🟢
Sodium fluoride, 5%, solution	🟢	🟡
Sodium bicarbonate	🟢	🟢
Sodium bisulfate, solution	🟢	🟢
Sodium bisulfate saturated solution	🔴	🔴
Sodium hydroxide	🟢	🟢
Sodium hypochlorite	🔴	🔴
Sodium nitrate	🟢	🟢
Sodium perchlorate, 10%	🟢	🟢
Sodium phosphate	🟢	🟢
Sodium sulfate	🟢	🟢
Sodium sulfite	🟢	🟢
Sodium thiosulphate	🟢	🟢
Sodium thiosulphite	🟢	🟢

Fluids	SS GRADE	
	AISI 316L	AISI 321
Steam	🟢	🟢
Stearic acid	🟢	🟢
Sulfur, moist	🟢	🟡
Sulfur, molten	🟢	🟢
Sulfur chloride, dry	🔴	🔴
Sulfur dioxide gas, moist	🟢	🟡
Sulfur dioxide gas, dry	🟢	🟢
Sulfuric acid, 5%, 10%	🟡	🔴
Sulfuric acid, 50%	🔴	🔴
Sulfuric acid, concentrated, 20°C	🟢	🟢
Sulfuric acid concentrated, boiling	🔴	🔴
Sulphurous acid	🟡	🔴
Tannic acid	🟢	🟢
Tartaric acid, 20°C	🟢	🟢
Tartaric acid, boiling	🟢	🟡
Tin 2 chloride saturated	🟢	🔴
Tin 4 chloride solution	🔴	🔴
Trichloroacetic acid	🔴	🔴
Trichloroethylene, dry	🟢	🟢
Trichloroethylene, moist	🔴	🔴
Vinegar	🟢	🟢
Water, potable	🟢	🟢
Yeast	🟢	🟢
Zinc chloride, 5%, still	🟢	🟢
Zinc cyanide, moist	🟢	🟢
Zinc nitrate, solution	🟢	🟢
Zinc sulfate	🟢	🟢

These chart informations are based on Balflex® knowledgement and experience and is intended as a guide and not as a guarantee. We cannot assure the perfect performance of the hoses as that depends on many factors as working pressure, pressure picks, fluid, ambient temperature, fluid temperature, concentration, duration of exposure, etc...

Balflex®

BALINOX 321 UNBRAIDED

ISO 10380 TYPE 2 - 10.5210.

Stainless steel annular corrugated tube AISI 321 UNBRAIDED.

#	inch	mm	mm	MPa	PSI	MPa	PSI	MIN BEND RAD STATIC mm	MIN BEND RAD FLEXING mm	KG kg/m
10.5210.006	1/4"	6,0	9,6	**1,0**	145	**4,0**	580	25	85	0,08
10.5210.008	5/16"	8,0	12,1	**0,8**	116	**3,2**	464	32	125	0,09
10.5210.010	3/8"	10,0	14,3	**0,8**	116	**3,2**	464	38	140	0,11
10.5210.013	1/2"	12,0	16,7	**0,6**	87	**2,4**	348	45	140	0,12
10.5210.016	5/8"	16,0	21,6	**0,6**	87	**2,4**	348	58	160	0,19
10.5210.020	3/4"	20,0	26,8	**0,5**	73	**2,0**	290	70	170	0,25
10.5210.025	1"	25,0	32,2	**0,4**	58	**1,6**	232	85	190	0,35
10.5210.032	1.1/4	32,0	41,1	**0,4**	58	**1,6**	232	105	260	0,44
10.5210.040	1.1/2"	40,0	49,5	**0,3**	44	**1,2**	174	130	300	0,68
10.5210.050	2"	50,0	60,3	**0,3**	44	**1,2**	174	160	320	0,88
10.5210.065	2.1/2"	65,0	81,0	**0,15**	22	**0,6**	87	180	410	1,07
10.5210.075	3"	80,0	95,0	**0,15**	22	**0,6**	87	200	450	1,10
10.5210.100	4"	100,0	117,0	**0,10**	15	**0,4**	58	290	560	1,40
10.5210.125	5"	125,0	150,0	**0,10**	15	**0,4**	58	325	710	2,67
10.5210.150	6"	150,0	175,0	**0,10**	15	**0,4**	58	380	815	3,22
10.5210.200	8"	200,0	225,0	**0,10**	15	**0,4**	58	500	1015	4,85
10.5210.250	10"	250,0	278,0	**0,05**	7	**0,2**	29	620	1270	7,15

INNER TUBE: :AISI 321 annular corrugated stainless steel
OUTER COVER: none

SAFETY FACTOR: 4: 1
APPLICATION: steam, chemicals, oxygen, thermofluid, naphta, cryogening

TEMPERATURE RANGE: -200ºC (-328°F) +600ºC (+1112°F)

COUPLINGS: Balflex® Welding Rings serie 31

BALINOX 321 + BRAID 304

ISO 10380 TYPE 2 - 10.5211.

Stainless steel annular corrugated tube AISI 321 with stainless steel braid AISI 304

#	inch	mm	mm	MPa	PSI	MPa	PSI	MIN BEND RAD STATIC mm	MIN BEND RAD FLEXING mm	KG kg/m
10.5211.006	1/4"	6,0	10,7	**12,0**	1740	**48,0**	6960	25	85	0,15
10.5211.008	5/16"	8,0	13,2	**10,0**	1450	**40,0**	5800	32	125	0,17
10.5211.010	3/8"	10,0	15,5	**9,0**	1305	**36,0**	5220	38	140	0,22
10.5211.013	1/2"	12,0	18,0	**8,0**	1160	**32,0**	4640	45	140	0,24
10.5211.016	5/8"	16,0	23,0	**7,0**	1015	**28,0**	4060	58	160	0,40
10.5211.020	3/4"	20,0	28,3	**6,4**	928	**25,6**	3712	70	170	0,50
10.5211.025	1"	25,0	33,5	**5,0**	725	**20,0**	2900	85	190	0,63
10.5211.032	1.1/4	32,0	42,8	**4,0**	580	**16,0**	2320	105	260	0,85
10.5211.040	1.1/2"	40,0	51,2	**3,5**	508	**14,0**	2030	130	300	1,17
10.5211.050	2"	50,0	62,5	**3,0**	435	**12,0**	1740	160	320	1,61
10.5211.065	2.1/2"	65,0	83,0	**2,4**	348	**9,6**	1392	180	410	1,99
10.5211.075	3"	80,0	97,0	**1,8**	261	**7,2**	1044	200	450	2,20
10.5211.100	4"	100,0	119,0	**1,6**	232	**6,4**	928	290	560	3,00
10.5211.125	5"	125,0	152,5	**1,4**	203	**5,6**	812	325	710	4,90
10.5211.150	6"	150,0	177,5	**1,0**	145	**4,0**	580	380	815	5,71
10.5211.200	8"	200,0	228,0	**0,8**	116	**3,2**	464	500	1015	9,15
10.5211.250	10"	250,0	281,0	**0,8**	109	**3,0**	435	620	1270	13,75

INNER TUBE: AISI 321 annular corrugated stainless steel
OUTER COVER: one stainless steel AISI 304 braid

SAFETY FACTOR: 4: 1
APPLICATION: steam, chemicals, oxygen, thermofluid, naphta, cryogening

TEMPERATURE RANGE: - 200ºC (-328°F) +600ºC (+1112°F)

COUPLINGS: Balflex® Welding Rings serie 31

Balflex®

BALINOX 321 + DOUBLE BRAID 304

ISO 10380 TYPE 2 - 10.5212.

Stainless steel annular corrugated tube AISI 321 with double stainless steel braid AISI 304

#	inch	mm	mm	MPa	PSI	MPa	PSI	MIN BEND RAD STATIC mm	MIN BEND RAD FLEXING mm	KG kg/m
10.5212.006	1/4"	6,0	12,0	**19,2**	2784	**76,8**	11136	25	85	0,23
10.5212.008	5/16"	8,0	14,5	**16,0**	2320	**64,0**	9280	32	125	0,25
10.5212.010	3/8"	10,0	17,0	**14,4**	2088	**57,6**	8352	38	140	0,32
10.5212.013	1/2"	12,0	19,5	**12,8**	1856	**51,2**	7424	45	140	0,37
10.5212.016	5/8"	16,0	24,5	**11,2**	1624	**44,8**	6496	58	160	0,61
10.5212.020	3/4"	20,0	30,0	**10,2**	1479	**40,8**	5916	70	170	0,75
10.5212.025	1"	25,0	35,0	**8,0**	1160	**32,0**	4640	85	190	0,91
10.5212.032	1.1/4	32,0	44,5	**6,4**	928	**25,6**	3712	105	260	1,30
10.5212.040	1.1/2"	40,0	53,0	**5,6**	812	**22,4**	3248	130	300	1,66
10.5212.050	2"	50,0	64,5	**4,8**	696	**19,2**	2784	160	320	2,35
10.5212.065	2.1/2"	65,0	85,5	**3,8**	557	**15,4**	2227	180	410	2,92
10.5212.075	3"	80,0	100,0	**2,9**	418	**11,5**	1670	200	450	3,30
10.5212.100	4"	100,0	121,5	**2,6**	371	**10,2**	1485	290	560	4,75
10.5212.125	5"	125,0	155,0	**2,2**	325	**9,0**	1299	325	710	7,15
10.5212.150	6"	150,0	181,0	**1,6**	232	**6,4**	928	380	815	8,20
10.5212.200	8"	200,0	213,0	**1,3**	186	**5,1**	742	500	1015	13,50
10.5212.250	10"	250,0	285,0	**1,2**	174	**4,8**	696	620	1270	20,40

INNER TUBE: AISI 321 annular corrugated stainless steel
OUTER COVER: two stainless steel AISI 304 braids

SAFETY FACTOR: 4: 1
APPLICATION: steam, chemicals, oxygen, thermofluid, naphta, cryogening

TEMPERATURE RANGE: -200ºC (-328°F) +600ºC (+1112°F)

COUPLINGS: Balflex® Welding Rings serie 31

BALINOX 316 UNBRAIDED

ISO 10380 TYPE 2 - 10.5160.

Stainless steel annular corrugated tube AISI 316L UNBRAIDED

#	inch	mm	mm	MPa	PSI	MPa	PSI	MIN BEND RAD STATIC mm	MIN BEND RAD FLEXING mm	KG kg/m
10.5160.006	1/4"	6,0	9,6	**1,0**	145	**4,0**	580	25	85	0,08
10.5160.008	5/16"	8,0	12,1	**0,8**	116	**3,2**	464	32	125	0,09
10.5160.010	3/8"	10,0	14,3	**0,8**	116	**3,2**	464	38	140	0,11
10.5160.013	1/2"	12,0	16,7	**0,6**	87	**2,4**	348	45	140	0,12
10.5160.016	5/8"	16,0	21,6	**0,6**	87	**2,4**	348	58	160	0,19
10.5160.020	3/4"	20,0	26,8	**0,5**	73	**2,0**	290	70	170	0,25
10.5160.025	1"	25,0	32,2	**0,4**	58	**1,6**	232	85	190	0,35
10.5160.032	1.1/4	32,0	41,1	**0,4**	58	**1,6**	232	105	260	0,44
10.5160.040	1.1/2"	40,0	49,5	**0,3**	44	**1,2**	174	130	300	0,68
10.5160.050	2"	50,0	60,3	**0,3**	44	**1,2**	174	160	320	0,88
10.5160.065	2.1/2"	65,0	81,0	**0,15**	22	**0,6**	87	180	410	1,07
10.5160.075	3"	80,0	95,0	**0,15**	22	**0,6**	87	200	450	1,10
10.5160.100	4"	100,0	117,0	**0,10**	15	**0,4**	58	290	560	1,40
10.5160.125	5"	125,0	150,0	**0,10**	15	**0,4**	58	325	710	2,67
10.5160.150	6"	150,0	175,0	**0,10**	15	**0,4**	58	380	815	3,22
10.5160.200	8"	200,0	225,0	**0,10**	15	**0,4**	58	500	1015	4,85
10.5160.250	10"	250,0	278,0	**0,05**	7	**0,2**	29	620	1270	7,15

INNER TUBE: AISI 316L annular corrugated stainless steel
OUTER COVER: none

SAFETY FACTOR: 4: 1
APPLICATION: steam, chemicals, oxygen, thermofluid, naphta, cryogening

TEMPERATURE RANGE: -200ºC (-328°F) +600ºC (+1112°F)

COUPLINGS: Balflex® Welding Rings serie 31

Balflex®

BALINOX 316 + BRAID 304

ISO 10380 TYPE 2 - 10.5161.

Stainless steel annular corrugated tube AISI 316L with stainless steel braid AISI 304

#	inch	mm	mm	MPa	PSI	MPa	PSI	MIN BEND RAD STATIC mm	MIN BEND RAD FLEXING mm	KG kg/m
10.5161.006	1/4"	6,0	10,7	**12,0**	1740	**48,0**	6960	25	85	0,15
10.5161.008	5/16"	8,0	13,2	**10,0**	1450	**40,0**	5800	32	125	0,17
10.5161.010	3/8"	10,0	15,5	**9,0**	1305	**36,0**	5220	38	140	0,22
10.5161.013	1/2"	12,0	18,0	**8,0**	1160	**32,0**	4640	45	140	0,24
10.5161.016	5/8"	16,0	23,0	**7,0**	1015	**28,0**	4060	58	160	0,40
10.5161.020	3/4"	20,0	28,3	**6,4**	928	**25,6**	3712	70	170	0,50
10.5161.025	1"	25,0	33,5	**5,0**	725	**20,0**	2900	85	190	0,63
10.5161.032	1.1/4	32,0	42,8	**4,0**	580	**16,0**	2320	105	260	0,85
10.5161.040	1.1/2"	40,0	51,2	**3,5**	508	**14,0**	2030	130	300	1,17
10.5161.050	2"	50,0	62,5	**3,0**	435	**12,0**	1740	160	320	1,61
10.5161.065	2.1/2"	65,0	83,0	**2,4**	348	**9,6**	1392	180	410	1,99
10.5161.075	3"	80,0	97,0	**1,8**	261	**7,2**	1044	200	450	2,20
10.5161.100	4"	100,0	119,0	**1,6**	232	**6,4**	928	290	560	3,00
10.5161.125	5"	125,0	152,5	**1,4**	203	**5,6**	812	325	710	4,90
10.5161.150	6"	150,0	177,5	**1,0**	145	**4,0**	580	380	815	5,71
10.5161.200	8"	200,0	228,0	**0,8**	116	**3,2**	464	500	1015	9,15
10.5161.250	10"	250,0	281,0	**0,8**	109	**3,0**	435	620	1270	13,75

INNER TUBE: AISI 316L annular corrugated stainless steel
OUTER COVER: one stainless steel AISI 304 braid

SAFETY FACTOR: 4: 1
APPLICATION: steam, chemicals, oxygen, thermofluid, naphta, cryogening

TEMPERATURE RANGE: -200ºC (-328°F) +600ºC (+1112°F)

COUPLINGS: Balflex® Welding Rings serie 31

BALINOX 316 + DOUBLE BRAID 304

ISO 10380 TYPE 2 - 10.5162.

Stainless steel annular corrugated tube AISI 316L with double stainless steel braid AISI 304

#	inch	mm	mm	MPa	PSI	MPa	PSI	MIN BEND RAD STATIC mm	MIN BEND RAD FLEXING mm	KG kg/m
10.5162.006	1/4"	6,0	12,0	**19,2**	2784	**76,8**	11136	25	85	0,23
10.5162.008	5/16"	8,0	14,5	**16,0**	2320	**64,0**	9280	32	125	0,25
10.5162.010	3/8"	10,0	17,0	**14,4**	2088	**57,6**	8352	38	140	0,32
10.5162.013	1/2"	12,0	19,5	**12,8**	1856	**51,2**	7424	45	140	0,37
10.5162.016	5/8"	16,0	24,5	**11,2**	1624	**44,8**	6496	58	160	0,61
10.5162.020	3/4"	20,0	30,0	**10,2**	1479	**40,8**	5916	70	170	0,75
10.5162.025	1"	25,0	35,0	**8,0**	1160	**32,0**	4640	85	190	0,91
10.5162.032	1.1/4	32,0	44,5	**6,4**	928	**25,6**	3712	105	260	1,30
10.5162.040	1.1/2"	40,0	53,0	**5,6**	812	**22,4**	3248	130	300	1,66
10.5162.050	2"	50,0	64,5	**4,8**	696	**19,2**	2784	160	320	2,35
10.5162.065	2.1/2"	65,0	85,5	**3,8**	557	**15,4**	2227	180	410	2,92
10.5162.075	3"	80,0	100,0	**2,9**	418	**11,5**	1670	200	450	3,30
10.5162.100	4"	100,0	121,5	**2,6**	371	**10,2**	1485	290	560	4,75
10.5162.125	5"	125,0	155,0	**2,2**	325	**9,0**	1299	325	710	7,15
10.5162.150	6"	150,0	181,0	**1,6**	232	**6,4**	928	380	815	8,20
10.5162.200	8"	200,0	213,0	**1,3**	186	**5,1**	742	500	1015	13,50
10.5162.250	10"	250,0	285,0	**1,2**	174	**4,8**	696	620	1270	20,40

INNER TUBE: AISI 316L annular corrugated stainless steel
OUTER COVER: two stainless steel AISI 304 braid

SAFETY FACTOR: 4: 1
APPLICATION: steam, chemicals, oxygen, thermofluid, naphta, cryogening

TEMPERATURE RANGE: -200ºC (-328°F) +600ºC (+1112°F)

COUPLINGS: Balflex® Welding Rings serie 31

Balflex®

BRAID 304

10.5140.

Stainless steel braid AISI 304

#	inch	mm	wire diameter mm	nº of wires	carriers	braid angle	braid coverage %	KG kg/m
10.5140.006	1/4"	6,0	0,25	6	24	90	97,5	0,07
10.5140.008	5/16"	8,0	0,25	7	24	90	95,1	0,08
10.5140.010	3/8"	10,0	0,25	8	24	90	94,0	0,10
10.5140.013	1/2"	12,0	0,25	10	24	90	96,3	0,12
10.5140.016	5/8"	16,0	0,30	11	24	90	95,5	0,21
10.5140.020	3/4"	20,0	0,30	9	36	90	96,6	0,25
10.5140.025	1"	25,0	0,30	10	36	90	94,6	0,27
10.5140.032	1.1/4	32,0	0,35	8	48	90	93,1	0,40
10.5140.040	1.1/2"	40,0	0,35	10	48	90	94,4	0,49
10.5140.050	2"	50,0	0,40	11	48	90	95,5	0,73
10.5140.065	2.1/2"	65,0	0,40	11	64	90	95,2	0,92
10.5140.075	3"	80,0	0,40	12	64	90	93,2	1,06
10.5140.100	4"	100,0	0,50	11	64	90	90,3	1,60
10.5140.125	5"	125,0	0,57	10	72	98	87,8	2,22
10.5140.150	6"	150,0	0,57	11	72	98	85	2,49
10.5140.200	8"	200,0	0,67	9	96	102	86,8	4,30
10.5140.250	10"	250,0	0,70	12	96	104	93,7	6,60

INNER TUBE: seamless corrugated polytetrafluorethylene (PTFE)
OUTER TUBE: 1 stainless steel wire braid

SAFETY FACTOR: 4: 1
APPLICATION: steam, chemicals, oxygen, thermofluid, naphta, cryogening

TEMPERATURE RANGE: -200ºC (-328°F) +600ºC (+1112°F)

COUPLINGS: Balflex® Welding Rings serie 31

EXHAUST TUBE

10.5001.

Polygonal stripwound galvanized steel exhaust tube, interlocked, medium pitch

#	inch	mm	mm	thickness of strip mm	thickness of strip inch	width of strip mm	width of strip inch	MIN BEND RAD mm	KG kg/m
10.5001.032	1.1/4"	32,0	35,0	0,30	0,30	16,0	16,0	135	0,07
10.5001.035	1.3/8"	35,0	38,0	0,30	0,30	16,0	16,0	145	0,08
10.5001.040	1.1/2"	40,0	43,5	0,30	0,30	16,0	16,0	165	0,10
10.5001.045	1.3/4"	45,0	48,0	0,30	0,30	16,0	16,0	168	0,12
10.5001.050	2"	50,0	54,5	0,30	0,30	16,0	16,0	170	0,21
10.5001.055	2.3/16"	55,0	59,5	0,30	0,30	16,0	16,0	215	0,25
10.5001.060	2.3/8"	60,0	64,5	0,30	0,30	16,0	16,0	235	0,27
10.5001.065	2.1/2"	65,0	69,5	0,30	0,30	16,0	16,0	245	0,40
10.5001.070	2.3/4"	70,0	74,5	0,30	0,30	16,0	16,0	255	0,49
10.5001.075	3"	75,0	78,5	0,30	0,30	16,0	16,0	265	0,73
10.5001.080	3.3/16"	80,0	83,5	0,30	0,30	16,0	16,0	280	0,92
10.5001.085	3.3/8"	85,0	89,5	0,30	0,30	16,0	16,0	315	1,06
10.5001.090	3.5/8"	90,0	94,5	0,30	0,30	16,0	16,0	350	1,60
10.5001.095	3.3/4"	95,0	100,0	0,40	0,40	24,0	24,0	550	2,22
10.5001.100	4"	100,0	105,0	0,40	0,40	24,0	24,0	555	2,49
10.5001.110	4.3/8"	110,0	115,0	0,40	0,40	24,0	24,0	565	4,30
10.5001.115	4.5/8"	115,0	120,0	0,40	0,40	24,0	24,0	570	6,60
10.5001.120	4.3/4"	120,0	125,0	0,40	0,40	24,0	24,0	575	2,22
10.5001.125	5"	125,0	130,0	0,40	0,40	24,0	24,0	590	2,49
10.5001.130	5.3/16"	130,0	135,0	0,40	0,40	24,0	24,0	625	4,30
10.5001.150	6"	150,0	155,0	0,40	0,40	24,0	24,0	655	6,60

INNER TUBE: galvanized steel medium pitch, polygonal cross-section
OUTER TUBE: 1 stainless steel wire braid

SAFETY FACTOR: 4: 1
APPLICATION: steam, chemicals, oxygen, thermofluid, naphta, cryogening

TEMPERATURE RANGE: -50ºC to +250ºC

VERSIONS: Stainless steel on demand

WELDING RINGS

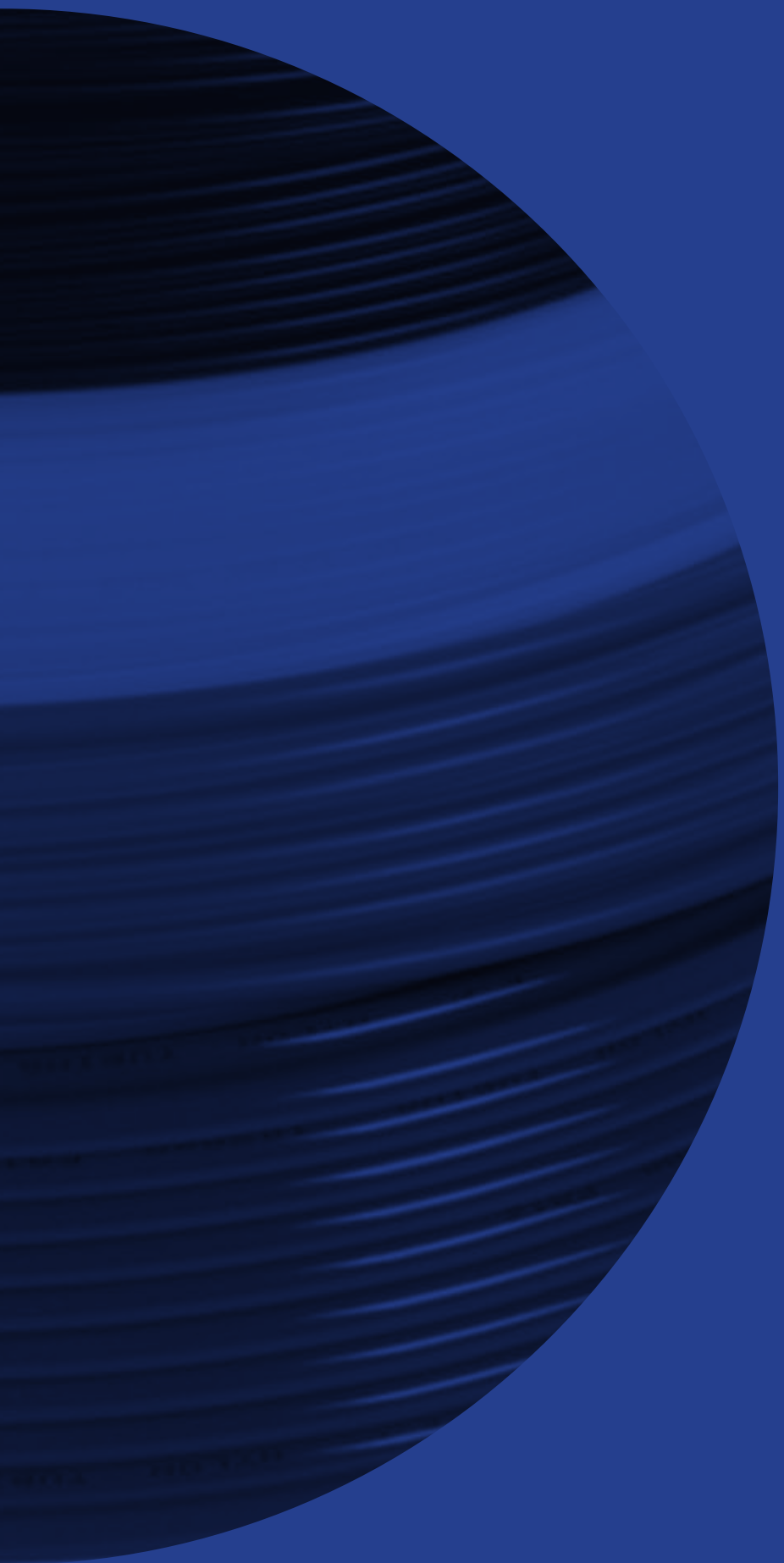
31.00.S

Stainless Steel AISI 304 welding rings for single braind Stainless steel hose

#	inch	mm	mm	mm
31.00.06S	1/4"	11,5	14,5	20,0
31.00.08S	5/16"	14,0	17,0	20,0
31.00.10S	3/8"	16,0	19,0	20,0
31.00.13S	1/2"	18,5	21,5	20,0
31.00.16S	5/8"	23,5	26,5	20,0
31.00.20S	3/4"	28,8	31,8	25,0
31.00.25S	1"	34,5	37,5	30,0
31.00.32S	1.1/4	43,5	46,5	30,0
31.00.40S	1.1/2"	52,0	55,0	35,0
31.00.50S	2"	63,0	66,0	35,0
31.00.65S	2.1/2"	84,0	87,0	40,0
31.00.75S	3"	97,5	100,5	50,0
31.00.100S	4"	120,0	123,0	50,0
31.00.125S	5"	154,0	157,0	50,0
31.00.150S	6"	179,0	182,0	50,0
31.00.200S	8"	229,0	232,0	50,0
31.00.250S	10"	282,0	285,0	50,0

Balflex®

PU-PA Tubing



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PU-PA Tubing

Balflex® Tubing are produced to Balflex® specifications and according to international standards, covering a wide variety of applications, with best chosen high quality grade polymers, for a extensive range of applications.

The Balflex® Tubing range in this catalogue includes:

- Balflex® PU Tubing (Blue Color) - I.D. mm – 12.2020.
- Balflex® PU Tubing (Blue Color) - I.D. inch – 12.2030.
- Balflex® PA6 Tubing (Black Color) - I.D. mm – 12.2000.
- Balflex® PA6 Tubing (Black Color) - I.D. inch – 12.2010.

General Guidelines

Balflex® PU Tubing or Polyurethane Tubing is suitable for pneumatic uses where low temperatures or tight bend radius rule out the more traditional nylon tubing. Blue polyurethane tubing is capable of withstanding higher pressure than the standard version and in addition it has increased shock absorbencies capacity and does not work harden.

Balflex® PA6 Tubing is suitable for automation, tooling, instrumentation, pneumatics, lubricating and low pressure hydraulic lines.

PU TUBING

POLYURETHANE TUBING (98 Shore A) - 12.2020 / 2030

Blue Color, Pu Tubing for automation, robotics, tooling, pneumatics and low pressure hydraulic systems, working temperature: - 35ºC (- 31ºF) to + 80ºC (+ 176ºF)

mm SIZE

#	mm	inch	mm	inch	mm	inch	MPa	PSI	Coil Lenght meter
12.2020.040	4,0	0.16	2,4	0.09	0,8	0.03	**1.2**	174	100
12.2020.044	4,4	0.17	2,8	0.11	0,8	0.03	**1.2**	174	100
12.2020.050	5,0	0.20	3,0	0.12	1,0	0.04	**1.2**	174	100
12.2020.060	6,0	0.24	4,4	0.17	0,8	0.03	**0.6**	87	100
12.2020.061	6,0	0.24	4,0	0.16	1,0	0.04	**1.0**	145	100
12.2020.080	8,0	0.32	6,0	0.24	1,0	0.04	**0.6**	87	100
12.2020.081	8,0	0.32	5,5	0.22	1,25	0.05	**1.0**	145	100
12.2020.082	8,0	0.32	5,0	0.20	1,5	0.06	**1.2**	174	100
12.2020.083	8,3	0.33	5,7	0.22	1,3	0.05	**1.0**	145	100
12.2020.100	10,0	0.39	7,5	0.30	1,25	0.05	**0.6**	87	100
12.2020.101	10,0	0.39	7,0	0.28	1,5	0.06	**1.0**	145	100
12.2020.120	12,0	0.47	9,0	0.35	1,5	0.06	**0.6**	87	50
12.2020.121	12,0	0.47	8,0	0.31	2,0	0.08	**1.0**	145	50
12.2020.140	14,0	0.55	11,0	0.43	1,5	0.06	**0.5**	73	50
12.2020.141	14,0	0.55	10,0	0.39	2,0	0.08	**0.8**	116	50
12.2020.160	16,0	0.63	12,0	0.47	2,0	0.08	**0.8**	116	50
12.2020.180	18,0	0.71	13,0	0.51	2,5	0.10	**0.8**	116	50

BALFLEX - PU - Ø4 X 0.8 mm - WP 1.2 MPa

inch SIZE

#	inch	mm	inch	mm	inch	mm	MPa	PSI	Coil Lenght meter
12.2030.02	1/8"	3,20	0.063	1,60	0.031	0,8	**1.2**	174	100
12.2030.03	3/16"	4,75	0.124	3,15	0.031	0,8	**1.0**	145	100
12.2030.04	1/4"	6,35	0.171	4,35	0.039	1,0	**1.0**	145	100
12.2030.06	3/8"	9,52	0.257	6,52	0.059	1,5	**1.0**	145	100
12.2030.08	1/2"	12,70	0.382	9,70	0.059	1,5	**1.0**	145	50

BALFLEX - PU - Ø1/4" X 0.039in - WP 150 Psi

Balflex®

PA6 Tubing

According to DIN 73378 - 12.2000 / 2010

Black Color, PA6 Tubing for automation, tooling, instrumentation, pneumatics, lubricating and low pressure hydraulic lines, working temperature: - 40ºC (- 40ºF) a + 125ºC (+ 257ºF)

mm SIZE

#	mm	inch	mm	inch	mm	inch	MPa	PSI	Coil Lenght meter
12.2000.040	4,0	0.16	2,4	0.09	0,8	0.03	**3.1**	450	100
12.2000.060	6,0	0.24	4,0	0.16	1,0	0.04	**2.7**	392	100
12.2000.080	8,0	0.31	6,0	0.24	1,0	0.04	**1.9**	276	100
12.2000.100	10,0	0.39	7,0	0.28	1,5	0.06	**2.3**	334	100
12.2000.110	11,0	0.43	8,0	0.31	1,5	0.06	**2.1**	305	100
12.2000.120	12,0	0.47	9,0	0.35	1,5	0.06	**1.9**	276	100
12.2000.140	14,0	0.55	10,4	0.41	1,8	0.07	**1.8**	261	50
12.2000.150	15,0	0.59	11,4	0.45	1,8	0.07	**1.7**	247	50
12.2000.160	16,0	0.63	12,4	0.49	1,8	0.07	**1.6**	232	50

BALFLEX - PA6 - Ø8 X 1 mm - WP 1.9 MPa -

inch SIZE

#	inch	mm	inch	mm	inch	mm	MPa	PSI	Coil Lenght meter
12.2010.02	1/8"	3,20	0.063	1,60	0.031	0,8	**5.0**	725	100
12.2010.03	3/16"	4,75	0.124	3,15	0.031	0,8	**2.7**	392	100
12.2010.04	1/4"	6,35	0.171	4,35	0.039	1,0	**2.4**	348	100
12.2010.06	3/8"	9,52	0.257	6,52	0.059	1,5	**2.4**	348	100
12.2010.08	1/2"	12,70	0.382	9,70	0.059	1,5	**1.7**	247	100

BALFLEX - PA6 - Ø 3/8" X 0.059 in - WP 360 Psi -

PVC Hoses

pag. 136 **BALCRISTAL FOOD QUALITY**

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PVC Hoses

*The range of **Balflex®** PVC Hoses, manufactured according to **Balflex®** specifications compreends a wide variety of braid and spiral hoses (PVC rigid spiral wound and steel spiral wound to meet different applications).*

Balflex® optimized the production of these hoses and their compatibility with a wide range of fluids so as to assure a more extensive and complete offer. All the Balflex® PVC hoses are made from the best quality compound with virgin raw material so as to assure the best performance.

The program of Balflex® PVC hoses includes :

- Braided PVC Hoses
- Spiral PVC Hoses

Generalities about PVC hoses

Fluid compatibility: It is necessary to verify the fluid compatibility with the hose. A fluid that chemically attacks the hose can lead to contamination and obstruction of the equipment elements and to an early failure of the hose. The presence of gases requires special attention. The table of chemical resistance indicates the PVC compatibility with some fluids. Refer to Balflex® for the compatibility of other fluids. In case of doubt it is recommended a previous test.

Temperature: Excessive temperature is one of the PVC considerable restrictions, which provokes its accelerated aging. The fluid temperature, either functioning or not, it must not exceed the maximum functioning temperature indicated for the PVC of + 55ºC (+ 131ºF). It is also necessary to pay attention to the room temperature, mainly the one that results from heat sources in the proximity of the flexible.

Generalities about PVC

The letters PVC are the initials of PolyVinylChloride or Polyvinyl Chloride, PVC has as the main raw material the sodium chloride (kitchen salt), which is present in underground mines (mineral salt) and in unlimited amounts in the sea. It corresponds to 57% of its composition. The remaining 43% come from oil derived or alternatively from other sources such as calcium carbide and sugar cane.

The chlorine is obtained from sea-salt (sodium chloride) through electrolysis process. The electrolysis is a process that separates the chemical elements of a compound through the use of electricity. In a summarized way, first the decomposition is proceeded (ionization or disassociation) of the ions compound and, after that, with the passage of a continuous current through these ions, chemical elements are obtained. In many cases, depending on the substance to be electrolyzed and the means where it occurs, besides forming elements the formation of new compounds also occurs. The electrolysis process is a reaction to oxidoreduction opposite to the one that occurs in an electrolytic cell, being, thus, a non-spontaneous physic-chemical phenomenon.

To turn PVC resin into hose, it is necessary the mixture of several additives that will give each hose the appropriate characteristics to each application. The most used additives in PVC compounds for the hose manufacturing are the plastifiers, the thermal stabilizer, the pigments, the impact modifiers, the charges and the processing auxiliaries.

PVC, which is inactive, is one of the materials that present better resistance to the sterilization methods (vaporization, oxide of ethylene or gamma rays). PVC can be manufactured in every color by the addition of pigments, which make easier the identification of the hoses according to the use they are intended for. PVC is a product that can be considered ecological because it is 100% recyclable.

PVC Chemical Resistance Chart

Recommended | Recommended with Restrictions | Not Recommended | Non Toxic | OQ

Chemical	Concentration	TEMPERATURE 20o C	55o C
Acetate Solvents		Not Recommended	Not Recommended
Acetic Acid	10%	Recommended	Recommended with Restrictions
Acetic Acid	glacial	Recommended with Restrictions	Not Recommended
Acetone		Not Recommended	Not Recommended
Acrlylonitrile		Recommended	Recommended with Restrictions
Adipic Acid		Recommended	Recommended with Restrictions
Alcohol Butyl		Recommended	Recommended with Restrictions
Alcohol Ethyl		Recommended	Recommended with Restrictions
Alcohol Isorpopyl		Recommended	Recommended with Restrictions
Alcohol Methyl		Recommended	Recommended with Restrictions
Alcohol Acetate		Recommended	
Aluminium Choloride		Recommended	Recommended
Aluminium Hydroxide		Recommended	
Aluminium Sulfate		Recommended	Recommended
Allyl Chloride			
Ammonia	0.88 S.G. (Aqueous)	Recommended	Recommended
Ammonia	dry gas	Recommended	
Ammonia	liquid	Not Recommended	Not Recommended
Ammonium Chloride		Recommended	Recommended
Ammonium Hydroxide		Recommended	
Animal Oils			
Amyl Acetae		Not Recommended	Not Recommended
Aniline Oils			
Aromatic Hydrocarbons		Not Recommended	Not Recommended
Asphalt		Not Recommended	Not Recommended
ASTM Fuel A		Recommended	Recommended
ASTM Fuel B		Not Recommended	Not Recommended
ASTM # 1 Oil			
ASTM # 3 Oil			
Barium Chloride		Recommended	Recommended
Barium Hydroxide		Recommended	Recommended
Barium Sulfide		Recommended	Recommended

Chemical	Concentration	TEMPERATURE 20o C	55o C
Benzene		Not Recommended	Not Recommended
Benzine		Recommended with Restrictions	Recommended with Restrictions
Bordeaux Mixture		Recommended	Recommended
Borax		Recommended	Recommended
Boric Acid		Recommended	Recommended
Brine		Recommended	Recommended
Bromine Traces		Not Recommended	Not Recommended
Butyl Acetate		Not Recommended	Not Recommended
Calcium Hydroxide		Recommended	Recommended
Calcium Hypochloride		Recommended	Recommended
Carbonic Acid		Recommended with Restrictions	Not Recommended
Carbon Dioxide		Recommended	Recommended
Carbon Disulphite		Not Recommended	Not Recommended
Carbon Monoxide		Recommended	Recommended
Carbon Tetrachloride		Not Recommended	Not Recommended
Casein		Recommended	Recommended with Restrictions
Chlorine	dry gas	Recommended	Recommended
Chlorine	wet gas	Recommended with Restrictions	Not Recommended
Chlorine	water	Not Recommended	Not Recommended
Chlorobenzene		Not Recommended	Not Recommended
Chlorinated Hydrocarbons		Not Recommended	Not Recommended
Chloroform		Not Recommended	Not Recommended
Chromic Acid	10%	Recommended	Recommended with Restrictions
Citric Acid		Recommended	Recommended
Coal Tar		Not Recommended	Not Recommended
Copper Chloride		Recommended	Recommended
Copper Nitrate		Recommended	Recommended
Copper Sulphate		Recommended	Recommended
Cottonseed Oil			
Creosote		Not Recommended	Not Recommended
Cresol		Recommended	Recommended with Restrictions
Cresylic Acid		Not Recommended	Not Recommended

Chemical	Concentration	TEMPERATURE 20o C	55o C
Cyclohexane		🟢	🟡
Cyclohexanone		🔴	🔴
DDT Weed Killer		🟢	🟡
Detergent Synthetic		🟢	🟢
Developers Photographic		🟢	🟢
Dextrin		🟢	🟢
Dextrose		🟢	🟢
Dibutyl Phthalate		🔴	🔴
Dichlorobenzene		🔴	🔴
Diesel Oil		⚪	⚪
Diethylene Glycol		🟢	🟢
Diethyl Ether		🔴	🔴
Di-isodecyl Phthalate		🔴	🔴
Dicotyl Phthalate		🔴	🔴
Emulsifiers		🟢	🟢
Emulsions Photographic		🟢	🟢
Ethyl Acetate		🔴	🔴
Ethylene Dichloride		🔴	🔴
Ethylene Glycol		🟢	🟢
Fatty Acid		🟢	🟢
Ferric Chloride		🟢	🟢
Ferric Sulphate		🟢	🟢
Ferrous Chloride		🟢	🟢
Ferrous Sulphate		🟢	🟢
Fixing Solution Photografic		🟢	🟢
Fluorine		🟢	🟢
Formaldehyde	40%	🔴	🔴
Formic Acid	40%	🟢	🟢
Formic Acid	50%	🟡	🔴
Formic Acid	100%	🔴	🔴
Fuel Oil		⚪	⚪
Glacial Acetic Acid		🟡	🔴
Glucose		🟢	🟢
Glycerine		🟢	🟢
Grape Sugar		🔵	🔵
Grease			

Chemical	Concentration	TEMPERATURE 20o C	55o C
Heptane		🟡	🔴
Hexane		🔴	🔴
Hydrobromic Acid		🟢	🟢
Hydrochloric Acid	10%	🟢	🟢
Hydrochloric Acid	40%	🟢	🔴
Hydrofluoric Acid	10%	🟢	🟡
Hydrofluoric Acid	40%	🟢	🔴
Hydrofluoric Acid		🟢	🟢
Hydrofluosilicic Acid		🟢	🟢
HydrogenPeroxide		🟢	
Hydrogen Sulphide		🟢	
Iso-octan		🟢	🟡
Isopropyl Acetate		🔴	🔴
Kerosene		🟡	🟡
Ketones		🔴	🔴
Lactic Acid	10%	🟢	
Lactic Acid	100%	🔴	🔴
Lacquer Solvents		🟡	🔴
Linseed Oils			
Magnesium Chloride		🟢	🟢
Magnesium Hydroxide		🟢	🟢
Magnesium Sulphate		🟢	🟢
Malic Acid		🟢	🟢
Methyl Acetate		🔴	🔴
Methyl Bromide		🔴	🔴
Methyl Ethyl Ketone		🔴	🔴
Methylene Chloride		🔴	🔴
Mineral Oils			
Monochlorobenzene		🔴	🔴
Naphtha		🔴	🔴
Naphthalene		🟡	🔴
Nitric Acid	70%	🟢	🟢
Nitric Acid	40%	🟢	🟡
Nitric Acid	70%	🔴	🔴
Nitrobenzene		🔴	🔴
Nitrogen Fertilizers		🟢	

Chemical	Concentration	TEMPERATURE 20o C	55o C
Oleic Acid		🟢	🟡
Oxalic Acid		🟢	🟢
Palmitic Acid		🟢	🟢
Paraffin		🟢	🟢
Pentane		🟡	🔴
Perchloroethylene		🔴	🔴
Phenol		🟡	🔴
Phosphoric Acid		🟢	🟢
Pitch		🟢	🟡
Potassium Hydroxide		🟢	🟢
Propane		🟢	🟢
Sea Water		🟢	🟢
Sodium Hydroxide (caustic soda)	10%	🟢	🟢
Sodium Hydroxide (caustic soda)	50%	🟢	🟡
Sodium Cyanide		🟢	🟢
Soybean Oil			
Stearic Acid		🟢	🟢
Styrene		🔴	🔴
Sulphur Dioxide	dry	🟢	🟢
Sulphur Dioxide	moist	🟡	🔴
Sulphur Dioxide	liquid	🔴	🔴
Sulphuric Acid	45%	🟢	🟢
Sulphuric Acid	60%	🟡	🟡
Sulphuric Acid	98%	🔴	🔴
Sulphurous Acid	30%	🟢	
Tannic Acid		🟢	🟢
Tartaric Acid		🟢	🟢
Tetrahydrofuran		🔴	🔴
Toluene		🔴	🔴
Trichlorethylene		🔴	🔴
Triethanolamine		🟢	🟢
Tricresyl Phosphate		🔴	🔴
Turpentine		🟡	🔴
Urea		🟢	🟢
Vinegar		🟢	🟢
Vinyl Acetate		🔴	🔴

Chemical	Concentration	TEMPERATURE 20o C	55o C
Vinyl Chloride		🔴	🔴
Water		🟢	🟢
Wine		🔵	🔵
Xylene		🔴	🔴
Zinc Chloride		🟢	🟢
Zinc Sulphate		🟢	🟢

These chart informations are based on Balflex® knowledgement and experience and is intended as a guide and not as a guarantee. We cannot assure the perfect performance of the hoses as that depends on many factors as working pressure, pressure picks, fluid, ambient temperature, fluid temperature, concentration, duration of exposure, etc...

🔵 Recommended the use of Balflex® Food Quality Hoses as Balsteel (12.1227) and QA (12.9050)

⚪ Recommended Balflex® OQ (12.9010)

BALCRISTAL FOOD QUALITY

12.1010.

Low pressure, textile braid reinforced, non-toxic, odor and tasteless, food-quality PVC water hose

#	inch	SAE Dash	mm	mm	MPa	PSI	MPa	PSI	kg/m
12.1010.06	1/4"	-4	6,4	11,0	**10,0**	145	**30,0**	435	0,04
12.1010.08	5/16"	-5	7,9	13,0	**10,0**	145	**30,0**	435	0,10
12.1010.10	3/8"	-6	9,5	15,0	**8,0**	116	**24,0**	348	0,13
12.1010.12	1/2"	-8	12,7	17,0	**7,0**	101	**20,9**	303	0,15
12.1010.16	5/8"	-10	15,8	21,0	**7,0**	101	**20,9**	303	0,20
12.1010.19	3/4"	-12	19,1	25,0	**6,0**	87	**18,0**	261	0,26
12.1010.25	1"	-16	25,4	32,0	**5,0**	73	**15,1**	219	0,41
12.1010.32	1.1/4"	-20	32,0	42,0	**4,0**	58	**12,0**	174	0,70
12.1010.38	1.1/2"	-24	38,0	48,0	**4,0**	58	**12,0**	174	

INNER TUBE: transparent PVC, highly flexible, resistant to abrasion, non-toxic, food quality

INTERNAL SURFACE: smooth, passage facilitator
REINFORCEMENT: 1 braid of high tensile synthetic yarn

OUTER TUBE: transparent PVC, highly flexible, resistant to ozone, UV rays and to abrasion
COLOR: transparent crystal

SAFETY FACTOR: 3:1
APPLICATION: food industry
TEMPERATURE RANGE: -10ºC (+14ºF) +55ºC (+131ºF)

BALFLEX BALCRISTAL NON TOXIC - 6 X 11 mm - WP 10 Bar / 145 PSI

BALCRISTAL AIR & WATER

12.1030.

PVC Flexible Hose for Air & Water 225 PSI

#	inch	SAE Dash	mm	mm	MPa	PSI	MPa	PSI	kg/m
12.1030.04	1/4"	-4	6,4	10,8	**15,5**	225	**46,6**	675	0,08
12.1030.05	5/16"	-5	7,9	12,8	**15,5**	225	**46,6**	675	0,10
12.1030.06	3/8"	-6	9,5	15,0	**15,5**	225	**46,6**	675	0,14
12.1030.08	1/2"	-8	12,7	18,0	**15,5**	225	**46,6**	675	0,16
12.1030.10	5/8"	-10	15,8	21,3	**10,3**	150	**31,0**	450	0,20
12.1030.12	3/4"	-12	19,1	25,0	**10,3**	150	**31,0**	450	0,26
12.1030.16	1"	-16	25,4	32,6	**10,3**	150	**31,0**	450	0,42

INNER TUBE: transparent PVC, highly flexible, resistant to abrasion
INTERNAL SURFACE: smooth, passage facilitator

REINFORCEMENT: 1 braid of high tensile synthetic yarn
OUTER TUBE: transparent PVC, highly flexible, resistant to ozone, UV rays and to abrasion

COLOR: transparent crystal
COIL LENGHT: 50 / 100 meters
SAFETY FACTOR: 3 : 1
TEMPERATURE RANGE: -10ºC (+14ºF) +55ºC (+131ºF)

APPLICATION: industrial services of air and water, in compressors, pneumatic facilities, washing services and water or air conduction where it is important the visual follow-up of the operations

BALFLEX BALCRISTAL AIR &WATER - 10 X 15 mm - WP 15.5 Bar / 225 PSI

BALSTEEL SUCTION & DELIVERY NON-TOXIC

12.1227.

Flexible Hose of PVC Reinforced with Steel Spiral

#	inch	mm	mm	MPa	PSI	KG kg/m
12.1227.012	1/2"	12,0	18,0	**6,9**	100	0,19
12.1227.014	9/16"	14,0	20,0	**5,9**	85	0,21
12.1227.016	5/8"	16,0	23,0	**5,9**	85	0,23
12.1227.018	11/16"	18,0	25,0	**5,9**	85	0,27
12.1227.020	3/4"	20,0	27,0	**4,8**	70	0,31
12.1227.022	7/8"	22,0	29,0	**4,8**	70	0,50
12.1227.025	1"	25,0	33,0	**4,8**	70	0,39
12.1227.030	1.3/16"	30,0	39,0	**4,1**	60	0,55
12.1227.032	1.1/4"	32,0	41,0	**4,1**	60	0,68
12.1227.035	1.3/8"	35,0	44,5	**4,1**	60	0,76
12.1227.038	1.1/2"	38,0	47,0	**4,1**	60	0,90
12.1227.040	1.9/16"	40,0	49,5	**2,8**	40	0,90
12.1227.045	1.3/4"	45,0	55,0	**2,8**	40	0,90
12.1227.050	2"	50,0	60,0	**2,8**	40	1,22
12.1227.060	2.3/8"	60,0	72,0	**2,0**	29	1,50
12.1227.070	3.3/4"	70,0	83,0	**2,0**	29	1,95
12.1227.075	3"	76,0	89,0	**1,4**	20	2,40
12.1227.080	3.1/4"	80,0	94,0	**2,0**	29	2,65
12.1227.090	3.1/2"	90,0	101,0	**2,0**	29	2,80
12.1227.100	4"	102,0	114,0	**2,0**	29	3,00

INNER TUBE: PVC, highly flexible, resistant to abrasion, weather and UV rays
INTERNAL SURFACE: smooth, passage facilitator

REINFORCEMENT: 1 wire helix of galvanized steel of high resistance
COLOR: transparent crystal

SAFETY FACTOR: 3:1
TEMPERATURE RANGE: -10ºC (+14ºF) +55ºC (+131ºF)

APPLICATION: food industry, water pumps, agriculture, fiber impulsion

BALFLEX BALSTEEL - FOOD QUALITY - S & D - 25 X 32mm - BP 5 Bar / 70 PSI

Balflex®

BALFLAT 0.4MPa

12.1040.

Flat PVC Hose for Water and Pesticides

#	inch	mm	mm	MPa	PSI	MPa	PSI	kg/m
12.1040.025	1"	25,0	28,0	**4,0**	60	**12,0**	180	0,15
12.1040.032	1.1/4"	32,0	35,0	**4,0**	60	**12,0**	180	0,17
12.1040.040	1.1/2"	38,0	41,0	**4,0**	60	**12,0**	180	0,20
12.1040.050	2"	51,0	54,0	**4,0**	60	**12,0**	180	0,22
12.1040.060	2.1/2"	63,0	67,5	**4,0**	60	**12,0**	180	0,30
12.1040.075	3"	76,0	80,0	**4,0**	60	**12,0**	180	0,36
12.1040.100	4"	102,0	106,0	**4,0**	60	**12,0**	180	0,56
12.1040.125	5"	127,0	132,0	**4,0**	60	**12,0**	160	0,75
12.1040.150	6"	152,0	157,0	**4,0**	60	**12,0**	160	0,90
12.1040.200	8"	204,0	209,0	**4,0**	60	**12,0**	150	1,60

INNER TUBE: PVC compound resistant to pesticides
INTERNAL SURFACE: smooth, passage facilitator

REINFORCEMENT: braid of reinforced polyester
OUTER TUBE: PVC compound, resistant to ozone, UV rays and to abrasion

COLOR: black inner tube / blue outer tube
COIL LENGHT: 100 meters
APPLICATION: construction and irrigation in the agriculture. Excellent resistance to pesticides

TEMPERATURE RANGE: -10ºC (+14ºF) +55ºC (+131ºF)

BALFLEX BALFLAT - DN50 - 2" - WP 4 Bar / 60 PSI

BALFLAT 0.6MPa

12.1041.

Flat PVC Hose for Water and Pesticides

#	inch	mm	mm	MPa	PSI	MPa	PSI	kg/m
12.1041.025	1"	0,17	270	**6,0**	90	**18,0**	270	0,17
12.1041.032	1.1/4"	0,20	270	**6,0**	90	**18,0**	270	0,20
12.1041.040	1.1/2"	0,25	270	**6,0**	90	**18,0**	270	0,25
12.1041.050	2"	0,28	270	**6,0**	90	**18,0**	270	0,28
12.1041.060	2.1/2"	0,38	270	**6,0**	90	**18,0**	270	0,38
12.1041.075	3"	0,46	270	**6,0**	90	**18,0**	270	0,46
12.1041.100	4"	0,80	260	**6,0**	90	**18,0**	260	0,80
12.1041.125	5"	1,00	260	**6,0**	90	**18,0**	260	1,00
12.1041.150	6"	1,30	250	**6,0**	90	**18,0**	250	1,30
12.1041.200	8"	1,80	240	**6,0**	90	**18,0**	240	1,80

INNER TUBE: PVC compound resistant to pesticides
INTERNAL SURFACE: smooth, passage facilitator

REINFORCEMENT: braid of reinforced polyester
OUTER TUBE: PVC compound, resistant to ozone, UV rays and to abrasion

COLOR: black inner tube / blue outer tube
COIL LENGHT: 100 meters
TEMPERATURE RANGE: -10ºC (+14ºF) +55ºC (+131ºF)

APPLICATION: construction and irrigation in the agriculture. Excellent resistance to pesticides

BALFLEX BALFLAT - DN50 - 2" - WP 6 Bar / 90 PSI

Balflex®

FLATDRILL 10 AIR & WATER

10.3030.

Very light weight – very easy to handle. FLAT Air & Water 1.0MPa / 150PSI

#	inch	SAE Dash	mm	mm	MPa	PSI	MPa	PSI	kg/m
10.3030.12	3/4"	-12	19,0	23,0	**1,4**	200	**4,2**	600	0,24
10.3030.16	1"	-16	25,0	29,0	**1,4**	200	**4,2**	600	0,29
10.3030.24	1.1/2"	-20	40,0	44,0	**1,0**	150	**3,0**	450	0,30
10.3030.32	2"	-32	50,8	54,8	**1,0**	150	**3,0**	450	0,43
10.3030.40	2.1/2"	-40	65,0	69,0	**1,0**	150	**3,0**	450	0,59
10.3030.48	3"	-48	76,2	82,2	**1,0**	150	**3,0**	450	0,68
10.3030.64	4"	-64	101,6	107,6	**1,0**	150	**3,0**	450	0,93
10.3030.80	5"	-80	127,0	133,0	**1,0**	150	**3,0**	450	1,40
10.3030.96	6"	-96	152,4	160,4	**1,0**	150	**3,0**	450	1,59
10.3030.128	8"	-128	208,0	216,0	**1,0**	150	**3,0**	450	2,36

INNER TUBE: yellow or black PVC / nitrile rubber compound
REINFORCEMENT: high tenacity polyester jacket

OUTER TUBE: black or yellow PVC / nitrile rubber compound
SAFETY FACTOR: 3 : 1

TEMPERATURE RANGE: -25ºC (-13ºF) +80ºC (+176ºF)

APPLICATION: air and water in mining and construction. Contractors for sludge / slurry injection. Resistant to hydrocarbon

BALFLEX FLATDRILL 10 - AIR & WATER - DN75 - 3" - WP 1 MPa / 150 PSI - BS 6391

FLATDRILL 15 AIR & WATER

10.3040.

Very light weight – very easy to handle higher level of NBR in the compound.
FLAT Air & Water 1.0MPa / 150PSI

#	inch	SAE Dash	mm	mm	MPa	PSI	MPa	PSI	kg/m
10.3040.12	3/4"	-12	19,0	23,0	**1,4**	200	**4,2**	600	0,24
10.3040.16	1"	-16	25,0	29,0	**1,4**	200	**4,2**	600	0,29
10.3040.24	1.1/2"	-20	40,0	44,0	**1,0**	150	**3,0**	450	0,30
10.3040.32	2"	-32	50,8	54,8	**1,0**	150	**3,0**	450	0,43
10.3040.40	2.1/2"	-40	65,0	69,0	**1,0**	150	**3,0**	450	0,59
10.3040.48	3"	-48	76,2	82,2	**1,0**	150	**3,0**	450	0,68
10.3040.64	4"	-64	101,6	107,6	**1,0**	150	**3,0**	450	0,93
10.3040.80	5"	-80	127,0	133,0	**1,0**	150	**3,0**	450	1,40
10.3040.96	6"	-96	152,4	160,4	**1,0**	150	**3,0**	450	1,59
10.3040.128	8"	-128	208,0	216,0	**1,0**	150	**3,0**	450	2,36

INNER TUBE: black or yellow nitrile rubber compound
REINFORCEMENT: high tenacity polyester jacket

OUTER TUBE: black or yellow nitrile rubber compound
SAFETY FACTOR: 3:1

APPLICATION: air and water in mining and construction. Contractors for sludge / slurry injection. Resistant to hydrocarbon.

TEMPERATURE RANGE: -25ºC (-13ºF) +80ºC (+176ºF)

BALFLEX FLATDRILL 15 - AIR & WATER - DN51 - 2" - WP 1 MPa / 150 PSI - BS 6391

Balflex®

FLATDRILL 20 AIR & WATER

10.3050.

Very light weight – very easy to handle. Higher level of NBR in the compound.

#	inch	SAE Dash	mm	mm	MPa	PSI	MPa	PSI	kg/m
10.3050.12	3/4"	-12	19,0	24,0	**2,0**	300	**6,0**	900	0,17
10.3050.16	1"	-16	25,0	32,0	**2,0**	300	**6,0**	900	0,21
10.3050.24	1.1/2"	-24	40,0	45,1	**2,0**	300	**6,0**	900	0,44
10.3050.32	2"	-32	50,8	57,8	**2,0**	300	**6,0**	900	0,65
10.3050.40	2.1/2"	-40	65,0	72,0	**2,0**	300	**6,0**	900	0,73
10.3050.48	3"	-48	76,2	83,2	**1,7**	250	**5,1**	750	0,93
10.3050.64	4"	-64	101,6	109,6	**1,4**	200	**4,2**	600	1,14
10.3050.80	5"	-80	127,0	135,0	**1,0**	150	**3,0**	450	1,57
10.3050.96	6"	-96	152,4	160,4	**1,0**	150	**3,0**	450	2,00
10.3050.128	8"	-128	208,0	216,0	**1,0**	150	**3,0**	450	2,36

INNER TUBE: yellow or black nitrile rubber compound
REINFORCEMENT: high tenacity polyester jacket

OUTER TUBE: yellow or black nitrile rubber compound
SAFETY FACTOR: 3:1

APPLICATION: air and water in mining and construction. Contractors for sludge / slurry injection. Resistant to hydrocarbon

TEMPERATURE RANGE: -25ºC (-13ºF) +80ºC (+176ºF)

BALFLEX FLATDRILL 20 - AIR & WATER - DN51 - 2" - WP 2 MPa / 300 PSI - BS 6391

AIRPRESSOR AIR & WATER

10.1234.

Flexible hose of PVC compound for air & water 300 PSI

#	inch	SAE Dash	mm	mm	MPa	PSI	MPa	PSI	kg/m
10.1234.04	1/4"	-4	6,4	12,2	**2,0**	300	**6,0**	900	0,11
10.1234.05	5/16"	-5	7,9	14,0	**2,0**	300	**6,0**	900	0,13
10.1234.06	3/8"	-6	9,5	15,7	**2,0**	300	**6,0**	900	0,16
10.1234.08	1/2"	-8	12,7	18,5	**2,0**	300	**6,0**	900	0,18
10.1234.10	5/8"	-10	15,8	22,5	**2,0**	300	**6,0**	900	0,30
10.1234.12	3/4"	-12	19,1	26,0	**2,0**	300	**6,0**	900	0,29
10.1234.16	1"	-16	25,4	33	**2,0**	300	**6,0**	900	0,47

INNER TUBE: black PVC compound, highly flexible, resistant to abrasion
INTERNAL SURFACE: smooth, passage facilitator

REINFORCEMENT: 1 braid of high tensile synthetic yarn
OUTER TUBE: black PVC compound, resistant to ozone, UV rays and to abrasion

COIL LENGHT: 50 / 100 meters
SAFETY FACTOR: 3 : 1
TEMPERATURE RANGE: -10ºC (+14ºF) +55ºC (+131ºF)

APPLICATION: industrial services of air and water, in compressors, pneumatic facilities, washing services and for water and air conduction

BALFLEX AIRPRESSOR AIR & WATER - 3/8" - 10 X 16 mm - WP 2 MPa / 300 PSI

AUTOWASH CAR WASH

10.1223.

Flexible Hose of PVC compound with 2 braids Car Wash 1160PSI

#	inch	SAE Dash	mm	mm	MPa	PSI	MPa	PSI	kg/m
10.1223.08	1/2"	- 8	12,7	24,0	**8.0**	1160	**24.0**	3480	0,5

INNER TUBE: PVC compound, highly flexible, resistant to abrasion
INTERNAL SURFACE: smooth, passage facilitator

REINFORCEMENT: 2 braids of high tensile synthetic yarn
OUTER TUBE: PVC compound, highly flexible, resistant to ozone, UV rays and to abrasion

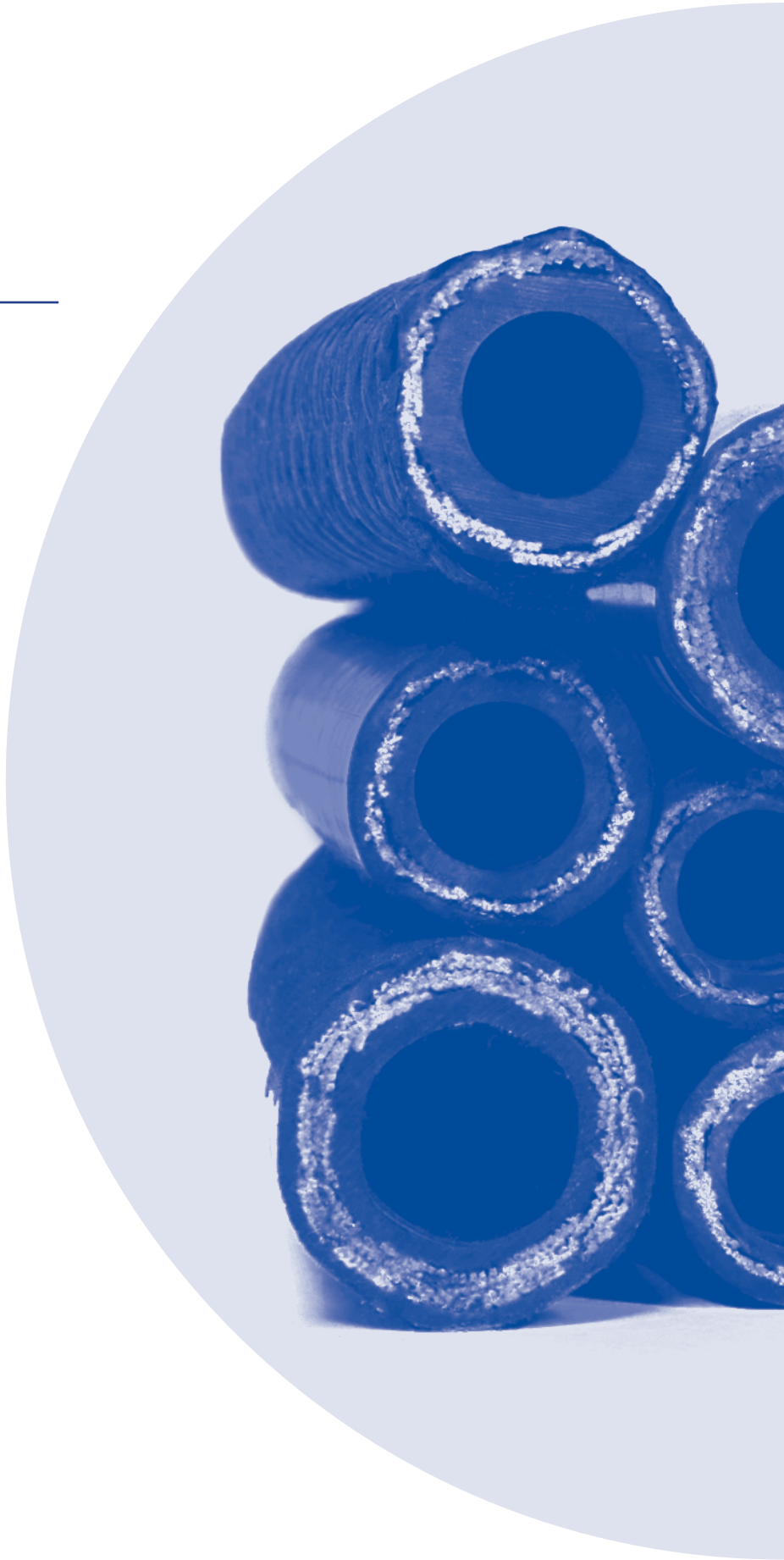
COLOR: black inner tube / blue outer tube
COIL LENGHT: 50 / 100 meters
SAFETY FACTOR: 3 : 1

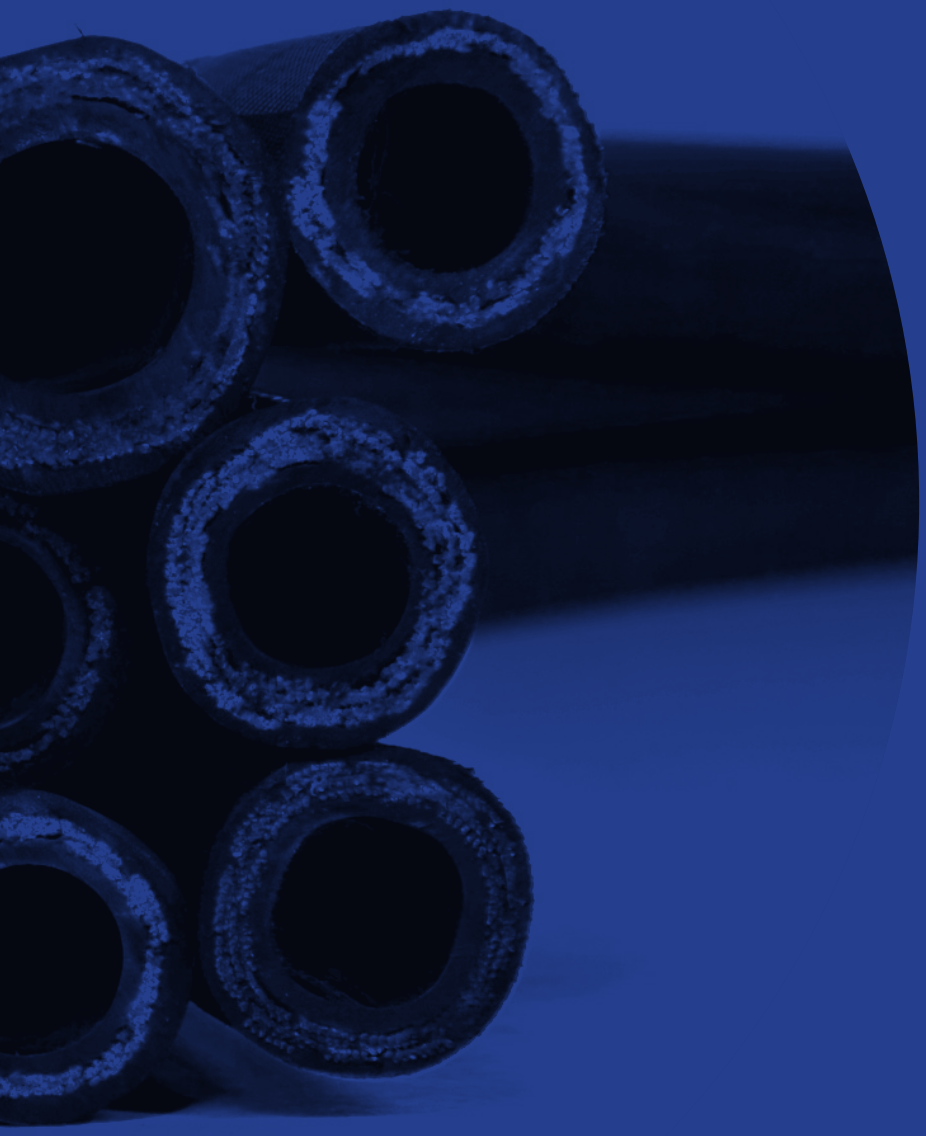
TEMPERATURE RANGE: -10ºC (+14ºF) +55ºC (+131ºF)
APPLICATION: car washing services or industrial pressure washing

BALFLEX AUTOWASH - DN12 - 1/2" - WP 8 MPa / 1160 PSI

Balflex®

Appendix





Selection of hydraulic hoses

Working pressure

When selecting a hose it should be considered that it's working pressure should be higher than the maximum operating pressure of the system. For determination of the maximum operating pressure the system engineer should always consider possible pressure peaks during start up and inversion. Pressure peaks may be so short that they are only measurable with electronic devices. In suction applications, the capacity of the hose to withstand negative pressure is a decisive factor. Working pressures are given for working temperature of + 20ºC (+ 68ºF). For increased temperatures a de-rating factor should be considered. The rated working pressures of Balflex® hydraulic hoses are summarized in table 1.

NOTE: Only an accurate knowledge of the pressure history of the service cycles of the equipment should lead to a sub-dimensioning of the hose by the engineer, bearing in mind the recommendations of SAE J 1927 standards.

Temperature

Excessive temperature is one of the main limitations of rubber and induces accelerated aging. Fluid temperature, either in motion or with the equipment stopped, should not exceed the maximum working temperature recommended for each hose. Likewise, surrounding temperature should be considered, specially when resulting from heat sources in the proximity of the hose assembly.

Air and Gaseous applications

Hose assemblies that are to be used in air and other gaseous applications shoud be pin-pricked, through the cover, prior to use.

These micro perforations allow gas that has permeated the inner tube of the hose to escape into the atmosphere. This prevents gases from accumulating and blistering the hose cover.

Fluid compatibility

Fluid compatibility with the hose and the coupling should be verified. Fluids that chemically attack the hose can lead to the contamination and obstruction of the hydraulic system and to premature failure of the hose. Handling gases requires special attention. As an orientation, the **Balflex®** Hydraulic Hose Fluid Compatibility Chart gives a classification of compatibility with some fluids. Consult **Balflex®** for compatibility of other fluids and rubber compounds. Whenever in doubt test before application.

Assembly geometry

Installation should guarantee that the minimum bend radius of the hose is respected and that bending occurs only in one plane. Hose length may suffer a variation between – 4% and + 2%, when submitted to pressure. The assembly length should provide enough margin for this change in length. Torsion and traction of the assembly must be avoided and protection and restrain of the assembly should be considered if there are obstacles to avoid. Mechanical loads acting on the assembly, including vibration, should be kept at a minimum. Free swivelling connectors should be used whenever torsion is present. Whenever hose failure may result in whipping (for example in gas applications) restraint through a steel cable to the connecting parts should be considered. When connecting a moving part, the free movement of the assembly without touching any surface should be assured. Positioning of the assembly should consider that risks of bodily injure and equipment damage through spillage or fluid ejection are minimized. Table 4 shows some correct and incorrect installation situations.

Permeability

All hoses present a certain degree of permeability, especially with gases and highly volatile liquids. The designer should consider the possibility that this permeability results in system or environment contamination.

Environmental compatibility

The hose and couplings compatibility with the working environment factors, as temperature, fire hazard, UV light, ozone, chemicals and electrical charges should be considered. External protection sleeves require an adequate assembly.

Dimensioning

Dimensioning of all components should guarantee that pressure loss is kept at a minimum, in order not to reduce power transmission and to avoid overheating or turbulence of the fluid that might lead to deterioration of the lining.

Electrical conductivity

To minimize the risk of Explosion or Eletrocution from electrical discharge through the assembly due to static electricity build up or non-conductivity. Whenever the hose is not unequivocally branded either non-conductive or anti-static, its electrical characteristics should always be considered as not controlled.

Abrasion

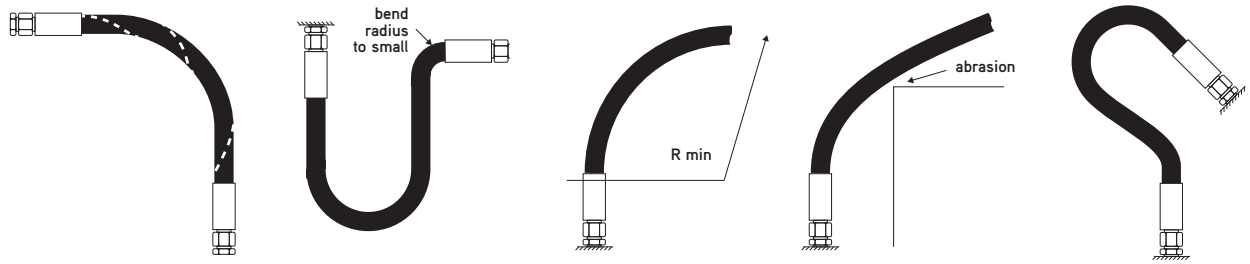
Accelerated external abrasion, through contact in motion or exposure to projected particles reduces drastically hose life and leads to premature failure through exposure of the reinforcement. For special applications Balflex® recommends hoses with special abrasion resistant rubber compounds or protection through adequate sleeves.

Couplings selection

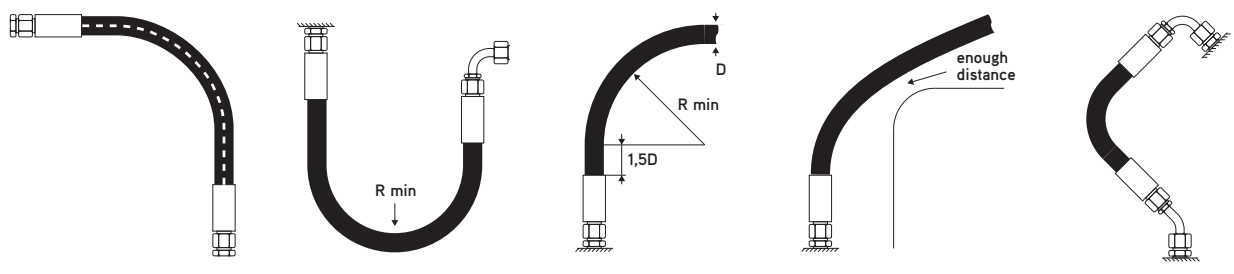
Couplings are a fundamental part of the geometry of hose assemblies. The compatibility of sealing and securement of the couplings to the system ports should be verified. The recommended coupling series for each hose should be used and the assembly instructions carefully followed. Inadequate couplings may damage the hose and lead to a premature failure.

Table 4: Examples of installation of hoses assemblies

Incorrect

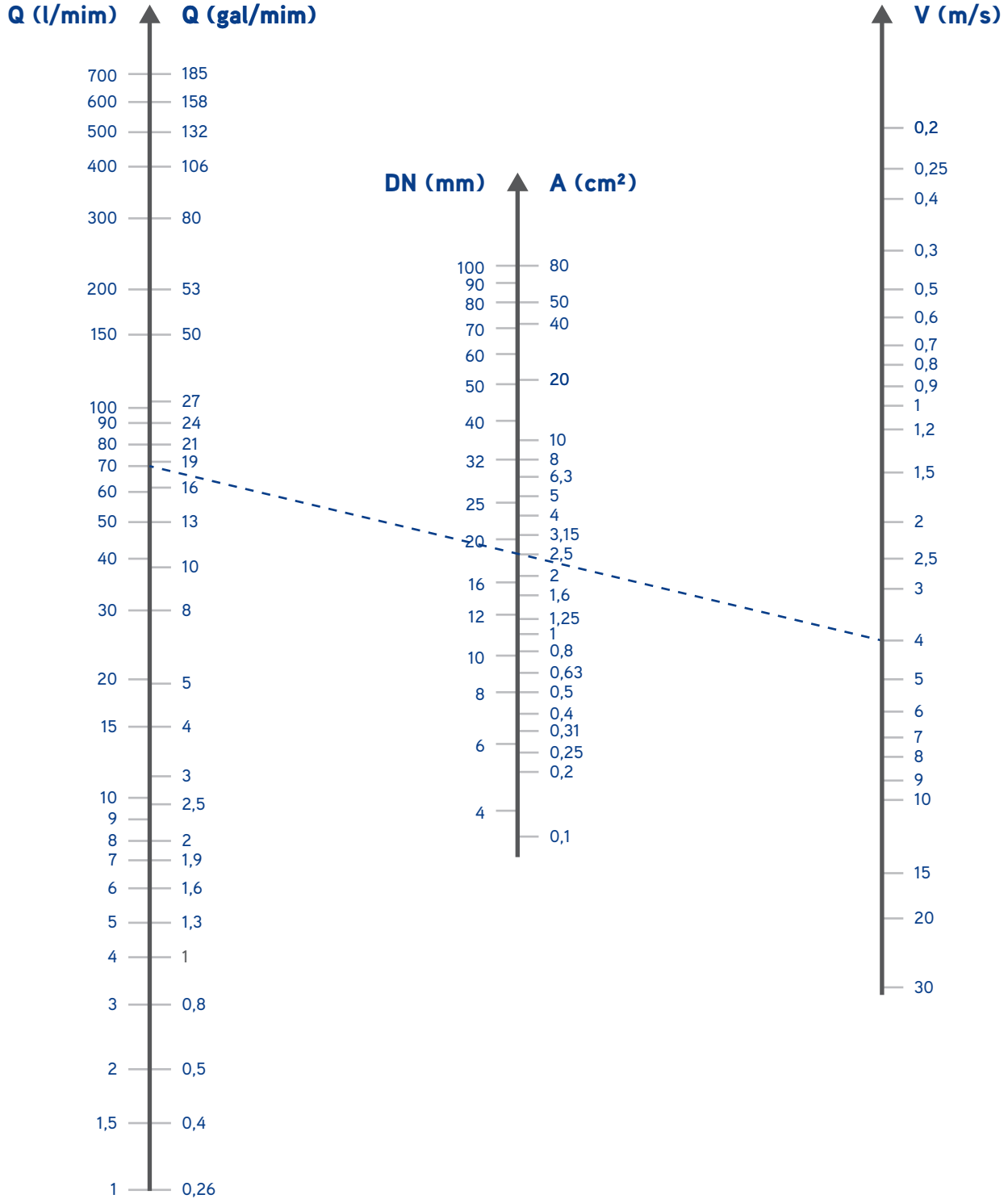


Correct



Hose Selection Chart

This graphic helps finding the Nominal Hose Diameter-DN (mm) or the Dash Size. Firstly, one must know the Flow Rate and Fluid Velocity values that are being used. These two pieces of information must be found in the outer graphic lines. Then by linking these two values with a straight line, one should obtain the Nominal Hose Diameter-DN (mm) or the Gauge Diameter-A (cm²). The example below shows that for a fluid velocity of 4 meters per second and a flow rate of 70 liters per minute or 19 gallons per minute, one should choose a hose with DN of 19mm it means 3/4" hose or a dash hose -12.



Hydraulic Hose – General Safety Guidelines

Maintenance technicians, fabricators, end-users and installers need to be aware of the potential safety hazards when handling or even when in proximity to hydraulic hose assemblies. The following conditions can lead to personal injury and property damage:

1. Always use hose in well-ventilated areas; some fluids may permeate the hose cover and create fume and/or fire hazards.

2. Hydraulic systems typically operate at very high pressures. Any leak of pressurized fluid can penetrate the skin, causing severe tissue damage and burns. One good approach is to use guards or shields around the hose assembly to reduce the risk of injury.

3. Whipping – under high operating pressures, the hose and/or fitting can come loose or blow, causing the end of the hose to whip with great force. Again, the hose assembly should be shielded, guarded and, whenever possible, secured to avoid injury or damage from whipping.

4. Hydraulic fluids are flammable and can explode with a source of ignition. To avoid possible injury or property damage, care should be taken to eliminate ignition sources and to properly route the hose assembly to minimize the chance of combustion.

5. Most hose is conductive. Some applications require use of non-conductive hose to avoid electrocution.

6. When hydraulic hose assemblies fail, the equipment it powers will fail, too, sometimes abruptly and without warning. Never work directly beneath hydraulically powered booms, shovels or other large, heavy pieces of equipment.

7. When air or gaseous materials are being conveyed, the correct hose should be used. A pin-perforated cover may be required. Perforations in the cover will prevent permeated gases from accumulating and blistering the cover. Check with your supplier for the correct hose specification.

8. Extreme care should be used when operating hand-held hydraulic tools where the operator is in proximity to the hydraulic hose assembly. The following steps should be taken to avoid injury:

   a. Use strain relievers on each end of the hose to prevent kinking, excessive bending or stress on the hose at the coupling.

   b. Never use the hose assembly to pull or carry the tool.

   c. Exposed hose near the operator should be guarded in case hose assembly fails to prevent injury from high pressure or high temperature fluid.

   d. Operators should be protected with the required safety clothing for the job and fluids being used.

   e. The hose should be protected against any external damage.

9. Hose assemblies should be properly routed to avoid strain and the possibility of the hose bursting. Proper routing will also protect the assembly against flex fatigue, excessive heat or abrasion.

10. When selecting a hose style and assembly, check for hose compliance to all relevant government, industry, and safety standards or regulations.

High-Pressure Injection Hazards

High-pressure injection injuries (also known as grease gun injuries), are caused by the accidental injection of a foreign material, such as grease, oil, or solvent under pressure, through the skin and into the underlying tissue. This is analogous to medical techniques used to administer immunization shots without a needle.

A grease gun injury can cause serious delayed soft tissue damage and should be treated as a surgical emergency. Any person sustaining an injury of this sort should seek immediate medical attention, regardless of the appearance of the wound or its size.

Accidents involving injection injuries can occur when using any type of pressurized equipment. Two common cases in which petroleum products may be involved are accidents with pressurized grease guns or with hydraulic systems.

Pressurized grease guns are commonly used in service stations, garages and industrial plants. Typically, most service stations have grease guns operating at 500-1.000 kPa (90-150 psi) air pressure. Most modern industrial hydraulic systems operate in the range of 13 to 35 MPa (2,000 to 5,000 psi). A stream of oil ejected from a nozzle or leak under pressure of this magnitude has a velocity comparable to the muzzle velocity of a rifle bullet.

The most common sites of injury are the fingers or hand. However, any part of the body can be involved. With grease guns, especially, accidents usually occur when the injured person wipes the tip of the nozzle with his finger or the nozzle slips off the grease fitting while being held in place.

Grease may also be injected into the body from a leak in the grease line. In **hydraulic system accidents**, a leak in a hydraulic line can emit a high-velocity stream of oil and cause injury if it strikes a person. Workers are commonly injured when they try to stop the leak by covering it with their hand or finger.

Chemical irritation is not a major problem with most petroleum products because hydraulic oils and greases are generally non-irritating and low toxicity to skin. However, the resulting bacterial infection can be a problem because of the damaged tissue and circulation in the wound, even though it has been surgically opened and the foreign material removed. One of the dangers from this type of injury is that it is not recognized quickly by the injured person as being serious. Often the initial wound may be very small and essentially painless. The injured person may even continue working. However, in every case in which a person receives this type of injury, he or she should stop work and get immediate medical treatment.

The following are some basic rules that must be observed:

DON'T

- × Play around with or use a grease gun for practical jokes;
- × Touch the end of a grease gun;
- × Use any part of the body to test a grease gun for grease flow;
- × Use any part of the body to stop a leak in a hydraulic line.

DO

- Routinely check all hoses for wear and possible weak spots;
- Handle a grease gun with respect for its power;
- Take special care when starting up a new hydraulic system to be sure that every part of the system can withstand the operating pressure.

IN CASE OF A GREASE GUN ACCIDENT, SEEK IMMEDIATE MEDICAL TREATMENT. Identify the grease or oil involved in the accident. Contact the supplier or the manufacturer to obtain the product's Material Safety Data Sheet (MSDS) about possible toxicity if a physician or hospital needs more information.

Hydraulic Hose and Electrocution

Although it is a mercifully infrequent occurrence, workers have been burned or electrocuted when using metal-reinforced hoses on aerial bucket trucks near energized power lines. Hydraulic hose, fluid and power lines are a deadly combination. Electrical contact between two power line phases through a metal-reinforced hydraulic hose can generate sufficient heat to rupture the hose and cause a fire. In addition, an electrocution hazard can be created if a metal-reinforced hose on the boom of a truck contacts an energized power line and allows current to flow through the truck chassis. Either scenario can quickly result in serious injury or death.

OSHA standards require that all hydraulic tools used on or near energized power lines or equipment be supplied with non-conducting hoses with sufficient strength for normal operating pressures. NIOSH recommends that the following precautions be taken to control the hazards associated with hydraulic hoses used on aerial bucket trucks:

- Employers should not install metal-reinforced hydraulic hoses on any part of the boom, aerial bucket or hydraulic attachments of aerial bucket trucks used near energized power lines;
- Employers should remove any metal-reinforced hoses currently installed on any part of the boom, aerial bucket or hydraulic attachments of aerial bucket trucks used to work near energized power lines. Before work begins, employers should require a competent person to conduct an initial and daily job site survey and inspect all equipment to identify hazards and implement appropriate controls;
- Employers should stress the importance of adherence to established safe work procedures. These include covering energized power lines in the immediate work area with insulating hoses or blankets, or de-energizing and grounding the lines before work begins. Workers should test de-energized power lines to verify that they have actually been de-energized;
- Employers should provide all workers with task-specific training that shows how each step controls the identified hazard;
- Employers should install all hydraulic hoses used in aerial buckets so that the flow of hydraulic fluid can be stopped immediately by the worker in the bucket. This objective can be achieved by incorporating a control valve into the hydraulic system in the aerial bucket. Manufacturers should continue research into the development of hydraulic fluids that are non-flammable and non-conducting.
- Employers should encourage equipment and tool manufacturers to design an independent coupling system to prevent the use of unsuitable hydraulic hoses on booms, aerial buckets or aerial bucket attachments. Labelling or colour coding hoses may also help workers who service this equipment.

These Guidelines reflect common practice procedures to be held for a Safe use of Hydraulic Fluid Power.

In no event shall Balflex® have any liability whatsoever to any person for any special, punitive, incidental or consequential damages been caused by mishandling of Hydraulic Fluid Power systems.

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