



Industrial Batteries –
System solutions for railways.

Cost-saving, versatile, reliable.

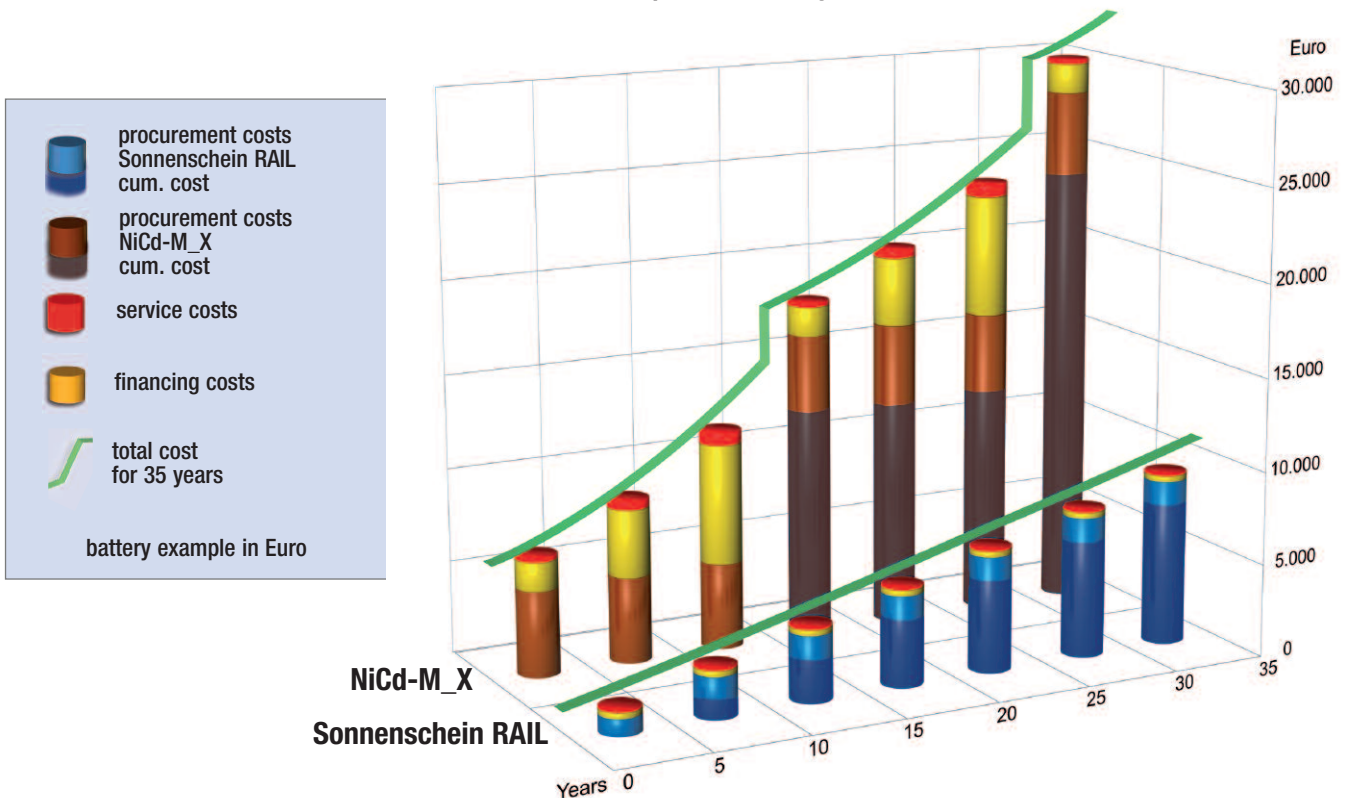


Batteries for railway rolling stock

Classic or valve-regulated batteries from Exide Technologies, particularly maintenance-free (VRLA), are outstanding value for money. The graph below shows a comparison with the much higher priced NiCd railway

battery. When finance over the 35 year train life is taken into account plus the maintenance cost, it is clear that the Exide Technologies product requires a smaller budget.

**Economic analysis –
Sonnenschein RAIL and NiCd cost comparison for 35 years**



Technical characteristics and data

Sonnenschein PzV

Type*	Nominal capacity C ₅ /Ah	Typical battery systems		Dimensions per crates / trays		
		Nominal Voltage V	Number of crates / trays Parts	Length max. mm	Width max. mm	Height max. mm
Batteries						
26V 2 PzV 110	110	104	4	712	218	380
18/16V 3 PzV 165	165	104	6	712	218	380
26V 2 PzV 100	100	104	4	653	258	370
54V 3 PzV 210	210	108	2	696	847	460
12V 2 PzV 100	100	24/108	2/9	384	255	377
8V 3 PzV 165**	165	24/112/120	3/14/15	384	255	365
6V 4 PzV 220	220	24/120	4/20	384	255	377
4V 6 PzV 330**	330	24	6	384	255	365
4V 7 PzV 385**	385	24/120	6/30	384	255	365
4V 8 PzV 440**	440	24	6	384	255	365
12V 8 PzV 440	440	24	2	800	350	380
14V 3 PzV 210	210	112	8	586	230	465
8V 6 EPzV 420 R	420	64	8	500	215	470
8V 8 EPzV 440 R	440	64	8	700	203	376
Cells				Dimensions per cell		
2V 5 PzV-BS 145	145	96	48	109	158	275
2V 6 PzV-BS 175	175	18	9	125	158	275

*) other DIN & BS cell and battery types are available on request

**) positive plate with 23 tubes



Sonnenschein RAIL

Typ	Nominal capacity C ₅ /Ah	Nominal voltage V	Nominal capacity			Weight kg	Terminal position	Terminal
			Length max. mm	Width max. mm	Height max. mm			
SRC 12V 33 G	33	12	210	175	175	14,6	G-M6	3
SRC 12V 40 A	40	12	242	175	190	18,0	A	3
SRC 12V 51 A	51	12	278	175	190	20,8	A	3
SRL 12V 61 A	61	12	353	175	190	23,0	A	3
SRL 12V 61 F10	61	12	353	175	196*	23,6	F-M10	3
SRC 12V 65 A	65	12	353	175	190	26,8	A	3
SRC 12V 65 G	65	12	353	175	190	26,8	G-M6	3
SRP 12V 80 A	80	12	330	171	236	30,0	A	2
SRP 12V 88 A RF	88**	12	330	171	236	30,0	A	2
SRC 12V 105 A	105	12	345	172	283	38,7	A	3
SRP 12V 122 A	122	12	513	223	225	47,0	A	4
SRL 12V 165 A	165	12	518	274	238	64,0	A	4
SRP 12V 175 A	175	12	518	274	238	67,0	A	4
SRC 6V 180 A	180	6	246	192	275	31,0	A	1
SRC 6V 240 A	240	6	312	182	359	47,0	A	1

A flame-retardant UL94-V0 version is available on request only

*) add. 24 mm for connector and screw

**) Nominal capacity C₂₀

SRL= Sonnenschein RAIL Longlife

SRC= Sonnenschein RAIL Cyclic

SRP= Sonnenschein RAIL General Purpose



Marathon L

Type*	Nominal capacity C ₂₀ /Ah	Nominal voltage V	Dimensions			Weight kg
			Length max. mm	Width max. mm	Height max. mm	
L6V110	118	6	272	166	190	23,0
L6V160	170	6	359	172	226	31,5
L2V220	236	2	209	136	265	16,0
L2V270	289	2	209	136	265	18,3
L2V320	346	2	209	202	265	24,2
L2V375	404	2	209	202	265	26,5
L2V425	456	2	209	202	265	28,8
L2V470	507	2	209	270	265	32,6
L2V520	559	2	209	270	265	35,0
L2V575	618	2	209	270	265	37,3

*) other types of the Marathon L and XL range are available on request



Technical characteristics and data

Classic PzS

Type*	Nominal capacity C ₅ /Ah	Typical battery systems		Dimensions per crates / trays		
		Nominal Voltage V	Number of crates / trays Parts	Length max. mm	Width max. mm	Height max. mm
26V 2 PzS 110	110	104	4	712	218	380
18/16V 3 PzS 165	165	104	6	712	218	380
26V 2 PzS 110	110	104	4	653	258	370
54V 4 PzS 280	280	108	2	638	847	460
52V 3 EPzB 96	96	104	2	688	583	398
26V 2 PzS 120	120	104	4	688	583	398
12V 2 PzS 110	110	24/108	2/9	384	255	370
8V 3 PzS 165**	165	24/112/120	3/14/15	384	255	365
6V 4 PzS 220	220	24/120	4/20	384	255	370
4V 6 PzS 330**	330	24	6	384	255	365
4V 7 PzS 385**	385	24/120	6/30	384	255	365
4V 8 PzS 440**	440	24	6	384	255	365
6V 4 EPzS 320	320	24	4	265	210	441
8V 8 EPzS 480	480	24	3	488	215	405
14V 3 EPzS 240	240	112	8	586	230	465
6V 3 EPzS 240	240	24	4	345	230	444
8V 6 EPzS 400	440	24	3	502	250	440
4V 8 EPzS 480	480	24	6	570	186	365
8V 8 EPzB 440 R	440	64	8	578	214	450
8V 9 EPzB 495 R	495	64	8	690	172	440



*) other DIN & BS cell and battery types and models (e.g. ETH/ETX high-performance batteries) are available on request

***) cells with 23 positive tubes

Classic RAIL

Type*	Nominal capacity C ₅ Ah	Nominal Voltage V	Dimensions			Weight approx. kg
			Length max. mm	Width mm	Height mm	
CR 12V 40	40	12	210	175	190	13,7
CR 12V 50	50	12	242	175	190	17,3
CR 12V 60	60	12	278	175	190	20,7
CR 12V 80 L	80	12	353	175	190	26,4
CR 12V 105	105	12	513	189	223	45,5
CR 12V 135	135	12	513	223	223	47,8
CR 12V 180	180	12	513	270	242	62,7
CR 12V 190	190	12	518	276	242	61,0



Technical features

Valve-regulated batteries (VRLA)	Vented batteries
with robust dryfit gel technology or AGM glass mat technology. Both systems are maintenance-free!	with high-performance tubular plates or compact block batteries with grid plates.
<ul style="list-style-type: none"> ■ No liquid electrolyte - no spilling ■ No insulation faults due to wet batteries ■ No wet, sticky or corroded battery boxes ■ No risk of excessive or insufficient topping-up ■ Reduced risk of fire caused by neglecting to top-up ■ Full capacity from charge retention (no standby capacity reduction) ■ Proof against deep-discharge ■ Designed in accordance with IEC 60254-1 and IEC 60896-21 (respectively) ■ Very low self-discharge, long storage period ■ High mechanical strength and resistance against vibration and shock due to the VRLA design ■ Can be recycled easily and completely 	<ul style="list-style-type: none"> ■ Classic, robust lead-acid battery technology with liquid electrolyte ■ High operational safety even under rough conditions ■ Water top-up systems for group or individual topping-up available ■ Full capacity from charge retention (no standby capacity reduction) ■ High mechanical strength and resistance against vibration and shock due to proven design ■ Can be recycled easily and completely

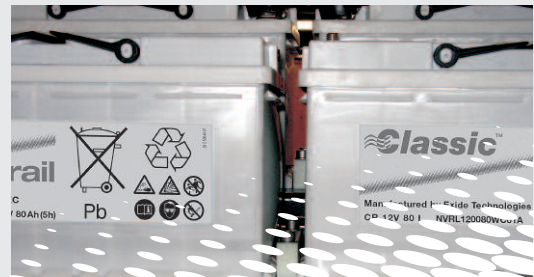
Individual system solutions.

Exemplary system technology

As a worldwide leading manufacturer of lead-acid batteries for railway rolling stock, Exide Technologies offers battery systems for classic applications in locomotives, coaches and modern train sets in regional and main-line service. In addition, Exide Technologies also produces particularly compact battery systems for international

high-speed trains (e.g. Velaro, ICE, ICT, TGV & KTX) and all mass transit applications (e.g. sub- and tramways).

Exide Technologies sets great store on keeping financing and maintenance costs as low as possible to help our OEM and operator customers to reduce costs. We want to make our customers successful!



Exide Technologies Industrial Energy



Exide Technologies, with operations in more than 80 countries, is one of the world's largest producers and recyclers of lead-acid batteries. Exide provides a comprehensive and customized range of stored electrical energy solutions.

Based on over 100 years of experience in the development of innovative technologies, Exide is an esteemed partner of OEMs and serves the spare parts market for industrial and transportation applications. The Industrial Energy business unit offers an extensive range of storage products and services, including solutions for

telecommunications systems, railway applications, mining, photovoltaic (solar energy), uninterruptible power supply (UPS), electrical power generation and distribution, fork lifts and electric vehicles.

Exide Technologies takes pride in its commitment to a better environment. Its Total Battery Management programme, (an integrated approach to manufacturing, distributing and recycling of lead-acid batteries), has been developed to ensure a safe and responsible life cycle for all of its products.

Exide Technologies
www.industrialenergy.exide.com

