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# PHENOLIC RESIN

## PF-106

Indian Space Research Organisation (ISRO) at its Vikram Sarabhai Space Centre (VSSC) has developed different types of resins for catering to specific applications in Launch Vehicles and Satellites.

PF-106 is a resol type thermosetting phenol-formaldehyde polymer used for processing high temperature resistant ablative materials such as carbon phenolic and silica phenolic composites. PF 106 is a high temperature curing resin which has excellent ablative properties and char strength.

### Operational Steps for Synthesising PF 106

1. Melting of Phenol.
2. Charging of formalin and molten phenol into the reactor in the desired mole ratio.
3. Addition of catalyst.
4. Condensation polymerization of phenol and formalin.
5. Neutralization of reaction mixture with acid.
6. Settling of reaction mixture
7. Removal of water of reaction and salt.
8. Drying of resin to remove traces of water and other volatiles.
9. Addition of required quantity of alcohol

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- 10. Filtration and product packing.
- 11. Storage

**PF 106 Salient Features**

<b>Appearance</b>	Yellowish brown to dark brown liquid
<b>Viscosity</b>	150 - 250
<b>Specific gravity</b>	1.12 – 1.16
<b>Total solids</b>	60 – 65 for ½ hr. (%)
<b>Free phenol (%)</b>	6 (max.)
<b>Free formalin (%)</b>	3 (max.)
<b>Point of trouble</b>	6 – 10 ml of water of resin

**Storage conditions**

<b>Temperature</b>	10-20 C
<b>Shelf Life</b>	3 months (in above condition)

**Application**

The resin finds application as binder for high temperature resistant ablative composites materials such as carbon phenolic, silica phenolic and epoxy phenolic systems.

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*ISRO is willing to offer the technology of PF-106 to capable and interested parties who are in the field of manufacturing similar items.*

*Interested industries/ entrepreneurs are requested to contact the address given below with all relevant particulars regarding their line of current activity, infrastructure available, market assessment of the product, financial arrangements, strength of the company, turn over and sales of their products for the past few years and a copy of their latest annual report.*

**For further details, please contact:**

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