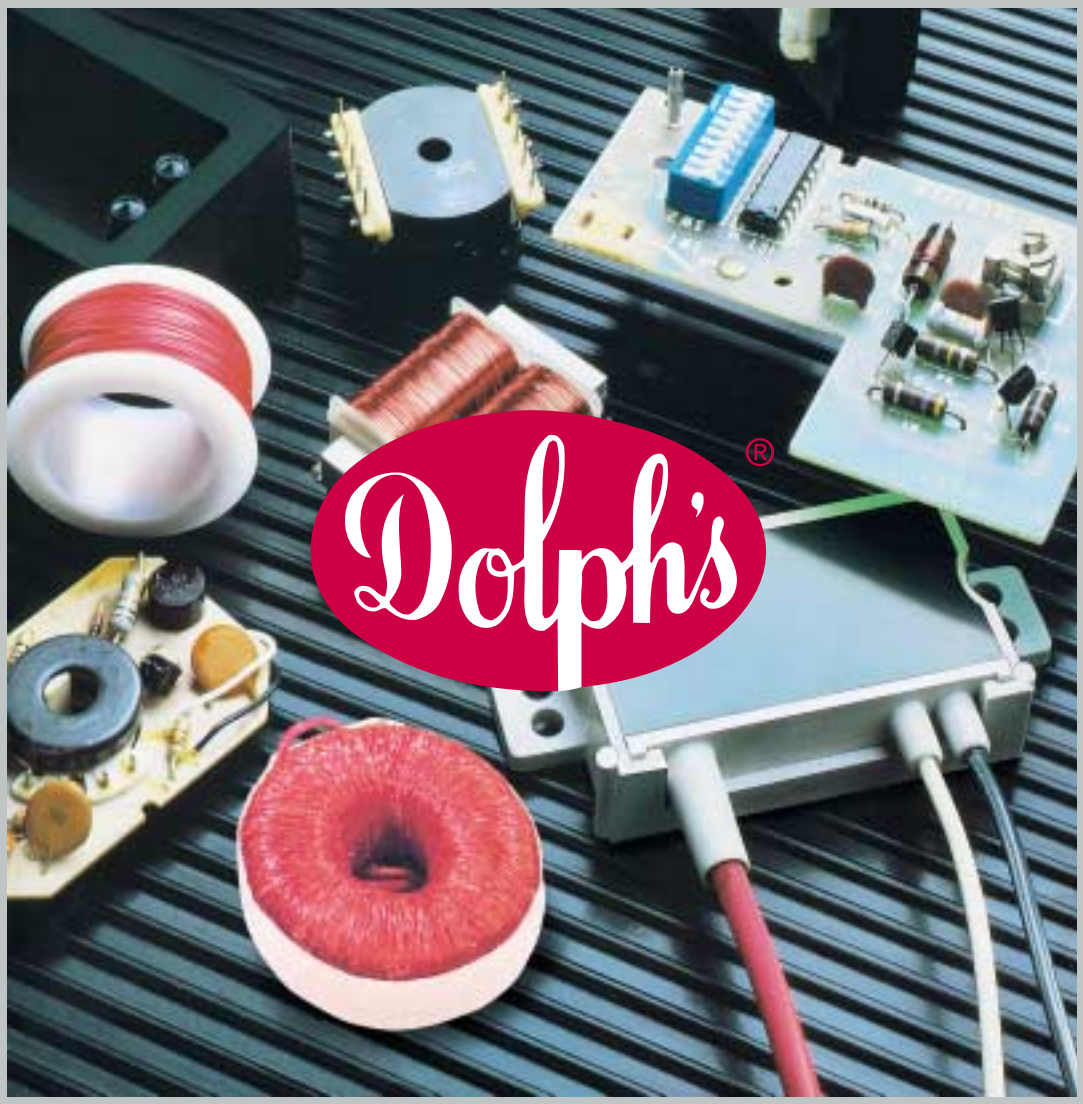
NEW REVISED EDITION

SELECTION CHART



EPOXIES & POLYBUTADIENE RESINS

FORMULATED SPECIFICALLY FOR THE ELECTRICAL AND ELECTRONICS INDUSTRY

EPOXY REACTOR PROPERTIES

DESCRIPTION	REACTOR	RESIN	MIX RATIO	MIXED VISCOSITY	1 WEEK HARDNESS
Class B, Fast Room Cure Reactor • High exotherm • Pot Life: 60 minutes in a one pound mass. Initial cure: 1-3 hrs. @ 70°F; Complete cure: 24 hrs. @ 70°F	RE-2000	CC-1024A	100:10	1,500	75
		CB-1054A	100:7	3,200	70
		CR-1050	100:7	3,300	75
		CB-1069	100:7	5,500	80
		CB-1078	100:5	8,600	80
Class B Room Cure Reactor • Low viscosity, moderate exotherm • Pot Life: 2 hours in a one pound mass. Initial cure: 2-4 hrs. @ 70°F; Complete cure: 24 hrs. @70°F	RE-2001	CC-1024A	100:50	2,000	50
		CB-1054A	100:25	3,500	60
		CR-1050	100:30	3,680	65
		CB-1069	100:25	2,880	65
		CB-1078	100:20	3,840	75
Class F, Heat Cure Reactor • Extremely low shrinkage • Excellent elevated temperature electricals • Pot Life: 5 days @ 70°F in a one pound mass. Cure: 5-7 hours @ 225°F; post cure at operating temperatures.	RE-2005	CC-1024A	100:15	2,200	75
		CB-1054A	100:10	5,500	65
		CR-1050	100:10	6,500	80
		CB-1069	100:10	6,880	80
		CB-1078	100:7	11,000	80
Class B, Very Fast Room Cure Reactor • High exotherm • Good for potting or casting in small mass or thin sections. Pot Life: 15-30 minutes in a one pound mass. Initial cure: 1-2 hrs. @ 70°F; Complete cure: 24 hrs @ 70°F	RE-2009	CC-1024A	100:20	1,800	75
		CB-1054A	100:15	4,960	60
		CR-1050	100:15	6,000	75
		CB-1069	100:15	5,120	80
		CB-1078	100:10	10,800	80
Class B, Room Cure Reactor • Low exotherm • Low shrinkage. Pot Life: 1 1/2 hrs. in a one pound mass. Initial cure: 4-6 hrs. @ 70°F, Complete cure: 24 hrs @ 70°F	RE-2010	CC-1024A	100:50	3,500	70
		CB-1054A	100:25	7,500	55
		CR-1050	100:30	11,000	65
		CB-1069	100:25	12,500	65
		CB-1078	100:20	11,520	75

VISCOSITY

This term is generally given in centipoises. For a comparison of centipoises with common materials, use the list below:

Water . . . . . .1 cps.
Light Machine Oil . . . . . .100 cps.
Glycerine . . . . . .1,500 cps.
Karo Syrup . . . . . .3,500 cps.
Molasses . . . . . .10,000 cps.
Chassis Grease . . . . . .Thixotropic

DISTRIBUTOR'S GUIDE TO FORMULATING A SPECIAL RESIN

DOLPH can supply custom formulations to meet special customer needs. For technical assistance, contact your DOLPH Representative or the Customer Service Department.

Volume: To economically supply a special resin requires a minimum volume shipment. Distributors may meet several customers' needs with one resin. Please call Customer Service or your DOLPH Representative for details.

Status: Find out whether this is current production or a new application. Next, obtain product information and specification if available. Also, ask customers about their *wish list* (i.e. "How could the current product be better?") Get more information about the product and application. Send information to DOLPH.

Design: What does the part look like? Size? Shape? Other materials (wire, insulation, components, cup, etc.) used in the part? For potting or casting, what percent of the cavity is to be filled by resin? How large is the cavity?

Preference: Does the manufacturer have a particular resin in mind? If so, what are his concerns?

Application: How will the resin be used? Potting? Casting? Encapsulation? Impregnation?

Function: What does the resin need to do for the product? Protect? Support? Hide? Cushion? Thermal conductivity?

Standards: What standards, if any, must be met? (e.g. Mil, UL, CSA, etc.)

Production: Is production to be automated or manual, continuous or batch? Are ovens available? Is room temperature cure preferred? What is the daily production volume?

Viscosity and Thixotropy: Should the product flow freely (low viscosity)? Must it fill spaces? Are there holes or crevices where the resin should not flow (high viscosity and/or thixotropy)? Should the product retain a high and/or uniform build (thixotropy)?

Properties: Does the resin require flame retardance? Thermal shock resistance? Resilience? Structural strength? Machining? Chemical or abrasion resistance?

Appearance: Is color or finish an issue?

Packaging: What size container (1, 5 or 55 gallon) is preferred?

POLYBUTADIENE RESINS

DOLPHON Polybutadiene Resins are flexible, elastomeric compounds with Shore A Hardness ranging from 35 - 60. Especially formulated for encapsulating electrical and electronic devices, they have excellent hydrolytic stability, good thermal conductivity, low embedment stress and thermal shock ranging from -70° to +155°C. Other features: extraordinary resistance to moisture and chemicals, excellent adhesion, easy to repair, excellent replacement for silicones and epoxies.

POLYBUTADIENE RESINS — Potting, Casting and Coating

	RESIN DESIGNATOR	COLOR	FILLER	REACTOR	TEMPERATURE CLASS (°C)	DIELECTRIC STRENGTH VOLTS/MIL 1/8" SECTION	HARDNESS SHORE 'A' @ 70°F ‡ 24 HR.	HARDNESS SHORE 'A' @ 70°F ‡ 1 WK.	% SHRINKAGE DURING CURE	MIX RATIO (PARTS BY WEIGHT) RESIN	MIX RATIO (PARTS BY WEIGHT) REACTOR	MIXED VISCOSITY, CPS (RESIN AND REACTOR) @ 80° F	MIXED VISCOSITY, CPS (RESIN AND REACTOR) CPS @ ° F	POT LIFE (100 GRAMS) 70° F	POT LIFE (100 GRAMS) HRS.@° F	CURE TIME INITIAL CURE	CURE TIME COMPLETE CURE
General purpose, black, filled potting and casting resin for all types of electrical and electronic devices. Excellent for automotive products, potting connectors and cable splices.	**DOLPHON CB-1109**	Black	Filled	RE-2018	130	665	25	40	0.09	100	15	3,800		1 hr.		2 - 4 hrs. @ 70° F	24 hrs. @ 70° F
Low viscosity, clear amber compound for potting coils, transformers, printed circuit boards and electronics. Excellent for electromagnets. Easily repaired.	**DOLPHON CC-1120**	Amber	Unfilled	CC-1120-B	130	620	15	35	0.2	100	25	1,500		3 hrs.		3 - 5 hrs. @ 70° F	24 hrs. @ 70° F
Thixotropic black-filled compound for brushing, dipping and spraying where high build is required. Excellent adhesion to a wide variety of substrates. Excellent for *glob top* applications.	**DOLPHON CB-1128**	Black	Filled	CB-1128-B	130	665	60	60	N/A	100	6	Thixotropic		45 min.		2 - 4 hrs. @ 70° F	24 hrs. @ 70° F
Flame retardant general purpose elastomeric compound for potting and casting electrical and electronic devices. Meets UL 94, V-O.	**DOLPHON CB-1130**	Black	Filled	CN-1130-B	130	1,000	40	55	< 0.01	100	10	8,000		40 min.		2 - 4 hrs. @ 70° F	1 week @ 70° F
Tough black compound. Excellent thermal stability. No embedment stress at -55°C. Exceptional compound developed for automotive and other severe applications.	**DOLPHON CB-1131**	Black	Filled	CB-1131-B	130	620	40	70	< 0.01	100	16	9,900		45 min.		2 - 4 hrs. @ 70° F	24 hrs. @ 70° F
This filled, one-part liquid resin offers easy use, high flexibility, and exceptional resistance to abrasion. Excellent for transformers, coils, switches and controllers.	**DOLPHON CB-1145**	Black	Filled	One Package	130	562	30	40	< 0.1	One Package		2,500		N/A		2 - 3 hrs. @ 300° - 325° F	

EPOXY RESINS

DOLPHON Epoxy Resins vary from flexible to rigid compounds and range from low viscosity to paste-like, thixotropic adhesives. A series of reactors is available to tailor each system to specific needs.

ONE PART — Dipping

	RESIN DESIGNATOR	COLOR	FILLER	REACTOR	TEMPERATURE CLASS (°C)	DIELECTRIC STRENGTH VOLTS/MIL 1/8" SECTION	HARDNESS SHORE 'D' @ 70°F ‡ 24 HR.	HARDNESS SHORE 'D' @ 70°F ‡ 1 WK.	% SHRINKAGE DURING CURE	MIX RATIO (PARTS BY WEIGHT) RESIN	MIX RATIO (PARTS BY WEIGHT) REACTOR	MIXED VISCOSITY, CPS (RESIN AND REACTOR) @ 80° F	MIXED VISCOSITY, CPS (RESIN AND REACTOR) CPS @ ° F	POT LIFE (100 GRAMS) 70° F	POT LIFE (100 GRAMS) HRS.@° F	CURE TIME INITIAL CURE	CURE TIME COMPLETE CURE
Red epoxy dipping resin designed to replace coil taping for toroids, field coils, transformers, etc. Also can be used as a conformal coating for electronic devices.	**DOLPHON CR-1098**	Red	Filled	One Package	130	350	SHORE 'A' 60	60	N/A	One Package		5 RPM	7,000-12,800	N/A		1 hour @ 300° F	

ONE PART — Wet Winding

	RESIN DESIGNATOR	COLOR	FILLER	REACTOR	TEMPERATURE CLASS (°C)	DIELECTRIC STRENGTH VOLTS/MIL 1/8" SECTION	HARDNESS SHORE 'D' @ 70°F ‡ 24 HR.	HARDNESS SHORE 'D' @ 70°F ‡ 1 WK.	% SHRINKAGE DURING CURE	MIX RATIO (PARTS BY WEIGHT) RESIN	MIX RATIO (PARTS BY WEIGHT) REACTOR	MIXED VISCOSITY, CPS (RESIN AND REACTOR) @ 80° F	MIXED VISCOSITY, CPS (RESIN AND REACTOR) CPS @ ° F	POT LIFE (100 GRAMS) 70° F	POT LIFE (100 GRAMS) HRS.@° F	CURE TIME INITIAL CURE	CURE TIME COMPLETE CURE
Especially formulated for wet winding, sealing and filling. Extraordinary bond strength and chemical resistance. Superior electrical properties.	**DOLPHON CN-1119**	Beige	Filled	One Package	180	420	85	85	N/A	One Package		Thixotropic Paste		N/A		7 - 8 hrs. @ 300° F	

TWO PART SYSTEMS — Casting and Potting

	RESIN DESIGNATOR	COLOR	FILLER	REACTOR	TEMPERATURE CLASS (°C)	DIELECTRIC STRENGTH VOLTS/MIL 1/8" SECTION	HARDNESS SHORE 'D' @ 70°F ‡ 24 HR.	HARDNESS SHORE 'D' @ 70°F ‡ 1 WK.	% SHRINKAGE DURING CURE	MIX RATIO (PARTS BY WEIGHT) RESIN	MIX RATIO (PARTS BY WEIGHT) REACTOR	MIXED VISCOSITY, CPS (RESIN AND REACTOR) @ 80° F	MIXED VISCOSITY, CPS (RESIN AND REACTOR) CPS @ ° F	POT LIFE (100 GRAMS) 70° F	POT LIFE (100 GRAMS) HRS.@° F	CURE TIME INITIAL CURE	CURE TIME COMPLETE CURE
Clear, unfilled epoxy system for applications where maximum penetration is desired. Low viscosity and flexibility permit use even on fine wires as a general purpose impregnant and encapsulant.	**DOLPHON CC-1024**	Clear Amber	Unfilled	RE-2000	130	500	70	75	0.5	100	10	1,500		30 min.		1 - 3 hrs. @ 70° F	24 hrs. @ 70° F
				RE-2001	130	440	50	50	0.5	100	50	2,000		1½ hrs.		2 - 4 hrs. @ 70° F	24 hrs. @ 70° F
				RE-2005	155	500	75	75	0.2	100	15	2,200	120 @ 150	5 days	1 @ 150	5 - 7 hrs. @ 225° F	
				RE-2009	130	500	75	75	0.5	100	20	1,800		20 min.		1 - 2 hrs. @ 70° F	24 hrs. @ 70° F
				RE-2010	130	440	60	70	0.2	100	50	3,500		1½ hrs.		4 - 6 hrs. @ 70° F	24 hrs. @ 70° F
Red, machinable epoxy system for potting and encapsulation of sensors, thermostats, coils, motors, transformers, electronic assemblies. Cures to a high gloss finish. Low viscosity allows easy mix and pour without voids.	**DOLPHON CR-1050**	Red	Filled	RE-2000	130	410	70	75	0.4	100	7	3,300		1 hr.		1 - 3 hrs. @ 70° F	24 hrs. @ 70° F
				RE-2001	130	430	65	65	0.2	100	30	3,680		1½ hrs.		2 - 4 hrs. @ 70° F	24 hrs. @ 70° F
				RE-2005	155	450	80	80	0.2	100	10	6,500	700 @ 150	5 days	1 @ 150	5 - 7 hrs. @ 225° F	
				RE-2009	130	420	70	75	0.4	100	15	6,000		30 min.		1 - 2 hrs. @ 70° F	24 hrs. @ 70° F
				RE-2010	130	430	60	65	0.2	100	30	11,000		1½ hrs.		4 - 6 hrs. @ 70° F	24 hrs. @ 70° F
Flexible, black, flame retardant epoxy system for potting and encapsulation of sensors, thermostats, coils and motors. Especially recommended for MIL-T-27 and other military uses. Meets MIL-I-16923-C.	**DOLPHON CB-1054**	Black	Filled	CB-1054-B	155	430	60	60	0.21	100	100	10,000	1,760 @ 150	6 wks.	6 @ 150	3 - 5 hrs. @ 275° F	
				RE-2000	130	400	65	70	0.4	100	7	3,200		1 hr.		2 - 3 hrs. @ 70° F	24 hrs. @ 70° F
				RE-2001	130	410	45	60	0.3	100	25	3,500		1½ hrs.		2 - 4 hrs. @ 70° F	24 hrs. @ 70° F
				RE-2005	155	410	65	65	0.2	100	10	5,500	1,280 @ 150	5 days	1 @ 150	5 - 7 hrs. @ 225° F	
				RE-2009	130	400	60	60	0.45	100	15	4,960		30 min.		1 - 2 hrs. @ 70° F	24 hrs. @ 70° F
				RE-2010	130	410	40	55	0.2	100	25	7,500		1½ hrs.		4 - 6 hrs. @ 70° F	24 hrs. @ 70° F
Black, machinable epoxy system for all types of electrical and electronic assemblies. Excellent thermal conductivity. This medium viscosity, filled epoxy cures to a fine, glossy finish.	**DOLPHON CB-1069**	Black	Filled	RE-2000	130	405	75	80	0.4	100	7	5,500		30 min.		1 - 3 hrs. @ 70° F	24 hrs. @ 70° F
				RE-2001	130	430	60	65	0.25	100	25	2,880		1½ hrs.		2 - 4 hrs. @ 70° F	24 hrs. @ 70° F
				RE-2005	155	415	80	80	0.15	100	10	6,880	1,250 @ 150	5 days	1 @ 150	5 - 7 hrs. @ 225° F	
				RE-2009	130	410	80	80	0.4	100	15	5,120		15 min.		1 - 2 hrs. @ 70° F	24 hrs. @ 70° F
				RE-2010	130	435	60	65	0.2	100	25	12,500		1½ hrs.		4 - 6 hrs. @ 70° F	24 hrs. @ 70° F
Versatile, black epoxy system for potting and casting all varieties of coils, transformers, electronic modules, and power supplies. This very low cost compound offers low shrinkage, high thermal conductivity, plus excellent electrical and physical properties. Also available in cream, CN-1078.	**DOLPHON CB-1078**	Black	Filled	CB-1078-B	130	400	75	75	0.1	100	20	5,750		2 hrs.		12 hrs. @ 70° F	7 days @ 70° F
				RE-2000	130	400	75	80	0.2	100	5	8,600		1 hr.		1 - 3 hrs. @ 70° F	24 hrs. @ 70° F
				RE-2001	130	420	55	75	0.1	100	20	3,840		1½ hrs.		2 - 4 hrs. @ 70° F	24 hrs. @ 70° F
				RE-2005	155	410	80	80	0.05	100	7	11,000	3,360 @ 150	5 days	1 @ 150	5 - 7 hrs. @ 225° F	
				RE-2009	130	400	75	80	0.2	100	10	10,800		30 min.		1 - 2 hrs. @ 70° F	24 hrs. @ 70° F
				RE-2010	130	415	40	75	0.1	100	20	11,520		1½ hrs.		4 - 6 hrs. @ 70° F	24 hrs. @ 70° F
Flame retardant, machinable two-part liquid epoxy resin system especially formulated for electrical and electronic components and equipment applications requiring low exotherms.	**DOLPHON CB-1147**	Black	Filled	CB-1147-B	130	440	70	80	< 0.05	100	100	16,000		30 min.		1 hr. @ 70° F	24 hrs. @ 70° F

TWO PART SYSTEMS — Pre-measured Kits

	RESIN DESIGNATOR	COLOR	FILLER	REACTOR	TEMPERATURE CLASS (°C)	DIELECTRIC STRENGTH VOLTS/MIL 1/8" SECTION	HARDNESS SHORE 'D' @ 70°F ‡ 24 HR.	HARDNESS SHORE 'D' @ 70°F ‡ 1 WK.	% SHRINKAGE DURING CURE	MIX RATIO (PARTS BY WEIGHT) RESIN	MIX RATIO (PARTS BY WEIGHT) REACTOR	MIXED VISCOSITY, CPS (RESIN AND REACTOR) @ 80° F	MIXED VISCOSITY, CPS (RESIN AND REACTOR) CPS @ ° F	POT LIFE (100 GRAMS) 70° F	POT LIFE (100 GRAMS) HRS.@° F	CURE TIME INITIAL CURE	CURE TIME COMPLETE CURE
Semi-rigid, red, thixotropic paste for daubing, buttering or isolating components. Excellent for vertical surfaces.	**CR-1034H**	Red	Filled	CR-1034H-B	130	390	80		0.4	100	5	Paste		1.5 hrs		3-4 hrs. @ 70° F	24 hrs. @ 70° F
Semi-rigid, red, epoxy resin for potting and casting applications.	**CR-1035**	Red	Filled	CR-1035-B	130	410	75		0.4	100	7	3,300		1.5 hrs		1-2 hrs. @ 70° F	24 hrs. @ 70° F
Flexible, black, thixotropic paste for daubing, buttering or isolating components. Excellent for vertical surfaces.	**CB-1057**	Black	Filled	CB-1057-B	130	430	75		0.013	100	100	Paste		2.5 hrs		3-4 hrs. @ 70° F	24 hrs. @ 70° F
Flexible, black, epoxy resin for potting and casting applications.	**CB-1076**	Black	Filled	CB-1076-B	130	400	40		0.2	100	40	7,500		2 hrs		1-2 hrs. @ 70° F	24 hrs. @ 70° F
Honey-like liquid epoxy for potting, casting and coating applications.	**CC-1095**	Clear	Unfilled	CC-1095-B	130	450	70		0.7	100	20	3,800		45 min.		2-4 hrs. @ 70° F	24 hrs. @ 70° F

Adhesive

	RESIN DESIGNATOR	COLOR	FILLER	REACTOR	TEMPERATURE CLASS (°C)	DIELECTRIC STRENGTH VOLTS/MIL 1/8" SECTION	HARDNESS SHORE 'D' @ 70°F ‡ 24 HR.	HARDNESS SHORE 'D' @ 70°F ‡ 1 WK.	% SHRINKAGE DURING CURE	MIX RATIO (PARTS BY WEIGHT) RESIN	MIX RATIO (PARTS BY WEIGHT) REACTOR	MIXED VISCOSITY, CPS (RESIN AND REACTOR) @ 80° F	MIXED VISCOSITY, CPS (RESIN AND REACTOR) CPS @ ° F	POT LIFE (100 GRAMS) 70° F	POT LIFE (100 GRAMS) HRS.@° F	CURE TIME INITIAL CURE	CURE TIME COMPLETE CURE
Epoxy adhesive for bonding applications. Good thermal shock resistance. Thixotropic paste.	**DOLPHON CR-1056**	Red	Filled	CC-1056-A	130	390	60	70	N/A	100	100	Thixotropic Paste		2 hrs.		2-4 hrs. @ 70° F	24 hrs. @ 70° F

SELECTING THE PROPER DOLPHON® RESIN SYSTEM

DOLPH offers a large selection of resin systems to meet your particular needs. Using these guidelines, select the system with the physical and electrical properties that your application requires.

1. **Mechanical Requirements:** If the resin system will provide structural support or requires machining, choose an epoxy with Shore D of 70 or higher. A flexible system of 60 or below provides a cushioning effect and low stress during cure.
2. **Filled or Unfilled:** Filled systems generally have higher thermal conductivity, better thermal shock properties and greater impact resistance. They also may conceal technology and provide tamper resistance. Unfilled systems generally offer easy machining, low viscosity and clarity.
3. **Thermal Shock:** More resilient resins ease stress during temperature swings. Generally, polybutadienes are superior. Epoxy systems with a Shore D of 70 or less are also suitable.
4. **Operating Temperature:** Heat-curing resin systems have a higher temperature class.
5. **One-Part or Two-Part Systems:** Room temperature cure systems have two components to be mixed together. Heat cure systems may be one part or two parts. DOLPHON one-part, heat-curing, epoxy systems are very stable and easier to use since measuring and mixing are eliminated. Two-part systems require measuring and mixing, and offer a range of choices such as room temperature cure or heat cure, rigid or flexible, short or long pot life.
6. **Heat or Room Temperature Cure:** Are ovens available for elevated temperature cure? Can components of the units withstand oven temperatures?
7. **Pot Life and Processing:** Room-Temperature curing systems have a short to moderate pot life. One or two-part heat curing systems have a longer pot life. For mix meter systems, choose a short pot life. Manual systems require a moderate to long pot life.
8. **Epoxy Reactors:** Most DOLPHON two-part epoxy resins are offered with a choice of reactors so that the manufacturer may vary pot life, hardness, viscosity and cure cycle by using different reactors with any particular epoxy resin. More details are in this brochure.

Selected resin systems are available in pre-measured kits. Ask your DOLPH distributor for a DOLPHON Resin Kit Selector!

‡ Shore A Durometer measures soft rubbers and elastomeric plastics. Shore D Durometer is used for hard rubber & harder grades of plastics. Shore D may be associated as follows:

40-55 = Very Flexible
55-70 = Flexible
70-85 = Semi Rigid
85-95 = Rigid

Commitment to Quality and Service is basic to our business — from start to finish.

Dolph has always been first with new products and processes for the industry. We take full responsibility for every step in the manufacture of insulating varnishes and resins — backed by the industry's finest research, customer service, and technical support. Continuous improvement is our philosophy.

Our 10-acre complex at Monmouth Junction, New Jersey, was planned and built solely for the manufacture of insulating varnishes and resins. We produce the basic resins from which our finished products are made. Our quality control standards are the toughest in the industry.

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- Masking Compounds
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- Conformal Coatings
- Plastisols
- Aerosol Products
- VPI Resins
- Epoxy Resins
- Trickle & Roll-Thru Resins
- Wet Winding Resins
- Epoxy Varnishes
- Polyesters
- Polybutadienes

The following selection charts are available:

- DOLPH Epoxies and Polybutadiene Resins
- DOLPH Rapid Reference Guide
- DOLPH Varnishes and Resins
- DOLPH-SPRAY® Aerosols
- DOLPHON® Epoxy Resins
- DOLPHON Resin Kits
- DOLPHON Solventless Polyester Resins
- DOLPHON VPI Resins

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