REICHHOLD
A DIC GROUP COMPANY

PRODUCT BULLETIN

Creatively connecting knowledge and application.

August 13, 2004

HYDREX® 100 HF SERIES
100% VINYL ESTER RESIN

DESCRIPTION

HYDREX®100HF is a series of low HAP vinyl ester resins suitable for fabricating small to large FRP structures using vacuum infusion or a similar process at room temperature.

HYDREX®100 HF (33375-00) is NON promoted, requires the addition of Cobalt and is formulated to cure ONLY with CHP (Superox 46727) and the addition of Cobalt promoter. Do NOT use blends of CHP/MEKP with this product.

HYDREX®100HF (33375-30) is prepromoted and is formulated to cure ONLY with CHP (Superox 46727). Do NOT use blends of CHP/MEKP with this product.

APPLICATIONS

- Tooling applications
- FRP Structures such as marine and transportation applications
- Not Recommended for fuel storage

FEATURES	BENEFITS
• Versatile	• Meets SCAQMD Rule 1162 and Rule 50
• Variable gel times	• Low exotherm – excellent for thick and thin laminates
• Low water absorption	• Premium resin for tooling applications
• Improved surface profile	• Can be used for marine skincoat, bulk build
• High Heat distortion temperature (253°F)	• Gel times to meet your process requirements
• High flow rates	• Superior blister resistance
• Non-foaming upon initiation	• Excellent to impact, thermal, and de-molding cracks
• Manufactured using statistical process and quality controls	• Minimized print-through for improved surface appearance
	• Excellent physical and mechanical properties
	• Ease of handling, no degassing required
	• Consistent performance, batch-to-batch

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TYPICAL PROPERTIES

PHYSICAL DATA IN LIQUID STATE AT 25°C / 77°F - HYDREX® 100HF 33375-00

Property	Unit	Value	Test Method
Non Volatiles	%	66.5	18-001
Brookfield Viscosity (LVF, spindle #2 @ 12 rpm)	cps	175	18-021
Gel Time**	minutes	55	18-050
Specific gravity		1.06	18-030

** With 2.00% by volume of Superox® 46727 + .3% Cobalt 12% Solution per 100 grams of resin

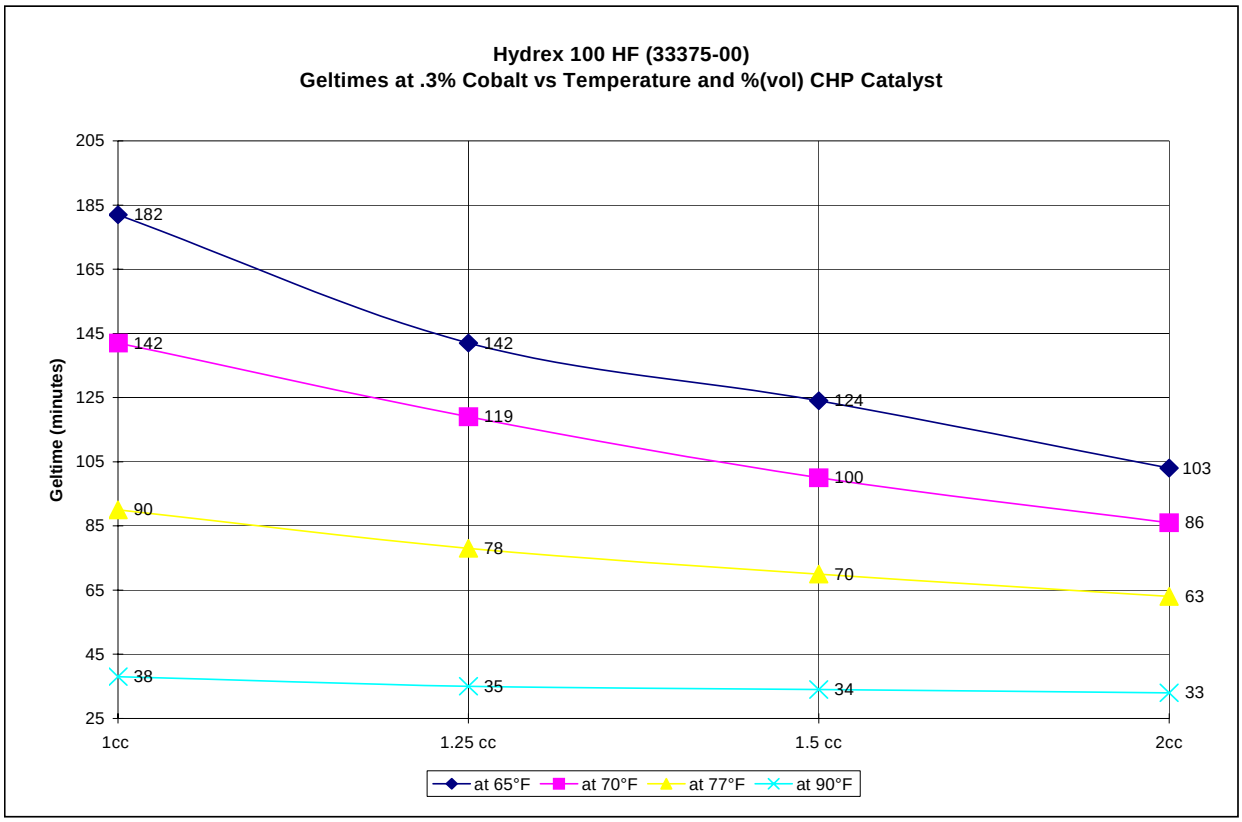
PHYSICAL DATA IN LIQUID STATE AT 25°C / 77°F - HYDREX® 100HF 33375-30

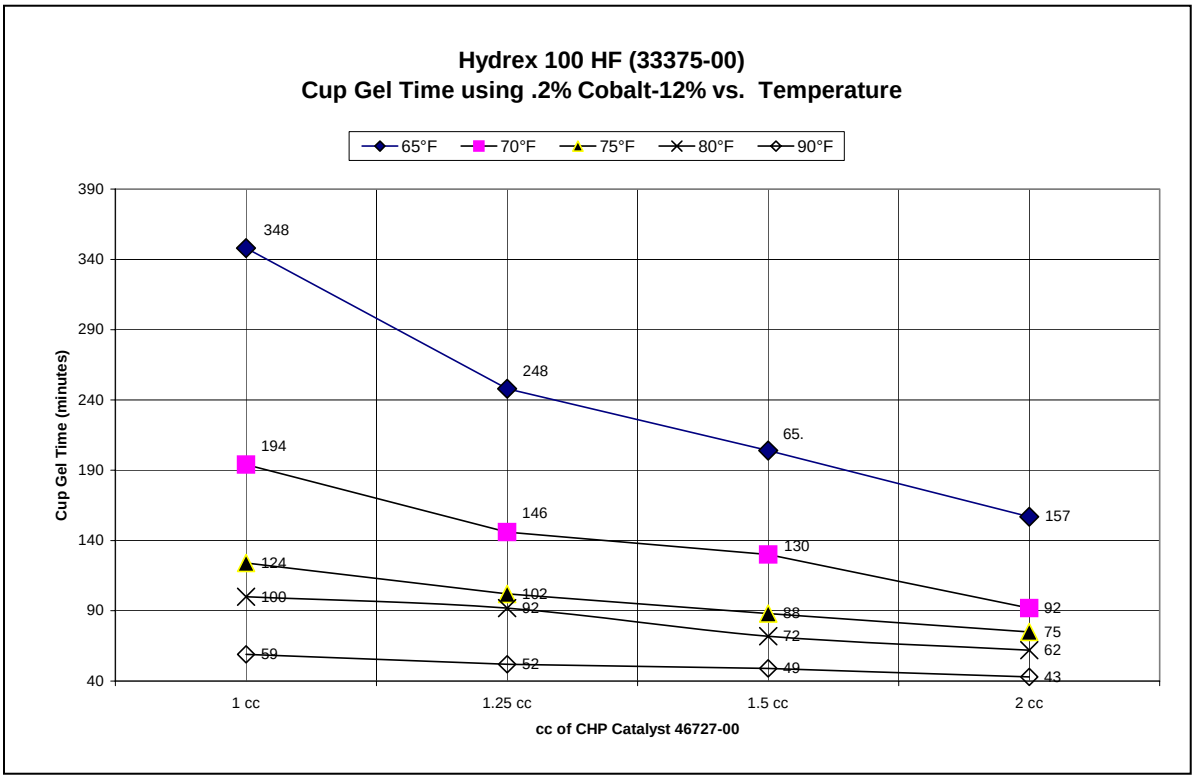
Property	Unit	Value	Test Method
Brookfield Viscosity (LVF, spindle #2 @ 12 rpm)	cps	150	18-021
Gel Time**	minutes	33	18-050

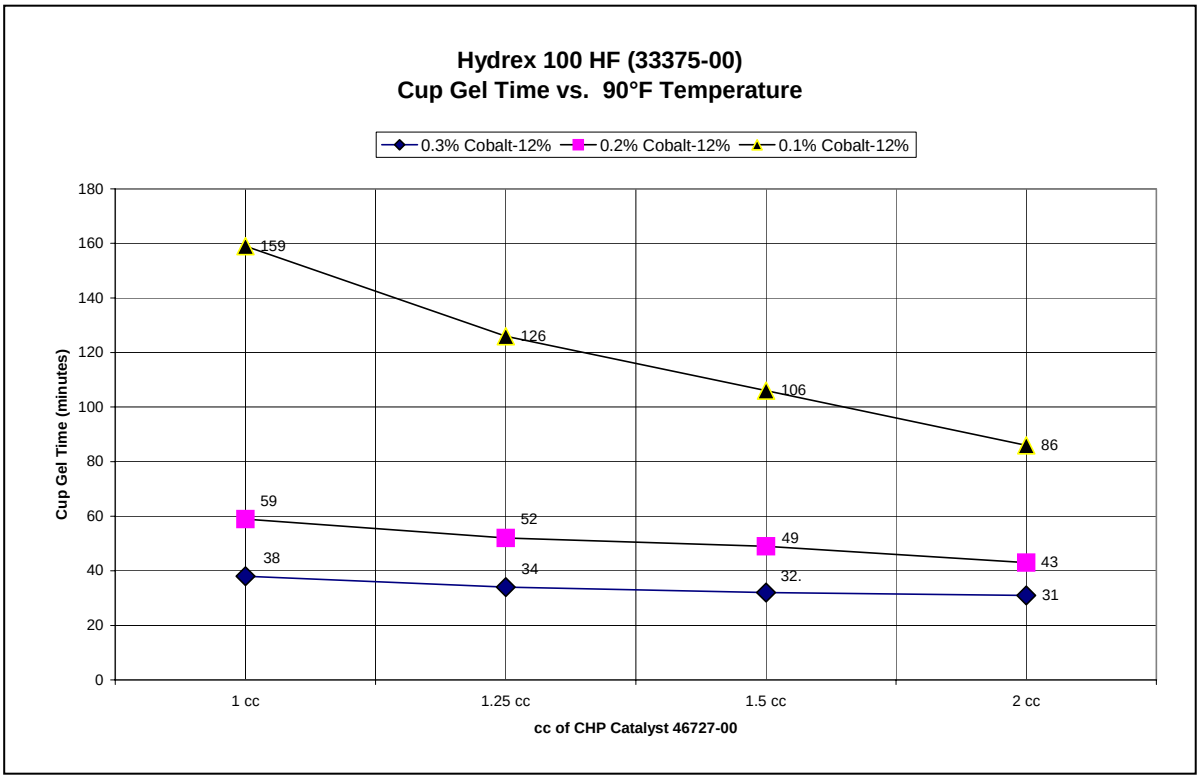
** With 1.50% by volume of Superox® 46727

MECHANICAL PROPERTIES

Property	Unit	Value	Test Method
Barcol Hardness		43	D-2583
Heat Distortion Temperature	ºC / ºF	123 / 253	D-648
Flexural Strength	psi	21,200	D-790
Flexural Modulus	x 10^5 psi	5.8	D-790
Tensile Strength	psi	12,100	D-638
Tensile Modulus	x 10^5 psi	5.5	D-638
Tensile Elongation @ Break	%	3.0	D-638
Water Absorption 24 hours @ 25ºC,	% weight gain	0.16	D-570
Water Absorption 2 hours @ 100ºC,	% weight gain	0.51	D-570


Hydrex 100 HF (33375-00)
Geltimes at .3% Cobalt vs Temperature and %(vol) CHP Catalyst
Geltime (minutes)
205
185
165
145
125
105
85
65
45
25
182
142
142
124
103
142
119
100
86
90
78
70
63
38
35
34
33
1cc
1.25 cc
1.5 cc
2cc
at 65°F
at 70°F
at 77°F
at 90°F


Hydrex 100 HF (33375-00)
Cup Gel Time using .2% Cobalt-12% vs. Temperature
65°F
70°F
75°F
80°F
90°F
Cup Gel Time (minutes)
390
340
290
240
190
140
90
40
348
248
65.
157
194
146
130
92
124
102
92
88
75
100
72
62
59
52
49
43
1 cc
1.25 cc
1.5 cc
2 cc
cc of CHP Catalyst 46727-00



CURING

Cure initiated with 2.00 vol% Superox® 46727 and promoted with .3% of a cobalt 12% solution. Clear casting cured overnight at room temperature, then post-cured 2 hours at 150ºF and 2 hours at 250ºF. HYDREX® 100 HF 33375 resins are formulated for use with Superox® 46727. Use of another initiator may result in inconsistent properties.

HYDREX® 100 HF 33375-00 resin is not pre-promoted and the addition of cobalt is necessary. Superox® 46727 CHP and only a CHP Catalyst will induce gel and cure at room temperature. As with all polyesters, rate and degree of cure are functions of initiator concentration and of temperature. Resin and work area should be between 24ºC (75ºF) and 35ºC (95ºF) to ensure satisfactory results. Initiator levels should be within a range of 1.0-2.5% based on the weight of the resin. The use of initiator levels outside of this range may result in an inadequate cure, with laminates exhibiting moderate to severe post-cure after de-molding. If different gel times are required, contact your Reichhold representative to determine alternative products available for special requirements.

Certain precautions are required to ensure proper secondary bond performance. Secondary bonding will be adversely affected in resin-rich areas or in laminates that have been exposed to heat or direct sunlight for an extended period of time. Contamination of the primary laminate (e.g., grinding dust, oil, moisture, waxes, or release agents, etc.) will also adversely affect secondary bond performance. If any of these conditions occur, or if greater than 48 hours has elapsed, thorough sanding and cleaning of the substrate is recommended before secondary laminate application.

The type of glass reinforcement used will also affect secondary bond performance. A Reichhold representative will be happy to assist with the selection of reinforcements.

STORAGE

To ensure maximum stability and maintain optimum resin properties, resins should be stored in closed containers at temperatures below 75ºF (25ºC) and away from heat sources and sunlight. All storage areas and containers should conform to local fire and building codes. Drum stock should be stored away from all sources of flame or combustion. Inventory levels should be kept to a reasonable minimum with first-in, first-out stock rotation. Additional information on handling and storing unsaturated polyesters is available in Reichhold's application bulletin "Bulk Storage and Handling of Unsaturated Polyester Resins." For information on other Reichhold resins or initiators, contact your sales representative or authorized Reichhold distributor.

STANDARD PACKAGE

Non-returnable 55-gallon metal drums (500 lbs. net) or 40,000-44,000-lb. tank truck.

SAFETY

Obtain a copy of the material safety data sheet on this product before use. Material safety data sheets are available from your Reichhold sales representative. Such information should be requested from suppliers of any chemical and understood before working with the material.

DIRECTLY MIXING ANY ORGANIC PEROXIDE WITH A METAL SOAP, AMINE, OR OTHER POLYMERIZATION ACCELERATOR OR PROMOTER WILL RESULT IN VIOLENT DECOMPOSITION.

Read the HYDREX® 100F Material Safety Data Sheet before handling storing or using this product.