

# Spiral Hydraulic Hoses

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## Spiral Hydraulic Hoses

*Balflex® hydraulic Spiral hoses are produced to Balflex® specifications and according to ISO 3862, SAE J517 and EN 856 standards. They cover a wide variety of very high pressure applications, in rubber, steel spiral reinforcement, for petroleum and water base hydraulic fluids.*

*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.*

### General Guidelines

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Balflex® hydraulic Spiral hoses are designed with a safety factor of 4:1 relating minimum burst pressure and recommended working pressure. Working pressure and nominal diameter are always branded on the hose.

Hydraulic hoses are designed for petroleum base hydraulic fluids applications with a temperature range of -40°C (-40°F) to +100°C (+212°F). Special rubber compounds and other lining materials allow to exceed these limits. Hydraulic hoses may also be used for water base hydraulic fluids if the working temperature does not exceed +70°C (+158°F). With the presence of air in the fluid working temperature should be reduced to +60°C (+140°F).

Selection, assembly and installation of hydraulic Spiral hoses should follow Balflex® recommendations and SAE J1273 and DIN 20066 standards. **Hydraulic hose assemblies should always be inspected and hydraulically tested before installation.** All hydraulics systems should be tested against leakage and malfunction in an appropriate area after any intervention.

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

**The failure of a hydraulic Spiral 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 projections of hydraulic fluid, the projection of couplings and it's parts, the whipping of unrestrained hose, spillage and combustion of the fluid, electrical shocks through contact with electrical sources, immovability, fall or sudden movement of masses controlled by the hydraulic system.



**Table 1: Rated working pressure at 20°C (+68°F) of Balflex® hydraulic Spiral hoses (MPa / PSI)**

Balflex	Standard	1/4"	3/8"	1/2"	5/8"	3/4"	1"	1.1/4"	1.1/2"	2"
		-4 DN5	-6 DN6	-8 DN12	-10 DN16	-12 DN19	-16 DN25	-20 DN31	-24 DN38	-32 DN51
BALMASTER	DIN EN 856 R12 / ISO 3862 / SAE J517 R12		28.0	28.0	28.0	28.0	28.0	21.0	17.5	17.5
			4000	4000	4000	4000	4000	3100	2600	2600
BALMASTER	DIN EN 856 4SP / ISO 3862	45.0	44.5	41.5	35.0	38.0	32.0	21.0	21.0	17.5
		6600	6500	6100	5100	5600	4700	3100	3100	2600
POWERSPIR	DIN EN 856 4SH / ISO 3862					42.0	42.0	35.0	30.0	25.0
						6100	6100	5100	4400	3700
POWERSPIR	DIN EN 856 R13 / ISO 3862 / SAE J517 R13					42.0	42.0	35.0	35.0	35.0
						6100	6100	5100	4400	3700
POWERSPIR	ISO 3862 / SAE J517 R15		42.0	42.0	42.0	42.0	42.0	42.0	42.0	42.0
			6100	6100	6100	6100	6100	6100	6100	6100

**Table 2: Pressure Conversion**

<b>bar</b>	0,00134	0,0025	0,0339	0,069	0,098	<b>1,00</b>	1,01	10,0	100
<b>PSI</b>	0,0194	0,036	0,492	<b>1,001</b>	1,421	14,504	14,69	145,04	1450,38
<b>MPa</b>	-	-	0,003	0,007	0,0098	0,10	0,101	<b>1,00</b>	10,00
<b>1 atm</b>	0,001	0,0025	0,0335	0,068	0,097	0,987	<b>1</b>	9,87	98,69
<b>m H2O (20°C)</b>	0,014	0,026	0,346	0,704	<b>1</b>	10,207	10,34	102,074	3,4
<b>in Hg (20°C)</b>	0,0396	0,074	<b>1,001</b>	2,04	2,89	29,53	29,91	295,3	3,4
<b>in H2O (20°C)</b>	0,538	<b>1,005</b>	13,623	27,73	39,38	401,86	407,09	4018,65	40186,47
<b>mm Hg (20°C)</b>	<b>1,005</b>	1,88	25,43	51,75	73,51	750,06	759,81	7500,62	75006,17

**Example:** 1 MPa = 145,04 PSI ; 1 MPa = 10,0 bar

**Table 3: Conversion Factors**

Unit	Factor	Converted Unit
1 m (meter)	1000	mm (millimeter)
1 m (meter)	1,09362	yard
1 m (meter)	3,28084	foot
1 mm (millimeter)	0,001	m (meter)
1 mm (millimeter)	0,03937	Inch
1 inch	25,4	mm (millimeter)
1 inch	0,0254	m (meter)
1 foot	0,3048	m (meter)
1 yard	0,9144	m (meter)
F°	$C° \times 1,8 + 32$	F° (Fahrenheit)
C°	$(F° - 32) : 1,8$	C° (Celsius)

Example : 1 m = 3,28084 feet ; 1 inch = 25,4 mm

Example : +100°C = +212°F



# Fluid Compatibility and Resistance Chart for Balflex Spiral Hydraulic Hoses

● Recommended     
 ● Recommended with Restrictions     
 ● Not Recommended

Acetic Acid		Ethyl Glycol	●	Oil of Turpentine	●
Acetic Acid (30%)	●	Ethyleneoxide	●	Oleic Acid	●
Acetone	●	Fluorine	●	Oxalic Acid	●
Acetylene	●	Formaldehyde	●	Perchloroethylene	●
Ammonia, Gas (Hot)	●	Formaldehyde 40%	●	Phenol	●
Ammonia, Liquid	●	Fuel Oil	●	Phosphoric Acid (10%)	●
Ammoniumchloride		Gaseous Hydrogen	●	Phosphoric Acid (70%)	●
Amyl Acetate	●	Gasoline	●	Phosphate Ester Base Oil	●
Aniline	●	Glycerin / Glycerol	●	Saturated Steam	●
Animal Oils	●	Glycol to 66°C	●	Sea Water	●
Benzol / Benzene	●	Hexane	●	Silicone Oils	●
Butane	●	Hydraulic Oil	●	Soap Solutions	●
Butyl Acetate	●	Hydrochloric Acid 37%	●	Soda	●
Butyl Alcohol / Butanol	●	Hydroger Peroxide (Dil.)	●	Sodium Chloride Solutions	●
Calcium Chloride Solutions		Hydroger Peroxide (Conc.)	●	Sodium Hydroxide 20%	●
Carbon Dioxide	●	Isocyanates		Sodium Hypochloride 10%	●
Carbon Disulfide	●	Isopropil Alcohol	●	Sulphur	●
Carbonates	●	Kerosene	●	Sulphur Dioxide	●
Caustic Soda	●	Liquid Oxygen	●	Sulphuric Acid up to 50%	●
Chlorinated Solvents	●	LPG	●	Sulphuric Acid above 50%	●
Chlorine	●	Lubricating Oils	●	Toluene	●
Chloroform	●	Mercury	●	Trichloroethylene	●
Citric and Solutions	●	Methyl Alcohol / Methanol	●	Vegetable Greases	●
Compressed Air	●	Methyl Chloride (Cold)	●	Water	●
Cyclohexane	●	Methyl Ethyl Khetone	●	Xylene	●
Crude Petroleum Oil	●	Mineral Oils	●		
Diocetyl Phthalate		Naphtha	●		
Diesel Fuel	●	Naphthalene	●		
Ethers	●	Natural Gas	●		
Ethyl Acetate	●	Nitric Acid (Dil.)	●		
Ethyl Alcohol	●	Nitric Acid (Conc.)	●		
Ethyl Chloride	●	Nitrobenzen	●		







The following data is based on tests and believed to be reliable; however the tabulation should be used as a guide ONLY, since it does not take into consideration all variables, such as elevated temperatures, fluid contamination, concentration, etc. that may be encountered in actual use. All critical applications should be tested. Note: All data based on 20°C/70°F unless otherwise noted.

# BALMASTER BESTFLEX 4SP



DIN EN 856 4SP / ISO 3862 - 10.1008.-F

Very high pressure, extra flexible, four steel wire spirals reinforced hydraulic hose

REFERENCE	#	inch	inch	SAE Dash								
					mm	mm	MPa	PSI	MPa	PSI	mm	kg/m
4SP-04-F	10.1008.04F	DN6	1/4"	-4	6.5	17,4	<b>45,0</b>	6600	<b>180,0</b>	26400	150	0,70
4SP-06-F	10.1008.06F	DN10	3/8"	-6	9.6	19,9	<b>44,5</b>	6500	<b>178,0</b>	26000	180	0,80
4SP-08-F	10.1008.08F	DN12	1/2"	-8	12,9	22,8	<b>41,5</b>	6100	<b>166,0</b>	24400	230	1,15
4SP-10-F	10.1008.10F	DN16	5/8"	-10	16.0	26,4	<b>35,0</b>	5100	<b>140,0</b>	20400	250	1,26
4SP-12-F	10.1008.12F	DN19	3/4"	-12	19.2	30,6	<b>38,0</b>	5600	<b>152,0</b>	22400	300	1,44
4SP-16-F	10.1008.16F	DN25	1"	-16	25,6	37,7	<b>32,0</b>	4700	<b>128,0</b>	18800	340	2,15
4SP-20-F	10.1008.20F	DN31	1.1/4"	-20	32.1	48,6	<b>21,0</b>	3100	<b>84,0</b>	12400	460	2,75
4SP-24-F	10.1008.24F	DN38	1.1/2"	-24	38.3	55,0	<b>21,0</b>	3100	<b>84,0</b>	12400	560	3,35
4SP-32-F	10.1008.32F	DN51	2"	-32	51.0	68,1	<b>17,5</b>	2600	<b>70,0</b>	10400	660	4,60

**INNER TUBE:** seamless oil resistant synthetic rubber  
**REINFORCEMENT:** 4 spirals of high tensile steel wire  
**OUTER TUBE:** black wrapped, oil, weather and abrasion resistant synthetic rubber  
**SAFETY FACTOR:** 4:1

**APPLICATION:** petroleum base hydraulic fluids  
**TEMPERATURE RANGE:** -40°C (-40°F) +100°C (+212°F); Intermittent service: +120°C (+248°F) Max. temperature recommended for water base hydraulic fluids: +70°C (+158°F) Max. temperature recommended for air: +60°C (+140°F)

**COUPLINGS:** Balflex® 2-piece fittings serie 23/24 with 20 serie ferrules. Balflex® Multicrimp fittings serie BW23  
 \*On sizes - 6 (3/8") and - 8 (1/2") the Balflex® BALMASTER DIN EN 856 4SP and Balflex® POWERSPIR SAE 100R15 hoses are the same, and they are branded Balflex® POWERSPIR.

**AVAILABLE VERSIONS:** tough cover / Armourguard

**BALFLEX** /// **BALMASTER BESTFLEX** DIN EN 856 - 4SP - DN6 - 1/4" - ISO 3862 - WP <sup>45 MPa</sup> 6600 PSI - Flame Resistant - MSHA IC-252/00









# POWERSPIR BESTFLEX 4SH



DIN EN 856 4SH / ISO 3862 - 10.1009.-F

Very high pressure, extra flexible, four steel wire spirals reinforced hydraulic hose

REFERENCE	#	inch	inch	SAE Dash	 mm	 mm	 MPa	PSI	 MPa	PSI	 MIN BEND RAD	 KG
4SH-12-R13/15-F	10.1009.12F	DN19	3/4"	-12	19,2	30,8	<b>42,0</b>	6100	<b>168,0</b>	24400	280	1,56
4SH-16-R13/15-F	10.1009.16F	DN25	1"	-16	25,6	37,6	<b>42,0</b>	6100	<b>168,0</b>	24000	340	2,09
4SH-20-F	10.1009.20F	DN31	1.1/4"	-20	32,1	44,5	<b>35,0</b>	5100	<b>140,0</b>	20400	460	2,57
4SH-24-F	10.1009.24F	DN38	1.1/2"	-24	38,3	51,7	<b>30,0</b>	4400	<b>120,0</b>	17600	560	3,44
4SH-32-F	10.1009.32F	DN51	2"	-32	51,0	66,0	<b>25,0</b>	3700	<b>100,0</b>	14800	700	4,90

**INNER TUBE:** seamless oil resistant synthetic rubber

**REINFORCEMENT:** 4 spirals of very high tensile steel wire

**OUTER TUBE:** black wrapped, oil, weather and abrasion resistant synthetic rubber

**SAFETY FACTOR:** 4:1

**APPLICATION:** petroleum base hydraulic fluids

**COUPLINGS:** Balflex® 2-piece fittings serie 24/26 with 20 serie ferrules. Balflex® Multicrimp fittings serie BW23/JJ

**AVAILABLE VERSIONS:** tough cover / Armourguard

**TEMPERATURE RANGE:** -40°C (-40°F) +100°C (+212°F); Intermittent service: +120°C (+248°F) Max. temperature recommended for water base hydraulic fluids: +70°C (+158°F) Max. temperature recommended for air: +60°C (+140°F)

\*On sizes - 12 (3/4") and - 16 (1") the Balflex® POWERSPIR DIN EN 856 4SH and SAE 100R13 and SAE 100R15 hoses are the same. The working pressure of Balflex® POWERSPIR DIN EN 856 4SH / SAE 100R13 / SAE 100R15 3/4" and 1" are higher than standard SAE 100R13.

**BALFLEX** // POWERSPIR BESTFLEX 6K // DIN EN 856 4SH / EXCEEDS SAE 100R13 / SAE 100R15 - DN25 - 1" - ISO 3862 - WP **42 MPa** / 6100 PSI - Flame Resistant - MSHA IC-252/00



# BALMASTER BESTFLEX R12



SAE 100R12 / DIN EN 856 R12 / ISO 3862 - 10.1012.-F

Very high pressure, extra flexible, four steel wire spirals reinforced hydraulic hose

REFERENCE	#	DN	inch	SAE Dash	mm	mm	MPa	PSI	MPa	PSI	MIN BEND RAD	KG
R12-06-A	10.1012.06F	DN10	3/8"	-6	9,6	19,6	28,0	4000	112,0	16000	120	0,80
R12-08-A	10.1012.08F	DN12	1/2"	-8	12,9	23,1	28,0	4000	112,0	16000	170	1,15
R12-10-A	10.1012.10F	DN16	5/8"	-10	16,0	27,0	28,0	4000	112,0	16000	190	1,26
R12-12-A	10.1012.12F	DN19	3/4"	-12	19,2	30,1	28,0	4000	112,0	16000	230	1,44
R12-16-A	10.1012.16F	DN25	1"	-16	25,6	37,3	28,0	4000	112,0	16000	290	2,15
R12-20-A	10.1012.20F	DN31	1.1/4"	-20	32,1	46,5	21,0	3100	84,0	12400	400	2,75
R12-24-A	10.1012.24F	DN38	1.1/2"	-24	38,3	53,0	17,5	2600	70,0	10400	480	3,35
R12-32-A	10.1012.32F	DN51	2"	-32	51,0	66,5	17,5	2600	70,0	10400	630	4,60

**INNER TUBE:** seamless oil resistant synthetic rubber  
**REINFORCEMENT:** 4 spirals of high tensile steel wire

**OUTER TUBE:** black wrapped, oil, weather and abrasion resistant synthetic rubber  
**SAFETY FACTOR:** 4:1  
**APPLICATION:** petroleum base hydraulic fluids

**TEMPERATURE RANGE:** -40°C (-40°F) +100°C (+212°F); Intermittent service: +120°C (+248°F) Max. temperature recommended for water base hydraulic fluids: +70°C (+158°F) Max. temperature recommended for air: +60°C (+140°F)

**COUPLINGS:** Balflex® 2-piece fittings serie 23/24 with 20 serie ferrules. Balflex® Multicrimp fittings serie BW23  
**AVAILABLE VERSIONS:** tough cover / Armourguard

**BALFLEX** // **BALMASTER BESTFLEX** SAE 100R12 / DIN EN 856 - DN10 - 3/8" - ISO 3862 - WP 28 MPa / 4000 PSI - Flame Resistant - MSHA IC-252/00

# POWERSPIR BESTFLEX R13



SAE 100R13 / DIN EN 856 R13 / ISO 3862 - 10.1014.-F

Very high pressure, extra flexible, four or six steel wire spirals reinforced hydraulic hose

REFERENCE	#	DN	inch	SAE Dash	mm	mm	MPa	PSI	MPa	PSI	MIN BEND RAD	KG
4SH-12-R13/15-A	10.1009.12F	DN19	3/4"	-12	19,2	30,8	42,0	6100	168,0	24400	280	1,56
4SH-16-R13/15-A	10.1009.16F	DN25	1"	-16	25,6	37,6	42,0	6100	168,0	24000	340	2,09
R13-20-A	10.1014.20F	DN31	1.1/4"	-20	32,1	49,4	35,0	5100	140,0	20400	420	3,90
R13-24-A	10.1014.24F	DN38	1.1/2"	-24	38,3	56,9	35,0	5100	140,0	20400	500	4,96
R13-32-A	10.1014.32F	DN51	2"	-32	51,0	70,9	35,0	5100	140,0	20400	620	7,09

**INNER TUBE:** seamless oil resistant synthetic rubber  
**REINFORCEMENT:** 4 or 6 spirals of high tensile steel wire  
**OUTER TUBE:** black wrapped, oil, weather and abrasion resistant synthetic rubber  
**SAFETY FACTOR:** 4:1  
**APPLICATION:** petroleum base hydraulic fluids

**TEMPERATURE RANGE:** -40°C (-40°F) +100°C (+212°F); Intermittent service: +120°C (+248°F) Max. temperature recommended for water base hydraulic fluids: +70°C (+158°F) Max. temperature recommended for air: +60°C (+140°F)  
**COUPLINGS:** Balflex® 2-piece fittings serie 24/26 with 20 serie ferrules. Balflex® Multicrimp fittings serie BW23/JJ

**AVAILABLE VERSIONS:** tough cover / Armourguard  
**NOTES:** According to ISO 3862/EN 856 type R13/SAE J517 type R13, the Balflex® POWERSPIR SAE 100R13 hose is of 4 steel wire spirals on sizes -12 (3/4") and -16 (1") and of 6 steel wire spirals on sizes -20 (1.1/4"), -24 (1.1/2") and -32 (2").

\*On sizes -12 (3/4") and -16 (1") the Balflex® POWERSPIR DIN EN 856 4SH and SAE 100R13 and SAE 100R15 hoses are the same. The working pressure of Balflex® POWERSPIR DIN EN 856 4SH SAE 100R13 3/4" and Balflex® POWERSPIR DIN EN 856 4SH SAE 100R13 1" are higher than standard SAE 100R13.

**BALFLEX** // **POWERSPIR BESTFLEX** SAE 100R13 / DIN EN 856 / ISO 3862 - DN38 - 1.1/2" - WP 35 MPa / 5000 PSI - MSHA IC-252/00









# POWERSPIR BESTFLEX R15



## SAE 100R15 / ISO 3862 – 10.1016.-F

Very high pressure, extra flexible, four or six steel wire spirals reinforced hydraulic hose

REFERENCE	#	inch	inch	SAE Dash								
					mm	mm	MPa	PSI	MPa	PSI	mm	kg/m
R15-06-F	10.1016.06F	DN10	3/8"	-6	9,7	22,0	<b>42,0</b>	6100	<b>168,0</b>	24000	140	0,80
R15-08-F	10.1016.08F	DN12	1/2"	-8	12,9	25,2	<b>42,0</b>	6100	<b>168,0</b>	24000	190	1,15
R15-10-F	10.1016.10F	DN16	5/8"	-10	16,0	27,2	<b>42,0</b>	6100	<b>168,0</b>	24000	200	1,35
4SH-12-R13/15-F	10.1009.12F	DN19	3/4"	-12	19,2	31,5	<b>42,0</b>	6100	<b>168,0</b>	24000	224	1,56
4SH-16-R13/15-F	10.1009.16F	DN25	1"	-16	25,6	38,4	<b>42,0</b>	6100	<b>168,0</b>	24000	272	2,10
R15-20-F	10.1016.20F	DN31	1.1/4"	-20	32,1	50,2	<b>42,0</b>	6100	<b>168,0</b>	24000	400	3,65
R15-24-F	10.1016.24F	DN38	1.1/2"	-24	38,3	56,8	<b>42,0</b>	6100	<b>168,0</b>	24000	450	4,75
R15-32-F	10.1016.32F	DN51	2"	-32	51,0	71,5	<b>42,0</b>	6100	<b>168,0</b>	24000	650	6,62

**INNER TUBE:** seamless oil resistant synthetic rubber

**REINFORCEMENT:** 4 or 6 spirals of high tensile steel wire

**OUTER TUBE:** black wrapped, oil, weather and abrasion resistant synthetic rubber

**SAFETY FACTOR:** 4:1

**TEMPERATURE RANGE:** -40°C (-40°F) +100°C (+212°F); Intermittent service: 120°C (+248°F) Max. temperature recommended for water base hydraulic fluids: +70°C (+158°F) Max. temperature recommended for air: +60°C (+140°F)

**APPLICATION:** petroleum base hydraulic fluids

**COUPLINGS:** Balflex® 2-piece fittings serie 24/26 with 20 serie ferrules. Balflex® Multicrimp fittings serie BW23/JJ

**AVAILABLE VERSIONS:** tough cover / Armourguard

**NOTE:** On size -12 (3/4") and -16 (1") the Balflex® POWERSPIR DIN EN 856 4SH and SAE 100R13 and SAE 100R15 hoses are the same

**BALFLEX POWERSPIR BESTFLEX 6K TYPE SAE 100R15 / ISO 3862 - DN51 - 2" - WP 42 MPa 6100 PSI - Flame Resistant - MSHA IC-252/00**