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GRP Manhole Cover Application Temperature & Service Life Information

Our factory are specializing in producing composite material manhole cover, the material is GRP, shorted for Glass Reinforced Plastic

1 GRP Manhole Cover Material Quality

Our GRP products are made of:

- i) unsaturated polyester resin(UP) (Iso type resin, vinyl ester resin)
- ii) glass fiber (E-glass 2400 Tex)
- iii) quartz
- iv) corundum
- v) antioxidant
- vi) firming agent
- vii) promoter
- viii) UV additive
- ix) ethylene-propylene-diene-monomer
- x) Cr13
- xi) other auxiliary materials

2 Application Temperature Scope

The materials used to manufacture the manhole covers are important, that is why we only use quality materials. The main material that contributes to the product application temperature is the non saturated polyester resin. It belongs to the thermosetting resin, the performance after its solidification is as follows:

Longitudinal strength: 250~800Mpa;
Compressive strength: 300~600Mpa;
Stretch modulus: 25-35Gpa;
Break elongation ratio: 1.3-10.0%;
Bending strength: 700~1400Mpa;

Curving module: 25–35Gpa;
Poisson-ratio: 0.35;
Relative density: 1.11–1.15;
Water-absorptivity (24h): 10–30mg;
Volume resistivity: $1 \times (10^{12} - 10^{14}) \Omega \text{ cm}$

unsaturated polyester resin for the reinforced plastics uses the most universal resin, general application temperature in $-40 \text{ }^{\circ}\text{C} \sim 80 \text{ }^{\circ}\text{C}$. If there is any special request, we may introduce a special function structure to cause its temperature to be lower or higher. When the temperature approaches $-40 \text{ }^{\circ}\text{C}$, resin brittleness will occur. When temperature surpasses $80 \text{ }^{\circ}\text{C}$ for a long period of time (special heat resistant resin to be an exception) has the possibility to become soft or degrades. Therefore, our products application temperature is in the principle scope of $-40 \text{ }^{\circ}\text{C} \sim 80 \text{ }^{\circ}\text{C}$.

3 The Service Life

- i) From the resin heat resistance view, our products under the normal temperature uses, its service life may amount to above for 50 years.
- ii) The GRP manhole cover uses lamination compound craft on the surface layer between 5–8mm, where it joins the antioxidant to bear the marquis resin and it is filled by the aggregate of quartz, corundum and anti-friction materials (this kind of material is uses for the make grinding wheel), The surface of the manhole cover will not have any attrition because the designed 5–8mm provide wear resisting level extrapolation, it is possible to use above for 30 years.
- iii) The compound material of the manhole covers make sure that it could withstand more than 2 million fatigue shocks. Official tests and experiments have shown that cracks will not occur, giving it an extremely long service life.
- iv) It some places where summer temperature is higher at 43°C and the road surface temperature reaches as high as $50 \sim 60 \text{ }^{\circ}\text{C}$,

our Polymatrix manhole does not show any problem on the heat resistance after more than 3 years of exposure.

- v) To increase the intensity of the product, solidification craft processing is used after normal solidification process is done.
- vi) Although the resin has joined with antioxidant which will delay the product from yellow stain, after a long period of time some yellow stain will still appear. It is a normal condition and does not affect the product. Our suggestion is to use color of natural stone material where only minor color change will occur.
- vii) Load ability: A15(can load 1.5ton) B125 (can load 12.5ton)
C250(can load 25ton) D400(can load 40ton)

According to EN124:

A15: Areas which can only be used by pedestrians and pedal cyclists

B125: Footways, pedestrian areas and comparable areas, car parking decks.

C250: For gully tops installed in the area of kerbside channels of roads which when measured from the kerb edge, extend a maximum of 0.5m into the carriageway and a maximum of 0.2m into the footway.

D400: arriageways of roads including pedestrian streets, hard shoulders and parking areas, for all types of road vehicles.

Our Company Information

Hunan Common Future specializes in producing and supplying composite material(FRP/GRP) manhole cover, rain-grating ,tree-grating, flower pot, fence and so on. Our products are strictly produced according to the BS EN124 and have obtained various kinds of certificates. Until now, our competitive products not only had good market in home, but also exported to many countries such as Malaysia, Thailand, Vietnam, United Arab Emirates, Oman, Bulgaria, kuwait, Qatar, India, Greece, Spain and so on.

Our composite materials manhole covers are suitable for a huge range of applications that include:

1. Underground Electrical Installations: Draw pits, traffic lights, street lighting, Fiber optic cable ducts etc.
2. Telecommunication: Connection chambers , Water, Gas, Petrochemical Installations.

Advantage of our composite manhole cover:

1. No recycle value: Its popularity will contribute the manhole cover–stolen problem thoroughly.
2. High load capacity: Its high load capacity exceeds the ductile iron manhole cover.
3. Free design: It can be designed individually in terms of users' demands.
4. Good decorative effect: It can be designed in various colors and patterns with artistic effect of relief.
5. Long service life: There is no any crack in the experiment of 2,000,000 fatigue shocks.
6. Well sealed :It can be used to hermetically, and effectively prevent those poisonous gases leaking out from cesspool.
7. No any jangle: There is neither jangle nor rebound when cars pass by.
8. Good wear and corrosion resistance: It has good wear and corrosion resistance and it will be never rusted.

Our products have obtained various kinds of certificates, including:

1. Patent certificates for new applied products Patent Number: ZL01257174.1 & ZL 02277033X issued by China National Knowledge Property Right Bureau
2. Gold Medal at 2003's Hong Kong International Patent Technology Fair
3. Quality System Certificate Issued by China National Imp. & Exp. Commodities Inspection Corp.
4. Certificate of Recommended Products issued by China National Construction Association of Building Engineering

The Engineering Tests our products passed, including:

1. Test Report issued by National Center For Quality Supervision and Test of Building Engineering
2. Test Certificate issued by ABU DHABI region