

PRODUCT CODE : MISC. / 10.24

Synpol 220 & Synpol 160

Type : Modified liquid epoxy resin and reactive polyamide resin based hardener.

Description : Low viscosity epoxy and hardener system with long pot life having simple and easy application procedures

Specifications :	Synpol 220	Synpol 160
1) Appearance	Light yellow viscous liquid	Clear yellow viscous liquid
2) Density @ 25 ⁰ C.	1.16 - 1.17	0.95 – 0.98
3) Solvent	Nil	Nil
4) Viscosity at 25 ⁰ C poises	10 –20	4 - 10
5) Mixing ratio by weight	100	50
Mixing ratio by volume	100	60

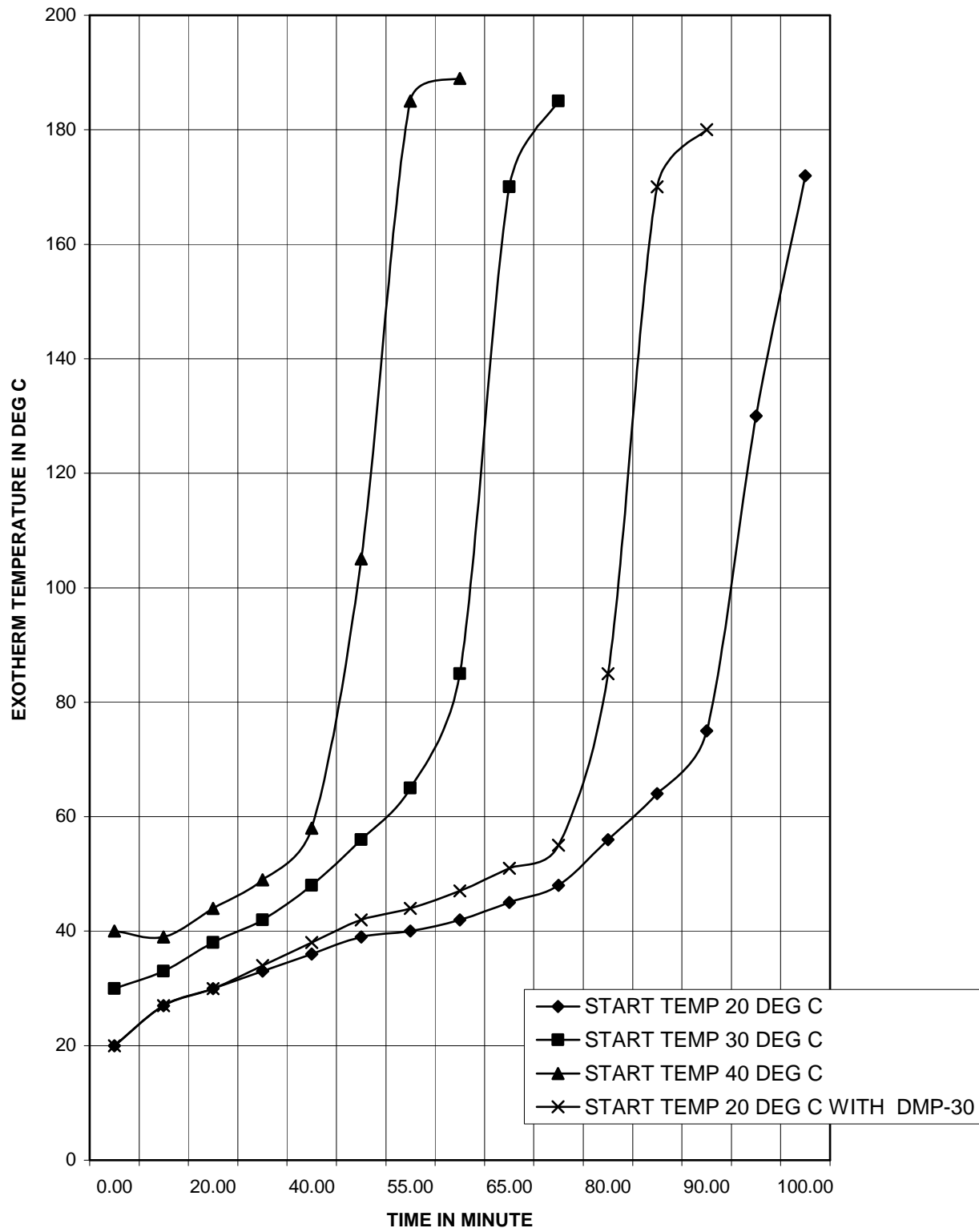
Ambient temperature and its effect on curing rate :

To determine the effect of ambient temperature on time required for gelation of the resin and hardener mixture, and to decide whether accelerator is required, so as to know whether complete cure has taken place. The following experiments were performed in the laboratory conditions.

Synpol 220 and Synpol 160 each weighed 100 and 50 gm. respectively in heat insulated paper cups. Such three sets are prepared and in the fourth set 49 gm. of hardener Synpol 160 and 1 gm. of accelerator D.M.P. 30 is added. The contents of four sets are mixed thoroughly with wooden or metal strip of one inch wide, for ten minutes. Then rise in temperature at every ten minutes, gel time, gel temperature, peak time and peak temperature are noted. These values are plotted in the graph. This graph will provide valuable information on the effect of ambient temperature on the rate of curing of these resins. The same graph is attached here with, for your study, so as to take proper action, if required. It has been found by experience that minimum 50⁰ C temperature by its own exothermic reaction is necessary to get complete cure and to get optimum properties of the cured mass. In other case use of accelerator is absolutely necessary.

Experiment No.	1	2	3	4
Weight in grams of resin before mixing				
Synpol 220	100	100	100	100
Synpol 160	50	50	50	49
DMP 30	-	-	-	1
Total	150	150	150	150
Temperature of resins adjusted before mixing ⁰ C	20	30	40	20
Gel time in minutes	91.00	59.00	47.00	78.00
Gel temperature ⁰ C	80.00	80.00	80.00	73.00
Peak Time in minutes	100.50	68.00	57.25	87.50
Peak Temperature ⁰ C	172.00	185.00	189.00	180.00

EXOTHERM CHART OF SYNPOL 220 & SYNPOL 160



Processing of Synpol 220 and Synpol 160 for Grouting at sight for Repairing of pitted/ corroded pipe :

In a suitable size of the the mixing vessel, take appropriate quantity of Epoxy resin and hardener as per mixing ratio by weight or by volume as given above. Prepare uniform mixture of both by use of any suitable mechanical stirring device having 40 – 60 RPM, so that there is no air bubble formation in the mixture. Continue mixing at least for 10 – 15 minutes depending upon ambient temperature. In winter when ambient temperature is 20⁰ C or even less, stirring should be continued till the temperature of the resin mix attains at least 35 – 40⁰ C by its own exothermic reaction. Then immediately pump the resin mixture in the annular space, till shell is completely filled and resin mixture starts overflowing from the top air vent. Further procedure should be followed as per usual practice. All equipments used for handling resin mixture should be cleaned using solvent (xylene) before resin gels.

The resin mixture will not fully cure particularly in extreme conditions of winter. Therefore it is absolutely necessary that resin & hardener mixture should be allowed to develop minimum 50 – 60⁰ C temperature after it is pumped in the shell of the pipe. If possible flow of crude oil may be reduced or totally closed for few hours, so that full cure of the epoxy system takes place. In the similar way if we take case of extreme summer, when the day temperature reaches up to 45⁰ C, the flow of crude oil in pipe line will actually help to control the exothermic reaction generating so much heat, which if not controlled may damage, leading to disintegration of the epoxy casting. Thus it is very essential to keep watch on the temperature of the casting, which should remain between 60 – 100⁰ C during curing reaction and till full cure takes place. We suggest to provide thermo-well in the MS shell to keep check on the temperature during curing cycle.

Test Report of Mechanical & Electric Properties of Cast Samples made out of Synpol 220 and hardener Synpol 160 after minimum 7 days of curing at ambient temperature.

Sr. No.	Property	Test Method	Unit	Test Results
1	Tensile Strength at Break	ASTM D 638	Kg/cm ²	470
2	% Elongation at break	Do	%	2
3	Durometer Hardness	ASTM D 2240	Shore “D”	90
4	Compressive Strength	ASTM D 695	Kg/cm ²	857
5	Compressive Strength after 7 days of hydrocarbon oil immersion at ambient temp	Do	Do	827
6	Hydrocarbon oil resistance After 7 days (Wt. Change)	--	%	0.07
7	Volume Resistance	ASTM D 257	Ohms	1.89 x 10 ¹⁴

MATERIAL SAFETY DATA :

Product name	Synpol 220	Synpol 160
Flash point ⁰ C. (Abel closed cup)	115	125
Flammability	Moderate fire risks.	
Toxicity	Moderately toxic by exposure and inhalation Avoid contact with skin	
Emergency treatment and measures		
1 Hygienic precautions	Adequate ventilations.	
2 Hygienic treatments (First Aid)	Flush eyes thoroughly with water. Apply ophthalmic cortisone for conjunctivitis and keratities. Wash out contaminated skin with soap and water. Gastric lavage (stomach wash), if swallowed, followed by saline catharsis.	
3 Fire precautions (in case of outbreaks)	Use dry chemical or carbon dioxide. Water spray may help to keep containers cool, to dilute leaked resins and to diffuse vapours.	
Spills and leakage	Absorb liquid materials in sand and collect solid material and burn under hood in incinerator.	
Disposal and waste treatment	Spray into furnace under controlled conditions.	

HANDLING PRECAUTIONS :

Epoxy resins and Hardeners can cause irritation of skin to some sensitive persons, if correctly not handled. Certain safety precautions must, therefore be observed and those handling the resins and hardeners should be given suitable instructions. Those working with resin and hardener, should keep personal cleanliness at the place of work, as it is very essential. The resin and hardener should not be allowed to come into direct contact with the skin. The most effective protection is achieved by wearing rubber or polythene gloves, the latter having the advantage that they can be replaced when dirty. They are more pleasant to wear, if cotton gloves are worn underneath. Parts of the skin which have come into contact with resin and or hardener should be washed with water and mild soap. Special cleaning creams have also proved to be highly effective.

STORAGE : Synpol 220 and Synpol 160 should be stored in cool place under shade. The properties are so adjusted to have storage stability of minimum 6 months.

PACKING : 25 kgs. M.S. drums and 200 kgs. M.S. barrels.

DISCLAIMER : Information in this literature is to the best of our knowledge true and accurate. However, since conditions under which our products may be used are beyond our control, recommendations are made without warranty or guarantee.

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