



**Crescent PPG Lining Pvt Ltd.,**  
F-1, SHIVANI COMPLEX, OPP BARKATULAH UNIVERSITY.  
HBD ROAD, VIDHYA VIHAR, BHOPAL, MP  
0755-2418976, E Mail : [crescenppg@gmail.com](mailto:crescenppg@gmail.com)  
[www.crescentltd.in](http://www.crescentltd.in)

## FRP LINING

### Objective:

Providing anti-corrosive treatment on the RCC / MS surface.

### Purpose:

Chemicals (Acid/Alkali) damaged the surface, structure because of its nature of being a corrosive material.

The exposed surfaces of M.S. required to be protected by the attack of Chemical (Acid/Alkali) to ensure the long life of the MS structure.

Out of several ways of protecting the surface, one of them is FRP Lining.

### Scope:

Area has to be decided where the FRP Lining has to be done.

Surface has to be prepared for the FRP Lining.

FRP Lining has to be developed by forming different layers of Fiber glass and Polyester resin bonded with the surface in such a way that it should remain intact with its parent surface for the expected life.

### Definitions:

**Area** : Which are prone to chemical attack and required to be protected (Area has to be decided by the user / client / consultant).

**Surface Req.** : For FRP Lining we required corrosion proof solid surface without any oil spots.

**Solid surface** stand for the surface's should not have any loose particle or should not have scaling and it should be oily free and clear surface. Surface should be free from any foreign particles dust etc.



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**Dry surface** stand for the surface free from traces of the moisture. To check the same we can put a piece of plastic sheet with load on the floor for one day, if moisture deposited below the sheet that shows still moisture content is there in the surface.

For Steel Surface we advise for the Sand (Grit) Blasting.

Bonding

The bonding strength of FRP with RCC 175 PSI.

Testing

Testing of FRP lining is done by spark testing machine to ensure that there is no pin hole in the lining this is applicable in metal surface.

Definitions and elaboration of the phrase.

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### PROCEDURE FOR FIXING OF FRP ON MS SURFACE

Material	Polyester Resin Accelerator (Cobalt 3% Solution) Catalyst (MEKP) Promoter (Depends upon type of Polyester Resin) Fiber Matt Surface Matt (C Layer) Top Coat
Equipments	Spark testing Machine Grinder / Cutter

#### Step by step procedure for fixing of FRP

01. Select the area where Thermoplastic-FRP lining has to be done.
02. Check the following in selected area.
  - Check dryness of surface
  - Roughness of Surface (For FRP surface requirement is clear surface with no traces of oil and it should be dust free and slightly coarse not smooth (polished surface))
  - Check loose particles if any
03. Cut the Fiber Matt that can be fixed in selected area from the roll.
04. Mark location of area where FRP lining has to be done.
05. **As per requirement take the Resin in small neat and clean jar (it should not have any traces of Accelerator/ Hardener/ Promoter).**
06. **Add 1.5% Promoter, mix it thoroughly.**
07. **Add 1 to 2% of Accelerator (if its of 6% Quality) and 2 to 4% if its of 3% Quality. Further the ratio little bit has to be adjust as per the working temperature, type of job etc. Mix it properly, the stick used for**
08. **Now collect the above mixed resin in a small job with the quantity which has to be apply in next lot in approximate 10 Minutes.**
09. **Add hardener 2% - 3% percent as per the requirement. Mix it properly.**
10. After that lay the layer of Fiber Mat & applies Mix chemical on it till the fiber mat is thoroughly wet.
11. On completion of One layer repeat the process to achieve required thickness (Process should not be repeated more then thrice) .
12. Allow FRP lining to cure
13. Apply C layer of FRP with General Purpose resin based to give higher resistively against chemical and abrasion



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14. After complete curing check the FRP Lining with spark testing Machine

### SPARK TESTING PROCEDURE (For Metal Tanks)

This phenomenon is attributed to the fact that high frequency currents possess a very high tendency of taking the nearest passes to earth. This method is therefore very useful in detecting faulty welding to achieve the same we have put the metallic wire below the welding strip so that return current should be

High frequency spark tester consists of a solenoid and an interrupter, which has a natural high frequency, and when the current passes through the solenoid the hammer is attracted by its core, thereby breaking the circuit and at the same time charging the condenser. The hammer then springs back reforming the contact and allowing the condenser to discharge through an inductance of a few tons of thick wire of the tesla coil contained in the handle. This discharge beam oscillatory in nature induces a very high potential in the inner winding of this tesla coil. The intense electrostatic fields produced within this inner coil give a diffused brush discharge from a small metal rod inserted in the handle of the tesla coil. This metal rod when brought with in one cm of the lining of the tank etc. produced a diffused spray discharge but if there is any minute crack or microscopic hole in the lining whether it be glass, rubber, or any other insulation this diffused discharge is concentrated into a bright spark passing through the hole or crack.

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In testing the tip of the metal rod from the handle of spark tester is run along the welded joints and if porosity is present blue spark will readily appear, the voltage rating of tester may vary from 5000 to 30000 volts depending upon the thickness of lining and magnitude of the porosity detected is 10000 to 15000 volts is a good general practice.

Guide lines for Machine Setting.



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Machine parameters should be set as given below.

1.	Voltage	:	10kV
2.	Frequency	:	Medium
3.	Current	:	10 amp
4.	Distance of tip from welding joint	:	Up to 1cm

This is a general guideline, machine has to be set and the qualified engineer deputed by the CRESCENT as per the site conditions should frizz its parameters.

Once it will be decided, technicians or any one else is not authorized to disturb it without the permission of the concern site engineer. The same setting should be continuing till the completion of the testing.

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