AQUAMID

66/6V0M

PA66/PA6, flame retardant, halogen and phosphorous free, for injection moulding.

TYPICAL PROPERTIES	CONDITION	STANDARD	UNIT	VALUE
PHYSICAL				
Density		ISO 1183	[g/cm³]	1,18
Mould shrinkage		ISO 2577	[%]	1.2 ÷ 1.5
MECHANICAL				
Tensile modulus	1 mm/min	ISO 527	[MPa]	3400
Tensile strain at break	50 mm/min	ISO 527	[%]	-
Tensile stress at yield	50 mm/min	ISO 527	[MPa]	75
Izod impact notched	+23 °C	ISO 180/1A	[kJ/m²]	4,5
Izod impact unnotched		ISO 180/1A	[kJ/m²]	72
THERMAL				
Heat distortion temperature	0.45 MPa	ISO 75	[°C]	-
Heat distortion temperature	1.80 MPa	ISO 75	[°C]	70
Softening point Vicat	50°C/h - 50N	ISO 306	[°C]	215
ELECTRICAL				
Volume resistivity		IEC 93	[Ω·cm]	10^{15}
Surface resistivity		IEC 93	[Ω]	10^{13}
Comparative tracking index	Solution A	IEC 112	[V]	600
FLAMMABILITY				
Flammability	0.4 mm	UL 94	[Class]	V0
Glow wire flammability index	1 ÷ 3 mm	IEC 60695-2-12	[°C]	960
FMVSS 302		FMVSS 302	[mm/min]	< 100

Test run at 23°C if not differently specified, DAM state (dry as moulded).

All data are subject to the producer's disclaimer. The values in this data sheet have to be considered typical of our standard production but not binding for the application of the moulded part.

PROCESSING CONDITIONS:

Predrying temperature/time	: 75÷85°C/4÷6h
Recommended melt temperature	: 260÷290 °C
Recommended mould temperature	: 60÷90 °C

These parameters are typical of the product but they have to be related to the type of machinery used and to the type of moulded part.

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AQUAFIL ENGINEERING PLASTICS

Informations about injection moulding

Drying process

The material is delivered with a humidity rate lower than 0.2%, however it is advisable to dry the material before moulding.

Use of material from regrind

Unfinished manufactures or agglomerates can be grinded and reprocessed. It is very important to bear in mind some factors that can affect the moulding process or the final piece:

- o Humidity
- o Powder
- o Contamination
- o Changing in colour
- o Reduction of mechanical properties

It is advisable to use not more than 20% of material from regrind.

Temperature

Mould, cylinder and spindle temperatures, written on the data sheets, are given as information to start the production (moulding process) and can be considered as typical values for most applications. The final piece geometry and the shape of the mould might need higher spindle's temperatures: in these cases it is very important that the time of permanence of the material at such temperatures is as short as possible.
A too much high spindle temperature might cause colour degradation or colour changing when using pigmented resins.

Time of permanence

This is the time the material stays in the mould at processing temperature. This time has to be as short as possible (for the PA it should be about 3-5 minutes). This time can be calculate as follows:

$$Tr = \frac{8 \cdot D}{Lpl} \cdot Tc$$

where:

Tr = time of permanence
D = screw diameter
Lpl = injection stroke
Tc = cycle time

Injection speed

The injection speed is calculate on the base of the complexity of the good produced, the quality of the mould and the injection system. At the beginning of the production process it is advisable to use low speed. It is still advisable to use high speed in the following cases:

- Avoiding a spindle solidification before the whole filling of the piece
- Reduction of the visibility of the junction lines
- Reduction of the orientation of the material in the mould

Changing the speed during the filling, following effects are possible:

- Low speed at the beginning of injection
  - o Reduces the deformation
  - o Reduces the "jetting" effect
  - o Reduces the number of opaque areas close to the injection spot
- Low speed at the end of injection
  - o Reduces the variation of the features of the piece
  - o Reduces the air compression avoiding burnings

Injection pressure

The injection pressure has always to be set so as to get a complete and satisfactory piece. The pressure to use, that at the beginning of the cycle has to be as low as possible, depends on different factors such as:

- Type and grade of the material
- Quality and finishing of the mould
- Type of injection spot
- Material viscosity

Post pressure

The post pressure or preservation pressure, acts for compensating the volumetric shrinkage of the melt material during the cooling phase in the mould. The duration of the application time depends on the solidification time in the injection spot:

- A not sufficient post-pressure could cause:
  - o Suck-marks
  - o Hollows
  - o Higher shrinkage
  - o Inconstant weight of the pieces
  - o Dimensional variation
- An excessive post-pressure could cause:
  - o Extraction problems
  - o Distortions
  - o Internal tensions (in the piece)

A lowering of the post-pressure at the end of the application time allows to:

- o Reduce the internal tensions (in the piece)
- o Reduce the distortions

Since the post-pressure is related to the mould and for this reason affected by the wall thickness, quality of the surface and type of injection spots, it is always hard to give precise indications about the level of post-pressure to use. Usually the level is between 30% and 60% of the injection pressure.

Back pressure

The back pressure has the following aims:

- o Compacting the melt material expelling air
- o Increasing the cut-stress on the material

This second point is very important when using masterbatches for colouring.

Usually the back pressure applied is between 3 and 5 bar. Be extremely careful by moulding resins and self-extinguishing polymeric alloys (reinforced with glass fibres and/or coloured). Generally the back pressure should not be higher than 10 bars.

Temperature of the mould

A mould, thermo-regulated in the right way, allows a cycle optimisation getting an high and constant quality of the piece. The temperature of the mould affects followings parameters:

- o Surface of the piece
- o Dimension
- o Shrinkage
- o Distortion
- o Speed and quality of the crystallization
- o Internal tension

Usually a cold mould is the main reason of problems in filling the mould and causes distortion in the pieces.