



THE NEW 
TRACTION BATTERY
WITH UNLIMITED POWER



Positive Energy

2010
We are Growing:
Esan Akümülatör ve
Malzemeleri San. ve Tic. A.Ş.
Founded



2014
Technological Innovations:
Line Automation, Robots and
Battery Charging Systems



2020
Mass Production of
Start & Stop
EFB Batteries



2010

1MILLION

2011
Exmet Investment:
Manufacturing Capacity:
1 Million 200 Thousand per Year

ISO

2015
Quality Assurance Systems:
ISO 10002



2018
R&D Center Approved by
Turkish Ministry of
Industry and Technology



2019
Esan Plastics:
Facility to Manufacture
Box Caps Opened



2021
Esan Metal

Sustainable
Excellence

Network of more than 200
Dealers Locally and Abroad

ISO 1000 Tim 1000
IATF: 16949

Export to more than
65 countries in 4 Continents

Esan Plastics

Esan Metal

R&D Center

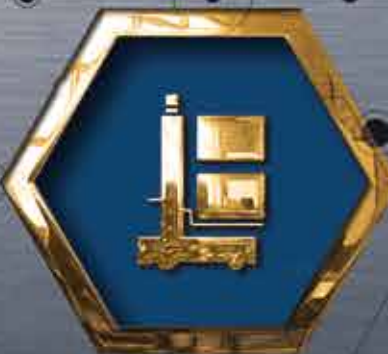
Turququality

THE NEW



TRACTION BATTERY

YOUR UNLIMITED POWER





Positive Energy



Traction Batteries

These are high capacity and long-life batteries used in electricity powered forklifts and tow trucks. With a tube positive plate structure enveloped by high porosity polyethylene separators preventing occurrence of short-circuits, these batteries deliver a high capacity and longer service life thanks to a lower internal resistance and a higher acid volume. The boxes and covers made of polypropylene materials that are glued to one another with hot glue technology offering full impermeability. When charged, the acid intensity is 1,290 gr/cm³ at 30°C and the electrolyte intensity at the end of discharge at 80% should be 1,140 gr/cm³. Any value higher than this discharge level at 80% will cause the cells to get deep charged, thus lowering the battery performance and shortening its life.

The traction series of batteries from Esan Battery offer the capacities as may be required for all battery applications with various plates at a range from 60 Ah to 155 Ah at DIN standards and at a range from 55 Ah to 105 Ah at BS standards.

Areas of Usage

- Forklifts
- Electricity-powered pallet trucks
- Cleaning machines
- Mine locomotives
- Stowing platforms
- Golf carts
- Conveying belts

2V Battery Cell Internal and External Design

- Main Features
- Design Features
- ✓ Benefits



1 Positive Grid <ul style="list-style-type: none"> ⚙ Injection technology ⚙ Lead allow with a lower antimony rate ✓ High corrosion resistance ✓ High retention with active substance 	6 Negative Active Substance <ul style="list-style-type: none"> ⚙ Lead oxide manufactured by us ✓ Manufacturing at standard quality ⚙ Full automatic vacuum negative paste mixing process ✓ Consistency in the amount of negative active substance 	11 Pole Connection <ul style="list-style-type: none"> ⚙ Welding with COS technology ✓ Strong connection
2 Positive Active Substance <ul style="list-style-type: none"> ⚙ 100% Red Lead ✓ Full capacity after 3–5 cycles ⚙ Power filling process ✓ 100% plate weighing control ✓ Active substance with a homogenous intensity ⚙ 99.99% pure lead in active substance ✓ Long service life, high conductivity, increased performance 	7 Separator <ul style="list-style-type: none"> ⚙ Mechanically enveloped, high porosity polyethylene separator ✓ Minimum risk of short circuit ✓ Low internal resistance 	12 Cover <ul style="list-style-type: none"> ⚙ Polypropylene design attached to the box with a hot glue for full impermeability
3 Tergal Tube <ul style="list-style-type: none"> ⚙ Non-woven high quality polyester tube ✓ Prevents leakage of active substance 	8 Formation <ul style="list-style-type: none"> ⚙ Full automatic charging process ✓ Standard quality for every cells ✓ Equal voltage and intensity in each cell 	13 Cell Box <ul style="list-style-type: none"> ⚙ Polypropylene box with a sufficient gap on the bottom for the leakage of active substance and occurrence of short circuits ✓ Maximum electrolyte level
4 Plug <ul style="list-style-type: none"> ⚙ Ultrasonic welding ✓ Provides a gap necessary for the elongation of wires. 	9 Electrolyte <ul style="list-style-type: none"> ⚙ High purity rate ✓ Long life performance 	14 Standard Battery Cap <ul style="list-style-type: none"> ⚙ Electrolyte level check and gas discharge ⚙ Intensity check and water addition ✓ Increased security for usage
5 Negative Grid <ul style="list-style-type: none"> ⚙ Casting technology ⚙ Lead allow with a lower antimony rate ✓ High resistance, corrosion resistance, low consumption of water 	10 Battery Terminal <ul style="list-style-type: none"> ⚙ Innovative conic design ✓ Impermeable structure ✓ Flexible for the elongation of plates ⚙ Brass insert covered by tin of 16 mm in diameter 	



DIN Type 2 V Cell Types

Plate Type: 60 Ah				
Type name	Nominal capacity (C ₅)*	max. cell sizes mm***		Weight kg**
		b: 198	h1: 343	
			h2: 370	
		l		
2 PzS 120	120	47		8.5
3 PzS 180	180	65		12.0
4 PzS 240	240	83		15.4
5 PzS 300	300	101		19.0
6 PzS 360	360	119		22.5
7 PzS 420	420	137		26.0
8 PzS 480	480	155		29.5
9 PzS 540	540	174		33.0
10 PzS 600	600	192		36.5

Plate Type: 80 Ah				
Type name	Nominal capacity (C ₅)*	max. cell sizes mm***		Weight kg**
		b: 198	h1: 408	
			h2: 435	
		l		
2 PzS 160	160	47		10.0
3 PzS 240	240	65		14.2
4 PzS 320	320	83		18.4
5 PzS 400	400	101		22.6
6 PzS 480	480	119		26.7
7 PzS 560	560	137		31.3
8 PzS 640	640	155		35.1
9 PzS 720	720	174		39.3
10 PzS 800	800	192		43.4

Plate Type: 90 Ah				
Type name	Nominal capacity (C ₅)*	max. cell sizes mm***		Weight kg**
		b: 198	h1: 478	
			h2: 505	
		l		
2 PzS 180	180	47		11.9
3 PzS 270	270	65		17.0
4 PzS 360	360	83		22.1
5 PzS 450	450	101		27.1
6 PzS 540	540	119		32.2
7 PzS 630	630	137		37.2
8 PzS 720	720	155		42.3
9 PzS 810	810	174		47.4
10 PzS 900	900	192		52.4

Plate Type: 105 Ah				
Type name	Nominal capacity (C ₅)*	max. cell sizes mm***		Weight kg**
		b: 198	h1: 514	
			h2: 541	
		l		
2 PzS 210	210	47		13,5
3 PzS 315	315	65		19,1
4 PzS 420	420	83		24,6
5 PzS 525	525	101		30,5
6 PzS 630	630	119		36,1
7 PzS 735	735	137		41,8
8 PzS 840	840	155		47,4
9 PzS 945	945	174		53,1
10 PzS 1050	1050	192		58,4

Plate Type: 115 Ah				
Type name	Nominal capacity (C ₅)*	max. cell sizes mm***		Weight kg**
		b: 198	h1: 548	
			h2: 575	
		l		
2 PzS 230	230	47		14,2
3 PzS 345	345	65		20,3
4 PzS 460	460	83		26,4
5 PzS 575	575	101		32,4
6 PzS 690	690	119		39,0
7 PzS 805	805	137		44,7
8 PzS 920	920	155		50,6
9 PzS 1035	1035	174		56,6
10 PzS 1150	1150	192		62,7

Plate Type: 125 Ah				
Type name	Nominal capacity (C ₅)*	max. cell sizes mm***		Weight kg**
		b: 198	h1: 568	
			h2: 595	
		l		
2 PzS 250	250	47		15.0
3 PzS 375	375	65		21.2
4 PzS 500	500	83		27.4
5 PzS 625	625	101		33.9
6 PzS 750	750	119		40.3
7 PzS 875	875	137		46.5
8 PzS 1000	1000	155		53.1
9 PzS 1125	1125	174		59.4
10 PzS 1250	1250	192		66.0

Plate Type: 140 Ah				
Type name	Nominal capacity (C ₅)*	max. cell sizes mm***		Weight kg**
		b: 198	h1: 688	
			h2: 715	
		l		
2 PzS 280	280	47		17.5
3 PzS 420	420	65		24.7
4 PzS 560	560	83		31.8
5 PzS 700	700	101		39.3
6 PzS 840	840	119		46.7
7 PzS 980	980	137		53.9
8 PzS 1120	1120	155		61.3
9 PzS 1260	1260	174		68.6
10 PzS 1400	1400	192		76.0

Plate Type: 155 Ah				
Type name	Nominal capacity (C ₅)*	max. cell sizes mm***		Weight kg**
		b: 198	h1: 713	
			h2: 740	
		l		
2 PzS 310	310	47		18.9
3 PzS 465	465	65		26.7
4 PzS 620	620	83		34.6
5 PzS 775	775	101		42.6
6 PzS 930	930	119		50.5
7 PzS 1085	1085	137		58.5
8 PzS 1240	1240	155		66.4
9 PzS 1395	1395	174		74.4
10 PzS 1550	1550	192		82.4



* IEC 60254-Part 1

** Weights of flooded and charged cells \pm 5%

*** Cell sizes \pm 2 mm, IEC 60254- Chapter 2

BS Type 2 V Cell Types

Plate Type: 55 Ah				
Type name	Nominal capacity (C ₅)*	max. cell sizes mm***		Weight kg**
		b: 158	h1: 401	
			h2: 428	
		I		
2 PzB 110	110	45		7.9
3 PzB 165	165	61		11.0
4 PzB 220	220	77		14.0
5 PzB 275	275	93		17.1
6 PzB 330	330	109		20.1
7 PzB 385	385	125		23.2
8 PzB 440	440	141		26.2
9 PzB 495	495	157		29.2
10 PzB 550	550	173		32.3

Plate Type: 65 Ah				
Type name	Nominal capacity (C ₅)*	max. cell sizes mm***		Weight kg**
		b: 158	h1: 457	
			h2: 484	
		I		
2 PzB 130	130	45		9.1
3 PzB 195	195	61		12.5
4 PzB 260	260	77		16.1
5 PzB 325	325	93		19.5
6 PzB 390	390	109		23.0
7 PzB 455	455	125		26.5
8 PzB 520	520	141		30.1
9 PzB 585	585	157		33.5
10 PzB 650	650	173		37.0

Plate Type: 75 Ah				
Type name	Nominal capacity (Cs)*	max. cell sizes mm***		Weight kg**
		b: 158	h1: 514	
			h2: 541	
			l	
2 PzB 150	150	45		10.3
3 PzB 225	225	61		14.2
4 PzB 300	300	77		18.2
5 PzB 375	375	93		22.2
6 PzB 450	450	109		26.2
7 PzB 525	525	125		30.2
8 PzB 600	600	141		34.2
9 PzB 675	675	157		38.2
10 PzB 750	750	173		42.2

Plate Type: 85 Ah				
Type name	Nominal capacity (C ₅)*	max. cell sizes mm***		Weight kg**
		b: 158	h1: 570	
			h2: 597	
		I		
2 PzB 170	170	45		11.5
3 PzB 255	255	61		16.2
4 PzB 340	340	77		20.5
5 PzB 425	425	93		25.0
6 PzB 510	510	109		29.4
7 PzB 595	595	125		33.8
8 PzB 680	680	141		38.4
9 PzB 765	765	157		42.6
10 PzB 850	850	173		47.2

Plate Type: 100 Ah				
Type name	Nominal capacity (Cs)*	max. cell sizes mm***		Weight kg**
		b: 158	h1: 606	
			h2: 633	
		I		
2 PzB 200	200	45		12.3
3 PzB 300	300	61		16.8
4 PzB 400	400	77		21.5
5 PzB 500	500	93		26.1
6 PzB 600	600	109		30.8
7 PzB 700	700	125		35.4
8 PzB 800	800	141		40.1
9 PzB 900	900	157		44.5
10 PzB 1000	1000	173		48.9

Plate Type: 105 Ah				
Type name	Nominal capacity (C ₅) [*]	max. cell sizes mm ^{***}		Weight kg ^{**}
		b: 158	h1: 686	
			h2: 713	
			I	
2 PzB 210	210	45		14.1
3 PzB 315	315	61		19.4
4 PzB 420	420	77		24.8
5 PzB 525	525	93		30.1
6 PzB 630	630	109		35.4
7 PzB 735	735	125		40.9
8 PzB 840	840	141		46.3
9 PzB 945	945	157		52.5
10 PzB 1050	1050	173		58.4

* IEC 60254-Part 1

** Weights of flooded and charged cells \pm 5%

*** Cell sizes \pm 2 mm, IEC 60254- Chapter 2



Battery Features

- ⚙ Design Features
- ✓ Benefits

1 Cell Connection Cables

- ⚙ Insulated flexible connection cables
- ✓ Quick and easy to change the cells
- ✓ Time saving and low cost

2 Cell Connection Bolts

- ⚙ Plastic head isolated bolts
- ✓ Voltage measurement point
- ✓ Insulating surface

3 Plugs and Sockets

- ⚙ Connector as per DIN 43589

4 Battery Output Cables

- ⚙ Insulated charging cable with colored marks
- ✓ Prevents short circuits
- ✓ Allows for a fast and correct connection

5 Sheet Frame

- ⚙ Made of steel
- ⚙ Covered by acid resistant plastic
- ✓ Delivers endurance and corrosion resistance
- ✓ Available with different color applications



Suitable for all voltage and cell configurations

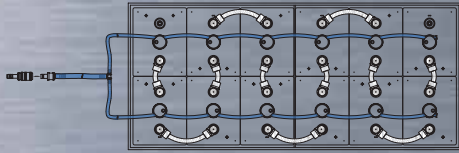
Sheet frame designs in different sizes for every volts and capacities

Insulated bolts and connectors increasing the security for the user and simplifying maintenance and repair

A complete series of accessories meeting almost all the needs and requirements

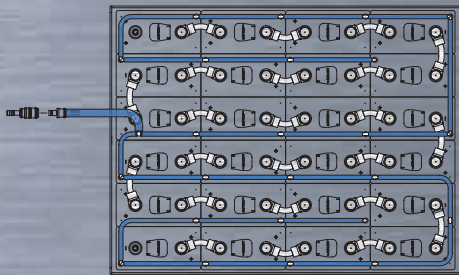
Suitable for all the applications from light duty to heavy service

Accessories



Automatic Filling System

A central pipe system mounted on the battery, quickly distributing an optimum amount of water to all the battery cells and delivering an optimum level of electrolyte and intensity.



Airmatic System

A pipe system mounted on the battery cells. Mixes the electrolyte solution carrying a lower level of air pressure to the cells. Contributes to the life and capacity by ensuring the acid intensity in the cell is homogenous distributed.

- Shorter charging time
- Reduced consumption of energy
- Water saving by up to 60%
- Less battery heating during charging



Electrolyte Level Indicator

An in-cell electrolyte level indicator with a simplified displaying system.

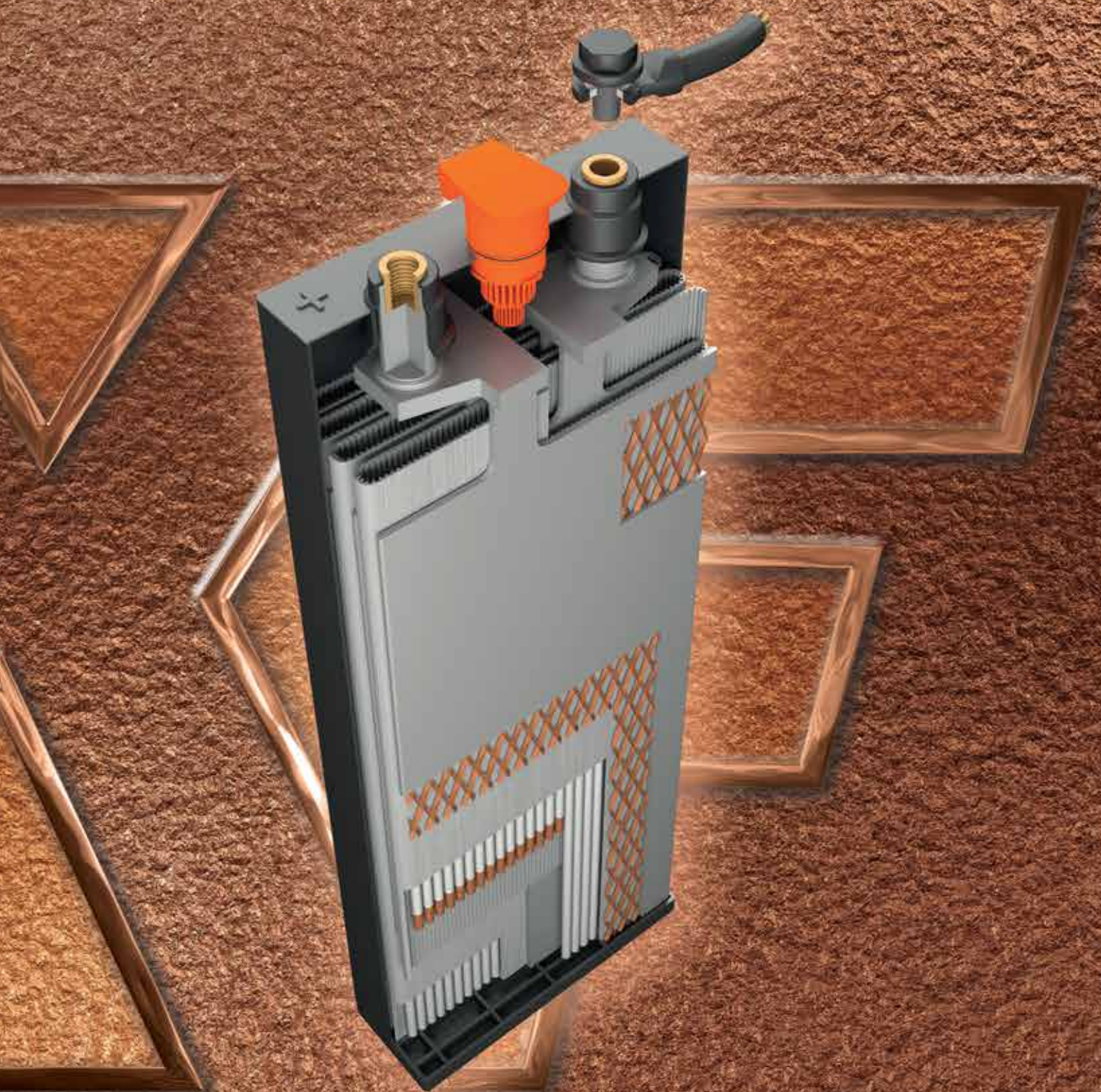




Xtreme Force

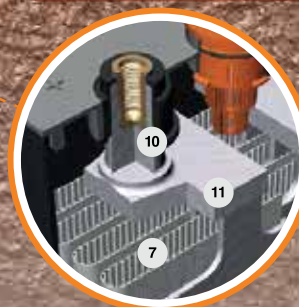
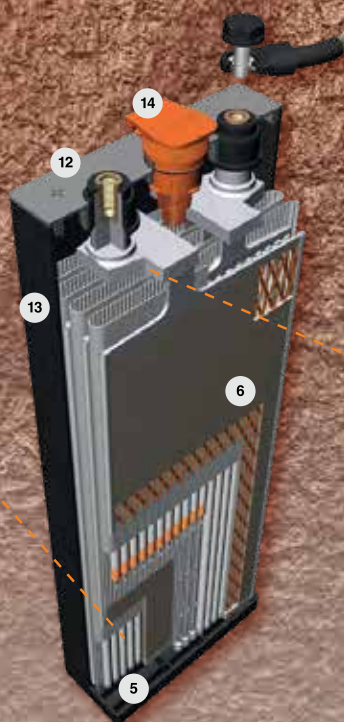
Esan Xtreme Force
High Copper
Technology





2 V Battery Cell internal and external design

Unique copper plate technology from Esan Battery



1 Negative Grid <ul style="list-style-type: none"> ⚙️ Copper grid offering more balanced current intensity on the plate surface ✓ Lower internal resistance 	5 Plug <ul style="list-style-type: none"> ⚙️ Ultrasonic welding ✓ Provides a gap necessary for the elongation of wires. 	10 Battery Terminal <ul style="list-style-type: none"> ⚙️ Innovative conic design ✓ Impermeable structure ✓ Flexible for the elongation of plates ⚙️ Brass insert covered by tin of 16 mm in diameter
2 Positive Grid <ul style="list-style-type: none"> ⚙️ Injection technology ⚙️ Lead allow with a lower antimony rate ✓ High corrosion resistance ✓ High retention with active substance 	6 Negative Active Substance <ul style="list-style-type: none"> ⚙️ Lead oxide manufactured by us ✓ Manufacturing at standard quality ⚙️ Full automatic vacuum negative paste mixing process ✓ Consistency in the amount of negative active substance 	11 Pole Connection <ul style="list-style-type: none"> ⚙️ Welding with COS technology ✓ Strong connection
3 Positive Active Substance <ul style="list-style-type: none"> ⚙️ 100% Red Lead ✓ Full capacity after 3-5 cycles ⚙️ Power filling process ✓ 100% plate weighing control ✓ Active substance with a homogenous intensity ⚙️ 99.99% pure lead in active substance ✓ Long service life, high conductivity, increased performance 	7 Separator <ul style="list-style-type: none"> ⚙️ Mechanically enveloped, high porosity polyethylene separator ✓ Minimum risk of short circuit ✓ Low internal resistance 	12 Cover <ul style="list-style-type: none"> ⚙️ Polypropylene design attached to the box with a hot glue for full impermeability
4 Tergal Tube <ul style="list-style-type: none"> ⚙️ Non-woven high quality polyester tube ✓ Prevents leakage of active substance 	8 Formation <ul style="list-style-type: none"> ⚙️ Full automatic charging process ✓ Standard quality for every cells ✓ Equal voltage and intensity in each cell 	13 Cell Box <ul style="list-style-type: none"> ⚙️ Polypropylene box with a sufficient gap on the bottom for the leakage of active substance and occurrence of short circuits ✓ Maximum electrolyte level
	9 Electrolyte <ul style="list-style-type: none"> ⚙️ High purity rate ✓ Long life performance 	14 Standard Battery Cap <ul style="list-style-type: none"> ⚙️ Electrolyte level check and gas discharge ⚙️ Intensity check and water addition ✓ Increased security for usage

Uninterrupted power technology developed specially for heavy businesses



Positive Energy



Cold storage rooms, exterior applications

Applications



Plants with high shelves, where heavier loads need to be lifted



Heavy duty applications requiring faster performance



All applications requiring multi-shift operations with a single battery



Seasonal works with high activities

1 Connection Cables

- ⚙ Insulated flexible connection cables
- ✓ Quick and easy to change the cells
- ✓ Time saving and low cost

2 Cell Connection Bolts

- ⚙ Plastic head isolated bolts
- ✓ Voltage measurement point
- ✓ Insulating surface

3 Output Cables

- ⚙ Insulated charging cable with colored marks
- Prevents short circuits
- Allows for a fast and correct connection

4 Plugs and Sockets

- ⚙ Connector as per DIN 43589



5 Automatic Water Filling System

- ⚙ Automatic filling plugs ensure that the cells are filled with an optimum level of pure water
- ✓ Minimizes maintenance time and cost

6 Airmatic system

- ⚙ A central pipe system permanently attached to the battery cells delivers the low air pressure to the cells.
- ✓ Homogenous electrolyte intensity
- ✓ Shorter charging time and lower temperature
- ✓ Reduction in energy costs since less energy is consumed

7 Sheet Frame

- ⚙ Made of steel
- ⚙ Covered by acid resistant plastic
- Delivers endurance and corrosion
- ✓ resistance
- ✓ Available with different color applications.

Double Shift Operation

The Xtreme Force batteries from Esan offer an option of quick charge when used with Airlift (airmix) thanks to the CSM copper plate technology and allow for the benefit from different charging options. Suitable for the opportunity charging, the Xtreme Force batteries from Esan offer an option of double shift operations.

Higher Energy Efficiency

Negative plates with CSM (Expanded Copper Metal) Copper grid allow reduce the internal resistance offering higher energy efficiencies and higher capacities.

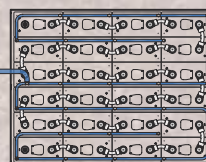
Higher Capacity at Standard DIN Norms

Our cells with CSM Copper technology are of the same sizes as the standard lead acid cells (IEC 60254-2) offering higher capacities compared to standard cells. Due to this advantage, the Xtreme Force batteries from Esan delivers a higher level of customer satisfaction, in particular, in the facilities with high shelves and during the performance of heavy-duty services.

Quick Charge

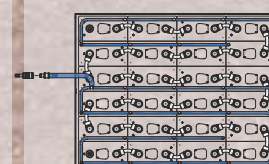
The Xtreme Force batteries from Esan can be charged within a period of 4 hours when charged with our high frequency (HF) special charging equipment and used with airlift (airmix). These quick charge and opportunity charge features allow for an option of multi shift operations, making the Xtreme Force batteries from Esan unique.

	Standard type	Advanced type	Advanced+ type
Airmatic system	no	yes	yes
Automatic water filling system	no	no	yes
Quick charging	no	yes	yes
Energy content	higher*	higher*	higher*
Low internal resistance	15%	15%	15%
Time to add pure water	normal	normal	faster up to 5 times



Airlift

Facilities with high shelves, where heavier loads need to be lifted



Airlift



Aquafilling

All applications requiring multi-shift operations with a single battery

Opportunity to work during 2 shifts with a single battery

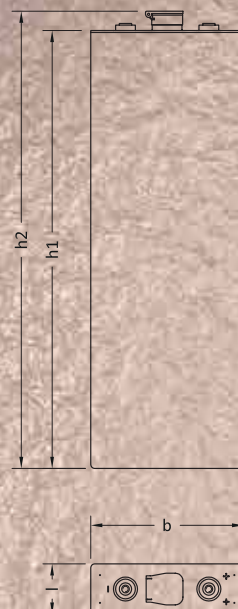


Plate Type: 130 Ah					
Type Name	Nominal Capacity (C5)	Nominal Energy (Wh)	Max. Cell Sizes (mm**)		Weight kg*
			b: 198	h1: 568	
				h2: 595	
				l	
2 PzSCSM 260	260	507	47		14,3
3 PzSCSM 390	390	761	65		20,1
4 PzSCSM 520	520	1014	83		26,0
5 PzSCSM 650	650	1268	101		31,9
6 PzSCSM 780	780	1521	119		37,8
7 PzSCSM 910	910	1775	137		43,7
8 PzSCSM 1040	1040	2028	155		49,7
9 PzSCSM 1170	1170	2282	174		55,5
10 PzSCSM 1300	1300	2535	192		61,4

Plate Type: 160 Ah					
Type Name	Nominal Capacity (C5)	Nominal Energy (Wh)	Max. Cell Sizes (mm**)		Weight kg*
			b: 198	h1: 713	
				h2: 740	
			l		
2 PzSCSM 320	320	624	47		17.7
3 PzSCSM 480	480	936	65		25.0
4 PzSCSM 640	640	1248	83		32.3
5 PzSCSM 800	800	1560	101		39.6
6 PzSCSM 960	960	1872	119		46.9
7 PzSCSM 1120	1120	2184	137		54.3
8 PzSCSM 1280	1280	2496	155		61.6
9 PzSCSM 1440	1140	2808	174		68.8
10 PzSCSM 1600	1600	3120	192		76.0

* Flooded and different cell weights $\pm 5\%$

** Cell sizes measured according to IEC 60254 – Part 2 (± 2)



Longer operation time
and higher life expectancy
compared to
standard batteries



ESAN Xtreme Force Battery Types

Plate Type	24V Battery Types	48V Battery Types	80V Battery Types
130Ah	24V-260AH (2 PzSCSM 260)	48V-260AH (2 PzSCSM 260)	80V-260AH (2 PzSCSM 260)
	24V-390AH (3 PzSCSM 390)	48V-390AH (3 PzSCSM 390)	80V-390AH (3 PzSCSM 390)
	24V-520AH (4 PzSCSM 520)	48V-520AH (4 PzSCSM 520)	80V-520AH (4 PzSCSM 520)
	24V-650AH (5 PzSCSM 650)	48V-650AH (5 PzSCSM 650)	80V-650AH (5 PzSCSM 650)
	24V-780AH (6 PzSCSM 780)	48V-780AH (6 PzSCSM 780)	80V-780AH (6 PzSCSM 780)
	24V-910AH (7 PzSCSM 910)	48V-910AH (7 PzSCSM 910)	80V-910AH (7 PzSCSM 910)
	24V-1040AH (8 PzSCSM 1040)	48V-1040AH (8 PzSCSM 1040)	80V-1040AH (8 PzSCSM 1040)
	24V-1170AH (9 PzSCSM 1170)	48V-1170AH (9 PzSCSM 1170)	80V-1170AH (9 PzSCSM 1170)
	24V-1300AH (10 PzSCSM 1300)	48V-1300AH (10 PzSCSM 1300)	80V-1300AH (10 PzSCSM 1300)
160Ah	24V-320AH (2 PzSCSM 320)	48V-320AH (2 PzSCSM 320)	80V-320AH (2 PzSCSM 320)
	24V-480AH (3 PzSCSM 480)	48V-480AH (3 PzSCSM 480)	80V-480AH (3 PzSCSM 480)
	24V-640AH (4 PzSCSM 640)	48V-640AH (4 PzSCSM 640)	80V-640AH (4 PzSCSM 640)
	24V-800AH (5 PzSCSM 800)	48V-800AH (5 PzSCSM 800)	80V-800AH (5 PzSCSM 800)
	24V-960AH (6 PzSCSM 960)	48V-960AH (6 PzSCSM 960)	80V-960AH (6 PzSCSM 960)
	24V-1220AH (7 PzSCSM 1220)	48V-1220AH (7 PzSCSM 1220)	80V-1220AH (7 PzSCSM 1220)
	24V-1280AH (8 PzSCSM 1280)	48V-1280AH (8 PzSCSM 1280)	80V-1280AH (8 PzSCSM 1280)
	24V-1440AH (9 PzSCSM 1440)	48V-1440AH (9 PzSCSM 1440)	80V-1440AH (9 PzSCSM 1440)
	24V-1600AH (10 PzSCSM 1600)	48V-1600AH (10 PzSCSM 1600)	80V-1600AH (10 PzSCSM 1600)

* This range is for indicative purposes. If you request a different type of batteries, please contact ESAN





Positive Energy



📍 Dilovası OSB 4. Kısım D 4011 Sok. No: 7 Gebze 41455 Kocaeli – Turkey

☎ +90 262 502 17 40

☎ +90 850 227 37 26

☎ +90 533 453 25 57

☎ +90 262 502 17 38

✉ esan@esanaku.com