

# EPOXY LAMINATING SYSTEMS

CM

## POLYESTER RESINS



Polyester resins are hygroscopic (they draw moisture from the air). There are two types of resin, and one or both types may be required, depending on the application. Type "A" resin has a small amount of wax in it, which comes to the surface and forms a barrier against the moisture. This permits the resin to cure completely and the surface is hard and easily sanded. Bond Coat "B" resin does not have any wax content. As a result the surface stays a little tacky, as the surface cure is being inhibited by moisture. This tacky surface provides excellent adhesion between coats. Bond Coat resin is therefore recommended for the first coat

of resin to fill the weave of the glass cloth, for bonding fiberglass cloth to plywood or other surfaces and for multi-layers of glass cloth.

### TYPE "A" RESIN

#1520-5 is a general purpose ortho surfacing resin intended for the finishing coat applied over the Bond Coat #1063-5, or for single coat application. A second coat may be applied after full cure and thorough sanding but is not recommended.

Polyester Resin #692 Quart .....	P/N 01-00346 .....
1 Gal. #1520-5 with 1 Oz. Catalyst .....	P/N 01-00347 .....
5 Gal. #1520-5 with 4 Oz. Catalyst .....	P/N 01-00348 .....
Additional catalyst may be required. 1 Oz. ....	P/N 01-06900 .....
4 Oz. ....	P/N 01-07325 .....

### TYPE "B" RESIN

#L253T-20 is a general purpose bond coat ortho resin for use in making multi laminates. It will not cure to a high gloss finish. Use 1520-5 for finish coat to obtain smooth, hard gloss finish. Replaces #1063-5.

1 Gal. #L253T-20 with 1 Oz. Catalyst .....	P/N 01-00349 .....
5 Gal. #L253T-20 with 4 Oz. Catalyst .....	P/N 01-00350 .....

Additional catalyst may be required.

Same catalyst used for #1520-5 and #L253T-20.

Note: Use #1520-5 finish coating over #L253T-20 but never use #L253T-20 over #1520-5.

Above resins are not for use in making fuel tanks. For fuel tanks (except those for gasohol) use #6060-5 Isophthalic Resin.\*

1 Gal. #6060-5 with 1 Oz. Catalyst .....	P/N 01-00351 .....
5 Gal. #6060-5 with 4 Oz. Catalyst .....	P/N 01-00352 .....

Additional catalyst may be required.

Catalyst same as for resins listed above.

\* Iso Resin is highly flexible. Has excellent adhesion to metal, wood, concrete, fiberglass and other "hard-to-adhere" surfaces. Compatible with most fuels. Iso is a wax-free resin and must be over-coated with Type "A" Surfacing Resin to obtain a surface cure.

**SURFACE CURING AGENT** is used in polyester resin to improve sanding properties. Added to #1063-5 Bond Coat or #6060-5 Isophthalic, it will provide same sanding properties as in Type "A" Surfacing Resin. Use in proportions of 2 oz. per gallon of resin. Surface Curing Agent is used in addition to catalyst.

4 Oz. in Polyethylene Dispenser Bottle .....	P/N 01-07100 .....
Pint (16 Oz.) in Polyethylene Dispenser Bottle .....	P/N 01-07200 .....
Gallon (128 Oz.) .....	P/N 01-07300 .....

## VINYL ESTER RESIN



Dow Chemical's Derakane 411-350 PA Vinyl Ester Resin is an epoxy-based Vinyl ester designed to provide superior toughness and high corrosion resistance. Many leading kit aircraft manufacturers use vinyl ester resins extensively due to its quality and ease of fabrication. We furnish medium "promoted" vinyl ester 411-350 PA resin which includes CONAP, DMA the resin is cured by adding the MEKP which is furnished with the kit. Gel times vary according to the amount of MEKP added and the ambient temperature. Shelf life of promoted vinyl ester resin is short at only a few months.

**MEDIUM PROMOTED:** Includes CONAP, DMA and other additives. Add MEKP for complete cure:

Quart .....	P/N 01-01076 .....
Gallon .....	P/N 01-07350 .....
MEKP NORAC Catalyst Only (4 oz.) .....	P/N 01-07325 .....
Vinyl Ester Resin 411-350PA - 1oz. ....	P/N 01-01109 .....
Vinyl Ester 1-Gal. Kit (Resin & Catalyst) .....	P/N 01-07355 .....
Vinyl Ester Resin 411 55 Gallon .....	P/N 01-01057 .....

RESIN: Color may vary by manufacturer.

### CATALYST LARGE QUANTITY CHART

Catalyst Concentration	Resin Quantity		
	Quart	Gallon	5 Gallon
1/2%	1/16 oz.	2/3 oz.	1-1/3 oz.
3/4%	1/4 oz.	1 oz.	5 oz.
1%	1/3 oz.	1-1/3 oz.	6-2/3 oz.
1-1/2%	1/2 oz.	2 oz.	10 oz.

WARNING: Mekp Catalyst is very dangerous to the eyes. Always wear full goggle protection and have running water at hand when working with Mekp.

## MGS EPOXY RESINS



MGS epoxy resins are approved for the production of certificated aircraft parts. The 335 and 285 systems are especially suited for homebuilders because of their long shelf lives, excellent workability, physiological friendliness, adjustable cure rates and excellent static and dynamic strength characteristics. The 285 system is available with fast and slow hardeners which can be blended with each other in any proportion to provide the desired working life and cure cycle. Pot lives and working times can be adjusted from fifteen minutes, using the fast hardeners, to six hours, when the slow hardeners are employed. Once the hardeners have been blended, the specified resin to hardener mixing ratio must be maintained. The 335 System is available only with fast hardener. Components of the 335 system should not be mixed with those of the 285 system. With both systems, if only the slowest hardener is used, the cure times should be extended to a few days, otherwise some brittleness may be noted. While room temperature curing results in good properties when the faster hardener combinations are used, some curing at elevated temperatures or post curing will result in the highest achievable strength and Tg, with the slower blends. Even unfavorable low temperature and high humidity conditions in the work environment will not effect the quality of the product and high gloss, uncontaminated, tack free surfaces are achievable every time. The resins do not contain any unreactive dilutants which with many systems result in de-gassing and bubbling of the painted finish. The MGS resins do NOT contain aromatic amines. While proper processing practices should be maintained, the physiological friendliness of these systems have been demonstrated by many years of production experience. The 285 system has slightly higher physicals than the 335 and will also achieve a higher maximum Tg after post curing. While the 335 is more viscous than the 285, after mixing with the appropriate hardeners, their viscosities are comparable. MGS systems are used in the construction of the Cozy, Diamond, Cirrus and other aircraft.

System 285 (Max. Tg 105 C - 110 C; 195 F - 230 F)		
Mixing ratio Resin:Hdnr	Pot life	Mixed Viscosity@20C
100:50 by volume	H285-F 40 min	300-500 cp
100:40 by weight	H287-S 4 hours	
	H285 : H287	
	40 : 60 2 hours	

### System 285 Prices

L285 Resin (1 Gal.) .....	P/N 01-41000 .....
H285F Hardener (.25 gal/1 qt.) .....	P/N 01-41005 .....
H287S Hardener (.25 gal/1 qt.) .....	P/N 01-41006 .....

System 335 (Max. Tg 75 C - 80 C; 160 F - 180 F)		
Mixing ratio Resin:Hdnr	Pot life	Mixed Viscosity@20C
100:45 by volume	H335-F 15 min	800 cp
100:38 by weight	H340-S 6 hours	400 cp
	H335 : H340	
	50 : 50 1.5 hours	
	20 : 80 4 hours	

### System 335 Prices

L335 Resin (Gal.) .....	P/N 01-41100 .....
H335F Hardener (.225 gal/0.9 qt.) .....	P/N 01-41105 .....
H340S Hardener (Slow) .....	P/N 01-41106 .....

Two units of hardener are required for each gallon of resin

Typical room-temperature properties of clear castings made with DERAKANE 411 resins

Property	DERAKANE 411-350PA
Tensile Strength, psi	11-12,000
Tensile Modulus, units 105 psi	4.9
Elongation, %	5-6
(DERAKANE 411-350)	(7-8)
Flexural Strength, psi	16-18,000
Flexural Modulus, units 105 psi	4.5
Compressive Strength, psi	16-17,000
Compressive Modulus, units 105 psi	3.5
Compressive Deformation at Yield, %	6.5-7.8
Specific Gravity	1.12
Heat Distortion Temp., °F	210-220
Barcol Hardness	35

### CATALYST SMALL QUANTITY CHART

(20 - 30 minute pot life at 2% mix ratio)

Catalyst Concentration	Resin Quantity - 30 drops = 1 cc				
	2 oz.	4 oz.	8 oz.	12 oz.	16 oz.
1/2%	9 drops	18 drops	36 drops	1.8 cc	2.5 cc
3/4%	14 drops	27 drops	2 cc	3 cc	4 cc
1%	18 drops	36 drops	2.5 cc	3.75 cc	5 cc
1-1/2%	27 drops	2 cc	4 cc	6 cc	8 cc
2%	36 drops	2.5 cc	5 cc	7.5 cc	10 cc