
Pultrusion Machine

1. GENERAL

Pultrusion is a continuous process of manufacturing of composite materials with constant cross-section whereby reinforcing fibers are pulled through a resin, possibly followed by a separate preforming system, and into a heated die, where the resin undergoes polymerization. Many resin types may be used in pultrusion including polyester, polyurethane, vinylester and epoxy.

Pultruded composite profiles are increasingly being used in a variety of applications. With the high strength, low weight, non-corrosive features, fiber reinforced polymer (FRP) materials are rapidly growing in demand, and FRP pultrusions are leading the way.

The manufacturing of pultruded profiles is the most efficient method of forming composite materials with consistent high quality and low scrap. The continuous process of FRP pultrusion allows high strength composite products to be produced at the absolute lowest cost.

Dasan Engineering is here to help the world find all composite and FRP pultrusion information available.

Learn how a pultrusion machine works, and why it is so effective at creating high strength composites at a low cost.

Another distinct advantage of the pultrusion process is cost. It is not unusual to find 80–90% of the cost of pultrusion profiles are the raw material costs.

The amortized machine costs and the labor to run pultrusion machines is a small portion of the total factory costs. This has been a primary driver for pultrusion being one of the fastest growing and accepted manufacturing processes in the composites industry.

Pultrusion Advantages

- Increased Strength (fiber processed under tension)
- High Fiber Content
- Highly Automated
- Consistent Quality
- Mass Production
- Low Labor Required
- Low Cost

FRP pultruded products are often stronger than a similar product manufactured by hand-lay up, vacuum bag infusion, and other composite processing methods. During the pultrusion process, the many fiber bundles are pulled downstream using hydraulic or caterpillar grippers. Due to this pulling, the fiber filaments are in tension when curing in the heated die. When in tension, the fibers have higher strength values and are better aligned allowing good compaction, with more fibers fitting into a given volume. Fiber density is extremely high, as all excess resin is squeezed out before entering the die.

Standard pultrusions can have fiber content of 50% by volume, 70% by weight, creating an extremely strong FRP composite.

Standard Profiles

- Round rods
- Round and shape tubes
- Strip/Bar
- Box sections
- Channels
- Angles
- Other Profiles

Uses

Pultrusion can be used to make a number of materials including fiberglass and carbonfiber. Like extrusions pultrusions can be made with a variety of cross sections, such as an I-beam. Materials made by pultrusion are very versatile. They are very light, and strong, and can be used in a variety of applications. Examples of the use of these materials include: structural siding, many household ladders, tool handles, and tubes.

Application and Used

- Air craft structure and parts
- Blades for wind turbines
- Automotive parts and components
- Recreational sports equipments
- Industrial parts

The **Pulman** is design of pultrusion machines varies. Two often used types are reciprocating (grip to grip) and continuous (caterpillar track).

Description of Pultruder

- Fiber Creel
- Winding unit
- Resin imprgnating bath
- Forming dies
- Heated metal die
- Puller (Drive) unit
- Cut-off saw

Dasan Engineering has been manufacturing pultrusion machines of all types

We introduced our advanced technology Model **Pulman** series pultrusion machine that features high precision bed-frame construction and many other new innovations. Precise resin content, fiber areal weights and profile shape be controlled at high production speeds. It's unique construction gives it superior rigidity and is the world's most advanced and user-friendly pultrusion machine. Our Pultrusion machines are available in product puling power from 5 ton to 30 tons and over.

In addition to the standard Pulman machines, custom machines can be built to need specific application requirements.

Specification

All **Pulman** Pultrusion machines are include

- Touch screen controll system
- Software program designed by Dasan Engineering
- Heated mold mounting die
- Blade cut-off saw with parts clamp
- Delivery table
- Installation and start-up support

Pulman Reciprocating series

Model	PMR10-0806	PMR15-1604	PMR20-2410	PMR25-3010	PMR35-4012
Profile dimension (mm)	200 x 150	400 x 200	600 x 250	750 x 250	1000x 300
Machine length (m)	14.2	14.5	17.4	18.5	18.5
Machine width (cm)	90	115	135	160	180
Machine weight (Kg)	5,500	6,000	6,500	7,400	8,200
Center height (cm)	108	108	108	108	108
Pull force (Kg)	10,000	15,000	20,000 (25,000)	25,000 (30,000)	32,000
Clamp force (Kg)	10,000	15,000	20,000 (25,000)	30,000 (38,000)	38,000
Puller Stroke (cm)	75	75	75	75	75
Clamping length (cm)	50	70	70	80	80
Speed Range (cm/min)	2 ~ 300	2 ~ 300	2 ~ 300	2 ~ 300	2 ~ 300

* Other custom machines can be manufacturing to specific application requirements.

Pulman Caterpillar series

Model	PMC09-0806	PMC15-1604	PMC20-2410	PMC25-3010	PMC30-4012
Profile dimension (mm)	200 x 150	400 x 200	600 x 250	750 x 250	1000 x 300
Machine length (m)	12	13.5	15.2	16.6	16.6
Machine width (cm)	80	100	130	150	175
Machine weight (Kg)	5,500	6,000	6,500	7,400	8,200
Center height (cm)	108	108	108	108	108
Pull force (Kg)	9,000	15,000	20,000	25,000	30,000
Clamp force (Kg)	9,000	15,000	20,000	25,000	30,000
Clamping length (cm)	100	130	150	175	200
Speed Range (cm/min)	15 ~ 200	15 ~ 200	15 ~ 200	15 ~ 200	15 ~ 200

* Other custom machines can be manufacturing to specific application requirements.

