

Plastics for Fusion Energy Applications



BENEFITS OF PLASTIC:

Plastics and composites with the following characteristics are often specified for fusion energy applications.

- Ductile behavior at cryogenic temperatures
- Reliable operation at elevated temperatures
- Resistance to degradation from thermal cycling
- Resistance to failure due to vibration and fatigue
- Low outgassing in vacuum
- Resistance to radiation
- Low thermal conductivity
- Electrical insulating characteristics
- The ability to operate in magnetic fields

Engineering materials to meet your needs

Curbell Plastics offers a wide range of plastics and composites to meet the demands of the fusion energy industry. Fusion reactors require materials capable of withstanding extreme temperatures, radiation, vacuum conditions, and more. We supply plastics that meet these demanding application requirements.

Plastics are used in a variety of fusion energy applications, including vacuum chamber components, thermal isolators, magnet supports, seals, and tritium injector parts.

Material selection, expert advice

"We needed a polymer material for cryogenic thermal isolators in a magnetic confinement fusion reactor. Curbell Plastics worked with us to identify a solution that met our technical requirements."

– Curbell Customer Feedback

TYPICAL APPLICATIONS:

- Thermal isolators
- Electrical insulators
- Magnet supports
- Assembly hardware including nuts, bolts, and threaded rods
- Seals
- Machine guards and housings
- Vacuum chamber components
- Tokamak components
- Mounting pads for optical lenses and mirrors
- Magnet coil housings
- Spacers
- Tritium injector components
- Gaskets
- Valve seals, seats, and stem tips
- Massive gas injection (MGI) valve components
- Gas intensifier components

COMMON MATERIALS:

- Acetal
- Composite threaded rods, nuts, and bolts
- DuPont™ Vespel® Polyimide
- G10/FR-4 Glass Epoxy
- HDPE
- PEEK
- Polycarbonate
- Polypropylene
- PTFE
- Torlon® PAI
- UHMW



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