

ENGINEERING
TOMORROW

Danfoss

Catalog

High-Performance Railway Hoses

Meeting EN45545-2



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Upgrade to a railway hose that meets your **inside and outside requirements**



The challenge facing the rail industry is to make rail travel as reliable, efficient, safe, and comfortable as possible. Power is fundamental to keeping rail networks moving—whether managing power in a centralized depot, in the rolling stock, or in helping ensure sufficient power reaches remote stations.

Driven by regulations and increased globalization, train builders and railway operators must find ways to reduce downtime, increase productivity, and enhance safety and security to drive profitability while making the industry more sustainable. Danfoss understands the need for power solutions that work.

Powering the rail industry means helping our customers build better and safer trains, while enabling railway operators to operate competitively with products designed for maximum reliability. Our focus on energy efficiency and safety means our customers can rest assured that they will be able to meet stringent regulations and drive the industry towards a sustainable future. With technical expertise and project management capabilities—plus a broad portfolio of electrical and hydraulic solutions—Danfoss can help minimize risk and secure rail projects.

EN 45545-2 is the unified standard that regulates the fire behavior of hose lines regarding toxicity, smoke density, and flammability for all EU countries and replaces country-specific standards.

Danfoss Railway hose series meets the requirements of EN45545-2 and covers a wide range of railway applications.

The railway hose series includes compact 1SC, 2SC and standard 1SN, 2SN hoses as well as textile and suction hoses that fulfill up to HL3 / R22 and HL3 / R23. Various standard hydraulic and air conditioning hoses have been tested according to EN45545-2 and achieve results up to HL3. An additional fire sleeve is required for some products.

Danfoss is offering leading **products that guarantee the highest levels of safety and performance** for all areas within the conveyance systems used.

Tested conformance to EN45545-2

The advent of a single standard for hose assembly fire behavior (EN 45545-2) has been adopted by and is replacing country by country standards. Danfoss supplies hoses that conform to every part of the standard. But Danfoss hoses elevate the product offering to HL3 compatible parts.

Meets and exceeds hazard requirements

Danfoss Railway hoses are certified to conform to the EN45545-2 standards.

Requirement set used for	Test Method and Reference	Testing for (unit)	Minimum/Maximum	Thresholds HL1 HL2 HL3	Danfoss Railway Hoses
Inside uses R22 (IN16; EL2; EL6A; EL7A; M2)	T01 EN ISO 4589-2: OI	Oxygen Content (%)	Minimum	28 28 32	Meets and/or exceeds HL3 up to minimum threshold
	T10.03 EN ISO 5659-3 25kWm ⁻²	Smoke Density (D _s max. dimensionless)	Maximum	600 300 150	Meets and/or exceeds HL3 up to minimum threshold
	T12 NF X70-100-1 and -2,600 °C	Smoke Toxicity (CIT _{NLP} dimensionless)	Maximum	1.2 0.9 0.75	Meets and/or exceeds HL3 up to minimum threshold
Outside uses R23 (EX12; EL2; EL5; EL6B; EL7B; M3)	T01 EN ISO 4589-2: OI	Oxygen Content (%)	Minimum	28 28 32	Meets and/or exceeds HL3 minimum threshold
	T10.03 EN ISO 5659-3 25kWm ⁻²	Smoke Density (D _s max. dimensionless)	Maximum	- 600 300	Meets and/or exceeds HL3 minimum threshold
	T12 NF X70-100-1 and -2,600 °C	Smoke Toxicity (CIT _{NLP} dimensionless)	Maximum	- 1.8 1.5	Meets and/or exceeds HL3 minimum threshold

Railway hose portfolio

Hose type	Hose spec	R22 (internal)	R23 (external)	Size	Comment
EC112 (1SC)	EN857	HL3	HL3	-4 to -16	ISO 15540
EC212 (2SC)	EN857	HL3	HL3	-4 to -32	ISO 15540
EC109 (1SN)	EN853	HL3	HL3	-4 to -16	—
EC209 (2SN)	EN853	HL2	HL3	-4 to -16	—
EC045 (2TE)	EN854	HL2	HL3	-3, -4, -12, -16	—
EC045 (2TE)	EN854	HL3	HL3	-5 to -10	—
EC060 (3TE)	EN854	HL2	HL3	-4 to -20	—
EC190 (Suction)	SAE 100R4	HL3	HL3	-12 to -48	—
EC155 (Airbrake)	UIC830-1/EN15807	HL1	HL2	-08 to -22	—

Standard hose portfolio qualified according to EN45545-2

Hose type	Hose spec	R22 (internal)	R23 (external)	Size	Comment
GH506 (4SH)	EN856	HL2	HL3	-12 to -32	ISO 18752 ISO 3862 Type 4SH
GH466 (R15)	SAE 100R15	HL2	HL3	-20 to -32	ISO 3862 Type R15
FC800 + 624	J3062 A/C	HL3	HL3	-12 to -24	ISO 15540, Fire Sleeve 624
FC510 (R2)	EN857 1SC	HL1	HL2	-4 to -20	—

Danfoss Railway hose according to EN45545-2

EC112

Danfoss Railway EN45545 EC112



Meets EN857 Type 1SC and EN45545-2

Part #	Hose I.D.			O.D. max.		Max. OP Proof		Burst	Bend Radius	Weight
	DN	mm	in	mm	in	bar	bar	bar	mm	kg/m
EC112-4	6	6.4	0.25	13.5	0.53	225	450	900	50	0.18
EC112-5	8	7.9	0.31	14.5	0.57	215	430	860	55	0.21
EC112-6	10	9.5	0.38	16.9	0.67	180	360	720	65	0.26
EC112-8	12	12.7	0.50	20.4	0.80	160	320	640	90	0.35
EC112-10	16	15.9	0.63	23.0	0.91	130	260	520	100	0.43
EC112-12	19	19.0	0.75	26.7	1.05	105	210	420	120	0.50
EC112-16	25	25.4	1.00	34.9	1.37	88	176	352	150	0.74

Operating temperatures

-40 °C to +125 °C (-40 °F to +257 °F)
 Air max: +75 °C max: +167 °F
 Water max: +85 °C max: +185 °F

Hazard level

R22/HL3
 R23/HL3

Fittings



1A Series

Inner tube

Synthetic rubber tube

Reinforcement

One steel braid

Cover

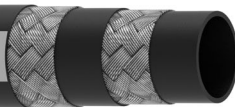
Black fire-retardant synthetic rubber cover

Typical applications

Hydraulic railway systems with petroleum and water-glycol based fluids, for lubricating oils and water

EC212

Danfoss Railway EN45545 EC212



Meets EN857 Type 2SC and EN45545-2

Part #	Hose I.D.			O.D. max.		Max. OP Proof		Burst	Bend Radius	Weight
	DN	mm	in	mm	in	bar	bar	bar	mm	kg/m
EC212-4	6	6.4	0.25	14.2	0.56	400	800	1600	50	0.29
EC212-5	8	7.9	0.31	16.0	0.63	350	700	1400	55	0.33
EC212-6	10	9.5	0.38	18.3	0.72	330	660	1320	65	0.41
EC212-8	12	12.7	0.50	21.5	0.85	275	550	1100	90	0.58
EC212-10	16	15.9	0.63	24.7	0.97	250	500	1000	100	0.69
EC212-12	19	19.0	0.75	28.6	1.13	215	430	860	120	0.81
EC212-16	25	25.4	1.00	36.6	1.44	165	330	660	150	1.17
EC212-20	31	31.8	1.25	44.4	1.75	125	250	500	210	1.53
EC212-24	38	38.1	1.50	51.5	2.03	100	200	400	250	1.89
EC212-32	51	50.8	2.00	64.2	2.53	90	180	360	315	2.42

Operating temperatures

-40 °C to +125 °C (-40 °F to +257 °F)
 Air max: +75 °C max: +167 °F
 Water max: +85 °C max: +185 °F

Hazard level

R22/HL3
 R23/HL3

Fittings



1A Series

Inner tube

Synthetic rubber tube

Reinforcement

Two steel braid

Cover

Black fire-retardant synthetic rubber cover

Typical applications

Hydraulic railway systems with petroleum and water-glycol based fluids, for lubricating oils and water

Danfoss Railway hose according to EN45545-2

EC109

Danfoss Railway EN45545 EC109



Meets EN853 Type 1SN and EN45545-2

Part #	Hose I.D.			O.D. max.		Max. OP Proof		Burst	Bend Radius	Weight
	DN	mm	in	mm	in	bar	bar	bar	mm	kg/m
EC109-04	6	6.4	0.25	14.1	0.55	225	450	900	100	0.22
EC109-05	8	7.9	0.31	15.7	0.62	215	430	860	115	0.26
EC109-06	10	9.5	0.38	18.1	0.71	180	360	720	130	0.33
EC109-08	12	12.7	0.50	21.4	0.84	160	320	640	180	0.41
EC109-10	16	15.9	0.63	24.5	0.96	130	260	520	200	0.47
EC109-12	19	19.0	0.75	28.5	1.12	105	210	420	240	0.59
EC109-16	25	25.4	1.00	36.6	1.44	88	176	352	300	0.87

Operating temperatures

-40 °C to +125 °C (-40 °F to +257 °F)
 Air max: +75 °C max: +167 °F
 Water max: +85 °C max: +185 °F

Hazard level

R22/HL3
 R23/HL3

Fittings



Inner tube

Synthetic rubber tube

Reinforcement

One steel braid

Cover

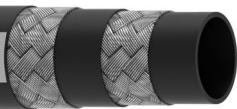
Black fire-retardant synthetic rubber cover

Typical applications

Hydraulic railway systems with petroleum and water-glycol based fluids, lubricating oils, and water

EC209

Danfoss Railway EN45545 EC209



Meets EN853 Type 2SN and EN45545-2

Part #	Hose I.D.			O.D. max.		Max. OP Proof		Burst	Bend Radius	Weight
	DN	mm	in	mm	in	bar	bar	bar	mm	kg/m
EC209-04	6	6.4	0.25	15.7	0.62	400	800	1600	100	0.38
EC209-05	8	7.9	0.31	17.3	0.68	350	700	1400	115	0.43
EC209-06	10	9.5	0.38	19.7	0.78	330	660	1320	130	0.54
EC209-08	12	12.7	0.50	23.0	0.91	275	550	1100	180	0.64
EC209-10	16	15.9	0.63	26.2	1.03	250	500	1000	200	0.75
EC209-12	19	19.0	0.75	30.1	1.19	215	430	860	240	0.93
EC209-16	25	25.4	1.00	38.9	1.53	165	330	660	300	1.29

Operating temperatures

-40 °C to +125 °C (-40 °F to +257 °F)
 Air max: +75 °C max: +167 °F
 Water max: +85 °C max: +185 °F

Hazard level

R22/HL2
 R23/HL3

Fittings



Inner tube

Synthetic rubber tube

Reinforcement

Two steel braid

Cover

Black fire-retardant synthetic rubber cover

Typical applications

Hydraulic railway systems with petroleum and water-glycol based fluids, lubricating oils, and water

Danfoss Railway hose according to EN45545-2

EC045



Meets EN854 Type 2TE and EN45545-2

Part #	Hose I.D.			O.D. max.		Max. OP Proof		Burst	Bend Radius	Weight
	DN	mm	in	mm	in	bar	bar	bar	mm	kg/m
EC045-3	5	4.8	0.19	12.6	0.50	80	160	320	35	0.12
EC045-4	6	6.4	0.25	14.2	0.56	75	150	300	40	0.15
EC045-5	8	7.9	0.31	15.7	0.62	68	136	270	50	0.17
EC045-6	10	9.5	0.38	17.3	0.68	63	126	250	60	0.20
EC045-8	12	12.7	0.50	20.7	0.81	58	116	230	70	0.24
EC045-10	16	15.9	0.63	24.9	0.98	50	100	200	90	0.33
EC045-12	19	19.0	0.75	28.0	1.10	45	90	180	110	0.38
EC045-16	25	25.4	1.00	35.9	1.41	40	80	160	150	0.55

Operating temperatures

-40 °C to +125 °C (-40 °F to +257 °F)
 Air max: +75 °C max: +167 °F
 Water max: +85 °C max: +185 °F

Hazard level

R22/HL3 size -5 to -10
 R22/HL2 size -3, -4, -12, -16
 R23/HL3

Fittings



Inner tube

Synthetic rubber tube

Reinforcement

Single textile braid

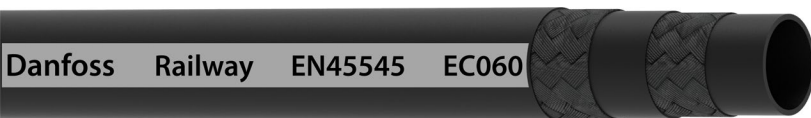
Cover

Black fire-retardant synthetic rubber cover

Typical applications

Hydraulic railway systems with petroleum and water-glycol based fluids, lubricating oils, and water

EC060



Meets EN854 Type 3TE and EN45545-2

Part #	Hose I.D.			O.D. max.		Max. OP Proof		Burst	Bend Radius	Weight
	DN	mm	in	mm	in	bar	bar	bar	mm	kg/m
EC060-4	6	6.4	0.25	15.2	0.60	145	290	580	45	0.17
EC060-5	8	7.9	0.31	17.7	0.70	130	260	520	55	0.24
EC060-6	10	9.5	0.38	19.3	0.76	110	220	440	70	0.27
EC060-8	12	12.7	0.50	22.7	0.89	93	186	372	85	0.34
EC060-10	16	15.9	0.63	26.9	1.06	80	160	320	105	0.48
EC060-12	19	19.0	0.75	30.0	1.18	70	140	280	130	0.49
EC060-16	25	25.4	1.00	37.4	1.47	55	110	220	150	0.69
EC060-20	31	31.8	1.25	43.8	1.72	45	90	180	190	0.85

Operating temperatures

-40 °C to +125 °C (-40 °F to +257 °F)
 Air max: +75 °C max: +167 °F
 Water max: +85 °C max: +185 °F

Hazard level

R22/HL2
 R23/HL3

Fittings



Inner tube

Synthetic rubber tube

Reinforcement

Two textile braid

Cover

Black fire-retardant synthetic rubber cover

Typical applications

Hydraulic railway systems with petroleum and water-glycol based fluids, lubricating oils, and water

Danfoss Railway hose according to EN45545-2

EC190



Meets SAE 100R4 and EN45545-2

Part #	Hose I.D.			Hose O.D. max.		Max. Operat. Pressure		Burst Pressure		Minimum Bend Radius		Vacuum	Weight	
	DN	mm	in	mm	in	bar	psi	bar	psi	mm	in	bar	kg/m	lbs/ft
EC190-12	19	19.0	0.75	32.6	1.28	21	305	84	1220	40	1.57	-0.80	0.83	0.56
EC190-16	25	25.4	1.00	38.2	1.50	17	245	68	980	45	1.77	-0.80	0.97	0.65
EC190-20	32	32.0	1.26	46.0	1.81	14	205	56	820	60	2.36	-0.80	1.29	0.87
EC190-24	38	38.0	1.50	52.4	2.06	10	145	40	580	65	2.56	-0.80	1.66	1.12
EC190-32	51	50.8	2.00	66.0	2.60	7	100	28	400	100	3.94	-0.80	2.37	1.59
EC190-40*	63	63.5	2.50	79.1	3.11	4	60	16	240	140	5.51	-0.80	2.92	1.96
EC190-48*	80	76.2	3.00	95.0	3.74	4	60	16	240	180	7.09	-0.80	4.18	2.81

Operating temperatures

-40 °C to +125 °C (-40 °F to +257 °F)
 Air max: +75 °C max: +167 °F
 Water max: +85 °C max: +185 °F

Hazard level

R22/HL3
 R23/HL3

Fittings



1G Series

Inner tube

Synthetic rubber tube

Reinforcement

High tensile synthetic textile, steel helix wire, and anti-static copper strand

Cover

Black fire-retardant synthetic rubber cover

Typical applications

Railway suction applications for petroleum, lubricating oils, fuels, gasoline, air, water, and water glycol

EC155



Meets UIC830-1, EN15807 and EN45545-2

Part #	Hose I.D.			Wall Thickness		O.D. max.		Max. OP Proof		Burst	Bend Radius	Weight
	DN	mm	in	mm	in	mm	in	bar	bar	bar	mm	kg/m
EC155-08	13	13	0.51	6.0	0.24	25	0.98	400	800	1600	100	0.49
EC155-10	16	16	0.63	6.0	0.24	28	1.10	350	700	1400	115	0.58
EC155-14	22	22	0.87	7.0	0.28	36	1.42	330	660	1320	130	0.85
EC155-18A	28	28	1.10	7.5	0.30	43	1.69	275	550	1100	180	1.14
EC155-22	35	35	1.38	9.0	0.35	53	2.09	250	500	1000	200	0.75

Operating temperatures

-40 °C to +70 °C (-40 °F to +158 °F)

Hazard level

R22/HL1
 R23/HL2

Fittings

Designed for half couplings acc. EN15807

Inner tube

Synthetic rubber tube

Reinforcement

Four textile cord reinforcement

Cover

Black fire-retardant synthetic rubber cover

Typical applications

Railway air brake systems to connect carriages by means of half-couplings according to DIN15807

Danfoss: your **single source supplier**

Not only is Danfoss the first manufacturer to carry an EN45545-2 conforming SAE 100R5 railway hose, but this hose also meets HL3 requirements for outside use. Beyond that, Danfoss also carries a full range of hoses, couplings, and PMC products.



High performance spiral hydraulic hose

Aeroquip GH466



Exceeds: SAE 100R15 | ISO 3862 Type R15, EN 856 R13

2 million flex impulse cycle performance according ISO6802

Part #	Hose I.D.			Hose O.D. (max.)		Max operating pressure		Burst pressure		Minimum Bend Radius		Weight	
	DN	mm	in	mm	in	bar	bar	bar	psi	mm	in	kg/m	lbs/ft
GH466-20	31	31.8	1.25	51.3	2.02	420	6100	1680	24400	420	16.54	3.48	2.34
GH466-24	38	38.1	1.50	58.8	2.31	420	6100	1680	24400	500	19.69	4.63	3.11
GH466-32	51	50.8	2.00	72.7	2.86	420	6100	1680	24400	630	24.80	6.70	4.50

Operating temperatures

-40 °C to +120 °C (-40 °F to +248 °F)

Hazard level

R22/HL2
R23/HL3

Fittings



6S (-20 to -24) 1W (-20 to -32)

Inner tube

Synthetic rubber tube

Reinforcement

6 high tensile spiral wire layers reinforcement

Cover

Dura-Tuff™
high abrasion resistant

Typical applications

High pressure hydraulic systems with constant high working pressure for use with petroleum based fluids

Agency listings

MSHA
DNV
BV
LR
EN45545-2
ABS

High performance spiral hydraulic hose

Aeroquip GH506



Exceeds: EN 856 Type 4SH | ISO 18752 | ISO 3862 Type 4SH

2 million flex impulse cycle performance according ISO6802**

Part #	Hose I.D.			Hose O.D. (max.)		Max operating pressure		Burst pressure		Minimum Bend Radius		Weight	
	DN	mm	in	mm	in	bar	psi	bar	psi	mm	in	kg/m	lbs/ft
GH506-12**	19	19.0	0.75	33.0	1.30	420	6100	1680	24400	280	11.02	1.49	1.00
GH506-16**	25	25.4	1.00	39.9	1.57	420	6100	1680	24400	340	13.39	2.05	1.38
GH506-20	31	31.8	1.25	47.1	1.85	350	5100	1400	20300	460	18.11	2.54	1.71
GH506-24	38	38.1	1.05	55.1	2.17	300	4350	1200	17400	560	22.05	3.27	2.20
GH506-32	51	50.8	2.00	69.7	2.74	250	3650	1000	14500	700	27.56	4.58	3.08

Operating temperatures

-40 °C to +100 °C (-40 °F to +212 °F)

Hazard level

R22/HL2
R23/HL3

Fittings



1W (-12 to -32)

**2 million flex impulse cycle performance according ISO6802 for size 12' and 16'

Inner tube

Synthetic rubber tube

Reinforcement

4 high tensile spiral wire reinforcement

Cover

Dura-Tuff™
high abrasion resistant

Typical applications

High pressure hydraulic systems with petroleum based fluids, challenging applications like construction equipment, agriculture machines, and stationary applications

Agency listings

MSHA
DNV
ABS

High performance specialty hoses

Aeroquip FC510 high-temp one braided hose



Exceeds: EN 857 1SC

Part #	Hose I.D.			Hose O.D. (max.)		Max operating pressure		Burst pressure		Minimum Bend Radius		Weight	
	DN	mm	in	mm	in	bar	psi	bar	psi	mm	in	kg/m	lbs/ft
FC510-4	6	6.4	0.25	14.9	0.59	345	5000	1380	20000	76	3.00	0.34	0.23
FC510-6	10	9.5	0.37	18.2	0.72	275	4000	1100	16000	89	3.50	0.43	0.29
FC510-8	12	12.7	0.50	20.7	0.81	240	3500	960	14000	127	5.00	0.50	0.34
FC510-10	16	15.9	0.63	24.4	0.96	190	2750	760	11000	152	6.00	0.66	0.44
FC510-12	19	19.0	0.75	28.2	1.11	155	2250	620	9000	178	7.00	0.77	0.52
FC510-16	25	25.4	1.00	35.2	1.39	138	2000	552	8000	229	9.00	1.05	0.71
FC510-20	31	31.8	1.25	43.7	1.72	112	1625	448	6500	279	11.00	1.61	1.08

Operating temperatures

-40 °C to +150 °C (-40 °F to +302 °F)

Hazard level

R22/HL1
R23/HL2

Fittings



Inner tube

AQP Elastomer tube

Reinforcement

Patented HI-PAC wire braid reinforcement

Cover

Blue AQP elastomer cover

Typical applications

Petroleum and fire-resistant hydraulic fluids, fuel and lubricating oils, gasoline, water, and other industrial fluids

Agency listings

DNV
EN45545-2
MED
MSHA
USCG

High performance large bore A/C hose

FC800 A/C Hose + 624 Fire Protection Sleeve



Meets SAE J3062 and J2064

Part #	Hose I.D.			Hose O.D. (max.)		Max operating pressure		Burst pressure		Minimum Bend Radius		Weight	
	DN	mm	in	mm	in	bar	psi	bar	psi	mm	in	kg/m	lbs/ft
FC800-12	16	16.4	0.65	27.2	1.07	35	500	140	2000	70.0	2.76	0.67	0.45
FC800-16	19	22.8	0.90	31.5	1.24	35	500	140	2000	80.0	3.15	0.71	0.48
FC800-20	25	29.3	1.15	38.6	1.52	35	500	140	2000	100.0	3.94	0.92	0.62
FC800-24	31	35.5	1.40	45.6	1.80	35	500	140	2000	160.0	6.30	1.15	0.77

Operating temperatures

-40 °C to +125 °C (-40 °F to +257 °F)

Hazard level

R22/HL3
R23/HL3

Fittings



Inner tube

CR Chloroprene inner tube and polyamide barrier foil

Reinforcement

Wire braid reinforcement

Cover

EPDM hose cover

Typical applications

Air conditioning and refrigeration

Certificate Examples

EN 45545-2

The EC112, EC212 and others have passed test requirements up to Hazard Level R22/HL3 and R23/HL3.



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RAPPORTO DI PROVA / TEST REPORT NO. 1554-1555.1S0040/22

METODO DI PROVA:

Test method

UNI EN 45545-2: 2020

DENOMINAZIONE DELLA PROVA:

Description of the standard

Requisiti di comportamento al fuoco di materiali e componenti
Requirements for fire behaviour of materials and components

RICHIEDENTE:

Sponsor

Danfoss Power Solutions II GmbH
Dr. Reckeweg Straße 1
D-76532 Baden-Baden (Germany)

DENOMINAZIONE DEL MATERIALE:

Denomination of the material

EC112

GAMMA DIAMETRI NOM. DEI CAMPIONI:

Nominal diameters range of the samples

Diameter from 6.4 mm to 25.4 mm
06+25 (Size from -04 to -16)

DESCRIZIONE DEL MATERIALE:

Description of the material

Tubo flessibile con rivestimento esterno in gomma tipo NBR di colore nero, rinforzato con una treccia in fili d'acciaio, rivestimento interno in gomma tipo NBR. Hose with external blue cover in rubber of NBR type, reinforced with one steel wire braid, inner cover in rubber of NBR type.



Questo documento fa riferimento ai Rapporti di Prova no. 1554.050030/22, no. 1555.050030/22, no. 1554.150030/22, no. 1555.150030/22, no. 1554.150050/22 e no. 1555.150050/22 emessi da questo Laboratorio. Il Laboratorio non è stato coinvolto in nessuna procedura di campionamento della produzione. This certificate refers to the Test Reports no. 1554.050030/22, no. 1555.050030/22, no. 1554.150030/22, no. 1555.150030/22, no. 1554.150050/22 and no. 1555.150050/22 issued by this Laboratory. The Laboratory has not been involved in any procedure of sampling of the production.

Prodotto / Product	M2 (Tubazioni flessibili per interno / Hoses - Interior) M3 (Tubazioni flessibile per esterno / Hoses - Exterior)		
Requisiti / Requirements	R22 - R23		
Prove richieste / Tests required	EN ISO 4589-2	EN ISO 5659-2	EN 17084 Method 2
Parametro / Parameter	LOI (%)	(25 kW/m ² - Flaming) D _s max	CT _{fl,p}
Valori trovati / Values found (Size -04 - DN 06 - Rif. Lab. no. 1554/22)	38.8	138	0.15
Valori trovati / Values found (Size -16 - DN 25 - Rif. Lab. no. 1555/22)	36.3	145	0.14
	Per / For	Per / For	Per / For
Limiti di accettazione Acceptance limits	R22 - R23 HL1: ≥ 28% HL2: ≥ 28% HL3: ≥ 32%	R22 HL1: ≤ 600 HL2: ≤ 300 HL3: ≤ 150	R23 HL1: --- HL2: ≤ 600 HL3: ≤ 300

Legenda ---: Nessun requisito / No requirement

VALUTAZIONE / JUDGEMENT

Sulla base dei risultati di prova sopra riportati il materiale in oggetto **È CONFORME** alle richieste di **UNI EN 45545-2: 2020** per livelli di rischio **HL1 - HL2 - HL3** set di requisiti **R22 e R23** per la gamma di diametri sopra riportati.

On the basis of the above results the sample in object **COMPLIES** with the requirements of **UNI EN 45545-2: 2020** for Hazard Levels **HL1 - HL2 - HL3** requirement set **R22 and R23** for the diameters range reported above.

Prato, 12/09/2022

Il Responsabile Certificazione
The Certification Manager
David Agostini

Il Direttore del Laboratorio
The Director of the Laboratory
Luca Ermini

Valid until: 11/09/2027 (*)



Questo documento deve essere letto congiuntamente ai Rapporti di Prova sopra riportati, per la descrizione del prodotto e per ogni altra notizia di dettaglio. Questo documento non costituisce approvazione di prodotto né tantomeno dichiarazione di conformità, che spetta esclusivamente al Produttore / Sponsor. Il riconoscimento Certifier si riferisce alle prove di EN 45545-2 riportate nella lista pubblicata. This document has to be read in conjunction with the Test Reports listed above, for the description of the product and for every other detail. This document does not represent type approval or certification of the product neither declaration of compliance, that is exclusively under the responsibility of the Manufacturer or Sponsor. The Certifier approval refers to the tests according to EN 45545-2 reported in the published list. (*) Validità riferita alla prescrizione di / Validity referred to the prescription of Reg. (UE) 1302/2014 (12.12.2014) §4.2.10.2.1 (3)

Il presente Rapporto di Prova non può essere riprodotto in forma parziale senza l'autorizzazione scritta di questo Laboratorio

EN ISO 15540

The EC112, EC212 and others have passed the 30 min. fire flame test (800 °C) and follow 2 min. proof pressure without any additional fire sleeve.



TYPE TEST REPORT Annex No. 1 to Report No. 137.OIS0110/22 of 18/02/2022

Test Certificate	
Fire resistance of hose assemblies	
Testing subject to ISO 15540	
Details on test specimen	
Hose: Flexible	Type: EC112-08 According to specification: Danfoss Power Solutions II GmbH
Nominal diameter: 12 (1/2")	Allowable working pressure: 160 [bar] Proof pressure: 320 [bar]
Hose manufacturer: Polymer Kauçuk San.Paz.A.Ş	Name: According to specification Danfoss Power Solutions II GmbH
Fittings type: 1A8BF8	Components: Nipple code: 1F40015-0808-S - Nut code: SH18306-08 - Socket code: 1A8 - Type of metal: carbon steel
Allowable working pressure: 160 [bar]	Proof pressure: 320 [bar]
Fitting manufacturer: Danfoss Power Solutions II GmbH - Name: According to specification Danfoss Power Solutions II GmbH	
Hose assembly: Danfoss Power Solutions II GmbH - Designation: According to specif. Danfoss Power Solutions II GmbH	
Hose assembly manufacturer: Danfoss Power Solutions II GmbH - Name: According to specification Danfoss Power Solutions II GmbH	
Address: Dr. Reckeweg Straße 1 - D-76532 Baden-Baden (Germany)	
Flame protection: No	
Test conditions	
Working pressure during the test: 5 ± 0.2 [bar]	Static test pressure following flame application: 320 [bar]
Duration of flame application: 30 [min]	Duration of static pressure load following flame application: 2 [min]
Water flow velocity: 1.03 m/s	Flow meter ± 1% Max scale value
Test results	
Temperature: of test medium in front of test specimen: 80 ± 2 [°C]	of test medium behind test specimen: 85 Max [°C]
Flame temperature: below centre of test specimen: 800 ± 50 [°C]	under fitting: 800 ± 50 [°C]
Actual test duration: 30 min (if deviating from the duration of flame application as stipulated under test condition)	
Tight at test pressure (proof pressure p = 320 [bar]) after flame application.	
Duration: 2 min	Results: SATISFACTORY
Measurement records and calibrations (see annex) No: see Test Report No. 137.OIS0110/22	
LAPI S.p.A. Records dated: 18/02/2022	
Description of failure	
N/A	
Remarks (e.g. on behaviour in fire)	
None in particular	
Assessment: Test passed: YES	
The test was carried out on at: (Prato) (Italy) Name Operator: Ing. Fabio Crescenti	
Address: LAPI S.p.A. Laboratory	
Inspector: None.	DIRECTIVE 2014/90/EU of 23 rd July 2014 and REGULATION (EU) 2021/1158 of 22 nd June 2021 - MC/36, L1
Date: 14/02/2022	

Il presente Rapporto di Prova non può essere riprodotto in forma parziale senza l'autorizzazione scritta di questo Laboratorio

ENGINEERING
TOMORROW



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Any information, including, but not limited to information on selection of product, its application or use, product design, weight, dimensions, capacity or any other technical data in product manuals, catalogues descriptions, advertisements, etc. and whether made available in writing, orally, electronically, online or via download, shall be considered informative, and is only binding if and to the extent, explicit reference is made in a quotation or order confirmation. Danfoss cannot accept any responsibility for possible errors in catalogues, brochures, videos and other material. Danfoss reserves the right to alter its products without notice. This also applies to products ordered but not delivered provided that such alterations can be made without changes to form, fit or function of the product. All trademarks in this material are property of Danfoss A/S or Danfoss group companies. Danfoss and the Danfoss logo are trademarks of Danfoss A/S. All rights reserved.