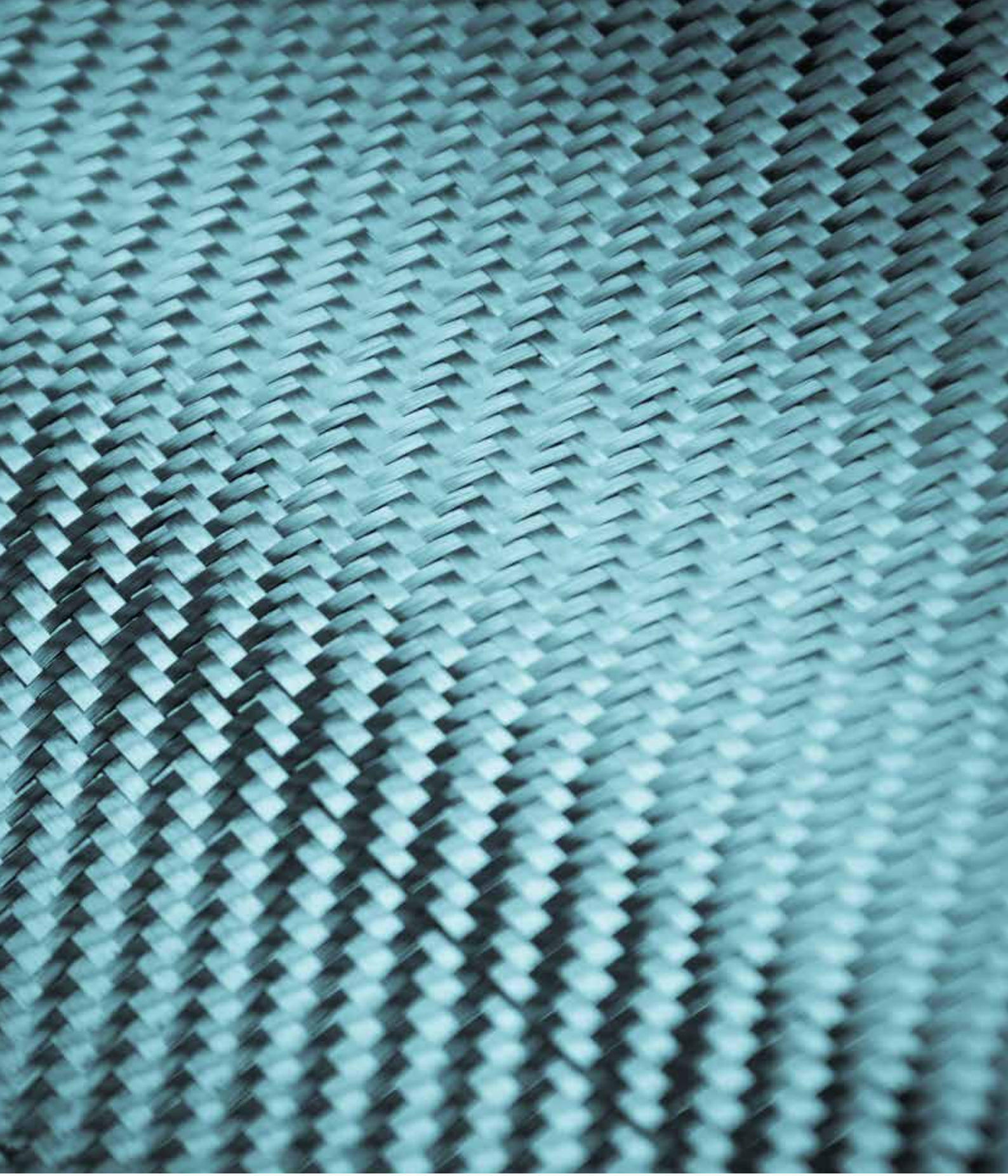
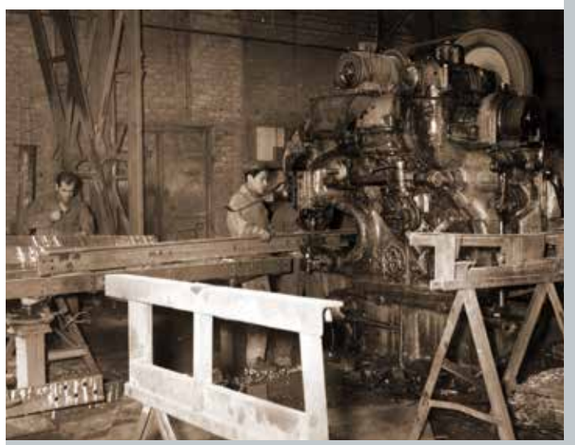


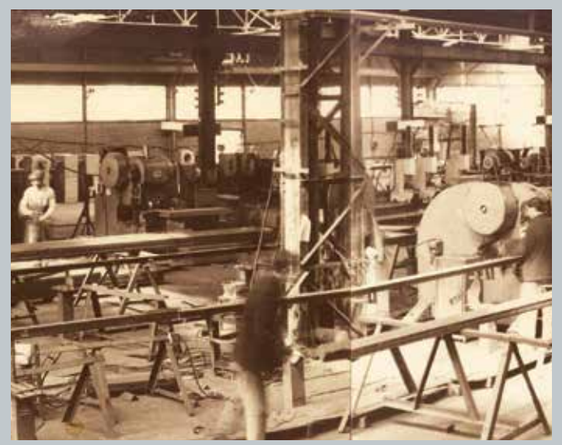
MİTAŞ COMPOSITES

Mitaş Composites operates in its modern factory located in Ankara ASO 2nd Industrial Zone. The facility, which was commissioned in 2018 by Mitaş Energy, became a company under the name Mitaş Composites Plastic Industry and Trade Inc. in 2019 and will continue to provide services to all its customers by working on innovative composite products with its experienced staff in design, production and assembly, environmentally friendly technology, R&D and quality laboratory.

Our vision is to be the best solution partner globally with its environmentally sensitive original designs by using new generation technologies and rational solutions in the composite sector.

Our mission is to keep the customer satisfaction at the highest level by providing quality products and services with the use of innovative, safe and environmentally friendly technologies and applications in the sector, to contribute to the spreading of the use of composite materials with the principle of continuous development.





MİTAŞ Group was primarily launched when MİTAŞ Metal Construction Inc. was established in Ankara, Turkey, in 1955, in order to operate to develop the Turkish power transmission and distribution infrastructure.

Having extended its fields of activity over the successful past years, MİTAŞ Group, today, operates on a global scale in the business of engineering, procurement, manufacturing and construction of towers, poles and high masts for power transmission and distribution, solar, telecommunication, lighting, and transportation infrastructure.

Headquartered in Ankara, the Group has the following manufacturing facilities located in Turkey and Italy.

GROUP PROFILE

- Lattice tower manufacturing factory in Ankara, Turkey, with annual capacity of 72.000 mt production and 90.000 mt galvanizing,

- Lattice tower manufacturing factory (Micha) in İzmir, Turkey, with annual capacity of 103.000 mt production and 85.000 mt galvanizing,

- Pole and high mast manufacturing factory in Ankara, Turkey with annual capacity of 30.000 mt production,

- Pole and high mast manufacturing factory in Siderpali, Italy, with annual capacity of 15.000 mt production,

- Plate fabrication factory in Ankara, Turkey, with annual capacity of 18.000 mt production and 32.000 mt galvanizing,

- Welding factory in Ankara, Turkey, with annual capacity of 12.000 mt production,

- Bolt manufacturing factory in Ankara, Turkey, with annual capacity of 30.000 mt production,

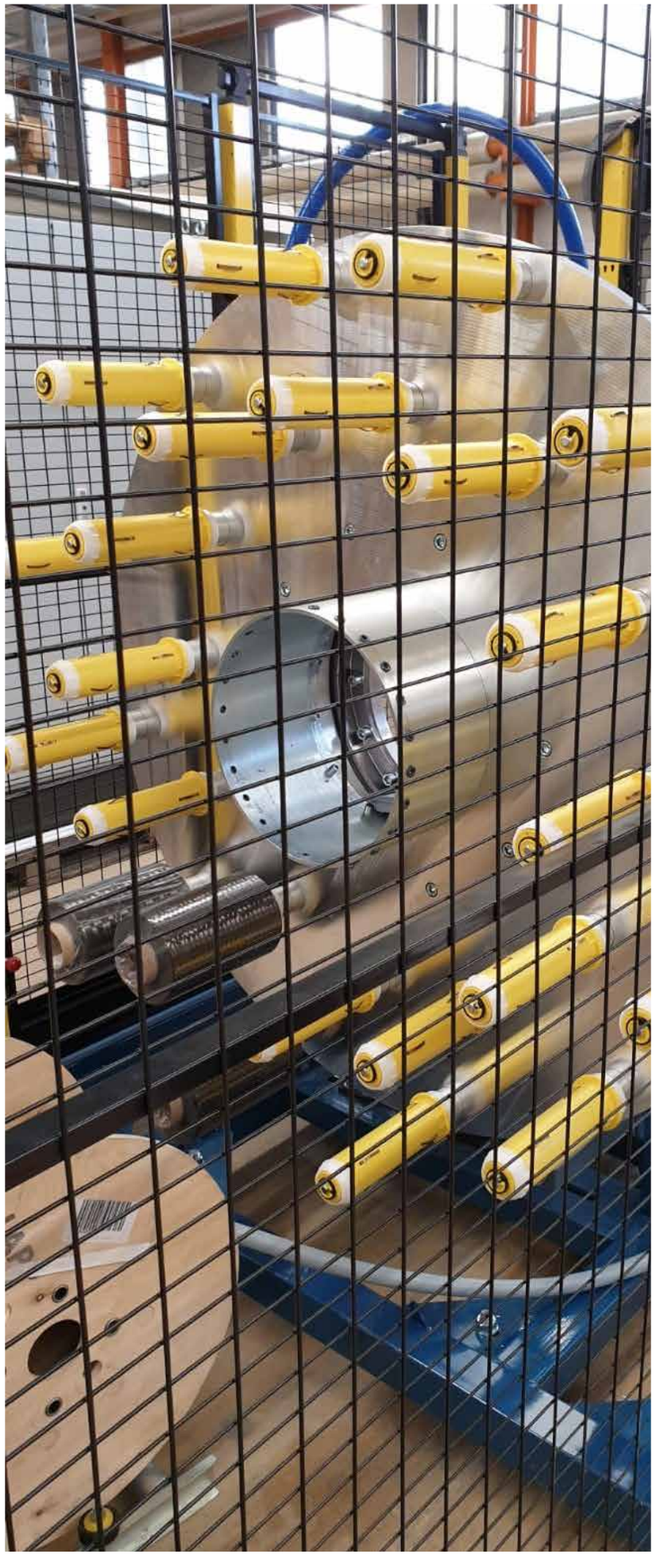
- Galvanizing factory in Ankara, Turkey, with annual capacity of 120.000 mt galvanizing,

- Galvanizing factory for automotive parts in İzmit, Turkey with annual capacity of 70.000 mt galvanizing,

- Composite manufacturing factory in Ankara, Turkey, with annual capacity of 700 mt production,

- Powder coating factory in Ankara, Turkey, with annual capacity of 12.000 mt coating,

Powering the World



COMPOSITES PLANT

This facility uses filament winding method up to 12 m length and 1000 mm dimensions in its high-quality and capacity computer-aided machines. Also, all the supporting operations from winding until the end product can be done by the CNC machines within the facility. The facility is capable of using not only glass but also advanced fibers like carbon and aramid together with polyester and epoxy resins. In the facility there is also a pultrusion line which enables to produce any kind of cross sections (I, U, L, O, etc.) up to 1000x200 mm continuously.

TECHNOLOGY

- 3 Axis CNC Filament Winding Line (L = 12m, Ømax = 800mm)
- 4 Axis Servo Creel CNC Filament Winding Line (L = 6m, Ømax = 800mm)
- Pultrusion Line: Linear, Radius, Pulwinding
- CNC Cutting, Drilling & Grinding Station
- 2 Resin Farms (Polyester & Epoxy)
- 20 tons Extractor
- Gelling Station
- Curing Oven

PRODUCTION METHODS

Filament Winding
It is a method of controlled winding of the impregnated fibers on the desired pattern, angle and thickness over a rotating mold, which was coated with a release agent. After the product is cured on the mold, it is extracted from the mold by a special machine. With this production method, it is possible to obtain very strong and high-quality products as the reinforcement rate is high. In addition, properties such as UV resistance, hardness and fire resistance of the product can be developed with the additions to the resin. Cylindrical or conical tubes and all other kinds of hollow profiles can be produced with this method. Fibers such as glass, carbon and aramid can be produced with resins such as polyester and epoxy

Linear Pultrusion
It is the fastest production method in composites. It is the method of pulling glass, carbon or aramid fibers combined with polyester or epoxy resins within a hot mold. The product is cured shortly after it is pulled out of the mold. There is no length limitation in the end product and any kind of section allowed by the mold can be pulled continuously. High strength and high-quality products can also be obtained with this method.

Radius Pultrusion
It is a version of linear pultrusion by which profiles with a certain bending diameter can be produced. The products are released from the mold as already cured and curved with this method.

Pulwinding
Pulwinding is a combination of Filament Winding and Pultrusion methods. The products obtained as a result of this method have higher resistance. With this method, it is possible to obtain more slender but rigid sections.

Mitaş Composites designs and produces a variety of composite poles with conical or cylindrical cross sections for lighting poles, flag poles, distribution poles, camera poles, telecommunication poles, decorative poles or smart city poles. Our poles can be designed according to any desired wind load as per the international standards like EN40-7, AASHTO LTS6-8, or TIA EIA 222. Poles are produced up to 12 m in one segment and can be joined together to reach more heights. Any number and length of brackets can be adapted to the poles as per the customer request. After the poles are produced they are properly packed in order to be assembled at site safely.

Advantages of Mitaş Composite Poles:

- Low Weight
- Easy Handling and Installation
- High Mechanical Strength
- Corrosion Resistance
- Low Maintenance Cost
- Dielectric Strength
- UV Resistance
- Flame Resistance
- ECO Friendly
- Passive Safety
- Radio Wave Transmissivity

CLP – MB / 08-100-200/1

CLP: Composite Lighting Poles

MB: Metal Base

08-100-200/1: Pole Length-Top Inner Diameter-Bottom Inner Diameter/ Number of Bracket

*Design of the poles are done according to EN40-7: Requirements for fiber-reinforced polymer composite lighting columns.
*For analysis of poles, area and weight of luminaires are taken as 0,2 m2 and 20 kg respectively.
*For the poles up to 6 m, the length of brackets is taken as 1 m while it is taken as 1.5 m for the poles longer than 6 m.
*Products with different dimensions and design criteria are also possible.

LIGHTING POLES

Pole Code	Pole Length (m)	Inner Diameters (mm)		Steel Base Dimensions (mm)	
CLP-MB/05-62-112/0	5	62	112	200	140
CLP-MB/06-62-122/0	6	62	122	210	150
CLP-MB/07-100-188/0	7	100	188	270	210
CLP-MB/08-100-200/0	8	100	200	280	220
CLP-MB/10-100-225/0	10	100	225	310	250
CLP-MB/12-100-250/0	12	100	250	330	270
CLP-MB/07-120-210/0	7	120	210	290	230
CLP-MB/08-120-222/0	8	120	222	300	240
CLP-MB/10-120-248/0	10	120	248	330	270
CLP-MB/12-120-273/0	12	120	273	360	300

Pole Code	Pole Length (m)	Inner Diameters (mm)		Steel Base Dimensions (mm)	
CLP-MB/05-62-112/1	5	62	112	210	150
CLP-MB/06-62-122/1	6	62	122	220	160
CLP-MB/07-100-188/1	7	100	188	270	210
CLP-MB/08-100-200/1	8	100	200	290	230
CLP-MB/10-100-225/1	10	100	225	330	250
CLP-MB/12-100-250/1	12	100	250	360	280
CLP-MB/07-120-210/1	7	120	210	300	240
CLP-MB/08-120-222/1	8	120	222	320	250
CLP-MB/10-120-248/1	10	120	248	350	270
CLP-MB/12-120-273/1	12	120	273	390	310

Pole Code	Pole Length (m)	Inner Diameters (mm)		Steel Base Dimensions (mm)	
CLP-MB/05-62-112/2	5	62	112	220	150
CLP-MB/06-62-122/2	6	62	122	240	160
CLP-MB/07-100-188/2	7	100	188	280	210
CLP-MB/08-100-200/2	8	100	200	310	230
CLP-MB/10-100-225/2	10	100	225	340	260
CLP-MB/12-100-250/2	12	100	250	390	290
CLP-MB/07-120-210/2	7	120	210	300	240
CLP-MB/08-120-222/2	8	120	222	330	250
CLP-MB/10-120-248/2	10	120	248	380	280
CLP-MB/12-120-273/2	12	120	273	410	310

DECORATIVE LIGHTING POLES

Code V=110 km/h	Pole Length (m)	Inner Diameters (mm)	Base Plate Dimensions (mm*mm)	Shaft	Base Plate Dimensions (mm*mm)
CDP-MB/03-62-92	3	Ø62-92	180x180	Any color / Self-illuminated	Aluminum or Composite
CDP-MB/04-62-102	4	Ø62-102	190x190	Any color / Self-illuminated	Aluminum or Composite
CDP-MB/05-62-112	5	Ø62-112	200x200	Any color / Self-illuminated	Aluminum or Composite
CDP-MB/06-62-122	6	Ø62-122	210x210	Any color / Self-illuminated	Aluminum or Composite

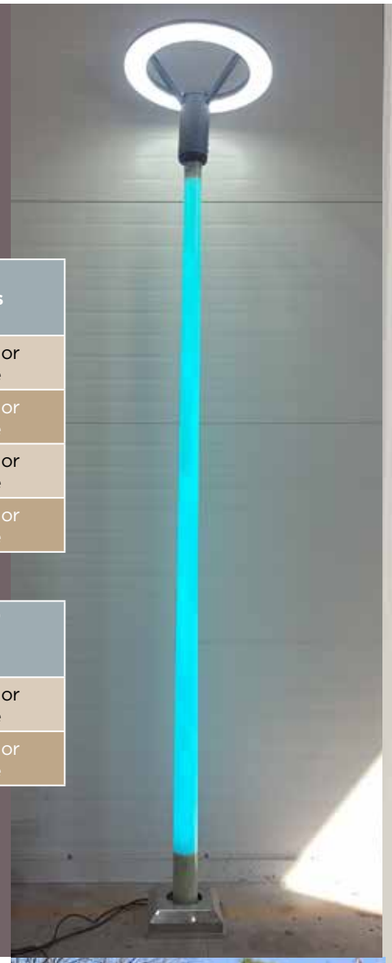
Code V=110 km/h	Bollard Length (m)	Inner Diameters (mm)	Base Plate Dimensions (mm*mm)	Shaft	Base Cover
CB-MB/080-100	0,8	Ø100	Ø150	Any color / Self-illuminated	Aluminum or Composite
CB-MB/100-100	1	Ø100	Ø150	Any color / Self-illuminated	Aluminum or Composite

CDP – MB / 03-62-92

- CDP: Composite Decorative Poles
- MB: Metal Base
- 03-62-92: Pole Length-Top Inner Diameter-Bottom Inner Diameter

CB – MB / 080-100

- CB: Composite Bollard
- MB: Metal Base
- 080-100: Bollard Length-Inner Diameter



FLAG POLES

Code V=120 km/h	Pole Length (m)	Flag Dimensions (cm)	Inner Diameters (mm)	Base Plate Dimensions (mm*mm)
CFP-MB/04-62-102	4	70x105	Ø62-102	180x180
CFP-MB/05-62-112	5	100x150	Ø62-112	190x190
CFP-MB/06-62-122	6	100x150	Ø62-122	200x200
CFP-MB/08-100-200	8	120x180	Ø100-200	300x300
CFP-MB/10-100-225	10	120x180	Ø100-225	340x340
CFP-MB/12-100-250	12	150x225	Ø100-250	360x360

Code V=120 km/h	Pole Length (m)	Flag Dimensions (cm)	Inner Diameters (mm)	Base Plate Dimensions (mm*mm)
CFP-MB/04-62-102	4	40x60	Ø62-102	180x180
CFP-MB/05-62-112	5	50x75	Ø62-112	190x190
CFP-MB/06-62-122	6	80x120	Ø62-122	210x210
CFP-MB/08-100-200	8	120x180	Ø100-200	280x280
CFP-MB/10-100-225	10	200x300	Ø100-225	340x340
CFP-MB/12-100-250	12	300x450	Ø100-250	380x380

CFP – MB / 08-100-200

- CLP: Composite Flag Poles
- MB: Metal Base
- 08-100-200: Pole Length-Top Inner Diameter-Bottom Inner Diameter

CAMERA POLES

Mitaş Composites offers a variety of camera surveillance poles as per the customer requests for different pole heights, camera dimensions, wind loading and deflection criteria. Composite camera poles are easy installed thanks to their light weight and have superior properties like low maintenance cost and corrosion resistance.

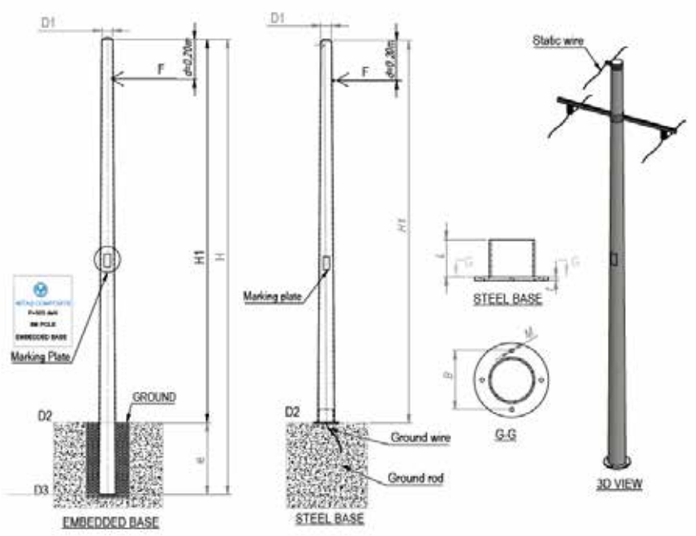
TELESCOPIC MASTS

Mitaş Composites produces either mechanical or electronical controlled telescopic masts. These masts can be either personnel or vehicle carried or ground mounted type. According to the usage glass polyester or carbon epoxy can be preferred in these products.

					Load Capacity,F (daN)								
No	Code	Inner Diameters (mm)	Length above Ground H1 (m)	Length under Ground e (m)	200	300	400	500	600	700	800	900	1000
1	CUP-EB-06-120-197	Embedded Base	4,7	1,3	✓	✓	✓	✓	✓	✓	✓	✓	✓
2	CUP-EB-07-120-209		5,6	1,4	✓	✓	✓	✓	✓	✓	✓	✓	✓
3	CUP-EB-08-120-222		6,5	1,5	✓	✓	✓	✓	✓	✓	✓	✓	✓
4	CUP-EB-09-120-235		7,4	1,6	✓	✓	✓	✓	✓	✓	✓	✓	✓
5	CUP-EB-10-120-248		8,2	1,8	✓	✓	✓	✓	✓	✓	✓	✓	✓
6	CUP-EB-11-120-260		9,2	1,8	✓	✓	✓	✓	✓	✓	✓	✓	✓
7	CUP-EB-12-120-273		10	2	✓	✓	✓	✓	✓	✓	✓	✓	✓
8	CUP-MB-06-120-197	Metal Base	6	-	✓	✓	✓	✓	✓	✓	✓	✓	✓
9	CUP-MB-07-120-209		7	-	✓	✓	✓	✓	✓	✓	✓	✓	✓
10	CUP-MB-08-120-222		8	-	✓	✓	✓	✓	✓	✓	✓	✓	✓
11	CUP-MB-09-120-235		9	-	✓	✓	✓	✓	✓	✓	✓	✓	✓
12	CUP-MB-10-120-248		10	-	✓	✓	✓	✓	✓	✓	✓	✓	✓
13	CUP-MB-11-120-260		11	-	✓	✓	✓	✓	✓	✓	✓	✓	✓
14	CUP-MB-12-120-273		12	-	✓	✓	✓	✓	✓	✓	✓	✓	✓

UTILITY POLES

Mitaş Composites utility poles are designed and produced in order to carry and distribute the small – medium voltage and telecommunication lines in urban or suburban areas. They can be designed according to the tip load and necessary deflections given by the related utility. The pole bases can either be embedded or anchored to the ground. Due to the surface texture of the poles, workers can easily climb on the poles for the maintenance of the carried lines.

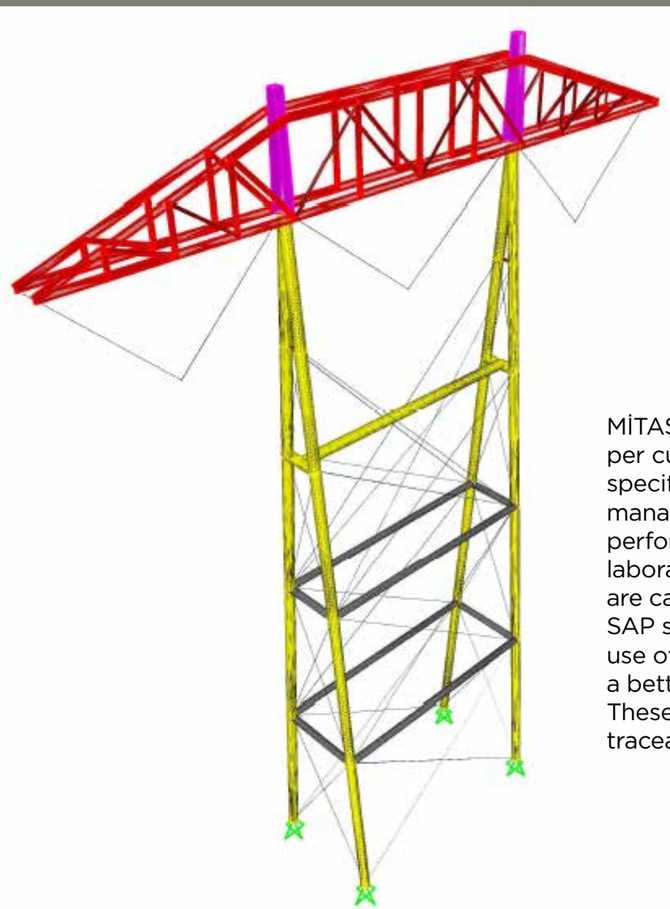


In addition to their known benefits like low weight, high strength and corrosion resistance, most significant advantages of using composite poles are their high dielectric strength, environmental friendliness and optional bush fire resistances. Mitaş Composites' products are an ideal choice for power distribution and power transmission tangent cross arms. Our composite crossarms can be installed with ease on utility poles whether it is a wood, steel, aluminum or composite material. Mitaş Composite offers a standard 100 mm x 100 mm x 6 mm standard cross arm with no theoretical length limit and very good mechanical, UV and dielectric resistances.

UTILITY LATTICE TOWERS

Mitaş Composites has the expertise and experience in the design and production of the composite towers for energy distribution lines up to 36 kV and for energy transmission lines up to 420 kV. The composite towers are designed in lattice or polygonal types in accordance with customer specifications and the applicable international standards.

A prototype of newly designed towers is assembled and inspected, then subjected to load tests at the competent test stations if specified by the customer for design verification purposes so that possible mistakes are corrected before the mass production and proper products are delivered with the effective product planning process.



MİTAŞ Composites fulfills its projects as per customer specifications, technical specifications and ISO 9001 quality management system. All tests are performed in inhouse or accredited testing laboratories. The production processes are carried out by means of the respective SAP software to ensure the most efficient use of labour, machines and materials for a better implementation of sustainability. These types of software ensure a full level of traceability for the products.

TELECOMMUNICATION TOWERS

MİTAŞ Composites offers services for the design, production and logistics of composite towers at the world-class standards in the telecommunication industry, being the approved manufacturer by many well-known GSM operators.

The designed and manufactured telecommunication towers are mainly categorized into two groups as lattice type and polygonal type. Ground and rooftop towers can be varied as 3 or 4 legs. Further, radar, communication, TV-FM, satellite, meteorology and observation towers as well as wind turbine supporting systems and special type guyed towers are designed and manufactured according to customer specifications.

Thanks to their low weight, easy assembly and radio wave transmissivity, composite materials are very advantageous in especially roof top pole and tower applications.

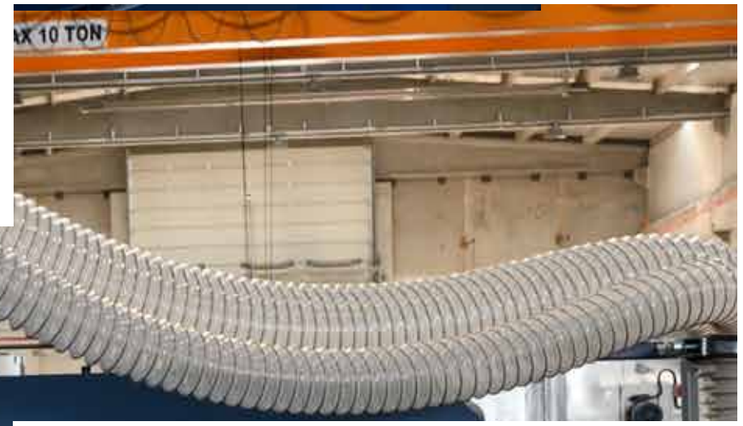
SPECIAL PRODUCTS

Mitaş Composites supplies tailor made solutions for different needs depending on customer needs from the different sectors. Glass polyester, glass epoxy and carbon epoxy products with very low tolerances and high precision can be produced in order to resist very high forces and pressures acting on the product. Also, integration of composite materials with parts and inserts can be done in house.

A Hybrid Composite Tower Application:
Blue and red profiles are FRP.

COMPOSITE PROFILES

Profiles with any cross sections upto 1000 mm width and 200 mm height are possible with pultrusion method in any requested color. Standard profiles of Mitaş Composites for linear pultrusion, which include L, U, Box, Pipe and Sheet sections are compatible with the below properties.



Item	Unit	Method	Minimum Requirement	
			E23	E17
Full section test	GPa	ISO 13706-2	23	17
Tensile modulus - longitudinal	GPa	EN ISO 527-4	23	17
Tensile modulus - transverse	GPa	EN ISO 527-4	7	5
Tensile strength - longitudinal	MPa	EN ISO 527-4	240	170
Tensile strength - transverse	MPa	EN ISO 527-4	50	30
Pin Bearing strength - longitudinal	MPa	ISO 13706-2	150	90
Pin Bearing strength - transverse	MPa	ISO 13706-2	70	50
Flexural strength - longitudinal	MPa	EN ISO 14125	240	170
Flexural strength - transverse	MPa	EN ISO 14125	100	70
Interlayer shear strength -longitudinal	MPa	EN ISO 14130	25	15

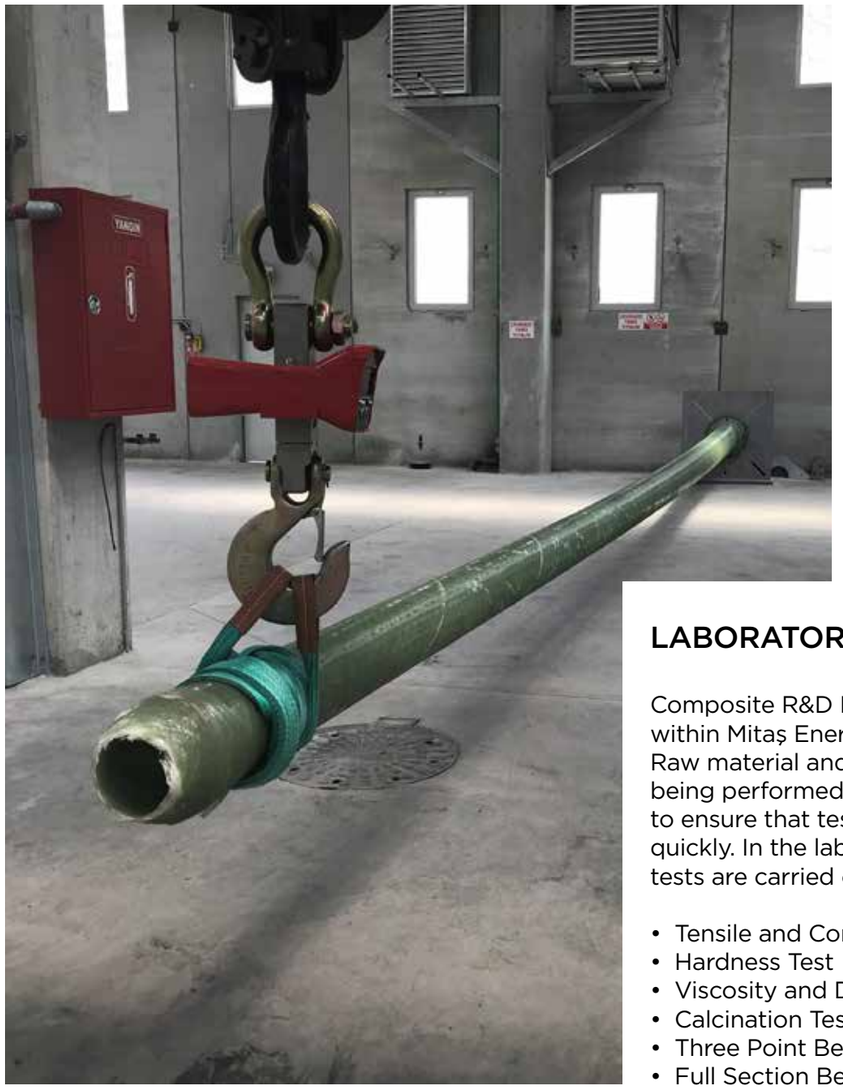
In addition to the linear pultrusion, radius pultrusion is also possible in Mitaş Composites which enables us to produce light and bended profiles with radii between 1.7 m and 3.6 m.

For the pipe profiles requesting additional rigidity, Mitaş Composites has Pulwinding solution. This feature is very advantageous for sailing posts as well as sports and leisure equipment.

ENGINEERING AND R&D

Mitaş Composites engineering department is capable of designing any kind of composite structures especially poles and towers according to the local and international design standards. As well as the well-known design softwares like PLS Pole FRP, PLS Tower and SAP2000, Mitaş Composites also uses the in-house developed calculation softwares in order to assure the resistance of the structures to the affecting loads. For the new developed products and R&D projects, design is checked with coupon tests in the laboratory and with full section tests in the workshop in order to verify the design.

Also, chemical formula development and adjustments according to the requirement of the final product can be done by the R&D department in our laboratory.



LABORATORY

Composite R&D Laboratory has been established within Mitaş Energy Composites Factory in 2018. Raw material and composite product tests are being performed in the laboratory. The aim is to ensure that tests are performed reliably and quickly. In the laboratory, mechanical and chemical tests are carried out.

- Tensile and Compression Test
- Hardness Test
- Viscosity and Density Measurement
- Calcination Test
- Three Point Bending Test
- Full Section Bending Test

INTEGRATED MANAGEMENT SYSTEM POLICY

MİTAŞ Composites Plastic Industry and Trade Inc. with all employees and resources tries to implement quality, environment and occupational health and safety by adopting these issues in order to be one of the leading companies in the field.
For this purpose; the activities in line with its objectives and targets are carried out in a sustainable manner in accordance with its integrated management covering the quality, environment and occupational health and safety created with the participation of all its assets and employees.

Within this context, Mitaş Composites guarantees;

- To form, apply and continuously improve an integrated management system covering quality, environmental and occupational health and safety in accordance with all legal regulations, customer requirements and other relevant provisions with efficient risk management,

- To approach and support any innovative methods for increasing process performance by setting its targets,

- To identify, evaluate, monitor and take necessary actions for the risk actions and opportunities that may affect the achievement of the Company's objectives according to the impact and probability within the scope of the risk management approach,

- To meet the customer's expectations at the most competent level by identifying these as a priority criterion in all processes within the framework of customer focus

- To reduce waste, increase recycling rate and reduce the use of natural resources by focusing on energy use, environmental balance and protection of natural resources,

- To eliminate all the factors that may cause accident, loss, occupational disease caused by activities and near miss by analyzing the existing hazards well,

- To improve the skills and competencies of employees and business partners on quality, environmental and occupational health and safety issues to ensure their participation and consultancy.

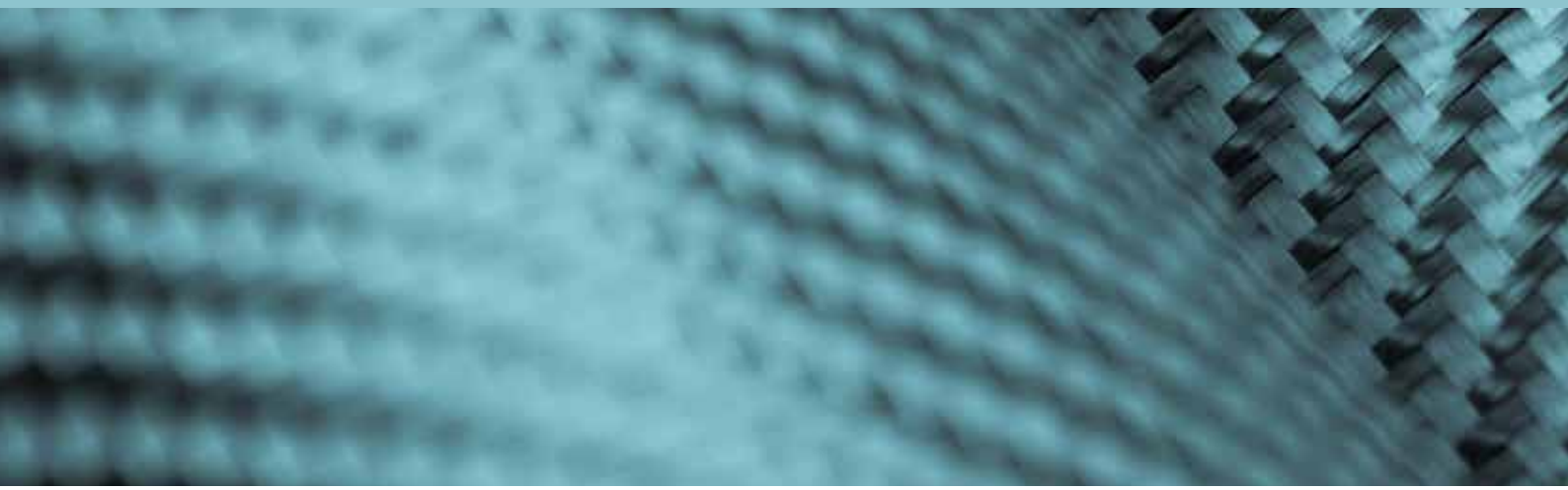
CERTIFICATES

ISO 9001:2015

ISO 45001:2018

ISO 14001:2015

FIRE RESISTANCE REPORT



MİTAŞ COMPOSITES

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