

## GFRP application in the modern Telecommunication Infrastructure

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**Abstract.** Together with the implementation of 5G technology in the mobile networks the construction of telecom civil infrastructure has received new challenges due to the increased load and static requirements on mobile towers.

One of the innovative solutions in reducing these costs and complexity is to use the GFRP which is a new trend in the telecom civil infrastructure.

GFRP (Glass Fiber Reinforced Plastics) is a composite material with glass fiber as reinforcement material and synthetic resin as matrix material and is designed following CEN/TS 19101, complies with European Union regulations.

The GFRP is widely used since long time in the wind power industry, bridge construction, civil building and other domains. But its usage in the telecom civil infrastructure is not widely spread.

It has several advantages comparing to the steel which are important for the production and construction of mobile tower sites. Here are several of them:

**Cost:** depend on the particular tower design the GFRP solution it can save up to 30% costs compared to the steel.

**Crane:** the costs for the Crane and the road block are saved. The GFRP tower has a modular design, it's constructed of elements with the length less than 3 meters and permits manual lifting by stairs or by house elevator and mounted together on the roof top using steel elements and steel bolts.

**Weight:** for the identical tower design and function GFRP has 35% to 50% less weight than the steel. This avoids static rejection in many cases.

Strong: GFRP material is 2x times stronger comparing to the steel.

Insulation: has excellent insulation and very good wave transmission, it has no electrical conductivity and assure a better lightning protection.

Faster: with GFRP solution less footprint is needed, as result companies have easier site acquisition process. Also the crane free solution saves the time.

Climate: it has low thermal conductivity, and can be used in different climatic zones such as south regions with high temperature and in the Nordic regions.

Green: no galvanization, no harmful gas and pollutions during production.

The application scenarios in most of the cases can be: Antenna pole, roof top pole, roof top tower, light greenfield tower.

In the future the tower solution based on Glass Fiber Reinforced Plastic will prove its sustainability and innovative value for the telecom civil infrastructure and will bring benefits for the whole telecommunication community including each of us as end mobile users.

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