Technical Information

CP-Polymer-Technik GmbH & Co. KG

WELLAMID 6600 glass fiber reinforced, UL 94 V-0

Rev 002 AS/ 01.12.2005

1. WELLAMID grades

WELLAMID 6600-PA66-GV 20 HWV0CP
WELLAMID 6600-PA66-GV 25 HWV0CP
WELLAMID 6600-PA66-GV 30 HWV0CP

2. Material description, properties and characteristics

Above mentioned WELLAMID qualities are glass fiber reinforced nylon grades for injection molding purposes. They are used to manufacture parts in particular for the electrical and the automotive industry. The compounds are based on a Nylon 66/6 copolymer and offer following characteristics:

- V-0 according to UL 94 (0,8 – 3,2 mm)
- Halogen and red phosphorus free
- high CTI value (550-600)
- low smoke toxicity and smoke corrosivity
- good mechanical properties
- high heat distortion temperature
- good processing properties
- easy to colour

For all mentioned WELLAMID grades the EC safety data sheet acc. to 91/155/EWG is valid.

3. Drying and processing information

During the packaging of WELLAMID the moisture content of the material is measured and revealed in an inspection certificate. In most cases WELLAMID grades can be processed without any pre-drying. Please note, that if Nylon has been overdried, processing problems and surface defaults might occur.

Due to our current experience, the following advice can be basically used for the molding of many parts:

Melt temperature	260 - 290° C (do not exceed 300° C)
Barrel temperature settings (feeder...nozzle)	265 / 270 / 275 / 275 / 270 °C
Screw rotation speed	medium
Back pressure	low
Flow front speed	medium to high (limited by the appearance of diesel effect, burned spots or splay
Mold surface temperature	80 – 100 °C
Hold pressure	medium to high (depends on runner and part design

To prevent a degradation of the flame retardant, a lower melt temperature is advantageous. However, high shear forces i.e. caused by narrow gates, high screw rotation speeds and/or high back pressures must be avoided.

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For all mentioned WELLAMID grades the EC safety data sheet acc. to 91/155/EWG is valid.

3. Compound properties and advantages

Above mentioned qualities were in particular developped to meet the most stringent requirements for modern flame retarded compounds in the E&E and automotive industry. Halogenated and red phosphorous containing substances are not used which ensures environmental compatibilty. WELLAMID 6600-PA66-GV (20 – 30) HWV0CP meets the requirements of the WEEE and RoHS directives. In terms of fire performance these grades dispose of following characteristics:

Property	Standard	Value
Flammability	UL 94, IEC 707	V-0 (0.8 – 3.2 mm)
Glow wire test (GWFI)	IEC 60695-2-12	960 °C (1 mm)
Oxygen index (LOI)	ISO 4589	32 %
Burning rate (US-FMVSS)	ISO 3795	passed

In contrast with traditional products the halogen free WELLAMID grades have extremely low levels of smoke density and smoke toxicity. In addition, as a result of the substitution of halogen-containing additives improved electrical properties are obtained (CTI (comparative tracking index) 550 – 600, IEC 112). WELLAMID grades are easy to process and are capable of being colored in bright shades (e.g. RAL 7035). A clear advantage to red phosphorus containing materials. In contrast with halogenated compounds WELLAMID qualities are less corrosive during processing.
Besides the fire performance injection molded parts dispose of several characteristic values typical for glass fibre reinforced nylon grades such as high mechanical strength, rigidity and toughness, good electrical isolation properties and resistance against several chemical media.
Guide values concerning mechanical, thermal and electrical data can be found in our technical data sheets. They are valid for natural colored materials. Coloration might have an impact on the corresponding properties.

4. Applications

Characteristic applications for WELLAMID grades are parts for the E&E and automotive industry. In these areas the compounds can be used for the production of articles such as switching units, coil cores, housings and circuit breakers.

5. Drying and processing information

During the packaging of WELLAMID the moisture content of the material is measured and revealed in an inspection certificate. In most cases WELLAMID grades can be processed without any pre-drying. Please note, that if Nylon has been overdried, processing problems and surface defaults might occur.

Due to current experience, the following advice can be basically used for the molding of many parts.

Melt temperature	270 - 290° C (do not exceed 300° C)
Barrel temperature settings (feeder...nozzle)	265 / 270 / 275 / 275 / 270 °C
Screw rotation speed	medium
Back pressure	low
Flow front speed	medium to high
Mold surface temperature	80 – 100 °C
Hold pressure	medium to high

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In many cases a good surface finishing can be reached by rising the melt and mould temperature. To prevent a degradation of the flame retardant, a lower melt temperature is advantageous. High shear forces i.e. caused by a higher screw speed or a higher back pressure should be avoided.

6. Recycling / Disposal

Single-sort wastes without impurities are suited to be reprocessed. However, certain conditions have to be considered.
Non single-sort wastes and qualitites with impurities should be recycled by means of thermal utilization.
Further information are available on request.

Ritterhude, 30.04.2004
AS

Technical Data Sheet

CP-Polymer-Technik GmbH & Co.KG

WELLAMID 6600-PA66-GV 25 HWV0CP

PA 66/6, 25% glass fiber reinforced,UL-approbation V-0, heat stabilized, improved properties

Properties	Unit		Method of testing	dry	moist
Mechanical properties					
Tensile strain at break	5 mm/min	%	ISO 527	3	6
Tensile stress at break	5 mm/min	MPA	ISO 527	130	95
Tensile modulus		MPa	ISO 527	9200	7200
Flexural modulus		MPa	DIN 52457	8100	
Charpy-impact strength	+23 °C	kJ/m²	ISO 179	75	100
	- 40 °C	kJ/m²	ISO 179		
Charpy-notched impact strength	+23 °C	kJ/m²	ISO 179	10	18
Thermal properties					
Melting temperature		°C	Kofler	240	
Heat deflection temperature	HDT/A 1,8 MPa	°C	ISO 75	225	
	HDT/B 0,45 MPa	°C	ISO 75	235	
Vicat	B/50	°C	ISO 306	230	
Coeffi. of linear thermal expansion		10^{-4}/K	DIN 53752	0,25	
Electrical properties					
Dielectric constant at	1 MHz		IEC 250	4	6
Dissipation factor at	1 MHz	10^{-4}	IEC 250	150	1500
Electric strength		kV/ mm	IEC 243-1	40	35
Comparative tracking index	CTI	step	IEC 112	550	
Volume resistivity		Ω cm	IEC 93 ISO 3915*	E15	E 12
Surface resistivity		Ω	IEC 93 ISO 3915*	E 12	E 10
Other properties					
Density		g/cm³	ISO 1183	1,37	
Flammability UL 94	0,75 mm	classific.	UL 94	V-0	
Flammability UL 94	1,50 mm	classific.	UL 94	V-0	
Flammability UL 94	3,00 mm	classific.	UL 94	V-0	
Moisture absorption	23° C / 50% r. F.	%	DIN 53495	2-2,5	
Molding shrinkage	4 mm wall thickn.	%		0,2/0,7	

Rev.: 002 * Norm for testing of conductive synthetic material $E = 10^X$

The values given have been established on standardised test specimens at room temperature. The figures should be regarded as guide values only and not as binding minimum. Kindly note that under certain conditions the properties can be affected to a considerable extent by the processing conditions, the design of mould and the colouring.

CP-Polymer-Technik GmbH & Co.KG 22.07.03 UZ/FE

Technische Information **WELLAMID 6600-PA66-GV (y) HWV0CP / UL-Listung**

CP-Polymer-Technik GmbH + Co. KG

QMFZ2 Component - Plastics | Monday, April 12, 2004 | E63957

CP-POLYMER-TECHNIK GMBH & CO KG
BERLINER STR 3-5 27721 RITTERHUDE GERMANY

Material Designation: **WELLAMID 6600-PA66-GV (y) HWV0CP**

Product Description: Polyamide 66 (PA66), furnished as granular material.

Color	Min. Thick. (mm)	Flame Class	HWI	HAI	RTI Elec	RTI Imp	RTI Str	IEC GWIT	IEC GWFI
ALL	0.80	V-0	-	-	-	-	-	-	-

CTI: - **HVTR:** - **D495:** - **IEC Ball Pressure (°C):** -

Dielectric Strength (kV/mm): -
Volume Resistivity (10ˣohm-cm): -
Dimensional Stability(%): -
ISO Tensile Strength (MPa): -
ISO Flexural Strength (MPa): -
ISO Heat Deflection (°C): -
ISO Tensile Impact (kJ/m²): -
ISO Izod Impact (kJ/m²): -
ISO Charpy Impact (kJ/m²): -

(Y) May be replaced by a two digit number between 20 and 30, inclusive, indicating glass fiber percentage.

Report Date: 7/1/2003 Underwriters Laboratories Inc®

UL94 small-scale test data does not pertain to building materials, furnishings and related contents. UL 94 small-scale test data is intended solely for determining the flammability of plastic materials used in components and parts of end-product devices and appliances, where the acceptability of the combination is determined by ULI.