



4MID PROCESS INFORMATION SHEET

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General processing instructions

Drying

4MID nylon is delivered in typical cylindrical pellet form, in special moisture-proof packaging. The recommended drying conditions for 4MID are between 80° and 110°C (175° and 230°F) for 2-4 hours. However, if moisture is absorbed due to improper storage, e.g. if the packaging is not kept sealed, longer drying times may be necessary. Care should be taken when prolonged drying times are employed so that the dryer temperature is properly maintained, as hot spots in the dryer may lead to yellowing. In all cases, desiccated air dryers yield the best results.

Startup and shutdown

The procedure for starting up is consistent with standard practice adopted by the plastic industry. The barrel and nozzle heaters are set to ensure the necessary stock temperature (typical values are presented in Table 1). As a precaution, confirmation of the melt temperature during the heat-up phase should be checked by measuring melt during open atmosphere discharge. Final optimization of the processing conditions can be adjusted to meet the product requirements.

If production is interrupted for some length of time, or the machine has to be shut down, any melt in the barrel should be purged whenever possible, and the heaters switched off. On restarting, the previously optimized processing conditions can be reset after the preliminary running-in phase.

Safety precautions during processing

The following information provides general precautions for processing 4MID nylon. For specific information, please refer to the product Safety Data Sheet (SDS).

4MID will not give off any toxic vapours provided that it is not exposed to temperatures over 310°C (590°F) for an extended period of time and sound industrial practices are followed.

In common with all other thermoplastic polymers, 4MID decomposes if it is subjected to excessive heat (e.g., if the injection temperature is too high or the residence time in the barrel is too long). The product can be degraded if it is allowed to stand in the barrel and the heaters are not switched off or if the plasticizing unit is cleaned by burning off any residues.

In cases of this nature, the mouldings display discoloration, charred particles and streaks.

Any product that has decomposed must be purged from the barrel. If this is not done, gas pressure in the barrel may

build up, particularly if a nozzle shut-off device is used which results in the gas trying to escape suddenly through the nozzles or hopper.

Safety guidelines should be practiced at all times, such as installation of guards and shields and proper ventilation systems. The work area should be well ventilated, preferably by an exhaust fan installed above the barrel.

4MID compatibility

4MID A & B resins may be mixed with one another to a certain extent and under certain circumstances.

For example, small amounts of 4MID B may be added to glass-reinforced 4MID A products to facilitate processing. However, excessive differences in viscosity should be avoided due to the limited homogenization capacity of the processing equipment.

4MID is generally immiscible with most other thermoplastics, including polystyrene and ABS. The presence of small quantities of these materials can act as contaminants and cause problems, e.g., in the form of delamination, particularly in the vicinity of the sprue, or as an impairment to impact resistance.

If a changeover is to be made from 4MID to another thermoplastic or vice versa, it is advisable to purge the barrel with high molecular weight polypropylene or polyethylene (HDPE) of approximately 10 melt index or a suitable compound with a cleansing action. Glass-reinforced 4MID resins also exert a good cleansing effect. Purging the barrel with HDPE is also recommended before dismantling the plastification unit for any reason.

Reprocessing

4MID nylon waste obtained from sprues, rejects, etc. can be ground and reprocessed in limited amounts, i.e., up to about 10%, provided that it has not been contaminated or previously degraded. Reground glass-reinforced 4MID is particularly sensitive to moisture. Even if the regrind has been stored in a dry place, it should be dried again immediately before processing because any moisture absorbed could lead to molecular degradation during processing. Mixing regrind with virgin pellets may alter the feed and flow characteristics, demoulding, shrinkage, and, in particular, the mechanical properties. Therefore, only virgin pellets should be used for moulding high performance engineering parts.

Shrinkage

Shrinkage is influenced by process parameters, such as mould temperature and pack pressure, and by design considerations, such as part thickness and geometry.



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Table 1 Typical processing temperatures and flow characteristics in the injection moulding of 4MID nylon

4MID	Injection temperature range		Mould temperature range	
	°C	°F	°C	°F
Unreinforced				
3A20000	280-300	535-575	40-60	104-140
3B20000 B65 BK70 N	250-270	480-520	40-60	104-140
	250-270	480-520	40-60	104-140
Reinforced				
3A22130	280-300	535-575	80-90	176-194
3B22130	270-290	520-555	80-90	176-194

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