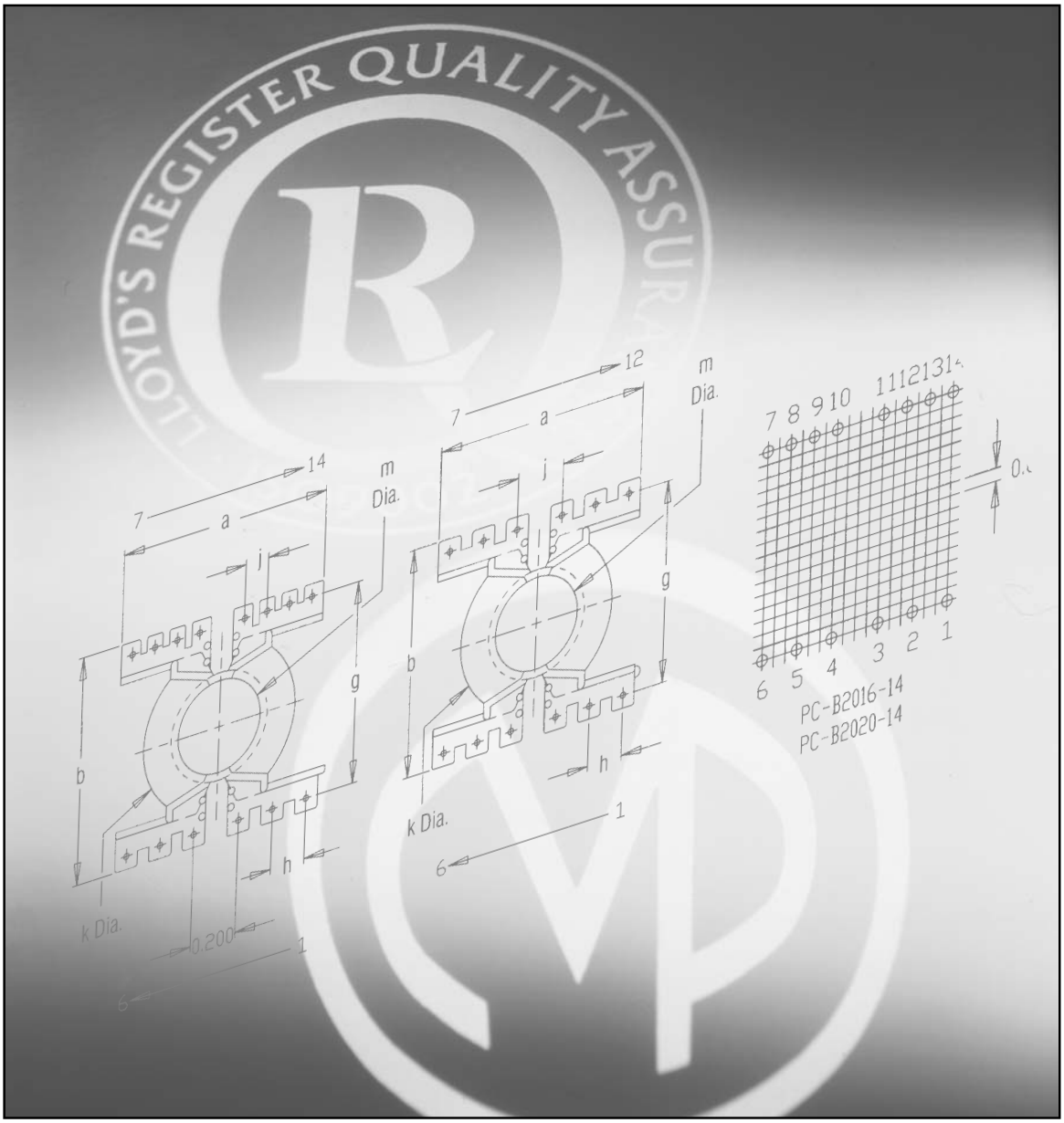
MILES · PLATTS

- 3D CAD Design service
- Material selection guides
- Mouldflow analysis capability
- Stereolithographic (SLA) modelling
- SLS (Selective Laser Sintering) rapid prototyping
- RoHS Statement



For further technical information please contact
sales@milesplatts.co.uk or www.milesplatts.co.uk

UL RECOGNISED
MOULDER - E176491

MILES · PLATTS

Miles-Platts standard moulding materials are:

UNN	Unreinforced Nylon 66
GNN	Glass reinforced Nylon 66
FUN	Flame retardant Unreinforced Nylon
FGN	Flame retardant Glass reinforced Nylon
FR3	PET Polyester for ETDs

This product guide is based upon the above standard materials. Other materials are available for any product subject to minimum usage quantities - please contact sales for details.

Moulding Materials

Miles-Platts have the capability to process an extensive variety of engineering thermoplastic materials. Giving the electrical / electronics engineer the flexibility to select the most appropriate specification to achieve a cost effective solution. Miles-Platts work closely with the 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 worldwide 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 recommended rating of Class B (130˚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.

Liquid Crystal Polymer - LCP

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

Thermoplastic Polyesters - 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.

Frame VA Ratings

Frame VA capabilities shown on standard bobbin tables for laminated core transformers are based on an approximate 70˚C temperature rise for single section bobbins and should only be taken as a design guide. The actual output VA that can be achieved will depend upon the utilisation factor of the available bobbin winding area for the wire sizes, screens and interwinding insulation used in the design.

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
Flexual 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 Modulus	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	VDE0471 Part 2-1 / IEC 695-2-1	˚C	850 (1.0)	960 (1.0)	650 (1.0)	850 (1.0)				960 (1.2)	750 (1.0)	
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	3.5
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.

For further technical information please contact sales
Tel: +44 (0) 116 262 2593 Fax: +44 (0) 116 253 7889

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
Unreinforced	–	A63	Frisetta	Frianyl A63V2	V2 (0.38)	E86034	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
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-9820	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 availalable from our Techincal 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

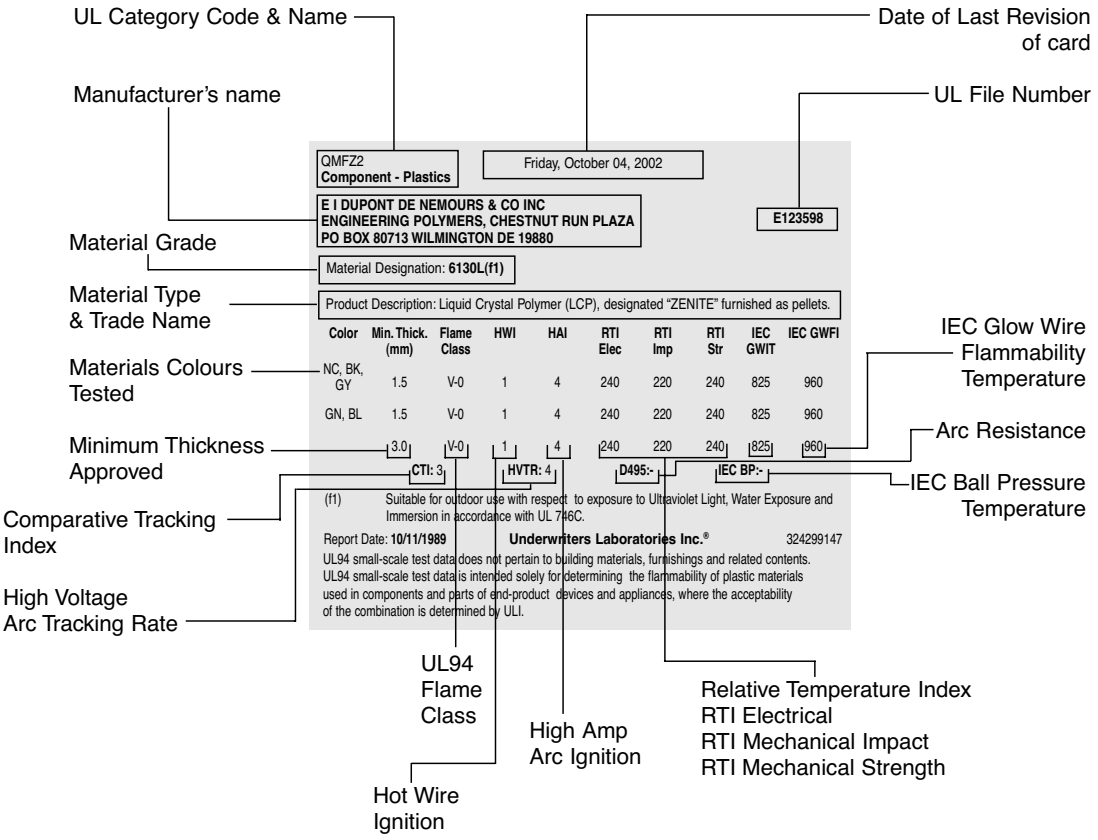
The responsibility for the selection of appropriate materials and systems lies with the manufacturer of the electro-technical product. Only experience or adequate acceptable tests provide basis for assigning rational temperature limits for the insulation. Service experience is an important basis for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

MILES · PLATTS

Layout of the UL Yellow card



Approval of engineering plastics

UL approval is generally essential before equipment can be sold in the United States. Approval tests on equipment are lengthy and expensive. The operation can however be greatly simplified if UL-approved materials, i.e. appearing on the yellow cards, are used. Engineering plastics manufacturers are therefore having an increasing number of materials approved., to make things easier for users.

Approval covers three aspects:

- flame class, governed by the UL 94 standards,
- temperature indices, governed by the UL 746 B standard,
- basic properties, determined under the UL 746 A standard.

The results are given for each material, in each colour, and for a specific thickness, which is the actual thickness of the specimen tested. This means that comparisons between materials are valid only if the thickness is the same.

MILES · PLATTS

Miles Platts achievement as a UL Recognised Moulder

QMMY2.E176491 - January 20, 1997

Fabricated Parts - Component

MILES-PLATTS LTD
39 Abbey Park Road
Leicester LE4 5AN England
United Kingdom

E176491

Fabricated plastic parts, Recognition based on material traceability, UL assigned designation A1753.

Marking: Company name and UL assigned designation on part, shipping carton, or spec sheet in shipping carton.

When using a moulded bobbin in a UL1446 insulation system a UL recognised moulder must manufacture the bobbin to ensure full traceability of materials.

RoHS Statement

All standard moulding materials used by Miles-Platts are certified by the relevant manufacturer to comply with European directive 2002/95/EC (RoHS). Please refer to our website for further information.

Miles-Platts provide lead-free plating on all terminals & wire.
Please consult technical sales for any specific requirements or information.

MILES · PLATTS

" We develop product and processes through innovation and technology. "

" Wir entwickeln Erzeugnisse und Verfahren durch Innovation und Technologie. "

" Nous développons des produits et des procédés par l'innovation et la technologie. "

" Desarrollamos los productos y los procesos mediante la innovación y la tecnología. "