



Flexible Hose & Expansion Joint



HANKOOK FLEXIBLE CO.

Metallic Flexible Hose for marine engine system

HMF-501 Swivel Type



HMF-502 Fixed Type



Material Spec.

- Bellows : STS316L, STS304
- Wire Braid : STS304
- Flange : SS400, STS316L, STS304
- Lap Joint : STPG370, STS316L, STS304

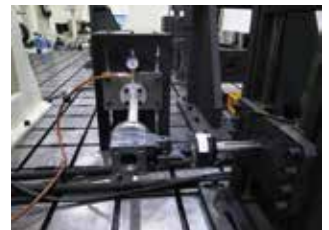
Specifications

- Application : Vibration absorption and preventing heat stress in piping of marine engines
- Press. Range : 0.1 bar ~ 30 bar
- Temp. Range : Max. 300°C
- Service : Fresh Water, Exhaust Gas, Lub. Oil, Fuel Oil, etc.

Model No. HMF-501 and HMF-502 are metallic flexible hoses and applied to the marine engine system.

These are used for to absorb the minute vibrations of the engine.

The safety of these models is verified by using on ships over 20 years. Furthermore these models passed all tests about the metallic flexible hose of ISO 10380 and have gained type approvals of each classification society.



* The above type is the type that is applied to the engine part of the current HHI, STX, DOOSAN ENGINE, etc.

* Flange connection and "face to face" length can be transformed by request of customer (JIS, ANSI, DIN, etc).

* The Bellows and Wire Braid can be single ply or multi-ply depending on the pressure.



Metallic Flexible Joint



Material Spec.

- Bellows : STS304 ■ Wire Braid : STS304
- Flange : SS400, STS304

Specifications

This joint is small but flexible, absorbing vibrations at the joints, which connect small pipes to the device. They are usually used in connecting pumps and pipes



HK501

- Construction :
Weled lap-joint on bellows,
swivel flange
- Press, Range : F.V ~ 30 bar
- Size : 10A ~ 250A



HK505

- Construction :
Weld union
- Press, Range : F.V ~ 50 bar
- Size : 8A ~ 50A



HK502

- Construction :
Welded flange on bellows,
fixed flange
- Press, Range : F.V ~ 30 bar
- Size : 10A ~ 250A



HK506

- Construction :
Female thread union
- Press, Range : F.V ~ 50 bar
- Size : 8A ~ 50A



HK503

- Construction :
Male thread hex nipple
- Press, Range : F.V ~ 50 bar
- Size : 8A ~ 50A



HK507

- Construction :
Male thread hex nipple to
loose nut
- Press, Range : F.V ~ 50 bar
- Size : 8A ~ 50A



HK504

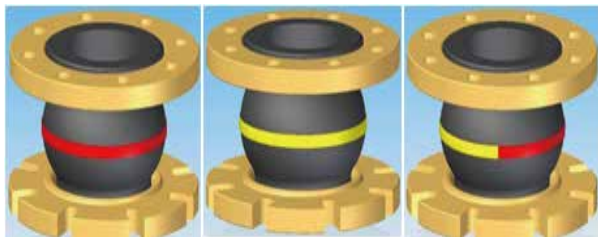
- Construction :
Female thread hex soket
- Press, Range : F.V ~ 50 bar
- Size : 8A ~ 50A



HK508

- Construction :
Female thread nut to
loose nut
- Press, Range : F.V ~ 50 bar
- Size : 8A ~ 50A

Rubber Compensator_Mold Type



Material Spec.

- Body : EPDM, NBR, CR
- Flange : SS400, STS316L, STS304

Specifications

- Application : Anti vibration of pipeline
- Press. Range : Max. 16 bar
- Temp. Range : Max. 90 °C
- Service : Water(EPDM), Oil(NBR)

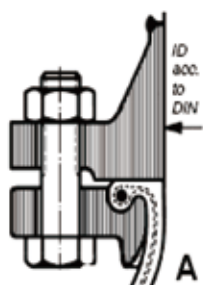
Flange Spec. : JIS B2220 5K

Nominal Dia.	Length (mm)	Flange Dim. (mm)				Movement			Max. Press. (bar)	Max. Temp. (°C)	Weight (kg)
		O.D	PCD	t	N-ØH	Comp. (mm)	Ext (mm)	Lat. (mm)			
5K 25A	130	95	75	10	4-Ø12	30	10	10	16	90	1.1
5K 32A	130	115	90	12	4-Ø15	30	10	10	16	90	1.8
5K 40A	130	120	95	12	4-Ø15	30	10	10	16	90	1.9
5K 50A	150	130	105	14	4-Ø15	30	10	10	16	90	2.5
5K 65A	150	155	130	14	4-Ø15	30	10	10	16	90	3.4
5K 80A	150	180	145	14	4-Ø19	40	10	10	16	90	4.5
5K 100A	150	200	165	16	8-Ø19	40	10	10	16	90	5.4
5K 125A	150	235	200	16	8-Ø19	40	10	10	16	90	7.3
5K 150A	150	265	230	18	8-Ø19	40	10	10	16	90	9.8
5K 200A	175	320	280	20	8-Ø23	45	15	15	16	90	13.4
5K 250A	175	385	345	22	12-Ø23	45	15	15	16	90	20.1

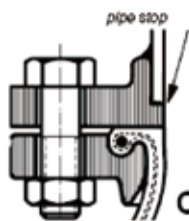
* The flange connection can be transformed by request of customer.(JIS, DIN, ANSI, etc)

Installation and Operation Hints for Rubber Compensator's

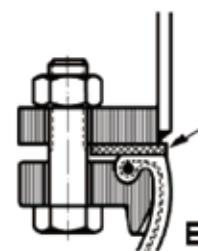
right :
Flanges with correct ID help prevent damage to rubber.



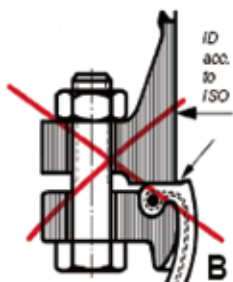
right :
Weld neck flanges with correct ID prevent damage to rubber.



right :
Additional flat packing can be used to prevent damage to rubber.



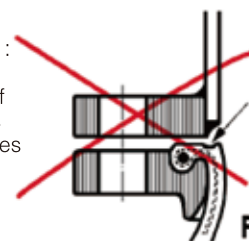
wrong :
Flanges with too large female diameter can damage rubber.



wrong :
Uneven end of pipe can cause damage to rubber.



wrong :
Inner edge of flanges damages rubber.



Rubber Expansion Joint_Hand-Built Type



Special Features

- To absorb expansion and contraction of the pipeline
- Noise and vibration absorption in pipeline
- Eccentricity and symmetric of the pipeline absorption
- Pipeline life extension

Material Spec.

Material Designation		Temp. Range	service
inside	outside		
CR	CR	-30°C~100°C	Sea water, Fresh water, Weak, Alkaline flow
CR	NR	-40°C~60°C	Volcano, Hydrochloric acid
CR	NBR	-25°C~100°C	Oil
EPDM	EPDM	-40°C~140°C	Steam

Nominal Size		Face to Face (min)		Dimensions. (mm)						Movements Capability					Max Press. (bar)	Weight (kg)	
DN	Inch	mm	Inch	ID	P.C.D	O.D	No. Bolts	Bolt Dia.	Thk.	Comp (mm)	Ext (mm)	Lat (mm)	Ang (deg.)	Tor (deg.)		Exp Joint	Retain ing Set
50	2	150	6	51	121	152	4	19	24	12	6	12.7	14.5	3	14	1.1	1.6
65	2.5	150	6	64	140	178	4	19	24	12	6	12.7	11.5	3	14	1.5	2.2
80	3	150	6	76	152	191	4	19	24	12	6	12.7	10.0	3	14	1.7	2.3
100	4	150	6	102	191	229	8	19	24	12	6	12.7	7.5	3	14	2.3	3.3
125	5	150	6	127	216	254	8	22	24	12	6	12.7	6.0	3	13	3.0	3.5
150	6	150	6	152	241	279	8	22	26	12	6	12.7	5.0	3	13	3.5	3.9
200	8	150	6	203	298	343	8	22	29	19	9.5	12.7	5.5	3	10	5.2	5.9
250	10	200	8	254	362	406	12	25	29	19	9.5	12.7	4.5	3	10	8.1	7.8
300	12	200	8	305	432	483	12	25	29	19	9.5	12.7	3.8	3	10	11.3	11.4
350	14	200	8	355	476	533	12	29	32	19	9.5	12.7	3.3	2	10	13.8	12.7
400	16	200	8	406	540	597	16	29	32	19	9.5	12.7	2.8	2	8	16.1	16.0
450	18	200	8	457	578	635	16	32	35	19	9.5	12.7	2.5	1	8	16.3	14.7
500	20	200	8	508	635	699	20	32	38	22	11	12.7	2.5	1	8	19.5	17.9
550	22	200	8	559	692	749	20	35	38	22	11	12.7	2.3	1	8	25.2	18.3
600	24	200	8	610	749	813	20	35	38	22	11	12.7	2.0	1	8	28.7	21.5
650	26	250	10	660	806	870	24	35	38	25	12.5	12.7	2.0	1	7	32.7	23.6
700	28	250	10	711	864	927	28	35	38	25	12.5	12.7	2.0	1	7	35.4	25.9
750	30	250	10	762	914	984	28	35	38	25	12.5	12.7	2.0	1	7	38.4	29.4
800	32	250	10	813	978	1060	28	41	38	25	12.5	12.7	1.8	1	7	42.7	37.5
850	34	250	10	864	1029	1111	32	41	38	25	12.5	12.7	1.8	1	7	45.7	37.8
900	36	250	10	914	1086	1168	32	41	38	25	12.5	12.7	1.5	1	7	49.0	40.2
950	38	250	10	965	1149	1238	32	41	38	25	12.5	12.7	1.5	1	7	53.8	50.0
1000	40	250	10	1016	1200	1289	36	41	38	25	12.5	12.7	1.5	1	7	56.3	50.9
1050	42	300	12	1067	1257	1346	36	41	40	28	14	12.7	1.5	1	6	76.6	52.6
1100	44	300	12	1118	1314	1403	40	41	40	28	14	12.7	1.5	1	6	80.8	56.3
1150	46	300	12	1168	1365	1454	40	41	40	28	14	12.7	1.3	1	6	85.4	57.9
1200	48	300	12	1219	1422	1511	44	41	40	28	14	12.7	1.3	1	6	89.6	63.1
1250	50	300	12	1270	1480	1568	44	48	40	28	14	12.7	1.3	1	6	92.9	63.3
1300	52	300	12	1321	1537	1626	44	48	42	28	14	12.7	1.3	1	6	97.8	70.1
1350	54	300	12	1372	1594	1683	44	48	42	28	14	12.7	1.3	1	6	106.5	73.8
1400	56	300	12	1422	1651	1746	48	48	42	28	14	12.7	1.3	1	6	112.9	80.4
1450	58	300	12	1473	1708	1803	48	48	42	28	14	12.7	1.0	1	6	118.0	86.7
1500	60	300	12	1524	1759	1854	52	48	42	28	14	12.7	1.0	1	6	122.8	86.7
1650	66	300	12	1676	1930	2032	52	48	42	28	14	12.7	1.0	1	6	144.7	107.0
1700	68	300	12	1727	1988	2089	56	48	42	28	14	12.7	1.0	1	6	155.4	114.2
1800	72	300	12	1829	2096	2197	60	48	44	28	14	12.7	0.9	1	5	167.0	121.9
2000	78	300	12	1981	2260	2362	64	54	44	28	14	12.7	0.9	1	5	192.0	136.1
2150	84	300	12	2134	2426	2534	64	54	49	28	14	12.7	0.8	1	5	210.0	150.1
2300	90	300	12	2286	2591	2705	68	60	53	28	14	12.7	0.75	1	4	227.6	198.4
2450	96	300	12	2438	2756	2877	68	60	53	28	14	12.7	0.7	1	4	253.9	241.4
2600	102	300	12	2591	2908	3048	72	67	60	28	14	12.7	0.66	1	4	271.9	248.2
2750	108	300	12	2743	3067	3219	72	67	60	28	14	12.7	0.62	1	4	295.1	265.6
2900	114	300	12	2896	3220	3391	76	73	60	28	14	12.7	0.59	1	3	339.3	330.6

1. "Filled Arch" construction reduces above movement by 50%.
2. The degree of Angular Movement is based on the maximum extension shown.
3. To calculate approximate movement of Multiple Arch expansion joints, take the movement show in the above table and multiply by the number of arches.
4. Flange Dimensions is ASME/ANSI B16.5 CL. 150#, ASME/ANSI B16.47 CL 150# Ser A. and AWWA C207 CL. D 150#.
5. The constructions of a one set Control Unit is Stud Bolt 1ea, Nut 8ea, Control Rod Plate 2ea and Special Washers 2ea.
6. The flange connection can be transformed by request of customer.(JIS, DIN, ANSI, etc)

Metallic Expansion Joint

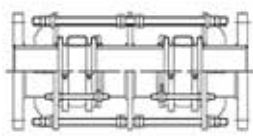


Material Spec.

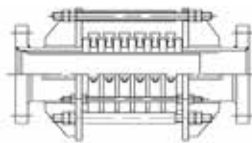
- Application : Vibration absorption and preventing heat stress in piping of marine engines
- Press. Range : vacuum ~ 5 bar ■ Temp. Range : Max. 600 °C
- Service : Fresh Water, Exhaust Gas, Lub. Oil, Fuel Oil, etc.

Specifications

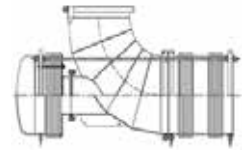
- Bellows : STS316L, STS304, STS321
- Flange : SS400, STS316L, STS304
- End Pipe : STPG370, SS400, STS316L, STS304



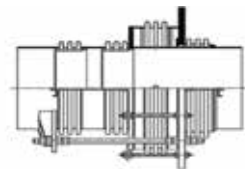
UNIVERSAL TYPE



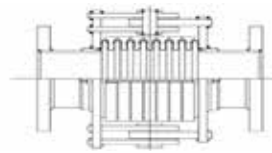
CONTROL-RING TYPE



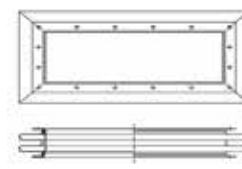
PRESSURE BALLANCE "L"



PRESSURE BALLANCE "S"



HINGE TYPE



RECTANGULAR TYPE

Non-Metallic Expansion Joint

Non-metallic expansion joints are flexible connectors designed to provide stress relief and seal in gaseous media in ducting systems. They are fabricated from a wide variety of non-metallic materials, including synthetic elastomers, fabrics, insulation materials and fluoroplastics, depending on the designs



Expansion Joint Capabilities & Advantages

- expansion or contraction of the duct due to temperature changes.
- isolation of components to minimize the effects of vibration or noise.
- movement of components during process operations.
- installation or removal of large components and erection tolerances.



• Single Layer Construction

An expansion joint formed of one consolidated layer, often constructed from elastomers and reinforcement materials or fluoroplastics and reinforcement materials



• Multi-Layer Construction

An expansion joint in which the various plies are of different materials which are not integrally bonded together



• Belt-Type Expansion Joint Configuration

An expansion joint in which the flexible element is made like a flat belt



• Flanged-Type Expansion Joint Configuration

An expansion joint in which the flexible element has flanges formed at right angles



• Expansion Joint Clamping Configuration

An expansion joint that utilizes both belt type and flanged configurations

Introduction

HANKOOK FLEXIBLE CO. was incorporated in Korea on the 1st April 1983 and manufactures of which are designed for engine line of shipping, oil refineries, power stations, gas turbine and combined cycle installations, cement, chemical plants and the building industries amongst others. Above products are used to prevent in advance the fatigue damage due to repetitive load such as heat variation and vibration generating due to the operation of different kinds of business systems. We was accepted the Type Approval for Flexible Hose and Expansion Joint by GL, BV, NK, KR, ABS, RINA, CCS and DNV. We have been developing and supplying products with direct cooperation with large shipyards for over 30 years.



History

- | | | |
|-------|----|--|
| 1983. | 4 | foundation of Hankook Flexible Co. |
| 1988. | 2 | start a business with Hyundai Heavy Ind. Co., Ltd. |
| 1989. | 1 | start a business with STX Engine Co., Ltd. |
| 1998. | 2 | achived BV classification ceryificate |
| 1999. | 8 | achived GL classification ceryificate |
| | 9 | achived KR classification ceryificate |
| 2001. | 3 | start a business with DOOSAN Engine Co., Ltd. |
| | 6 | achived ISO9001 ceryificate |
| 2002. | 3 | registration of utility model for bellows Joint structure |
| 2004. | 2 | achived DNV classification ceryificate |
| 2005. | 3 | achived NK classification ceryificate |
| 2008. | 6 | achived ABS classification ceryificate |
| | 11 | established Hankook Flexible Co. 2 factory in Sasang-gu, Busan |
| 2009. | 12 | achived RINA classification ceryificate |
| 2011. | 1 | achived CCS classification ceryificate |
| 2015. | 2 | Integration company |

Certificate

Class Type Approval Certification



ISO 2015

Registration of Utility Model





Piping machine



Bellows hydro forming machine



Bellows hydro forming machine



Bellows roll forming machine



Hydro press machine



Wire braiding machine

Global Leader of the bellows



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Hydro test



Hydro & burst test



Hydro test



Bending test



Fatigue test



Durability test