

**SEL Railway Hoses**

High performance Railway Hoses According EN45545-2

# High-performance railway hose meets R22/R23 test requirements for hazard levels 3 and 3



**EATON**

*Powering Business Worldwide*

**SEL**  
**HOSES**  
An Eaton Brand



The railway industry is one of the growing sectors with improving technology and changing national and international regulations to be able to offer faster, lower cost and more environmental services. SEL is aware of the sector's needs with its vision focus on energy efficiency, safety and productivity. 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 and make the industry more sustainable.

SEL 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'll be able to meet stringent regulations and drive the industry towards a sustainable future.

## Upgrade to a railway hose that meets inside and outside requirements

EN 45545-2 is the single standard for hose assembly fire behavior (toxicity, smoke density and oxygen-depletion), now adopted by all EU nations. Over the next few years EN45545-2 will replace the country-by-country standards formerly in place.

The SEL Railway Hose series of hoses conforms to the EN45545-2 standard and is

now available for use on a variety of railway uses. In fact, the Railway series of hoses also meet up to R22/HL3 and R23/HL3 requirements for our 1SN, 2SN, 3TE. The Railway series of hoses are available with R22/HL2 and R23/HL3 in 1SC, 2SC and 2TE models. The railway series of hoses are available with R22/HL2 and R23/HL2 in R4 model.

# SEL 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. SEL supplies hoses that conform to every part of the standard. But SEL hoses actually elevate the product offering to HL3 compatible parts

**Table 1**  
**EN45545-2 conformance tests by country**

Country	Standard	Test Item
<b>France</b>	<b>French standard NF F 16-101</b> Tests fire behavior, fire effluents and toxicity of the hose	Smallest, medium and largest width of a specific hose type: <ul style="list-style-type: none"> <li>• Flame resistance class I3</li> <li>• Smoke generation and toxicity class F3</li> </ul>
<b>Germany</b>	<b>German standard DIN 5510 part 2 (05/2009)</b> Tests fire behavior, fire effluents and toxicity of the hose	Smallest and largest nominal width of a specific hose type: <ul style="list-style-type: none"> <li>• Flammability class S3</li> <li>• Droplet class ST2</li> <li>• Smoke generation class SR2</li> <li>• Toxicity FED (t zul.) &lt; 1</li> </ul>
<b>Great Britain</b>	<b>British standard BS 6853</b> Tests fire behavior and fire effluents of the hose cover material	Rubber hose cover material Smoke behavior Release of toxins meets the limit value: category Ib, II
<b>Italy</b>	<b>Italian standard UNI CEI 11170-3</b> Tests fire behavior and fire effluents of hose material	The smallest and largest nominal width of a specific hose type: <ul style="list-style-type: none"> <li>• Smoke generation</li> <li>• Fire resistance</li> <li>• Toxicity</li> <li>• Overall class: LR4</li> </ul>

## Meets and exceeds hazard requirements

Most manufacturers have yet to meet the stringent requirement sets for R22 and R23. SEL Railway hoses are certified to conform to the EN45545-2 standards.

Requirement set used for	Test Method & Reference	Testing for (unit)	Minimum / Maximum	Thresholds HL1	HL2	HL3	Eaton Railway Hoses
<b>Inside uses</b> <b>R22</b> (IN16; EL2; EL6A; EL7A; M2)	T01 EN ISO 4589-2: 0I	Oxygen Content (%)	Minimum	28	28	<b>32</b>	Meets and/or exceeds HL3 minimum threshold
	T10.03 EN ISO 5659-3 25kWm <sup>-2</sup>	Smoke Density (D <sub>s</sub> max. dimensionless)	Maximum	600	300	<b>150</b>	Meets and/or exceeds HL3 maximum threshold
	T12 NF X70-100-1 and -2, 600° C	Smoke Toxicity (CIT <sub>NLP</sub> dimensionless)	Maximum	1.2	0.9	<b>0.75</b>	Meets and/or exceeds HL3 maximum threshold
<b>Outside uses</b> <b>R23</b> (EX12; EL2; EL5 EL6B; EL7B; M3)	T01 EN ISO 4589-2: 0I	Oxygen Content (%)	Minimum	28	28	<b>32</b>	Meets and/or exceeds HL3 minimum threshold
	T10.03 EN ISO 5659-3 25kWm <sup>-2</sup>	Smoke Density (D <sub>s</sub> max. dimensionless)	Maximum	-	600	<b>300</b>	Meets and/or exceeds HL3 maximum threshold
	T12 NF X70-100-1 and -2, 600° C	Smoke Toxicity (CIT <sub>NLP</sub> dimensionless)	Maximum	-	1.8	<b>1.5</b>	Meets and/or exceeds HL3 maximum threshold

Hose type	Hose spec	R22 (internal)	R23 (external)	Size
SEL Railway 1SC	EN 857	HL2	HL3	¼" to 1"
SEL Railway 2SC	EN 857	HL2	HL3	¼" to 1"
SEL Railway 2SC	EN 857	HL3	HL3	1 1/4" to 2"
SEL Railway 1SN	EN 853	HL3	HL3	¼" to 1"
SEL Railway 2SN	EN 853	HL3	HL3	¼" to 1"
SEL Railway 2TE	EN 854	HL2	HL3	3/16" to 1"
SEL Railway 3TE	EN 854	HL3	HL3	¼" to 1"
SEL Railway R4	SAE 100 R4	HL2	HL2	3/4" to 3"
SEL Railway Airbrake (UIC830-1)	SAE 100 R4	HL1	HL2	1/2" to 1 3/8"

# Railway 1SN



EN853 type 1SN / EN45545-2

DN	Hose I.D.		Hose O.D. (max)		Working Pressure	Min. Burst Pressure	Min. Bend Radius	Weight
	mm	in	mm	in				
6	6,4	0,25	14,1	0,55	225	900	100	0,22
8	7,9	0,31	15,7	0,62	215	860	115	0,26
10	9,5	0,38	18,1	0,71	180	720	130	0,33
12	12,7	0,5	21,4	0,84	160	640	180	0,41
16	15,9	0,63	24,5	0,96	130	520	200	0,47
19	19	0,75	28,5	1,12	105	420	240	0,59
25	25,4	1	36,6	1,44	88	352	300	0,87

### Temp. Range:

-40 °C to +125 °C

Air max +75°C

Water max +85°C

### Inner Tube:

Synthetic rubber tube

### Reinforcement:

One steel braid

### Cover:

Synthetic rubber cover

### Typical Application:

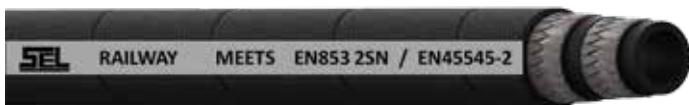
Hydraulic system service with petroleum and water based fluids, for general industrial service.

### Additional Certificates:

EN45545-2

ISO15540

# Railway 2SN



EN853 type 2SN / EN45545-2

DN	Hose I.D.		Hose O.D. (max)		Working Pressure	Min. Burst Pressure	Min. Bend Radius	Weight
	mm	in	mm	in				
6	6,4	0,25	15,7	0,62	400	1600	100	0,38
8	7,9	0,31	17,3	0,68	350	1400	115	0,43
10	9,5	0,38	19,7	0,78	330	1320	130	0,54
12	12,7	0,5	23,0	0,91	275	1100	180	0,64
16	15,9	0,63	26,2	1,03	250	1000	200	0,75
19	19	0,75	30,1	1,19	215	860	240	0,93
25	25,4	1	38,9	1,53	165	660	300	1,29

### Temp. Range:

-40 °C to +125 °C

Air max +75°C

Water max +85°C

### Inner Tube:

Synthetic rubber tube

### Reinforcement:

Two steel braids

### Cover:

Synthetic rubber cover

### Typical Application:

Hydraulic system service with petroleum and water based fluids, for general industrial service.

### Additional Certificates:

EN45545-2

ISO15540

## Railway 1SC



EN857 type 1SC / EN45545-2

DN	Hose I.D.		Hose O.D. (max)		Working Pressure	Min. Burst Pressure	Min. Bend Radius	Weight
	mm	in	mm	in	bar	bar	mm	kg/m
6	6,4	0,25	13,5	0,53	225	900	50	0,18
8	7,9	0,31	14,5	0,57	215	860	55	0,21
10	9,5	0,38	16,9	0,67	180	720	65	0,26
12	12,7	0,5	20,4	0,8	160	640	90	0,35
16	15,9	0,63	23	0,91	130	520	100	0,43
19	19	0,75	26,7	1,05	105	420	120	0,5
25	25,4	1	34,9	1,37	88	352	150	0,74

### Temp. Range:

-40 °C to +125 °C

Air max +75°C

Water max +85°C

### Inner Tube:

Synthetic rubber tube

### Reinforcement:

One steel braid

### Cover:

Synthetic rubber cover

### Typical Application:

Hydraulic system service with petroleum and water based fluids, for general industrial service.

### Additional Certificates:

EN45545-2

ISO15540

## Railway 2SC



EN857 type 2SC / EN45545-2

DN	Hose I.D.		Hose O.D. (max)		Working Pressure	Min. Burst Pressure	Min. Bend Radius	Weight
	mm	in	mm	in	bar	bar	mm	kg/m
6	6,4	0,25	14,2	0,56	400	1600	50	0,29
8	7,9	0,31	16,0	0,63	350	1400	55	0,33
10	9,5	0,38	18,3	0,72	330	1320	65	0,41
12	12,7	0,5	21,5	0,85	275	1100	90	0,58
16	15,9	0,63	24,7	0,97	250	1000	100	0,69
19	19	0,75	28,6	1,13	215	860	120	0,81
25	25,4	1	36,6	1,44	165	660	150	1,17
31	31,8	1,25	44,4	1,75	125	500	210	1,53
38	38,1	1,5	51,5	2,03	100	400	250	1,89
51	50,8	2	64,2	2,53	90	360	315	2,42

### Temp. Range:

-40 °C to +125 °C

Air max +75°C

Water max +85°C

### Inner Tube:

Synthetic rubber tube

### Reinforcement:

Two steel braids

### Cover:

Synthetic rubber cover

### Typical Application:

Hydraulic system service with petroleum and water based fluids, for general industrial service.

### Additional Certificates:

EN45545-2

ISO15540

## Railway 2TE



EN854 Type 2TE / EN45545-2

DN	Hose I.D.		Hose O.D. (max)		Working Pressure	Min. Burst Pressure	Min. Bend Radius	Weight
	mm	in	mm	in				
5	4,8	0,19	12,6	0,5	80	320	35	0,12
6	6,4	0,25	14,2	0,56	75	300	40	0,15
8	7,9	0,31	15,7	0,62	68	270	50	0,17
10	9,5	0,38	17,3	0,68	63	250	60	0,20
12	12,7	0,5	20,7	0,81	58	230	70	0,24
16	15,9	0,63	24,9	0,98	50	200	90	0,33
19	19	0,75	28,0	1,10	45	180	110	0,38
25	25,4	1	35,9	1,41	40	160	150	0,55

### Temp. Range:

-40 °C to +125 °C

Air max +75°C

Water max +85°C

### Inner Tube:

Synthetic rubber tube

### Reinforcement:

One textile braid

### Cover:

Synthetic rubber cover

### Typical Application:

Hydraulic system service with petroleum and water based fluids, for general industrial service.

### Additional Certificates:

EN45545-2

## Railway 3TE



EN854 Type 3TE / EN45545-2

DN	Hose I.D.		Hose O.D. (max)		Working Pressure	Min. Burst Pressure	Min. Bend Radius	Weight
	mm	in	mm	in				
6	6,4	0,25	15,2	0,60	145	580	45	0,33
8	7,9	0,31	17,7	0,69	130	520	55	0,41
10	9,5	0,38	19,3	0,76	110	440	70	0,58
12	12,7	0,5	22,7	0,89	93	372	85	0,69
16	15,9	0,63	26,9	1,05	80	320	105	0,81
19	19	0,75	30,0	1,18	70	280	130	1,17
25	25,4	1	37,4	1,47	55	220	150	2,42

### Temp. Range:

-40 °C to +125 °C

Air max +75°C

Water max +85°C

### Inner Tube:

Synthetic rubber tube

### Reinforcement:

Two textile braids

### Cover:

Synthetic rubber cover

### Typical Application:

Hydraulic system service with petroleum and water based fluids, for general industrial service.

### Additional Certificates:

EN45545-2

## Railway R4



SAE 100 R4/ EN45545-2

DN	Hose I.D.		Hose O.D. (max)		Working Pressure	Min. Burst Pressure	Min. Bend Radius	Vacuum	Weight
	mm	in	mm	in					
19	19	0,75	32,6	1,28	21	84	40	-0,80	0,83
25	25,4	1	38,2	1,50	17	68	45	-0,80	0,97
31	32	1,26	46,0	1,81	14	56	60	-0,80	1,29
38	38	1,5	52,4	2,06	10	40	65	-0,80	1,65
51	50,8	2	66,0	2,60	7	28	100	-0,80	2,37
63	63,5	2,5	79,1	3,11	4	16	140	-0,80	2,92
80	76,2	3	95,0	3,74	4	16	180	-0,80	4,18

### Temp. Range:

-40 °C to +125 °C

Air max +75°C

Water max +85°C

### Inner Tube:

Synthetic rubber tube

### Reinforcement:

One textile braid

### Cover:

Synthetic rubber cover

### Typical Application:

Hydraulic system service with petroleum and water based fluids, for general industrial service.

### Additional Certificates:

EN45545-2

## Railway Airbrake (UIC830-1)



DN	Hose I.D.		Hose O.D. (max)		Working Pressure	Min. Burst Pressure	Min. Bend Radius	Weight
	mm	in	mm	in				
13	13	0,51	25	0,98	10	70	70	0,487
16	16	0,63	28	1,10	10	70	90	0,525
22	22	0,87	36	1,42	10	70	120	0,868
28	28	1,10	43	1,69	10	70	150	1,139
35	35	1,38	53	2,09	10	70	170	1,548

### Temp. Range:

-40°C to +70°C

### Inner Tube:

Synthetic rubber tube

### Reinforcement:

4 textile cord

### Cover:

Fire retardant synthetic rubber cover

### Typical Application:

For use in railway air brake systems to connect carriages by means of half couplings according to DIN15807:2011

### Additional Certificates:

EN45545-2

UIC830-1

EN15807:2011











