

Not all GFRP Rebars are the same

Two international standards for manufacturing GFRPs should be specified as minimal, they are the **CSA S 807** and **ASTM D7957**

- CSA S 807-15 allows for all three grades of GFRP. Grade 3 is > 60GPa and above, with a durability classification D1.

Required under both standards, the manufacture must supply certificates of compliance for every lot supplied to the customer.

It is very important to include and reference all engineering specification documents when calling up for GFRP bars to ensure quality to avoid issues that may eventuate from poor manufactured bars.

The industry does not need a failure from non-certified bars.

It is very important that only certified GFRP rebar is used in any application such as load-bearing structures.

The process, the ingredients, and the surface finishes are all different from an FRP manufacturer to another, however, they all must meet minimal durability and mechanical properties to be compliant, see below.

Three main areas of GFRP Reinforcing that is critical.

1. **Physical properties**, cure ratios
2. **Mechanical properties**, minimal guaranteed tensile and modulus of elasticity, thermal expansion, transverse shear strength, including (KB factor bond strength) achieved by surface treatments methods such as sand coating, spiral deformation, etc.
3. **Durability properties** are very important to ensure the product will keep its mechanical properties by being resistant to moisture ingress leading to corrosion.

Mechanical properties from a manufacturer's product on mill certificate are one thing, this is data collected at the end of the manufacturing process for the mechanical properties only... NOT DURABILITY.

- The main reasons for using GFRP bars are for durability in aggressive environments, long term durability must be considered to maintain the mechanical properties of the bars.
- **(Durability)** cannot be determined by mechanical testing at the plant/mill.
- As per CSA S 807 durability of the bar can only be determined by long-term durability testing that MUST be conducted by a recognised third-party facility registered to undertake such testing.
- If the bar supplier cannot demonstrate long term durability, the project risks failure as high durable bars are required to maintain mechanical properties
- **Third-party certificates, manufacturing plans that are ISO certified** must be supplied to the end-user to be compliant

The reason, many FRP rebars currently on the market cannot meet the requirements of the above-stated certification documents. They often lack corrosion resistance, by having poor durability and bad physical properties. This lack of corrosion resistance often comes from the use of a resin system, lack of curing (producing too fast not allowing enough time for the resin to cure) lack of compatibility between the fibre and the resin system of a combination of these.

Knowing all this one can't just use any FRP rebar and be assured of the LONG-term structural integrity and for that reason, it is strongly recommended the use of certified FRP in all structures that must maintain structural integrity.