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# MOTIVE POWER BATTERIES FORCEblock



## **POWER PASSION**

**With an In-depth  
knowledge on battery  
technology, we can provide  
fully customized solutions.**

In almost three decades of experience in the production of batteries for industrial applications, we have countless solutions in several fields, discovering new ways to improve the performance of our batteries and maximize efficiency in every situation.

Our in-depth knowledge on battery technology allows us to select the best solution for each application, a key point for producing excellent lithium battery systems.

# **FORCEblock**

## MAIN APPLICATIONS



PRODUCT SOLUTION	FORCEblock
APPLICATION	Conventional Lead - Acid
TECHNOLOGY	VLA VRLA
MAINTENANCE	VLA = weekly VRLA = yearly
DESIGN	Multicell block (6V - 8V - 12V)
CAPACITY (C5)	16-340 Ah
INTER-CELL CONNECTIONS	Welded (internal)
DESIGN LIFE (CYCLES*)	VLA flat 500+/VLA tubular 1200+/VRLA AGM 400+ VRLA GEL 600+/VLA Modules 1500+
SINGLE POINT WATERING	Optional (depending on the battery model)
CHARGING SOLUTION	ON-BOARD   OFF-BOARD HF switching chargers

The new FORCEblock range has been designed to be a complete and reliable solution for ALL those LIGHT MOTIVE POWER applications such as EV, cleaning machines, small pallet trucks, aerial platform and lifts, as well as wheelchairs and golf cart. Now available in vented and sealed version, both flat and tubular plates models can be defined to properly satisfy the specific application.

La nuova gamma FORCEblock rappresenta una soluzione completa ed affidabile per tutte le applicazioni di TRAZIONE LEGGERA come, veicoli elettrici, macchine pulitrici, piccoli transpallet, piattaforme aeree e sollevatori, oltre a carrozzine elettriche e golf cart. Disponibili nei modelli tipo aperto e sigillato, entrambi le versioni con placche positive piane o tubolari possono essere opportunamente definite per soddisfare specifiche applicazioni.



(\*) 80% DoD at 30°C with Energy Pack configuration (applicable correcting factors to be considered)

MIDAC S.p.A. reserves the right to carry out at any time any kind of modification to the technical data, to the manufacturing procedures and/or top the range of products, without giving previous written information.

# FORCEblock

## VLA FLAT PLATES - VLA PIASTRE PIANE

P/N	Type	V	Ah (5h)	Ah (20h)	Dimensions (mm)			Weight Kg	Terminals Type	Vents Type	SPWS Type	Hold-down Type	Layout
					L	W	H						
3003308	6MFB185	6	185	240	244	190	282	33,2	DIN	S35	B	B0	2
3003268	12MFB60	12	60	75	275	175	190	20,7	DIN	M18	-	B3	0
3003273	12MFB75	12	75	90	353	175	190	26,1	DIN	M18	-	B3	0
3003278	12MFB80	12	80	100	312	175	225	27,9	DIN	M18	-	B1	0
3003282	12MFB115	12	115	140	510	189	223	41,4	DIN	M27	-	B0	3
3003287	12MFB145	12	145	180	513	223	223	49,1	DIN	M27	-	B0	3
3003291	12MFB185	12	185	230	518	273	240	64,4	DIN	M27	-	B0	3

## VLA TUBULAR POSITIVE PLATES - VLA PIASTRE POSITIVE TUBOLARI

P/N	Type	V	Ah (5h)	Ah (20h)	Dimensions (mm)			Weight Kg	Terminals Type	Vents Type	SPWS Type	Hold-down Type	Layout
					L	W	H						
3020738	6MFB185T US	6	185	220	260	180	275	27,4	DIN	M27	A	B0	2
3003296	6MFB185T	6	185	240	244	190	282	27,9	DIN	S35	B	B0	2
3020410	6MFB200T	6	200	260	244	190	282	30,4	DIN	S35	B	B0	2
3020870	6MFB300T US	6	300	380	305	180	365	43,9	DIN	M27	A	B0	2
3022242	8MFB160T US	8	160	190	260	180	275	32,4	DIN	M27	A	B0	0
3020408	12MFB80T	12	80	105	312	175	225	26,1	DIN	M18	-	B1	0
3020409	12MFB90T	12	90	120	345	170	235	28,7	DIN	M27	A	B0	0
3023427	12MFB120T	12	120	150	345	170	290	36,5	DIN	M27	A	B0	0

## VLA MODULES TUBULAR PLATES - MODULI VLA PIASTRE POSITIVE TUBOLARI

P/N	Type	V	Ah (5h)	Ah (20h)	Dimensions (mm)			Weight Kg	Terminals Type	Vents Type	SPWS Type	Hold-down Type	Layout
					L	W	H						
3023734	3x4MDL60-G	6	240	290	248	198	370	45,0	M10	S35	C	B0	2
3023772	3x5MDL50-G	6	250	300	302	198	305	47,0	M10	S35	B	B0	2
3023736	3x6MDL50-G	6	300	360	356	198	305	56,0	M10	S35	B	B0	2
3023735	3x4MDL80-G	6	320	385	248	198	440	57,0	M10	S35	C	B0	2

## VRLA AGM

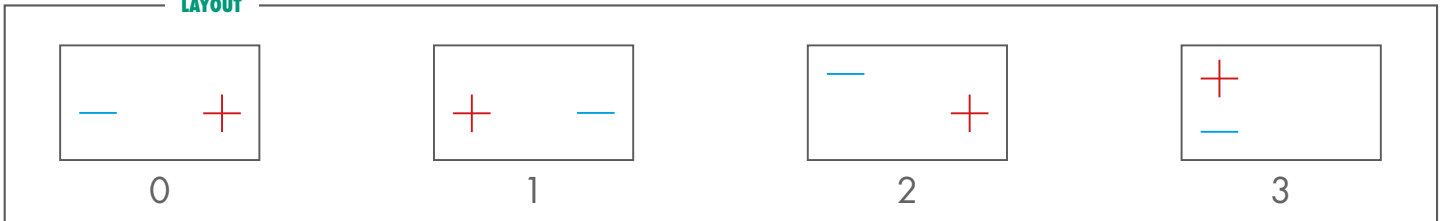
P/N	Type	V	Ah (5h)	Ah (20h)	Dimensions (mm)			Weight Kg	Terminals Type	Vents Type	SPWS Type	Hold-down Type	Layout
					L	W	H						
3021970	12MFB18A	12	16	18	181	76	167	5,3	E	-	-	B0	0
3021000	6MFB185A	6	200	240	244	189	275	32,0	M8	-	-	B0	2
3023763	6MFB340A	6	340	390	295	180	385	53,0	M8	-	-	B0	2



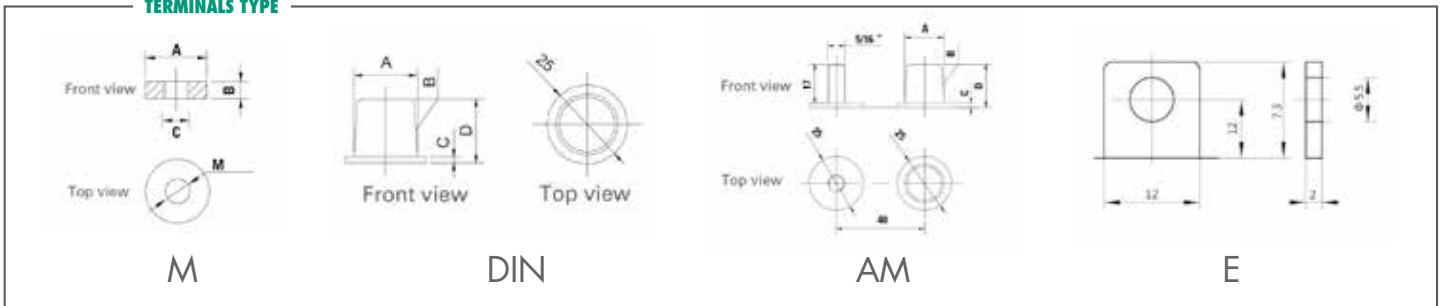
## VRLA GEL

P/N	Type	V	Ah (5h)	Ah (20h)	Dimensions (mm)			Weight Kg	Terminals Type	Vents Type	SPWS Type	Hold-down Type	Layout
					L	W	H						
3021213	6MFB180G	6	180	210	244	189	271	31,5	DIN	-	-	BO	2
3020872	6MFB250G	6	250	290	293	180	363	46,0	AM	-	-	BO	2
3023862	12MFB20G	12	20	24	166	175	125	8,5	M5	-	-	BO	0
3023863	12MFB28G	12	28	33	195	130	175	10,5	M6	-	-	BO	1
3023864	12MFB34G	12	34	40	197	165	170	13,0	M6	-	-	BO	0
3023865	12MFB50G	12	50	61	258	167	198	19,0	DIN	-	-	BO	1
3023866	12MFB63G	12	63	73	261	172	208	23,0	M6	-	-	BO	1
3023867	12MFB72G	12	72	86	308	172	232	27,0	AM	-	-	BO	1
3020998	12MFB75G	12	76	88	330	172	218	28,0	M8	-	-	BO	1
3023868	12MFB103G	12	103	120	327	180	274	36,0	AM	-	-	BO	1
3020999	12MFB105G	12	105	130	345	172	280	40,0	M8	-	-	BO	1

### LAYOUT



### TERMINALS TYPE



### SPWS TYPE

(Single Point Watering System)

BFS4 C4N000 M27 FLOAT H20

A

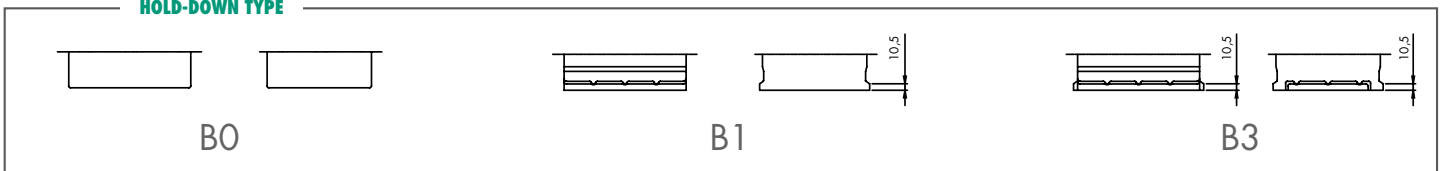
BFS3 A51000 FLOAT H20

B

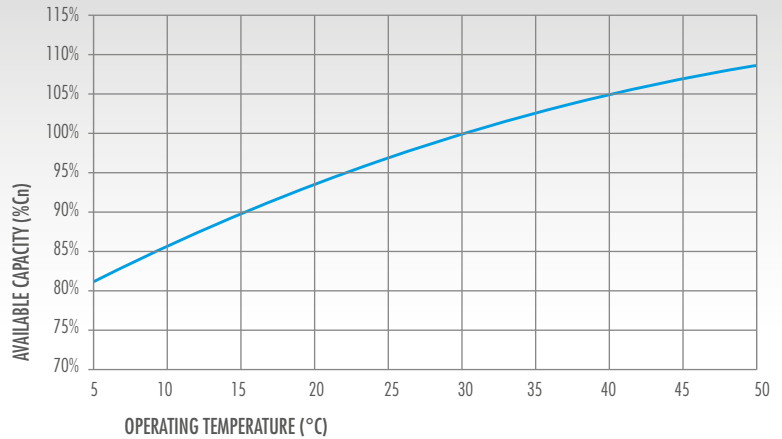
BFS3 A51000 FLOAT H44

C

### HOLD-DOWN TYPE

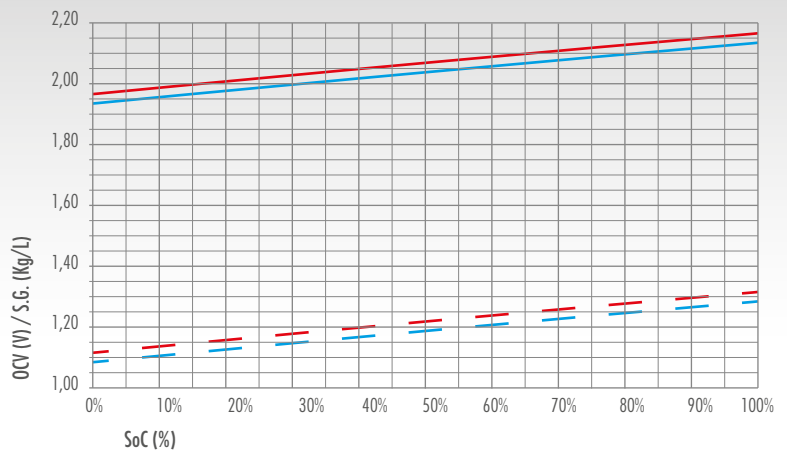


## AVAILABLE CAPACITY vs OPERATING TEMPERATURE



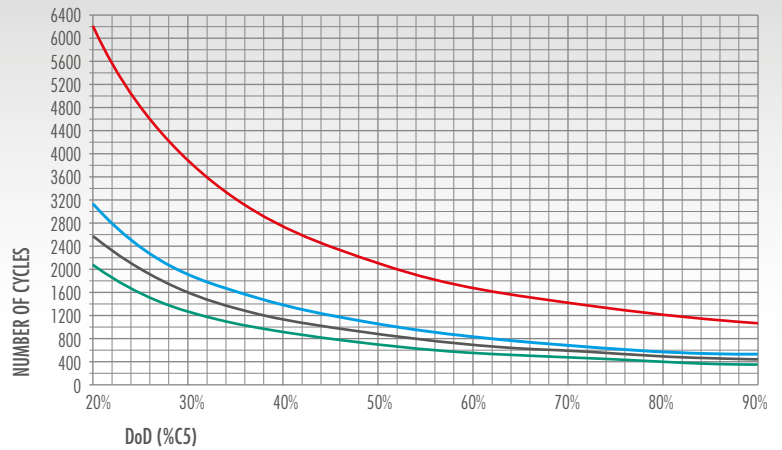
## OPEN CIRCUIT VOLTAGE (OCV) & SPECIFIC GRAVITY (S.G.) vs STATE OF CHARGE (SoC)

- VRLA - Open Circuit Voltage (Vpc)
- VLA - Open Circuit Voltage (Vpc)
- - - VRLA - Specific Gravity (Kg/L)
- - - VLA - Specific Gravity (Kg/L)



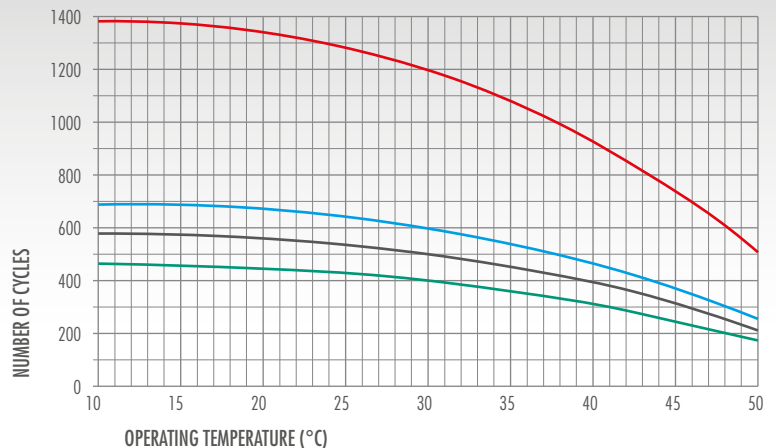
## NUMBER OF CYCLES vs DEPTH OF DISCHARGE (DoD)

- VLA - TUBULAR
- VRLA - GEL
- VLA - FLAT
- VRLA - AGM



## NUMBER OF CYCLES vs OPERATING TEMPERATURE

- VLA - TUBULAR
- VRLA - GEL
- VLA - FLAT
- VRLA - AGM





## IP65 CHARGERS ON-BOARD | OFF-BOARD INSTALLATION

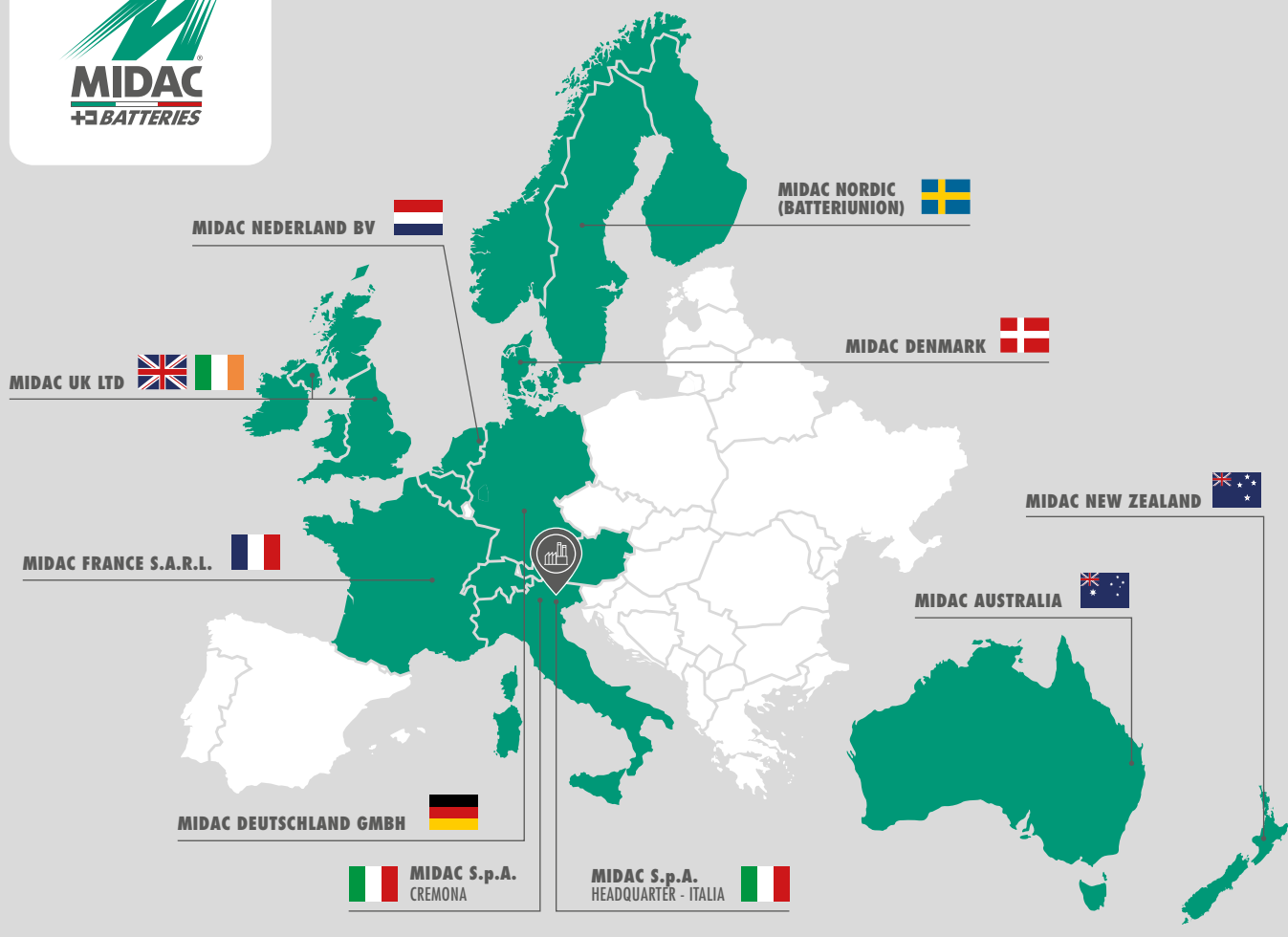


TYPE TIPO	Output Uscita		VLA BATTERY (charging time 7 to 8 hrs)	VRLA BATTERY (charging time 7 to 8 hrs)	Mains Rete	Phase Current Pmax	HOUSING DIMENSIONS DIMENSIONI ARMADIO			Weight Peso
			VLA BATTERIA (charging time 7 to 8 hrs)	VRLA BATTERIA (charging time 7 to 8 hrs)			L (front)	W (side)	H	
	V	A MAX	Ah MAX	Ah MAX	Vac	A MAX	mm	mm	mm	kg
S10 12-7	12	7	55	44	1x 110-240	0,6	98	49	192	1,8
S10 12-10	12	10	78	63	1x 208-240	0,8	98	49	192	1,8
S10 12-17	12	17	133	106	1x 208-240	1,4	98	49	192	1,8
S10 24-11	24	11	86	69	1x 208-240	1,7	98	49	192	1,8
RQ350 24V 13A	24	13	102	81	1x 120-240	3,8	188	80	252	3
IC650 24V 27A	24	27	211	169	1x 100-240	7,5	188	80	252	3
IC1200 24V 50A	24	50	391	313	1x 100-240	14,5	179	105	335	4,1
IC650 36V 18A	36	18	141	113	1x 100-240	7,5	188	80	252	3
IC1200 36V 33,3A	36	33,3	260	208	1x 100-240	14,5	179	105	335	4,1
IC650 48V 13,5A	48	13,5	105	84	1x 100-240	7,5	188	80	252	3
IC1200 48V 25A	48	25	195	156	1x 100-240	14,5	179	105	335	4,1

## IP20 CHARGERS OFF-BOARD INSTALLATION



TYPE TIPO	Output Uscita		VLA BATTERY (charging time 7 to 8 hrs)	VRLA BATTERY (charging time 7 to 8 hrs)	Mains Rete	Phase Current Pmax	HOUSING DIMENSIONS DIMENSIONI ARMADIO			Weight Peso
			VLA BATTERIA (charging time 7 to 8 hrs)	VRLA BATTERIA (charging time 7 to 8 hrs)			L (front)	W (side)	H	
	V	A MAX	Ah MAX	Ah MAX	±10% Vac	A MAX	mm	mm	mm	kg
HF 12-20M	12	20	156	125	1x230	1,5	243	112	78	2,1
HF 24-20M	24	20	156	125	1x 230	2,9	243	112	74	2,1
HF 24-30M	24	30	234	188	1x 230	4,9	243	112	74	2,1
HF 24-45M	24	45	352	281	1x 230	7,2	295	138	89	3,1
HF 24-60M	24	60	469	375	1x 230	9,7	295	138	89	3,1
HF 36-20M	36	20	156	125	1x 230	4,3	243	112	74	3,1
HF 36-40M	36	40	313	250	1x 230	9,5	295	138	89	3,1
HF 36-60M	36	60	469	375	1x 230	13,7	235	78	407	7,8
HF 48-15M	48	15	117	94	1x 230	4,3	243	112	74	3,1
HF 48-30M	48	30	234	188	1x 230	9,5	295	138	89	3,1
HF 48-40M	48	40	313	250	1x 230	11	235	78	407	7,2
HF 48-60M	48	60	469	375	1x 230	16	235	78	407	7,8



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#### MIDAC PRODUZIONE VERDE

Midac utilizza energia rinnovabile. Dal proprio impianto fotovoltaico viene prodotta energia per la produzione di batterie e accumulatori, evitando l'emissione di 400 tonnellate di CO<sub>2</sub> ogni anno.

#### MIDAC FABRICATION ÉCOLOGIQUE

Midac utilise des énergies renouvelables. Son installation photovoltaïque génère de l'énergie pour la production de batteries et d'accumulateurs, ce qui permet d'éviter l'émission de 400 tonnes de CO<sub>2</sub> chaque année.

#### MIDAC GREEN PRODUCTION

Midac uses energy from renewable sources. The company's photovoltaic plant generates energy for the production of batteries and accumulators, avoiding the emission of 400 tons of CO<sub>2</sub> each year.

#### MIDAC GRÜNE ENERGIE

Midac verwendet grüne Produktion, welche von der eigenen Solaranlage geliefert wird, um ihre Batterien und Akkumulatoren herzustellen. So sind wir in der Lage 400 Tonnen an CO<sub>2</sub> einzusparen.

#### MIDAC PRODUCCIÓN DE ENERGÍA VERDE

Midac utiliza energía renovable. Cuenta con un sistema fotovoltaico propio que produce energía para la fabricación de baterías y acumuladores permitiendo evitar la emisión de 400 toneladas de CO<sub>2</sub> al año.

#### MIDAC GRÖN PRODUKTION

Midac använder förnybar energi. Från den egna solcellsanläggningen produceras energi för tillverkningen av batterier och ackumulatörer, vilket innebär att 400 ton CO<sub>2</sub>-utsläpp kan undvikas varje år.

