

Order code	Manufacturer code	Description
88-3436	A2068	CHASSIS TRANSFORMER 230V 20VA 24V+24V RC

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The enclosed information is believed to be correct, Information may change without notice due to product improvement. Users should ensure that the product is suitable for their use. E. & O. E.	Revision A 20/02/2007

PRODUCT INFORMATION

ULTIMEG 2000-372

ANTI TRACKING
AIR DRYING ALKYD
CLEAR, GOLDEN
PIGMENTED VERSIONS AVAILABLE
AEROSOL VERSIONS AVAILABLE

ULTIMEG 2000-372 ANTI-TRACKING ENAMELS AND VARNISHES

GENERAL DESCRIPTION

The Ultimeg 2000-372 range of anti-tracking varnishes and enamels provide tough, impervious, insulating seals in difficult environments. The system dries rapidly in thin film to give very effective sealing off of electrical leakage paths together with excellent noise reduction characteristics. The cured product conforms to BSEN 600464 type 1.1 (IEC600464), has excellent resistance to transformer oils and moisture, and is suitable for use in Class B and F insulating systems. A low hazard fungicide is included in the varnished enamels, which gives a 0 rating (no growth) fungal resistance when tested to BS 3900 PTG6. This makes the system particularly suited for tropicalisation and for use on equipment working in warm humid climates.

APPLICATION

Suitable for noise reduction in small transformers and moisture protection, anti-tracking and tropicalisation on all types of electrical equipment.

SPECIFICATION

Viscosity	170-220 secs BS3900 PTA6 B4 flow cup at 25°C
Non-volatile content	40-42% (Clear & golden versions)
Specific Gravity	0.96-99 (Clear & golden versions)
Flashpoint	27°C
Shelf life	12 months at 21°C
Drying time	Touch dry 15 minutes Hard dry 45-60 minutes Full cure 24 hour

NOTE: Due to the introduction of improvements from time to time the right is reserved to supply products that may differ slightly from those illustrated or described in this publication.

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ULTIMEG 2000-372

PROCESSING

Method	Brush, dip or spray.		
Viscosity	Brush As supplied	Dip See workshop practice	Spray Thin with T4 thinner or use aerosol.
Reducer	Ultimeg 2000 T4 thinner.		

WORKSHOP PRACTICE

Procedure for dip impregnation of smaller components.

1. Thin Ultimeg 2000-372 with T4 thinners such to achieve a desired film build on components, (graphs are available on request).
2. Immerse the components completely into the varnish for 1-10 minutes.
3. Drain components for 15-30 minutes over the varnish.
4. Cure
 - a) At ambient
45 minutes - 2 hours components can be handled, but only 50-70% of properties have developed and there is still residue solvent to be eliminated.
24-48 hours 95% of properties are developed and there are only trace quantities of solvent still present within components whereas in the majority of cases this trace of solvent is diffused slowly into the atmosphere causing no further problem, if the components are used or packed in materials such as polystyrene some attack can occur.
 - b) The cure can be accelerated heating the components for 2 - 3 hours at 80°C will give an equivalent cure to 24 - 48 hours at ambient.

With heavily taped, tightly wound or larger components there is a risk of solvent entrapment. This risk is reduced by using a heat cure process.

The process each customer chooses depends on component size or design, film required, cure temperature and oven efficiency and thus only a guide can be given.

The cure time chosen is dependant on the size and type of component. Typical figures are given.

ULTIMEG 2000-372

CURE TIMES

Time	15 mins	45-60 mins	24-48 hrs	2-3 hrs
Temperature (deg C)	21°C	21°C	21°C	80°C
Comment	Touch dry	Components handleable	Cured	Cured

PROPERTIES OF CURED VARNISH

Dielectric strength	ASTM D115	72 kV / mm
	After 24hours immersion in water	30 kV / mm
Comparative tracking index		180
Flexibility		Pass 5mm (3/16") mandrel

HEALTH & SAFETY

Refer to Material Safety Data Sheet available.

PACKAGING

25 ltr, 5 ltr tins	Clear, golden.
5 ltr tins	Clear, golden, devolac grey, gentian blue, dark grey, red, white, black, salvameg blue.
400 ml aerosols	Clear, golden, red, dark grey, gentian blue, black.

AEV Plc Issue no. 2 rc Date: 05/07



varnishes resins and all insulation materials
 varnishes resins and all insulation materials
 merseyside advanced electrical varnishes varnishes

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AEV manufactured materials	AEV insulating materials	orange book - electric motor spares
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AEV manufactured materials section is divided in 6 different products, these include:

Varnishes Ultimeg 2000 Range	Resins Ultimeg 2000 Range	Polyurethane Resins Ultifil 3000
Epoxy resin Ultifil 2001	Ayrodev International	Aquameg

VARNISHES

product	thermal classification	viscosity (1)	VOC content %	flash point C	typical cure time/temp	application (2)	description of product
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SOLVENT BASED IMPREGNATING VARNISHES

U250 U250/30	H	L	65 70	32	10 hrs @ 150C	S/A/T/C	Freon resistant epoxy varnish for hermetic applications
U265	H	L	60	43	16 hrs @ 80C 4 hrs @ 120C	S/A/T/C	Low temperature curing varnish with high thermal capability
U327	H	L	50	43	2 mins @ 400C	Coreplate	Coreplate varnish for roller application
U332	N	L	50	33	8 hrs @ 180C	S/T/C	Polyesterimide varnish.Flexible with high thermal capability
U355	H	M	40	28	8 hrs @ 150C	S/A/T/C	Traditional, high quality, high bond varnish
U370 U370E	H	L	50 58	43	4 hrs @ 120C	S/A/T/C	General purpose, cost effective quick curing varnish
U380	H	L	50	43	4 hrs @ 130C	S/A/T/C	UL Pending, tank stable, high quality impregnating finish

WATER BASED IMPREGNATING VARNISHES

A180	F	L	35	>100	5 hrs @ 130C	T/C/thps	General purpose, costeffective polyester impregnating finish
A300	H	VL	9	>100	4 hrs @ 130C	S/A/T/C	Class H, high quality polyester impregnating varnish
A700	H	L	20	>100	5 hrs @ 150C	S/A/T/C	Class H, high quality freon resistant epoxy impregnating varnish

ENVELOPING VARNISHES (COATING)

U200	H	Thix	45	43	4 hrs @ 130C	thps/T/C/	Flexible, high build, red polyester
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U200R							enveloping varnish
U2001 WW	H	Thix	0	0	4 hrs @ 150C	S/T/C	High build single component epoxy resin.
UF820	B	Thix	0	0	24 hrs @ RT	S/T/C	2 part, red epoxy resin for high build protection of end windings

AIR DRYING VARNISHES

U376	B	L	70	26	15 mins TD 45 mins HD	fhps/T/C/	Fast drying, tropicalising varnish for coils and small transformers
U372 varnish	B/F	M	59	26	15 mins TD 45 mins HD	fhps/T/C/	Higher build, tropicalising varnish for noise reduction in transformers
U372 enamel	F	M	59	26	15 mins TD 45 mins HD	S/A/T/C/	High quality, anti tracking finishing varnish available in various colours
U372H enamel	H	M	55	26	15 mins TD 45 mins HD	S/A/T/C/	Class H, anti tracking finishing varnish available in in black or red
U374	B/F	L	59	43	60 mins TD 90 mins HD	T/C/	Higher flash slower cure,solderable air varnish
U600 A/B	F	L	54	22	1 hrTD 8hrs HD	T/C/PCB	2 part polyurethane conformal coating complies to BS5917 type UR1
U620	B	L	64	-1	1 hr TD 2 hrs HD	T/C/PCB	Acrylic conformal coating complies to BS5917 type AR1
U643	E	L	60	38	15 mins TD 30 mins HD	T/C/PCB	Isomerised rubber conformal coating
U750	-	Thix	63	-10	15 mins TD 45 mins HD	masking	Blue masking lacquer
A750	F	L	3	>100	15 mins TD 45 mins HD	S/A/T/C/	Water based air drying epoxy anti tracking varnish in red & clear. very low V.O.C.

KEYS

- 1) L = low M = Medium H = High
 - 2) S = Stators A = Armatures T = Transformers C = Coils
 - 3) TD = Touch Dry HD = Hard Dry
- Other) F = Finishing Anti Tracking Varnish
fhps = Fractional Horse Power Motors
Thix = Thixotropic

AEV offers a comprehensive range of varnishes. Included above are standard products that are generally in stock, but the complete range of varnishes is much more extensive. Further information is available upon application.



Moulding Materials

Miles-Platts have the capability to process an extensive variety of engineering thermoplastic materials. Giving the electrical / electronics designer the flexibility to select the most appropriate specification to achieve a cost effective solution. Miles-Platts work closely with leading plastic compound manufacturers such as DuPont, Nyltech, B.A.S.F., Bayer, DSM, Thermofil and Phillips Petroleum, continually testing new and advanced materials, ensuring that customers benefit from leading edge moulding technology.

There are important considerations essential in the selection of a suitable material, due to the rigorous quality criteria now demanded by modern electrical / electronic technology. Currently satisfying the majority of commercial applications are the following:

Nylon 66 Unreinforced and Nylon 66 Glass Reinforced

Used in the majority of coil bobbin applications world wide due to its relative low cost and ability to mould thin sections whilst retaining a high degree of stiffness. Unreinforced Nylon 66 and Glass Reinforced Nylon 66 have a rating of Class B (130 degrees C maximum).

Flame Retardant Nylon 66 Unreinforced and Nylon 66 Glass Reinforced

These materials have similar characteristics to Nylon 66. A Halogen-free Flame Retardant system is incorporated to meet a flammability rating of UL94V-0.

Nylon 46 Unreinforced and Glass Reinforced

Nylon 46 differs from Nylon 66, having a higher heat resistance, is tougher, more rigid and has low creep at high temperatures. Available in Flame Retardant and Non Flame Retardant.

Thermoplastic Polymers – PBTP and PETP

These materials are increasingly selected for applications where high stiffness, low moisture absorption, dimensional and thermal stability characteristics are required. DuPont RYNITE PET polyester resins have the additional advantage of UL1446 system approvals allowing high temperature classifications to be met.

Polyphenylene Sulfide – PPS

PPS has a high resistance to deformation, benefiting from extreme stiffness and is very stable at high temperature. Inherently non-flammable.

Liquid Crystal Polymer – LCP

LCP benefits from superior high temperature performance, dimensional stability whilst moulding extremely thin sections.

REINFORCED

PROPERTY	ASTM	TEST UNITS	Nylon 66	F/R Nylon 66	Nylon 66	F/R Nylon 66	F/R Nylon 46	PBT	PET	HTN	PPS	LCP
Tensile Strength at Break	D638	MPA	83	75	186	135	100	141	152	214	155	145
Elongation at break	D638	-	60	3	3	2	7	2.4	2.3	2.4	0.05	2.2
Flexural Strength	D790	MPA	-	125	-	205	235	217	221	-	260	174
Compressive Strength	D695	MPA	34	-	-	-	170	-	172	-	179	89
Impact Strength	D256	J/M	53	7	117	12	23	118	85	96	69	225
Flex Moduls	D790	GPa	2.8		9.0			9.6	10	10		13
Underwriters lab ratings		UL94	V-2	VO	HB	VO	VO	VO	VO	HB	VO	VO
Oxygen Index	D2863	%O ₂	31	32	-	32	37	35	33	-	46.5	39
Glow Wire Test	VDE 0471	°C	850	960	650	850				960	750	
	Part 2-1/IEC		(1.0)	(1.0)	(1.0)	(1.0)				(1.2)	(1.0)	
	695-2-1											
Dielectric	1 Khz	D150	4.0	-	-	-	4.5	4.2	4.1	4.4	3.8	3.5
Constant	1 Mhz	D150	3.9	-	4.5	-	4.5	4.2	4.1	4.0	3.8	5.5
	1 Ghz	D150	3.6	-	3.7	-	4.5	4.2	4.1	-	3.8	3.5
Comparative Tracking Index*	D3638	volts	-	575	600+	575	250	-	-	600+	200	167
Arc Resistance	D495	Seconds	-	-	135	-	-	-	117		34	-
Volume resistivity	D257	Log (ohm-cm)	13	14	15	14	10	15	15	15	15	16
Thermal expansion -50°C - 200°C	D696	cmcm/°C X 10 ⁻⁵	7	6-7	2.3	2-3	5	2.5	2.5	-	-	1.4
Heat deflection temperature	D648	°C	90	135	249	250	284	208	224	260	260	295
Water Absorption 24 hours	D570	-	1.2	1.15	0.7	0.75	0.9	0.05	0.05	0.4	-	0.002
Specific Gravity	D792	KGM-3	1.14	1.17	1.38	1.38	1.68	1.72	1.67	1.47	1.67	1.47
* CTI may vary depending on colour and grade specified.												



UL Approved Moulding Materials

MILES · PLATTS

Group	Miles Platts Material Code	Specific * Material Code	Manufacturer	Trade Name	UL 94 Flammability Rating	UL Yellow Card Number	Recommended ** Max. System Temp.
Nylon 66/6							
30% Glass Reinforced	GNN	T30	Rhodia	Technyl B218V30	HB (0.75)	E44716	Class B 130oC
Nylon 66							
30% Glass Reinforced	GNN	Z30	DuPont	Zytel 70G30 HSL	HB (0.75)	E41938	Class B 130°C***
25% Glass Reinforced	FGN	V25	Rhodia	Technyl A20 V25	V0 (0.75)	E44716	Class B 130°C
Unreinforced	FUN	U20	Rhodia	Technyl A20	V0 (0.75)	E44716	Class B 130°C
Unreinforced	UNN	101	DuPont	Zytel 101L	V2 (0.71)	E41938	Class B 130°C
Unreinforced	UNN	10F	DuPont	Zytel 101F	V2 (0.71)	E41938	Class B 130°C
High Temperature Nylon							
35% Glass Reinforced		HTN	DuPont	Zytel HTN 51G35HSL	HB (0.85)	E41938	Class H 180°C
35% Glass Reinforced		FTN	DuPont	Zytel HTN FR51G35L	VO (0.81)	E41938	Class H 180°C
Nylon 46							
30% Glass Reinforced		FST	DSM	Stanyl TE250 F6	V0 (0.35)	E47960	Class H 180°C
Unreinforced		F5U	DSM	Stanyl TE350	V0 (0.75)	E47960	Class B 130°C
PET Polyester							
30% Glass Reinforced		FR3	DuPont	Rynite FR530L	V0 (0.35)	E41938	Class N 200°C
PBT Polyester							
30% Glass Reinforced		ARN	DSM	Arnite TV 4260S	V0 (1.5)	E47960	Class F 155°C
30% Glass Reinforced		261	DSM	Arnite TV 4261	HB (0.71)	E47960	Class F 155°C
30% Glass Reinforced		FVX	GE Plastics	Valox 420 SEO	V0 (0.75)	E45329	(To Be Confirmed)
PPS Polyphenylene Sulphide							
40% Glass Reinforced		FRY	Chevron Phillips	Ryton R-4 02 XT	V0 (0.51)	E54700	Class N 200°C
LCP Liquid Crystal Polymer							
30% Glass Reinforced		FZN	DuPont	Zenite 6130L	V0 (0.38)	E41938	Class R 240°C
*****		***	Sumitomo Chemical Co Ltd	Sumikasuper E4008(k)	V0 (0.3)	E54705	Class F 180°C +
PF Phenolic							
*****		***	Sumitomo Bakelite Co Ltd	Sumikon PM-9630	V0 (0.16)	E41429	Class F 155°C +
*****		***	Sumitomo Bakelite Co Ltd	Sumikon PM-9630	V0 (0.16)	E41429	Class F 155°C +

The above list reflect the materials used over our standard ranges and the more popular grades used on custom designed mouldings. Not all of these materials are offered as standard on all products, details of standard materials for products are shown on the catalogue page. Should alternative materials to the standard material be required (including materials not shown) a request to our sales department should be made prior to ordering, minimum order quantities, and machine setting up charges may apply.

GNN is Miles Platts material code for a 30% Glass Reinforced Nylon to a flammability rating of UL94HB – We currently use the materials as listed above, but we reserve the right to use an alternative material of the same or better characteristics should quality or commercial reasons arise.

UNN is Miles Platts material code for an Unreinforced Nylon (used primarily for Insulation covers and potting boxes) to a flammability rating of UL94V2 – We currently use the materials as listed above, but we reserve the right to use an alternative material of the same or better characteristics should quality or commercial reasons arise.

FGN is Miles Platts material code for a Glass Reinforced Nylon to a flammability rating of UL94V0 – We currently use the materials as listed above, but we reserve the right to use an alternative material of the same or better characteristics should quality or commercial reasons

FUN is Miles Platts material code for an Unreinforced Nylon (used primarily for Insulation covers and potting boxes) to a flammability rating of UL94V0 – We currently use the materials as listed above, but we reserve the right to use an alternative material of the same or better characteristics should quality or commercial reasons arise.

Specific materials used for GNN, UNN, FGN & FUN can be ordered under their specific material codes, i.e. if only Technyl B218 V30 is required then the specific material code T30 should be used – ordering specific materials other than GNN, UNN, FGN or FUN can though mean an increase in the component price. Information on prices and availability should be discussed with our sales office.

* For specific material requirements use the Specific material code. Where a specific material grade is required for third party accreditation, this must be agreed in advance with Miles Platts. Please ensure that the required material is clearly indicated on your order.

**Recommended maximum system temperature classification may have been obtained by means of testing through UL 1446 or interpretation of IEC60085 / IEC 61587, please contact our technical office for further information.

*** DuPont Zytel 70G30HSL have now various Class F 155oC Systems available.

Many systems have been recognised by UL1446. Many materials have been incorporated into systems class ratings up to Class R 240oC. Complete details of these systems and information of how to apply them are available from our Technical sales department.

The materials listed above are those which we currently use on a regular basis, a further wide range of materials can be used if required, please contact our Technical sales department for further details.

Responsibility For Selection

The responsibility for the selection of appropriate materials and systems lies with the manufacturer of the electro-technical product. Only experience or adequate acceptable tests provide basis for assigning rational temperature limits for the insulation. Service experience is an important basis for the selection.

Author J.Weston
Last update 07/10/03

Most products are available direct from stock with same day despatch
- please contact sales for details

Technical Specification for A2068

Electrical Specification

Input 230V 50/60 Hz

Output 2 x 24V at 0.416A per winding

VA rating 20VA total

NLV 26.8V AC

Imag typical 35mA

Construction

Fully shrouded chassis mounting transformer using Flame retardant Vo bobbin

Termination, flat spade type with small hole, suitable for soldering and compatible with 110 fast on connectors

Terminal covers available

Finish Clear varnish dip

Fixing. Two hole fixing, one either side of the clamp on 74mm spacing.

Material

Bobbin** Miles Platt 35 x 1 SDS Part No S03000 FGN NAT, 25% Glass Reinforced Nylon to UL94V0

Shrouds** Miles Platts 35 x 1" Full Part No S03200 FUN NAT Unreinforced Nylon to UL94V0

Lams Pattern 35 0.50"

Wire Solderable 155°C Enamelled copper wire, Class F (155°C)
Modified Polyurethane UL File No E45523 (M)
QSE1. BS6811-3.9

Clamp CK35-16 Transteel

Varnish** Clear Dip AEV Ultimeg 2000 ClassF (155) 372C

** Data sheets are attached

Designed manufactured and tested in accordance with BS3535*, EN60950* and EN60742*.

* see below

* Additional information on compliance

1/ Additional fuse protection may be required.

2/ Secondary windings should not be wired in series

