

High Temperature Epoxies

Properties and Part Selection

Overview



Selection Table - Epoxy-Based Adhesive Properties

Features	Conductive		Room Temperature Cure			
Product Ref	120	132	4461IP	4525IP	4538	7050
Properties	High electrical conductivity	High thermal conductivity	Low viscosity adhesive & coating	High performance adhesive & potting	Super flexible stress free adhesive & potting	Super bonder adheres to most materials
Maximum Temp. °C	260	260	260	260	230	205
Components Colour	2-Silver	2-Silver	2-Amber	2-Black	2-Tan	2-Black
Viscosity cps	25,000	22,000	600	25,000	10,000	20,000
Density gm/cc	3.8	1.8	1.1	1.7	1	1.3
Hardness Shore 'D'	70	75	90	90	60 - 80A	70
Tensile Strength psi	6,500	7,200	9,500	10,000	6,000	5,000
Thermal Conductivity (W/m°C)	7.2	5.7	0.57	1.9	1.0	4.5
Thermal Expansion (x 10 ⁻⁵ / °C)	5.4	8.0	5.4	3.3	6.0	4.8
Dielectric Strength volt/mil	N/A	500	450	450	450	400
Volume Resistivity ohm-cm	0.00008	10 ⁶	10 ¹³	10 ¹⁵	10 ¹⁴	10 ¹⁴
Heat Distortion °C	210	210	210	210	75	75
Elongation %	0.2	0.2	5.0	2.0	12 - 100	3.0
Thermal Stability % (1000hr @ 200°C)	0.2	0.2	0.2	0.05	0.5	0.5
Shrinkage % max	0.2	0.8	0.8	0.2	0.8	0.8
Moisture Absorption % 30 Days	0.2	0.2	0.15	0.1	0.5	0.2
Mix Ratio (by weight)	100/3.5	100/27	100/17	100/8	100/120	100/10
Working Time 25 gms (mins. @ 24°C)	30	30	30	30	90	30
Cure (hrs. @ 24°C)	16	16	16	16	4 - 24	4 - 16
Cure (mins. @ 120°C)	7	5	5	5	60	1 - 2 hrs

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Selection Table - Epoxy-Based Adhesive Properties (Continued)

Features	315°C Thermal / Heat Cure			Machinable		One Part
Product Ref	4460	4700	4703	4540	454B	4420
Properties	High temperature low viscosity encapsulant	High temperature general purpose adhesive & casting	Ultra high temperature adhesive & tooling compound	Machinable aluminium casting and repair	Machinable non-sag putty	One component structural adhesive
Maximum Temp. °C	315	315	340	260	230	230
Components Colour	2-Amber	2-Black	2-Black	2-Silver	2-Silver	1-Grey
Viscosity cps	600	40,000	50,000	30,000	100,000	Paste
Density gm/cc	1.1	1.8	1.8	1.9	1.9	1.2
Hardness Shore 'D'	80	94	95	80	80	75
Tensile Strength psi	10,300	11,100	11,800	10,000	10,000	7,000
Thermal Conductivity (W/m°C)	0.57	1.9	2.6	5.0	5.0	1.2
Thermal Expansion (x 10 ⁻⁵ / °C)	6.4	6.4	6.8	8	8	4.5
Dielectric Strength volt/mil	500	550	450	100	450	400
Volume Resistivity ohm-cm	10 ¹⁴	10 ¹⁴	10 ¹⁰	10 ⁸	10 ¹⁰	10 ¹⁰
Heat Distortion °C	260	300	320	225	200	175
Elongation %	5	2	2	1.2	1.2	1.5
Thermal Stability % (1000hr @ 200°C)	0.1	0.1	0.02	0.5	0.5	0.6
Shrinkage % max	0.5	0.2	0.1	0.1	0.2	0.3
Moisture Absorption % 30 Days	0.1	0.02	0.15	0.2	0.2	0.5
Mix Ratio (by weight)	100/80	100/28	100/22	100/9	100/11	N/A
Working Time 25 gms (mins. @ 24°C)	N/A	N/A	N/A	30	30	N/A
Cure (hrs. @ 24°C)	N/A	N/A	N/A	16	16 - 24	N/A
Cure (mins. @ 120°C)	4 hours	4 hours	4 - 6 hours	8	10	60

Electrically Conductive

Product and Properties Guide

Electrical and Industrial Applications

Duralco 12X Series

Electrically Conductive Adhesives

Duralco® Conductive adhesives and potting compounds provide the conductivity required for many high temperature electronic and industrial applications. They will bond to glass, ceramics, metals and plastics, offering excellent resistance to most chemicals and solvents. Applications include solder replacement, semi-conductor bonding, shielding, electronics, circuit board repair, etc.

Duralco 120 - 260°C Silver based

Epoxy that cures at room temperature to form electrically conductive bond lines for use up to 260°C. Ideal for forming electrically conductive bonds, attaching heat sensitive components and as a solder replacement.

Duralco 122 - 260°C Nickel based

This Nickel filled adhesive and casting epoxy is specially formulated to provide an economical alternative to silver filled electrically conductive epoxies. Ideal for use in applications where the ultimate in electrical conductivity is not required.

Duralco 124 - 340°C Ultra Temp, Silver based

A two component, silver filled adhesive for High Power applications. Just mix and cure with mild heat.

Duralco 125 - 230°C Flexible, Silver based

Easy to use, "one to one", applicator kit. Just dispense, mix and apply this smooth creamy paste and cure at room temperature. Bonds to most metals, ceramics and plastics to form stress free, electrically conductive bonds.

Duralco 126 - 230°C One component, Silver filled

A single component highly conductive epoxy specifically designed for production applications. No mixing, no mess, just dispense and heat cure. Commonly used in automatic dispensing equipment.

Duralco 127 - 200°C Graphite based

Easy to use, "one to one", applicator kit. Just dispense, mix and apply. This smooth creamy paste cures at room temperature and is ideal for low cost production applications. Can be used in automatic dispensing equipment.

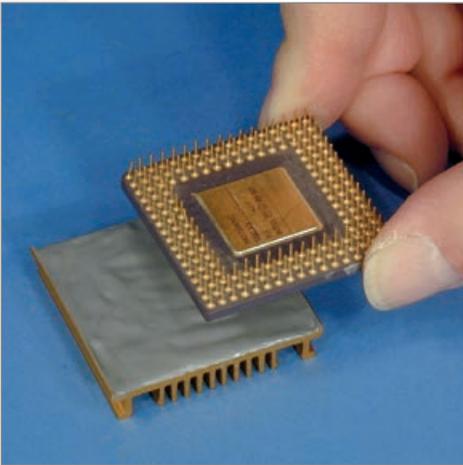


Performance Chart

Part Number	Volume Resistance	Thermal Conductivity	Cure Cycle Hours @ 25°C	Cure Cycle Minutes @ 95°C	Size
120	0.0*	7.20	16-24	10	2
122	0.7	2.16	16-24	10	4
124	0.002	7.20	4@120°C	N/A	2
125	0.002	5.76	16-24	20	1
126	0.002	7.20	1/2@135°C	10@160°C	2
127	0.02	3.60	16-24	20	2.5

* Denotes 0.00008 actual

Thermally Conductive Product and Properties Guide Electrical and Industrial Applications



Duralco 13X Series

Thermally Conductive Adhesives

Duralco® Thermally Conductive adhesives and potting compounds provide the heat dissipation required for many high temperature electronic and industrial applications. These ultra temperature adhesives combine a unique polymer system and specially thermally conductive fillers to provide continuous service up to 340°C. They have excellent adhesion to glass, ceramics, metals and plastics. Resistant to most chemicals and solvents.

Duralco 128 - 260°C Ceramic based

Is a highly thermally conductive, electrically resistant adhesive potting compound. Just mix the resin and hardener, apply and cure at room temperature. Curing may be accelerated with mild heat.

Duralco 132IP - 260°C Aluminium based

An Aluminium metal filled epoxy that cures at room temperature to form machinable, thermally conductive bond lines, providing the maximum heat transfer available in a 260°C epoxy system. Can be supplied as a no-sag putty, **Duralco 132P**, for heat tracing applications.

Duralco 133 - 315°C Aluminium based

A two component, heat curing, Aluminium filled, conductive epoxy. Cures with mild heat to form thermally conductive bond lines and heat transfer medium. It is readily machinable and ideal for all kinds of repairs and as a construction material.

Duralco 134 - 260°C Ceramic based Grease

Non-hardening, electrically insulating and thermally conductive grease. Ideal for use between components and heat sinks. Duralco 134 retains its paste like consistency, enabling parts to be easily removed and replaced and will not dry out even after extended periods of time.

Duralco 135 - 260°C Aluminium based Grease

Filled with an ultra fine, aluminium metal powder to provide the maximum possible heat transfer rate in a non-hardening grease. Commonly used in many industrial applications where electrical resistance is not critical.

Performance Chart

Part Number	Volume Resistance	Thermal Conductivity	Colour	Cure Cycle Hours @	Size
	Ω-cm	W/m°C		25°C	oz
128	10 ¹⁶	4.32	Tan	16-24	8
132IP	10 ⁵	5.76	Silver	16-24	16
132P	10 ⁵	5.76	Silver	16-24	8
133	10 ⁵	5.76	Silver	4@120°C	16
134	10 ¹⁶	5.04	Tan	N/A	8
135	N/A	5.76	Grey	N/A	4*

* Also available 8 oz

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High Temperature Epoxies

Duralco®

Adhesives, Fillers and Coatings

Duralco 4525IP

260°C Electrically Resistant

Cures at room temperature, or in 5 minutes at 120°C, to provide high temperature stability, high bond strength, low shrinkage, low moisture absorption and excellent chemical and electrical resistance. Ideal for high performance bonding, potting, sealing, repairs and casting.

Duralco 4525IP-1 Pint kit

Duralco 4525IP-2 Gallon kit

Also available in pre-measured kits, please contact us for details.

Duralco 4538

230°C Super Flexible

Provides a high level of thermal shock and vibration resistance, sound absorption and excellent adhesion to dissimilar substrates. Adheres to most plastics, metals, ceramics, glass, rubber and even Teflon (treated). Provides the flexibility of silicones and the chemical stability of epoxies. This variable system can be tailored to meet any application just by varying the mix ratio of resin to hardner, resulting in the flexibility required.

Duralco 4538-1 Pint kit

Duralco 4538-2 Gallon kit

Also available in pre-measured kits.

Duralco 4461IP

260°C Low Viscosity

A free flowing liquid adhesive, ideal for ultra thin bond lines, impregnating, coating and encapsulation. Cures at room temperature to provide chemical, solvent and corrosion resistance.

Duralco 4461-1 Pint kit

Duralco 4461-2 Gallon kit

Slow setting version

Duralco 4461SS-1 Pint kit

Duralco 4461SS-2 Gallon kit

Also available in pre-measured kits, please contact us for details.



High Temperature Epoxies

Duralco®

Adhesives, Fillers and Coatings



Duralco 4460

315°C Low Viscosity

For encapsulating and impregnation with a superior temperature rating, 4460 forms a protective coating, seals and protects against moisture, chemicals and corrosion. Provides high bond strength, high temperature stability and low moisture absorption. Requires a thermal cure cycle. Duralco 4460 is commonly found in aerospace, electronic, appliance, instrumentation and equipment applications

Duralco 4460-1 Pint kit

Duralco 4460-2 Gallon kit

Also available in pre-measured kits.

Duralco 4700

315°C Bonding Adhesive

An exceptionally durable epoxy, 4700 has excellent adhesion to metals, glass, ceramics and most plastics. This superior adhesive has high electrical resistance, low moisture absorption, high temperature stability and excellent chemical resistance. Requires thermal cure cycle.

Duralco 4700-1 Pint kit

Duralco 4700-2 Gallon kit

Also available in pre-measured kits, please contact us for details.

Duralco 4703

340°C Adhesive Tooling Compound

A composite of unique high temperature resins, metallic and ceramic particles, 4703 provides the ultimate in stability and strength in high temperature environments. It has excellent resistance to most chemicals, solvents and acids and is easily machined to close tolerances. Requires a thermal cure cycle.

Duralco 4703-1 Pint kit

Duralco 4703-2 Gallon kit.

Also available in pre-measured kits, please contact us for details.

High Temperature Epoxies

Overview

Adhesives, fillers and putty



Duralco 4540

260°C Machinable Casting and Repairs

4540 is an active aluminium metal filled epoxy that offers outstanding adhesion, ductility, thermal conductivity and shock resistance. Just mix and apply. No solvents. No outgassing. No complicated two or three stage cure cycles.

- Duralco 4540-1 Pint kit
- Duralco 4540-2 Gallon kit



Durabond 454 and 456

260°C Machinable Non-Sag Putty

A smooth, creamy putty that easily cures at room temperature to form an aluminium based, highly machinable, composite. Ideal for patching leaking pipes, valves and fittings; repairing pumps, machinery and equipment.

- Duralco 454B-1 0.5Kg
- Duralco 454B-2 2.0Kg
- Duralco RK454 (Aluminium) applicator kit*
- Duralco RK456 (Stainless) applicator kit*

*Repair kit consists of 2.5 oz Resin, 0.6 oz Hardener, Sandpaper, Mixing Sticks, Reinforcement Screen.

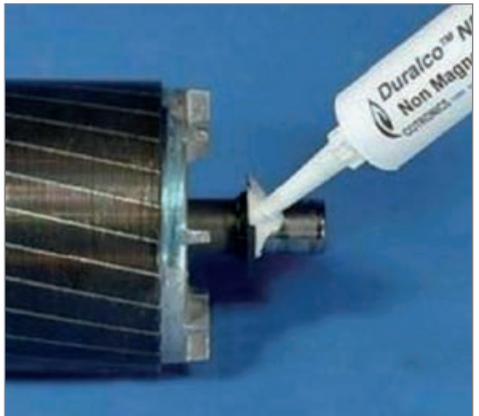


Duralco NM25

230°C Magnet Bonding Adhesive

A proven adhesive for bonding magnets while withstanding high temperatures. It is free of magnetic particles or conductive fillers which would interfere with magnetic fields while in use. Just mix and apply. It cures at room temperature to provide excellent chemical, solvent and moisture resistance. It will form thin bond lines and is ideal for use in applications with minimum clearances. Also available as non-sag putty (HV) or high temperature 315°C (HT) versions.

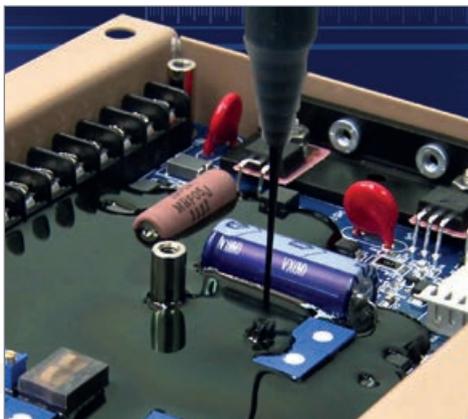
- Duralco NM25-1 Pint kit
- Duralco NM25HV-1 Pint kit
- Duralco NM25HT-1 Pint kit



Epoxy Potting Compounds

Durapot®

Electrical and Industrial Applications



Performance Chart

Part Number	Volume Resistance	Thermal Conductivity	Cure Cycle Hours @	Cure Cycle Minutes @
	Ω-cm	W/m°C	25°C	
861IP	10 ¹³	0.576	16-24	5@250°C
862	10 ¹⁴	0.576	4@120°C	60@350°C
863	10 ¹⁴	1.296	4@120°C	120@350°C
864	10 ¹⁴	1.008	24	120@250°C
865IP	10 ¹⁵	2.88	4-16	10@250°C
866	10 ¹⁵	0.216	24	10@250°C
868	10 ¹⁴	0.576	4@120°C	60@350°C

Notes:

Post cures at 120°C will improve moisture resistance for Durapot 861, 864, 865 and 866.

Durapot 861IP

260°C Low Viscosity Impregnant

A 100% reactive compound that provides excellent penetration, even in tightly wound coils. Just mix and cure at room temperature to provide excellent electrical, moisture and chemical resistance. Also available in flame retardant grades.

Durapot 862

315°C High Temperature Low Viscosity

High temperature version of 861IP

Durapot 863

340°C Ultra High Temperature

Offers unique properties stemming from a cross-linked, inorganic-organic polymer system. It is a 100% reactive and can be used to 340°C after curing at 175°C. Offers excellent dielectric properties, heat stability, moisture and solvent resistance.

Durapot 864

230°C Flexible, Low Viscosity

Provides the flexibility required for severe thermal shock applications. Bonds to dissimilar materials, including treated Teflon® and other difficult to bond plastics. Has the ability to impregnate and bond thousands of fibre optical strands.

Durapot 865IP

260°C Thermally Conductive Compound

Designed for applications requiring high heat flows and rapid thermal dissipation, excellent chemical resistance and high temperature stability. Used for thermally conductive casting, embedding, impregnating and encapsulation.

Durapot 866

260°C Thermally Insulating Compound

A thermally and electrically insulating compound. Convenient two part, room temperature curing system. Offers a low density, non-porous foam for high temperature applications.

Durapot 868

260°C High Temperature & Flexible

Ideal for thermal shock applications, stress free potting and bonding. Offers high electrical resistance, even at high temperatures up to 260°C.