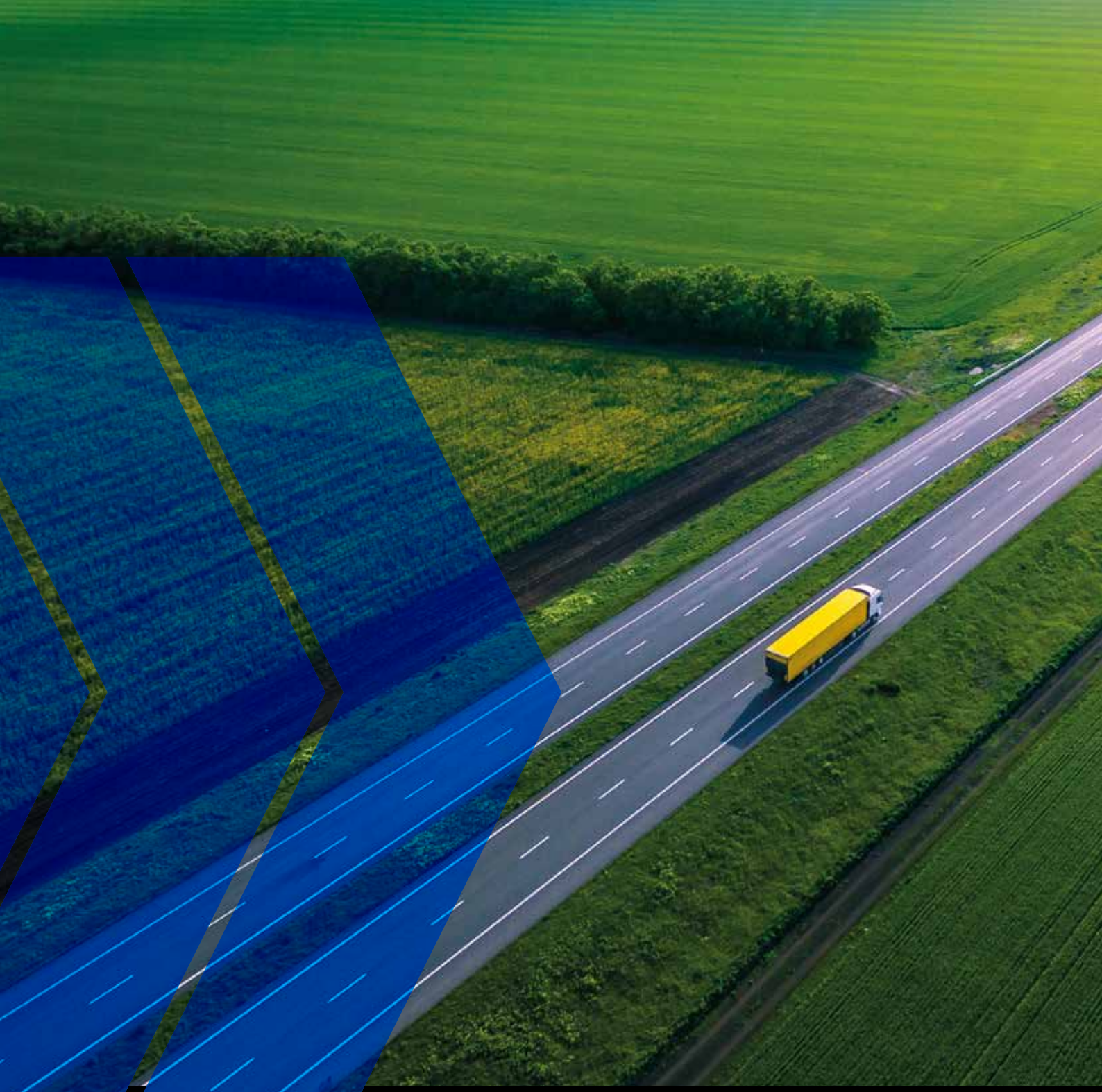


HIGH TECHNOLOGY FOR NEW HORIZONS

POWER CUBE
HIGH TECH BATTERY

ENERGY CUBE
HIGH TECH BATTERY

FIAMM

FIAMM

In the constant search for new energy storage solutions, FIAMM has created POWERCUBE and ENERGYCUBE, the two High Technology battery series for commercial vehicles to meet the diverse needs of today's automotive industry, from starting-only to the ever-increasing energy demands of heavy commercial vehicles for medium and long haul journeys.
Functionality, durability and reliability are the key concepts that have guided us throughout the study, design and manufacturing of this extensive range of batteries, which is now complete with the three different technologies AGM (Absorbent Glass Mat), AFB (Advanced Flooded Battery) and conventional Lead-Acid.

POWERCUBE & ENERGYCUBE BATTERIES FOR THE LATEST GENERATION OF COMMERCIAL VEHICLES

The application needs driven by the technological development of the latest commercial vehicles, in particular the medium- and long-range heavy vehicles, has given rise to increased demand for energy that has gained momentum over recent years following the introduction of more stringent emission standards and also for the higher number of overnight stops requiring the use of devices for ensuring comfort in the cab, such as climate control, heating and entertainment. For **starter batteries**, this means a significant increase in product operation, long life and reliability requirements.
In detail, the adaptation of the product to new vehicles and the often critical conditions of use in the field have generated a heavy demand for improving the following technical and functional characteristics:

- MORE ENERGY AVAILABLE FOR THE ELECTRIC/ELECTRONIC SYSTEM
- STARTING POWER IN CRITICAL CONDITIONS: LOW TEMPERATURES AND PARTIAL CHARGE
- DURABILITY IN TERMS OF DIS-CHARGE/CHARGE CYCLES
- RESISTANCE TO DEEP DISCHARGE CYCLES
- CHARGE ACCEPTANCE
- VIBRATION RESISTANCE

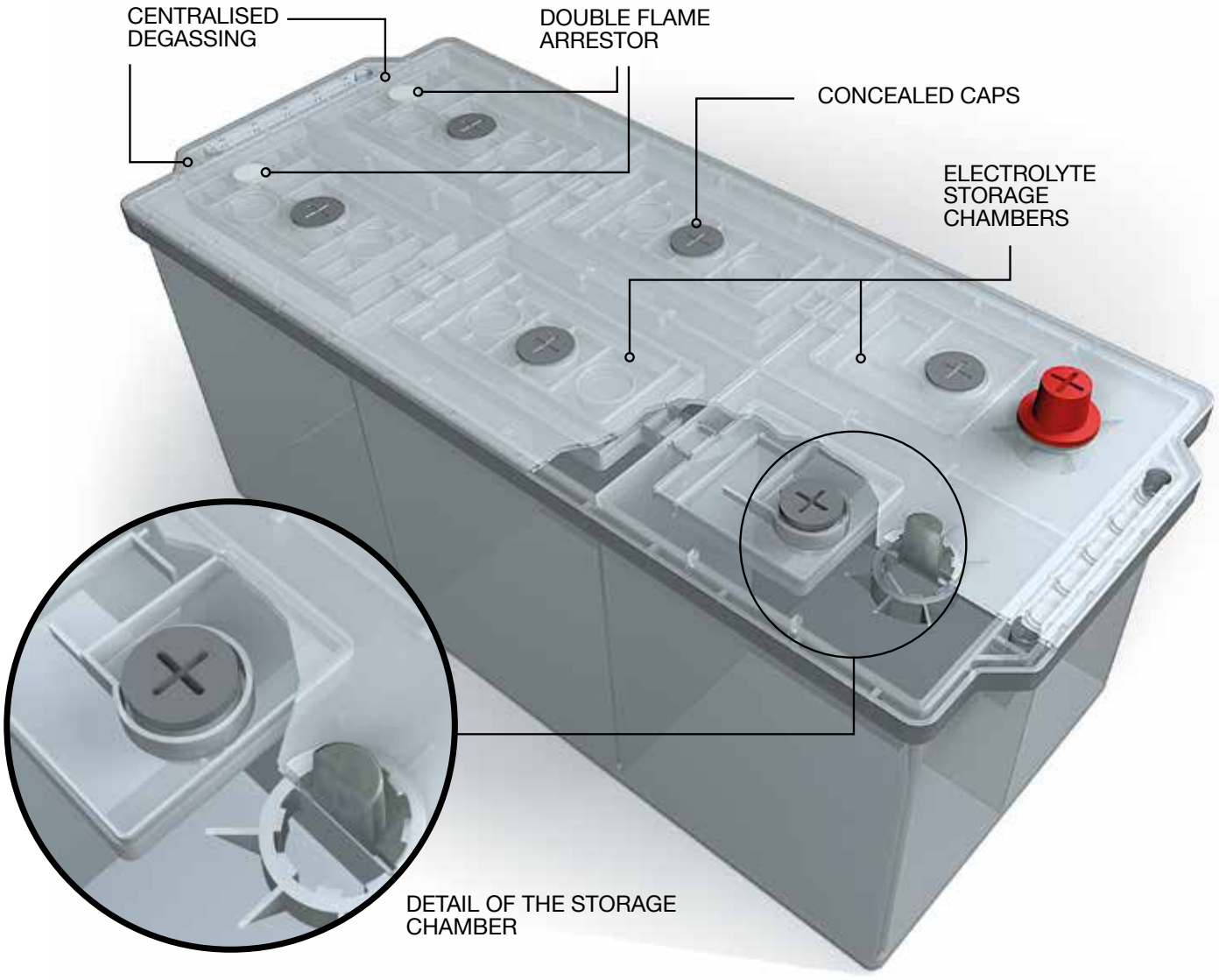
The technical superiority of FIAMM POWERCUBE and ENERGYCUBE batteries translates directly into tangible benefits for fleet owners, including lower overall operating costs. The high starting power in critical conditions, combined with the extended duration of discharge and charge cycles, means fewer replacements and maintenance, significantly reducing long-term expenses.

TECHNOLOGICAL INNOVATIONS

THE TECHNOLOGY OF THE NEW FLAT LID WITH INTERNAL LABYRINTH

In line with the current requirements of preventing the electrolyte from escaping, FIAMM has developed a flat lid with internal labyrinth, storage chambers and recondensation of the gases produced when the battery is being charged.

It is a centralised degassing lid with dual gas venting channel and explosion-proof dual flame arrestor pad. The caps are fitted with O-rings (OR) to guarantee maximum seal if the battery is handled incorrectly.



THE DUAL PLATE BLOCKING SYSTEM INSIDE THE CELLS

A new double plate blocking system has been introduced to increase vibration resistance:
A special resin blocks the plates to the bottom of the cell so they become integral with the battery box.
Applying the same resin to the top of the element as well ensures they remain totally blocked.
The blocking system ensures vibration resistance more than double that of the traditional systems, and exceeds the strictest requirement (V3) laid down by technical standard EN 50342-1, which requires 20 h of vibrations at 6G and 30 Hz at T = +25 °C.

POLYETHYLENE ENVELOPE SEPARATOR

The thicker polyethylene separator, made with materials having a higher resistance to breakage and/or perforation, guarantee better resistance and longer life of the battery when its use is the most critical: heavy cycling, intense discharges, overload and vibrations. It also reduces dangerous metallisation phenomena.

IMPROVED NEGATIVE ELECTRODE

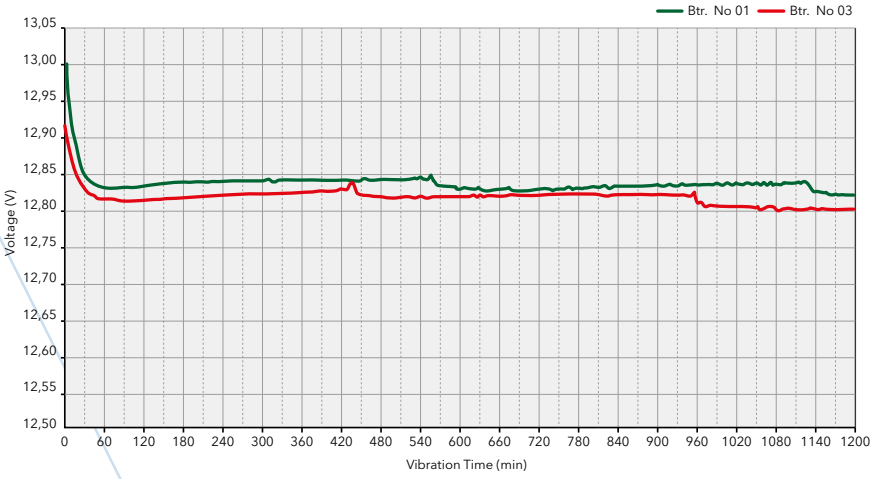
The negative plate was improved to increase the thickness of the grid and the density and formulation of the active negative matter. This leads to greater efficiency of the negative electrode, with improved electrical and mechanical performance of the battery.

PROCESS OF ACTIVE MATTER ADHERING TO THE GRID

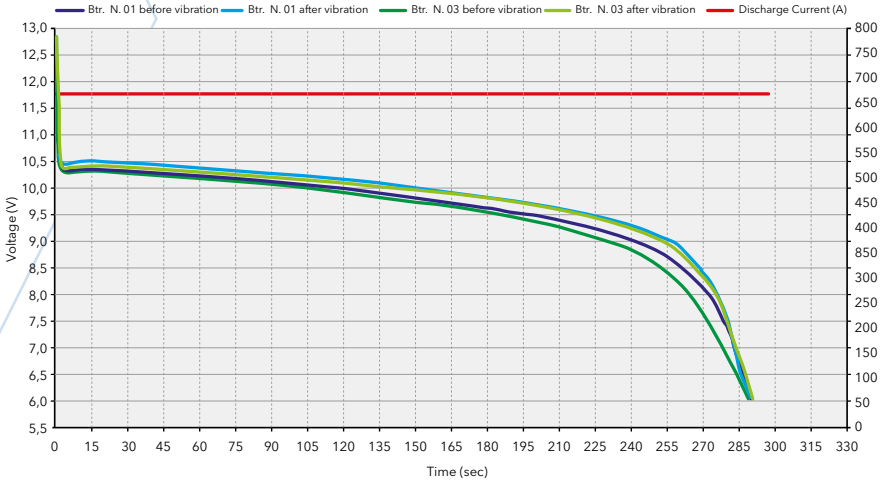
Improvement in the industrial process of “adhering” (coupling) the active matter to the grid, and in particular that of the positive plates, offers several benefits such as maintaining performance over time, increasing resistance to the charge/discharge cycles, improving resistance to intense discharge, increasing vibration resistance, reducing the shedding phenomenon (when the positive active matter detaches from the grid and falls onto the bottom of the cell).

The following charts show voltage performance at the battery terminals during the test, and the performance during rapid starting discharge before and after the vibration resistance test.
As the charts demonstrate, the vibrations caused no change in performance.

Vibration Resistance Test EN 50342-1 (30Hz 6G 20h at + 25 °C)



Vibration Resistance Test EN 50342-1 (30Hz 6G 20h at + 25 °C)



ENTRY INTO FORCE OF STANDARDS EN50342-1: 2015-11

The new edition of **EN50342-1: Lead-acid starter batteries - Part 1: General requirements and methods of test** came into force on 5 October 2018.
The electrical and mechanical characteristics of lead-acid batteries for automotive applications are measured according to this standard. One of the new features of the 2015 edition of EN50342-1 is the classification of several battery performance levels.

THE FEATURES TO BE CLASSIFIED AND THEIR LEVELS ARE:

EN 50342-1: 2015	MIN	MAX
Water consumption	W1	W5
Charge hold	C1	C2
Vibration resistance	V1	V4
Cycle duration	E1	E4

EXAMPLE OF THE CHARACTERISTICS ON THE LABEL:

12V 180AH 1100A EN
EN 50342-1: W2-C2-V3-E2

Classification only for models A, B and C

OUR RANGE

The FIAMM TRUCK line is divided into two product ranges that are subdivided into 5 levels that ensue from the combination of technology and type of cover and the specific Product Names that distinguish the more technologically advanced products from the more traditional ones so as to get a range better oriented toward specific requirements.

AGM TECHNOLOGY

The battery range POWERCUBE with AGM (Absorbent Glass Mat) technology was specially developed for heavy commercial vehicles that require maximum energy and high resistance to charge and discharge cycles, particularly when parked.
Recommended for EURO 6 vehicles.

> VRLA AGM battery with gas recombination
> Absolutely maintenance-free
> Sealed lid
> More starting power than traditional batteries
> Better endurance to charge/discharge cycles, more than double that of the best traditional batteries
> Better charge acceptance, particularly in dynamic conditions
> High resistance to intense discharges
> High vibration resistance

POWERCUBE B 180 AGM

POWERCUBE CX 230 AGM

AFB TECHNOLOGY

The battery range POWERCUBE with AFB (Advanced Flooded Battery) technology is designed for heavy commercial vehicles with high energy demands and high resistance to vibration. Recommended for EURO 6 vehicles.

> Battery with AFB (Advanced Flooded Battery) technology
> No maintenance
> More starting power than traditional batteries
> High resistance to charge and discharge cycles (higher cycling resistance than a conventional Pb-Ca battery)
> Excellent resistance to deep discharge
> High vibration resistance

POWERCUBE B 185 AFB

POWERCUBE CX 235 AFB

CONVENTIONAL LEAD-ACID TECHNOLOGY

The battery range POWERCUBE APC is intended for starting medium and long-distance heavy commercial vehicles, agricultural and construction machinery.

- Low-maintenance free acid battery requiring no top-ups, but the caps will allow it to be topped up if necessary
- Flat lid with internal labyrinth, gas recondensation chambers, caps with special O-ring preventing leaks, dual-channel centralised degassing with dual flame arrestor pad
- Innovative dual plate blocking system inside the cell that provides high resistance to vibrations and that complies with the highest automotive industry standards
- High starting power
- Excellent charge acceptance
- High endurance to charge/discharge cycles
- Good resistance to intense discharges
- Excellent vibration resistance

POWERCUBE B 180 APC

CONVENTIONAL LEAD-ACID TECHNOLOGY

The POWERCUBE APC battery range is intended for starting medium and long-distance heavy commercial vehicles and small agricultural machinery.

- Low-maintenance free acid battery requiring no top-ups, but the caps will allow it to be topped up if necessary
- Flat lid with internal labyrinth, gas recondensation chambers, caps with special O-ring preventing leaks, dual-channel centralised degassing with dual flame arrestor pad (only for A-B-C Batteries)
- Innovative dual plate blocking system inside the cell that provides high resistance to vibrations and that complies with the highest automotive industry standards
- Great starting power
- Good charge acceptance
- Good endurance to charge/discharge cycles
- Good vibration resistance

POWERCUBE B 160 EHD

CONVENTIONAL LEAD-ACID TECHNOLOGY

The battery range ENERGYCUBE RST is dedicated to starting light commercial vehicles light commercial vehicles and express delivery services.

> Low-maintenance free acid battery requiring no top-ups, but the caps will allow it to be topped up if necessary
> Standard lid
> Great starting power
> Good charge acceptance
> Good endurance to charge/discharge cycles
> Vibration resistance

ENERGYCUBE G28 100 RST

Performance of the new truck range - OVERVIEW

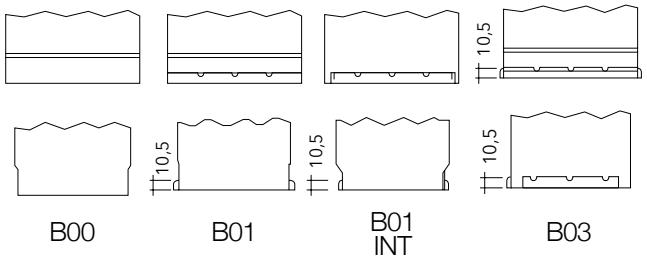
● low ●● medium ●●● good ●●●● high ●●●●● very good ●●●●●● excellent

	STARTING POWER	CHARGE ACCEPTANCE	CYCLING RESISTANCE	VIBRATION RESISTANCE
POWERCUBE AGM	⊕⊕⊕⊕⊕	⊕⊕⊕⊕⊕⊕	⊕⊕⊕⊕⊕⊕	⊕⊕⊕⊕⊕
POWERCUBE AFB	⊕⊕⊕⊕⊕	⊕⊕⊕⊕⊕	⊕⊕⊕⊕	⊕⊕⊕⊕⊕⊕
POWERCUBE APC	⊕⊕⊕⊕⊕	⊕⊕⊕⊕⊕	⊕⊕⊕⊕	⊕⊕⊕⊕⊕
ENERGYCUBE EHD	⊕⊕⊕⊕⊕	⊕⊕⊕⊕	⊕⊕⊕	⊕⊕⊕⊕⊕
ENERGYCUBE RST	⊕⊕⊕⊕⊕	⊕⊕⊕⊕	⊕⊕	⊕⊕⊕

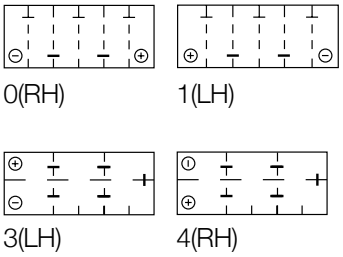
			APPLICATIONS								
Level	Product Name	technology	Overnight	Long distance	Express Delivery	Coach	City Bus	Small tractor	Big Tractor	Heavy Industrial	DIN size
1	**POWERCUBE AGM**	AGM	✓			✓	✓		✓	✓	D7-B-C
2	**POWERCUBE AFB**	AFB	✓	✓		✓	✓		✓	✓	B-C
3	**POWERCUBE APC**	APC	✓	✓		✓	✓		✓	✓	A-B-C
4	**ENERGYCUBE EHD***	EHD		✓	✓			✓			A-B-C & other formats
5	**ENERGYCUBE RST**	RST			✓			✓			Other formats

* flat cover (FLAT) only for A-B-C Batteries

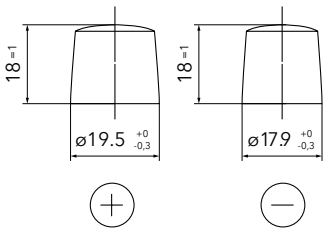
Base fasteners



Polarity



Terminal



TRUCK - TRACTOR BATTERIES / NEW RANGE									
Code	Size format	Technology	ID code	ETN	Capacity (C20) Ah	CCA (A) EN	Dimensions LxWxH (mm)	Terminals Layout	Base fastener
POWERCUBE - AGM - ABSORBENT GLASS MAT									
7907298	D7	AGM	D7 125 AGM	-	125	1000A SAE	266x280x230	2/1	B00
7907299	B	AGM	B 180 AGM	-	180	1100	513x223x223	3/1	B00
7907300	C	AGM	CX 230 AGM	-	230	1200	518x273x242	3/1	B00
POWERCUBE - AFB - ADVANCED FLOODED BATTERY									
7907226	B	AFB	B 185 AFB	-	185	1100	513x223x223	3/1	B00
7907451	C	AFB	CX 235 AFB	-	235	1200	518x273x242	3/1	B00
POWERCUBE - APC - ADVANCED POWER CYCLING									
7907301	A	APC	A 135 APC	635 105 085	135	850	513x223x223	3/1	B01 (Int.)
7907302	B	APC	B 180 APC	680 032 100	180	1000	513x223x223	3/1	B00
7907303	C	APC	CX 225 APC	725 012 115	225	1150	518x273x242	3/1	B00
POWERCUBE - EHD - ENHANCED HEAVY DUTY									
7907304	MCD110	EHD	D11 110 EHD	610 107 080	110	800	514x175x210	3/1	B03
7907305	A	EHD	A 120 EHD	620 108 085	120	850	513x189x223	3/1	B01 (Int.)
7907306	MAC120	EHD	MC12 120 EHD	620 107 085	120	850	510x175x228	4/1	B03
7907307	MAT132	EHD	MT 132 EHD	632 101 095	132	950	508x175x205	0/1	B01
7907308	MCD110	EHD	D11 135 EHD	635 106 095	135	950	514x175x210	3/1	B03
7907309	A	EHD	A 140 EHD	640 102 095	140	950	513x189x223	3/1	B01 (Int.)
7907310	MCD143	EHD	D14 148 EHD	648 101 100	148	1000	514x218x210	3/1	B03
7907312	B	EHD	B 160 EHD	660 104 105	160	1050	513x223x223	3/1	B00
7907313	MAC154	EHD	MC15 160 EHD	660 103 105	160	1050	510x218x228	4/1	B03
7907314	B	EHD	B 180 EHD	660104110	180	1100	513x223x223	3/1	B00
7907315	B	EHD	B 180 EHD (B03)	-	180	1100	513x223x223	3/1	B03
7907317	MAC154	EHD	MC15 185 EHD	685 101 120	185	1200	510x218x228	4/1	B03
7907318	C	EHD	CX 200 EHD	700 108 115	200	1150	518x273x242	3/1	B00
7907319	C	EHD	C 200 EHD	700 109 115	200	1150	518x273x242	4/1	B00
ENERGYCUBE - RST - RELIABLE STARTER									
7907320	GR28	RST	G28 100 RST	-	100	720	333x175x215	0/1	B03
7907321	GR28	RST	G28X 100 RST	-	100	720	333x175x215	1/1	B01
7907322	COM90	RST	CB 110 RST	-	110	850	349x175x239	0/1	B00
7907323	COM90	RST	CBX 110 RST	-	110	850	349x175x239	1/1	B00
7907324	COM90	RST	CB 110 RST (B01)	-	110	850	349x175x239	0/1	B01
7907325	COM120	RST	CH 125 RST	625 103 076	125	760	349x175x290	0/1	B00
7907326	COM120	RST	CHX 125 RST	625 104 076	125	760	349x175x290	1/1	B00

CHARGE YOUR TRAVEL WITH ENERGY AND POWER

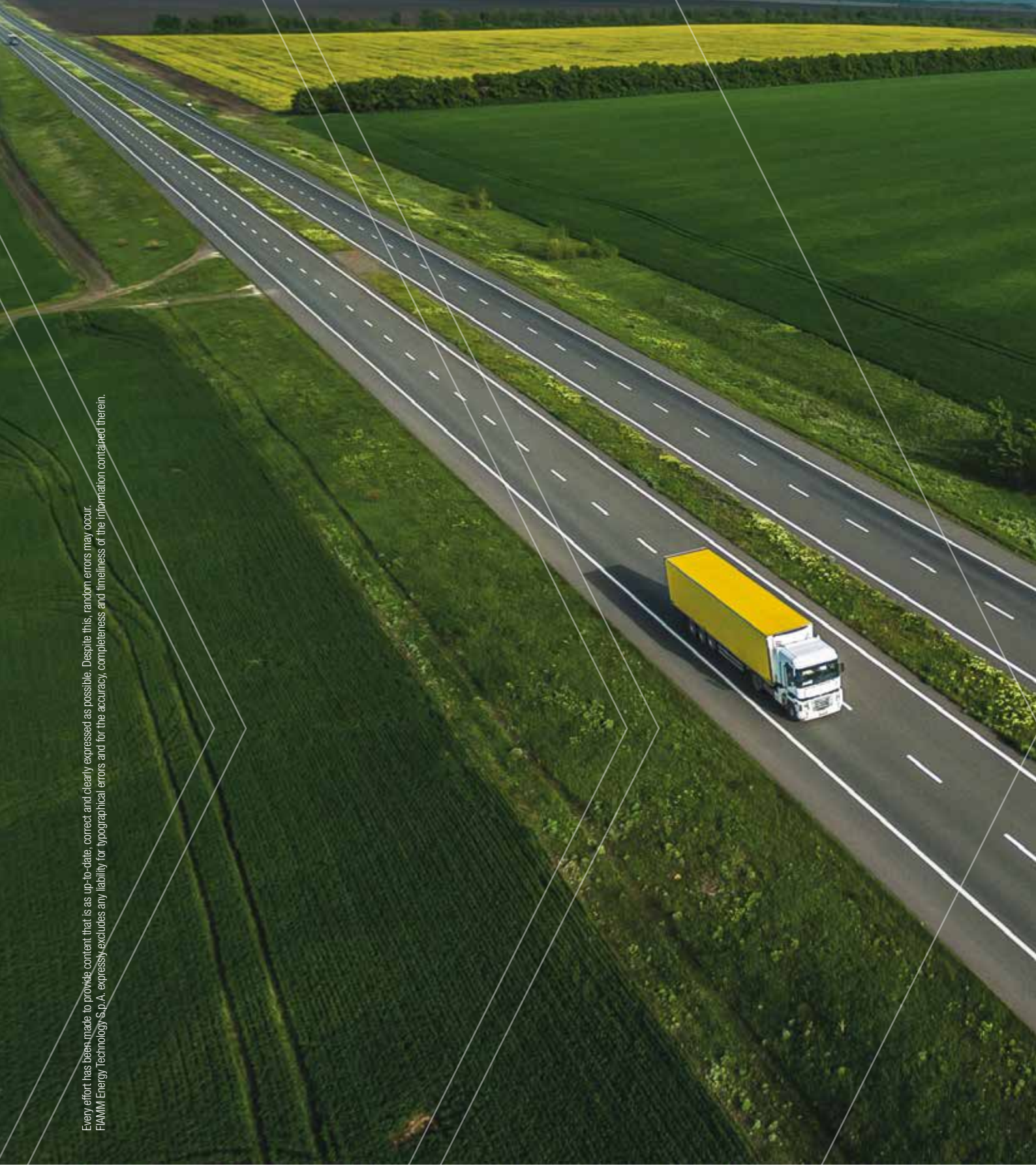
POWER CUBE HIGH TECH BATTERY AGM

POWER CUBE HIGH TECH BATTERY AFB

IF YOU DRIVE A COMMERCIAL VEHICLE THESE BATTERIES ARE FOR YOU

ENERGYCUBE and **POWERCUBE** are the two **High Technology** battery series that **FIAMM** has created for commercial vehicles, agricultural and construction machinery. You will find the most suitable battery for functionality, durability and reliability for the job.
And you will enjoy more energy and power on all of your journeys.

FIAMM
Your World, Our Energy



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