

**Aluminium
Electrolytic
Capacitors
Screw
terminal
Type****Aluminium
Electrolytic
Capacitors
Snap in Type****Modular
Electrolytic
Capacitor****Metallized
Polypropylene
D.C. link Capacitors**

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- **Company Name:** Kendeil S.r.l
- **Foundation:** 1979
- **Headquarters Address:** Via Irlanda 1 - I- 21013 Gallarate, Italy
- **Products:** Aluminium E-Caps, Aluminium foil, Film Caps DC Link
- **Staff:** 130 employees
- **Market Position:** A leading producer of aluminium e-caps and aluminium foil.

KENDEIL GROUP

ALUMINIUM FOIL FOR CAPACITORS

CAPACITORS



SATMA PPC
ALUMINIUM FOIL FOR ELECTROLYTIC CAPACITORS

- French company dedicated to produce aluminum capacitor foil.



Kendeil™

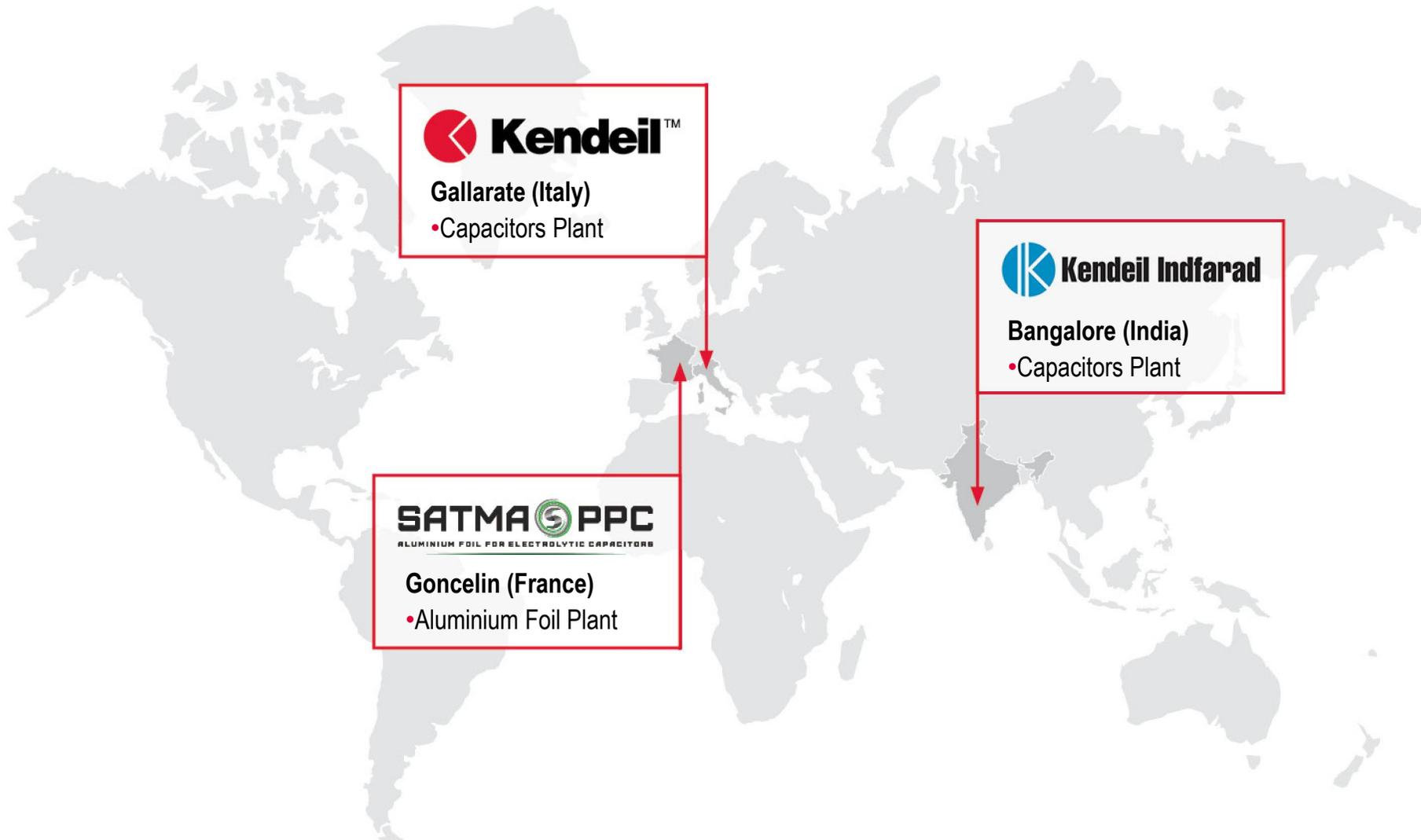
- Italian company dedicate to produce aluminium e-caps and film cap DC link.



Kendeil Indfarad

- Indian company dedicate to produce aluminium e-caps.

Production Plant Locations



Kendeil S.r.l

- **Location:** Gallarate (Italy)
- **Products:** Aluminium e-caps (screw terminal and snap - in and film caps DC link)
- **Capacity:** 4.500.000 pieces / year
- **Total site area:** 10.000 sqm



Kendeil Indfarad Electronics Pvt. Ltd.,

- **Location:** Bangalore (India)
- **Products:** Aluminium e-caps (screw terminal)
- **Capacity:** 240.000 pieces / year
- **Total site area:** 3.000 sqm

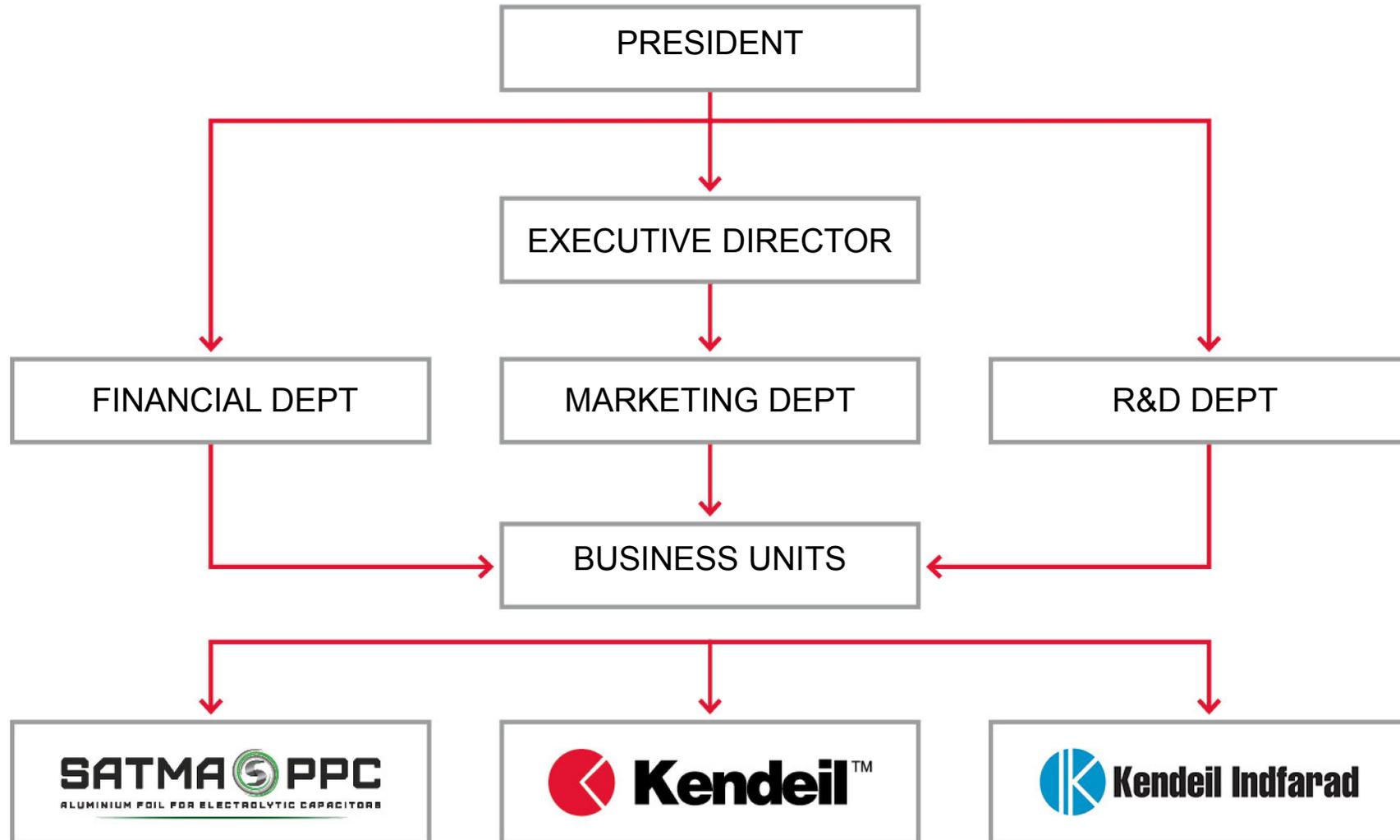


Satma ppc S.a.s

- **Location:** Gocelin (France)
- **Products:** Aluminium foil for capacitors (etched and formed)
- **Capacity:** 4.000.000 sq.m / year
- **Total site area:** 70.000 sqm



Group Organization Chart



MAIN APPLICATIONS OF Aluminium electrolytic capacitors and film capacitor DC link

INDUSTRIAL



Drives



Medical applications



Welding

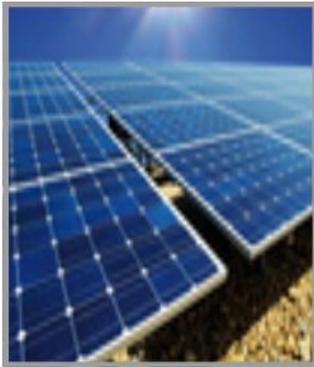


Uninterruptible power supply

ENERGY



Inverter for wind energy



Inverter for solar energy

RAILWAYS



Rail transportation

POWER CAPACITORS PRODUCT RANGE

ELECTROLYTIC CAPACITORS

FILM CAPACITORS



Screw terminal types



Snap in types



Modular Electrolytic Capacitors



Film DC Link

Aluminium E-Cap Product Range



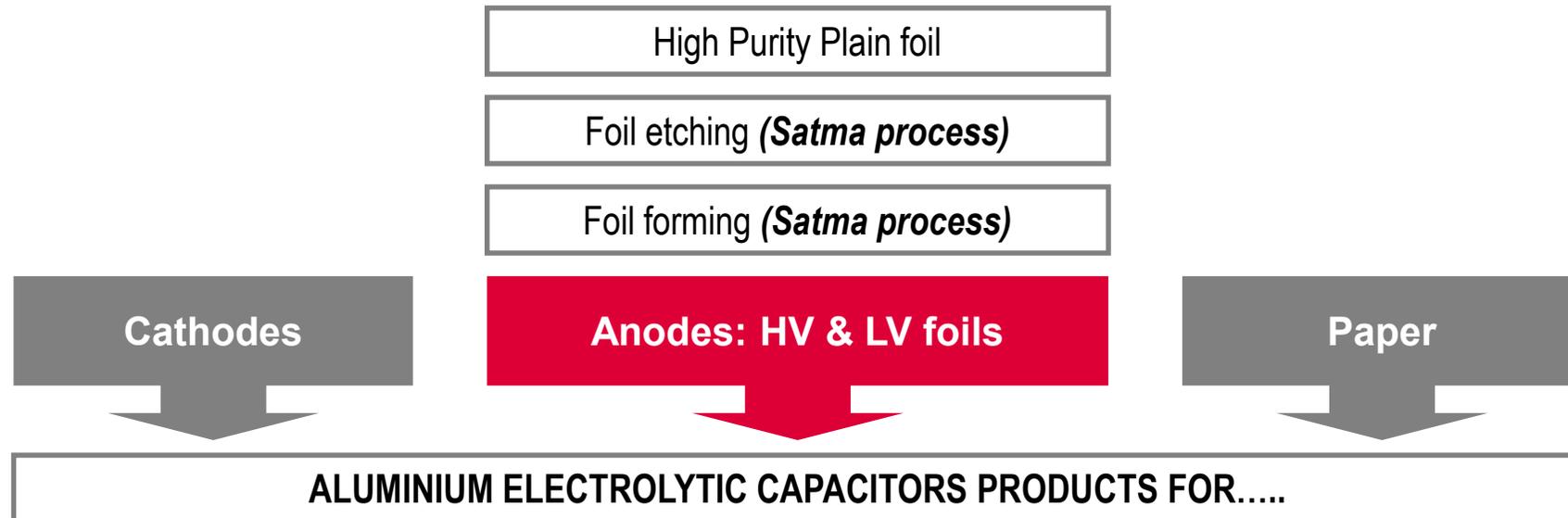
SCREW TERMINAL



SNAP - IN



From Aluminium Plain Foil to Aluminium E-Caps



SCREW TYPE

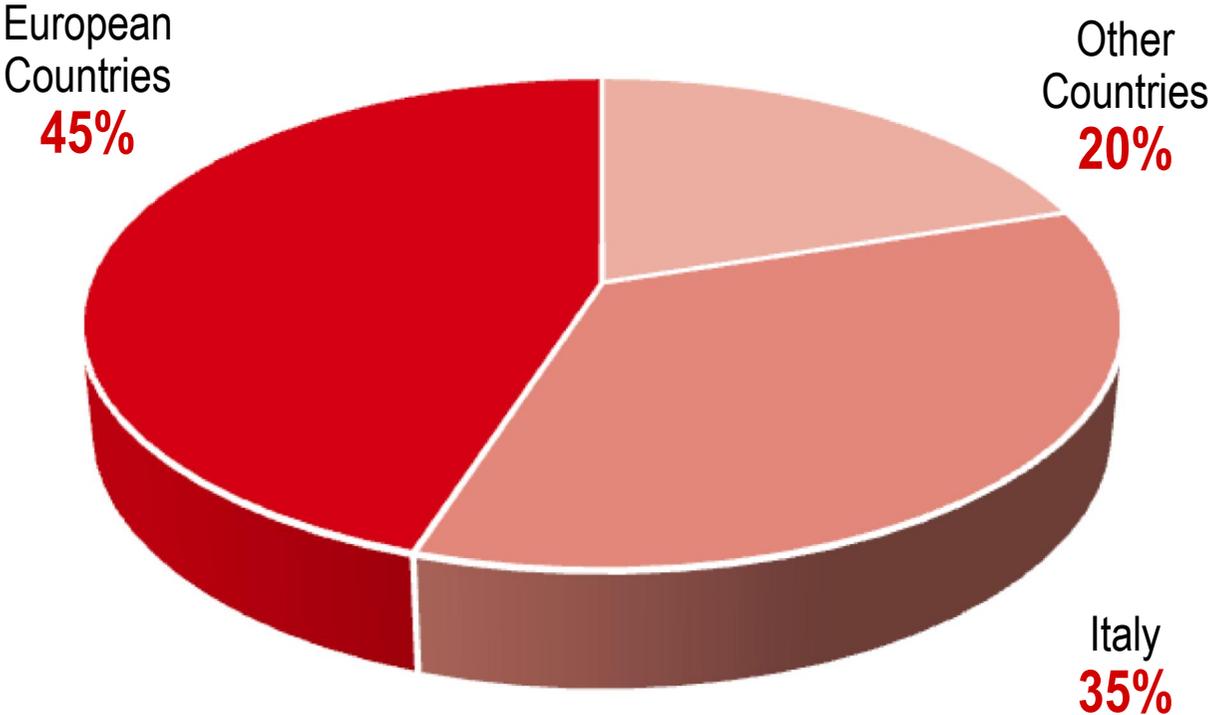


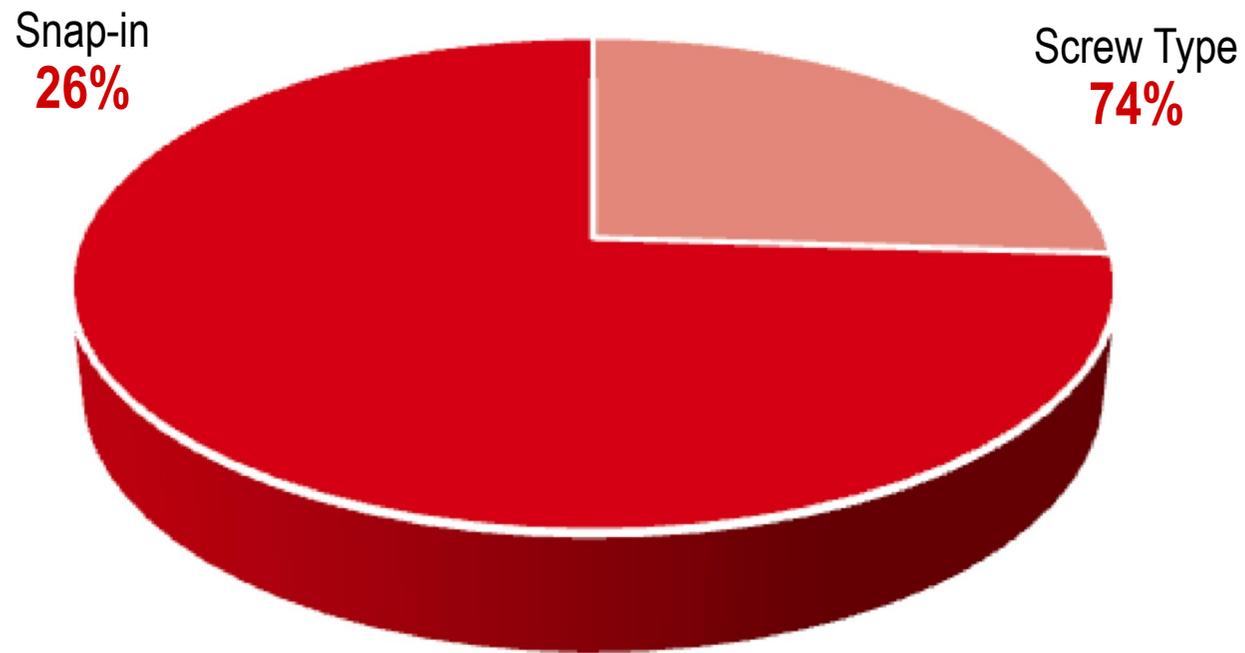
1.240.000 PCS PER YEAR

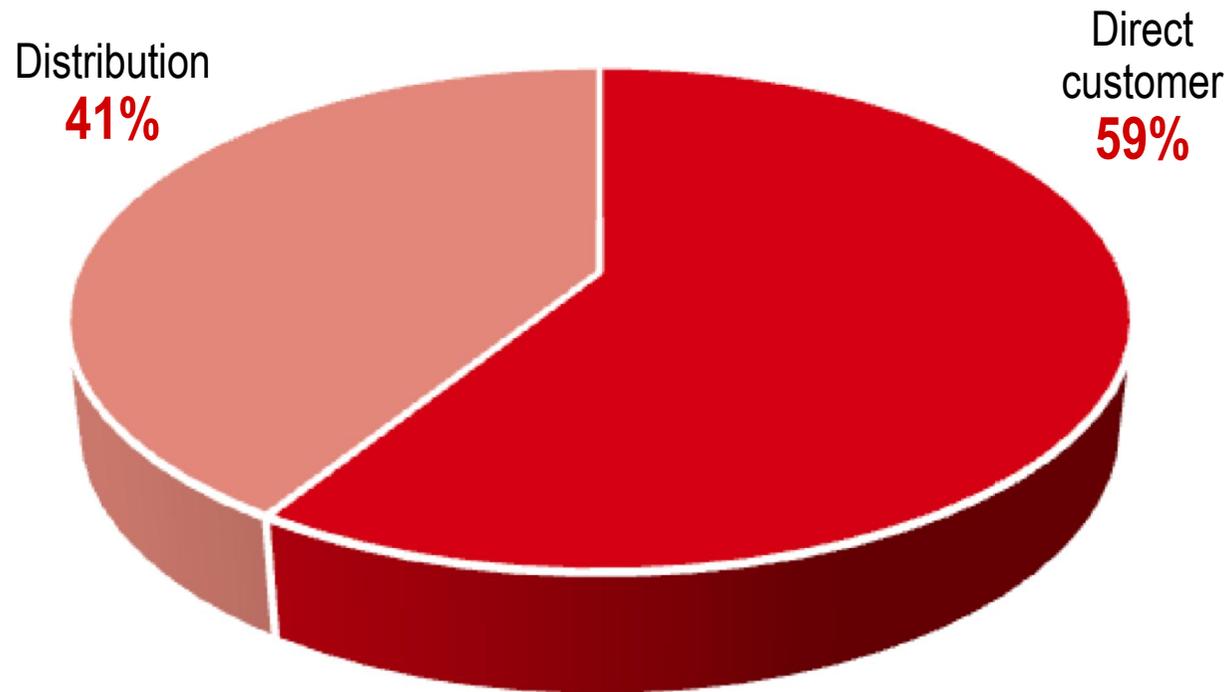
SNAP IN TYPE



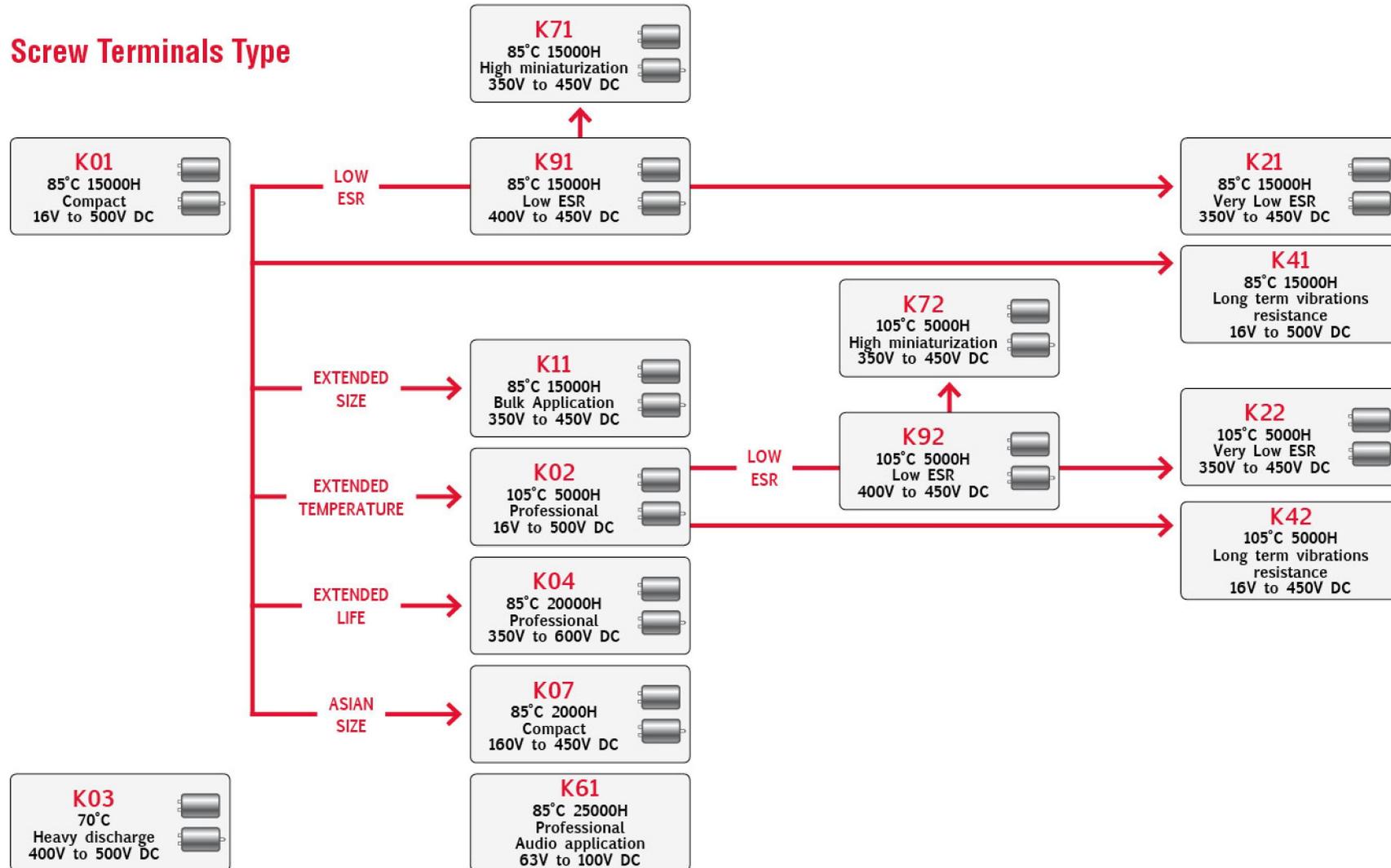
3.500.000 PCS PER YEAR







Screw Terminals Type



Aluminium E-Cap Screw Terminal Series 85°



Type	Technical Data	T.range Endurance	Features	Applications
K01	220 to 1,500,000 µF 16 to 500 Vdc	-40 to +85 ° C 15,000 hrs at 85 ° C	High Capacitance value for unit volume Low ESR and High ripple current Excellent electrical data in small sizes	Professional power electronics - Switch mode power supplies Frequency converters - Filtering devices
K04	1000 to 10,000 µF 350 to 600 Vdc	-40 to +85 ° C 20,000 hrs at 85 ° C	Extended life Low ESR and High ripple current	High professional power electronics - Power supplies Motor drives - Welding - Energy storage
K07	1800 to 15,000 µF 400 to 450 Vdc	-40 to +85 ° C 2,000 hrs at 85 ° C	Case size optimized for Asian Market	Professional power electronics - Industrial applications UPS - Frequency converters
K11	12000 to 30,000 µF 350 to 450 Vdc	-40 to +85 ° C 15,000 hrs at 85 ° C	Very High Capacitance value for unit volume	Parallel connection and high density of energy Energy storage - Bulk
K21	1200 to 15,000 µF 350 to 450 Vdc	-40 to +85 ° C 15,000 hrs at 85 ° C	Very Low ESR and High ripple current	Switch mode power suppliers - High ripple current converters - Motor drives
K41	220 to 1,500,000 µF 16 to 500 Vdc	-40 to +85 ° C 15,000 hrs at 85 ° C	Design optimized for long term vibrations stress High Capacitance value for unit volume Low ESR and High ripple current Excellent electrical data in small sizes	Designed for professional application under high mechanical stress, traction market
K71	2220 to 36,000 µF 350 to 450 Vdc	-40 to +85 ° C 15,000 hrs at 85 ° C	Design optimized for extremely high miniaturization Surge-proof capacitor in aluminium can with insulation sleeve To be mounted with ring clips or with threaded stud	Designed for professional application. Switch mode power suppliers, high ripple current converters, motor drives
K91	680 to 15000 µF 400 to 450 Vdc	-40 to +85 ° C 15,000 hrs at 85 ° C	Design optimized for low ESR and high ripple current Surge-proof capacitor in aluminium can with insulation sleeve To be mounted with ring clips or with threaded stud	Designed for professional application. Switch mode power suppliers, high ripple current converters, motor drives

Aluminium E-Cap Screw Terminal Series 105°



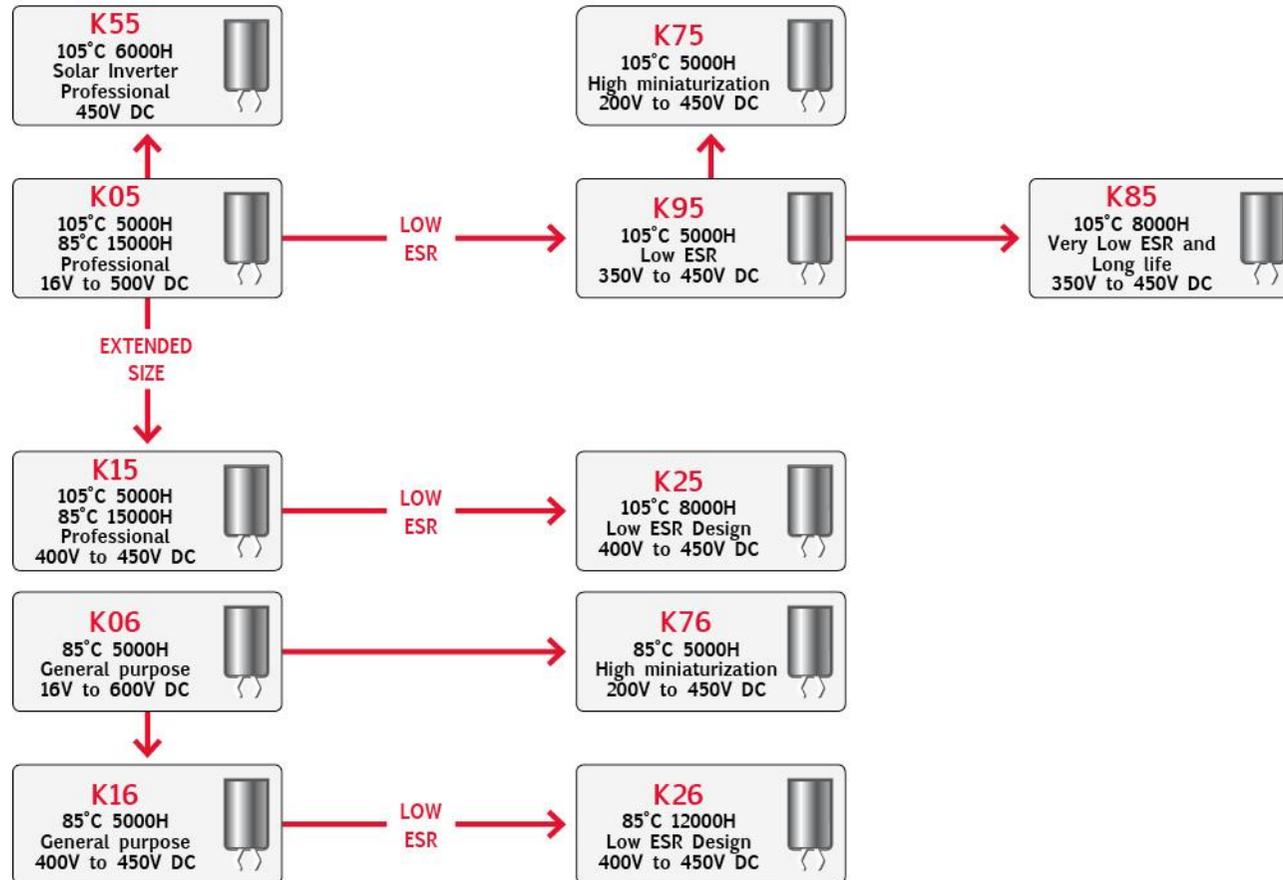
Type	Technical Data	T.range Endurance	Features	Applications
K02	100 to 470,000 µf 16 to 500 Vdc	-40 to +105 ° C 5000 hrs at 105 ° C	Very high Capacitance Value for unit volume Low ESR and High ripple current High reliability	High Professional power supplies - Motor drives Frequency converters - Filtering devices
K22	1000 to 12,000 µF 350 to 450 Vdc	-40 to +105 ° C 5,000 hrs at 105 ° C	Very Low ESR and High ripple current High reliability	Switch mode power supplies - High ripple current converters - Motor drives
K42	100 to 470,000 µf 16 to 450 Vdc	-40 to +105 ° C 5,000 hrs at 105 ° C	Design optimized for long term vibrations stress High Capacitance value for unit volume Low ESR and High ripple current High reliability	Designed for professional application under high mechanical stress, traction market
K72	2220 to 30,000 µf 350 to 450 Vdc	-40 to +105 ° C 5,000 hrs at 105 ° C	Design optimized for extremely high miniaturization Surge-proof capacitor in aluminium can with insulation sleeve To be mounted with ring clips or with threaded stud	Designed for professional application. Switch mode power supplies, high ripple current converters, motor drives
K92	470 to 10000 µF 400 to 450 Vdc	-40 to +105 ° C 5,000 hrs at 105 ° C	Design optimized for low ESR and high ripple current Surge-proof capacitor in aluminium can with insulation sleeve To be mounted with ring clips or with threaded stud	Designed for professional application. Switch mode power supplies, high ripple current converters, motor drives

Aluminium E-Cap Screw Terminal Series for Special Applications



Type	Technical Data	T.range Endurance	Features	Applications
K03	560 to 2,200 µf 400 to 500 Vdc	-20 to + 55 ° C n/a	Heavy discharge duty	Extreme application welding Strobe applications
K61	6800 to 47,000 µf 63 to 100 Vdc	-40 to +85 ° C 25,000 hrs at 85 ° C	Extremely linear characteristic between 20Hz to 22 KHz No effects of sound compression Precisely and realistic dynamic of sound	Design optimized for Audio application

Snap In Type



Aluminium E-Cap Snap - In Series 85°



Type	Technical Data	T.range Endurance	Features	Applications
K06	68 to 47,000 μ F 16 to 600 Vdc	-40 to +85 ° C 5000 hrs at 85 ° C	Very high Capacitance Value for unit volume Low ESR and High ripple current in small dimensions case size	Power switch mode power supplies Professional power electronics
K16	820 to 2700 μ F 400 to 450 Vdc	-40 to +85 ° C 5000 hrs at 85 ° C	Very high Capacitance Value for unit volume Low ESR and High ripple current in large dimensions case size	Power switch mode power supplies Professional power electronics
K26	1000 to 2700 μ F 400 to 450 Vdc	-40 to +85 ° C 12000 hrs at 85 ° C	Very high Capacitance Value for unit volume Very Low ESR and High ripple current in large dimensions case size	Ultra compact UPS, Solar inverters, High ripple current converters, Motor drives
K76	220 to 5600 μ F 200 to 450 Vdc	-40 to +85 ° C 5,000 hrs at 105 ° C	Design optimized for extremely high miniaturization Surge-proof capacitor in aluminium can with insulation sleeve Snap in terminals for PCB mounting	Designed for professional application. Switch mode power supplies, high ripple current converters, motor drives

Aluminium E-Cap Snap - In Series 105°



Type	Technical Data	T.range Endurance	Features	Applications
K05	68 to 47,000 µF 16 to 500 Vdc	-40 to +105 ° C 5,000 hrs at 105 ° C	Very high Capacitance Value for unit volume Low ESR and High ripple current in small dimensions case size	Power switch mode power supplies Professional power electronics
K15	820 to 2200 µF 400 to 450 Vdc	-40 to +105 ° C 5,000 hrs at 105 ° C	Very high Capacitance Value for unit volume Low ESR and High ripple current in large dimensions case size	Power switch mode power supplies Professional power electronics
K25	820 to 2200 µF 400 to 450 Vdc	-40 to +105 ° C 8,000 hrs at 105 ° C	Very high Capacitance Value for unit volume Low ESR and High ripple current in large dimensions case size	Ultra compact UPS, Solar inverters, High ripple current converters, Motor drives
K55	330 to 820 µF 450 Vdc	-40 to +105 ° C 6,000 hrs at 105 ° C 5,000 hrs at 50 ° C – 500 V	Very high Capacitance Value for unit volume Low ESR and High ripple current in large dimensions case size	Solar inverters, Professional power supplies
K75	220 to 4700 µF 200 to 450 Vdc	-40 to +105 ° C 5,000 hrs at 105 ° C	Design optimized for extremely high miniaturization Surge-proof capacitor in aluminium can with insulation sleeve Snap in terminals for PCB mounting	Designed for professional application. Ultra compact UPS, Solar inverters, High ripple current converters, Motor drives
K85	100 to 1000 µF 350 to 450 Vdc	-40 to +105 ° C 8,000 hrs at 105 ° C	Design optimized for high ripple current and very long life application Surge-proof capacitor in aluminium can with insulation sleeve Snap in terminals for PCB mounting	Designed for professional application. Ultra compact UPS, Solar inverters, High ripple current converters, Motor drives
K95	150 to 1000 µF 350 to 450 Vdc	-40 to +105 ° C 5,000 hrs at 105 ° C	Design optimized for high ripple current and long life application Miniaturized design Surge-proof capacitor in aluminium can with insulation sleeve Snap in terminals for PCB mounting	Designed for professional application. Ultra compact UPS, Solar inverters, High ripple current converters, Motor drives

Modular Electrolytic Capacitor



Applications: Designed for professional / industrial applications, switch mode power suppliers, high ripple current converters, motor drives.

Main performances features: Electrical design optimized for three level IGBT, high ripple current applications, +50% of ripple current / volume, longer life on application conditions.

Main mechanical features: Surge-proof capacitor in aluminium box, mechanical design optimized for low profile modular machines.

Type	Temperature range	Usefull Life	Voltage (vdc)	Capacitance	Dimension L(mm) D(mm) H(mm)
K1M	-40 to +85 ° C	15,000 hrs at 85 ° C	500 to 1200 Vdc	2500 to 15000 µF	293,0 x 123,5 x 113,5
K2M	-40 to +105 ° C	5,000 hrs at 105 ° C	500 to 1000 Vdc	3300 to 14000 µF	293,0 x 123,5 x 113,5

The target achieved of these innovative electrolytic capacitors are:

- Working voltage extension respect to standard electrolytic capacitors (from 500V to 1200V).
- Useful life of 15,000h at 85° C (K1M) and 5,000h at 105° C (K2M).
- Maximum ripple current of 250 Arms.
- Designed to maximize heat dissipation by heat sink or fluid cooler.
- Full insulated chassis (UL approved).
- Low capacitance value versus ground.

What are our Strength Points for Aluminium E-Caps ?



Innovative company	Kendeil introduced 24 new series, in the last six years.
High voltage technology	The main applications of Kendeil products are from 200V up to 600V for industrial uses.
Long life products	Kendeil has series to grant 20.000 hrs at rated condition
High capacitance / high voltage items	Kendeil Screw Terminal and Snap-in series include versions with high capacitance at high voltage.
Custom designs	Kendeil can design e-caps according to customer circuit applications.
Applications support	Kendeil have developed software models to provide fast accurate life predictions for any given operating condition.
Flexible production	The internal processes have been structured to provide an excellent level of customer service.
Upstream vertical integration with aluminium foil	Kendeil is the only company in the European Community to have vertically integrated to provide 100% of their foil requirements.

Through his upstream aluminium foil integration Kendeil can take advantage of:

- **Cost**

In a typical screw terminal, the anode foil accounts for around 70% and Kendeil can keep under control this main part of cost.

- **Provision foil**

Globally there are relatively few producers of high quality aluminium foil for e-caps.

In times of high demand, this creates a shortage of capability.

Kendeil's strategy to vertically integrate has provided protection from this potentially damaging situation.

D.C. Power Film Capacitors



INDUSTRIAL



ENERGY



RAILWAYS



SCREW TERMINAL



D.C. Power Film Capacitors Series



Type	Technical Data	T.range Endurance	Applications
K31	120 to 1000 μ f 600 to 1300 Vdc	-40 to +85 ° C 100.000 hrs at 85 ° C	Designed for professional power electronics – motor drives, solar Converters
K32	100 to 1000 μ f 600 to 1300 Vdc	-40 to +85 ° C 100.000 hrs at 85 ° C	Designed for professional power electronics – High frequencies switching motor drives. Traction market.
K34	600 to 1300 Vdc	-40 to +70 ° C 100.000 hrs at 70 ° C	Designed for professional power electronics. High frequencies switching motor drives. Traction market.

DC link film capacitors for low and medium / high frequencies:

K31	K32
Designed for low and medium frequencies switching (less than 15Khz).	Designed for low and medium and high frequencies switching by segmented metallization (exceeding 15Khz)

Main Customers and References



INDUSTRIAL	GREEN ENERGY	WELDING

Kendeil maintains 100% controls to ensure that quality of products meets Client's requirements, according to Quality Management System ISO 9001



The respect of the environment is a top priority for Kendeil:

- The European directive 2002/95/EC regarding the restrictions of usage for some substances (RoHS) has been applied since the beginning so that the Kendeil products do not have any critical percentage of forbidden substances.
- Kendeil fully respects the Waste Electrical and Electronic Equipment Directive (WEEE)



WEEE

- Kendeil's products do not contain any forbidden substances being compliant with REACH regulation 1907/2006 (REACH)
- Products designed and manufactured according to the most stringent european safety standards.



CE

- Italian law 81/2008 and 106/2009 on safety and protection of the health of staff on duty at the workplace.

Producing high quality and innovative power components bring Kendeil to be the first choice for the customers



Kendeil to achieve the mean of the strategy has developed two internal programmes:

- Quality material programme
- R&D programme