POLYMER CHIP DRYING

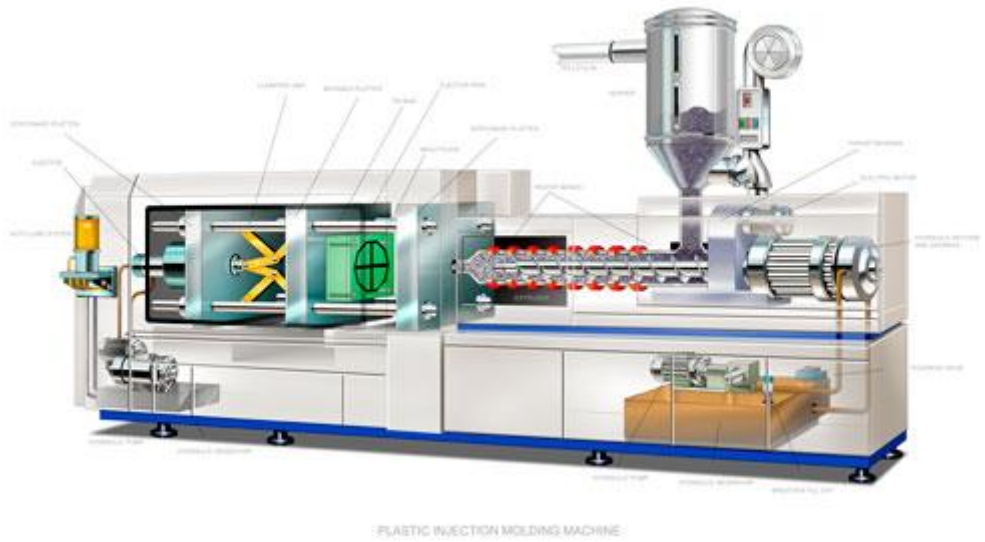
Polymer chips, such as PET, are the basic feed stock to plastics injection molding and extrusion machines. Before the process begins the chips must be dried in order to reduce free moisture content and improve the quality and appearance of the finished product. Careful control of this drying process is essential to product quality with respect to its strength and its appearance.

In the solid form, PET is very hygroscopic, which means it absorbs moisture from the atmosphere until the chips typically contain as much as 0.6 % water by weight. In order to attain a molded product of the right quality the water content must be reduced to a level of about 0.003 % by weight before the chips are heated prior to molding. This is because if chips containing more water than this were heated the polymer would hydrolyze, its molecular weight would be reduced and its physical properties would be affected.

Polymer chip feed stock is therefore routinely dried in a primary feed hopper before heating to melt temperature before being used in the injection molding or extruding machine. Drying is carried out by passing heated air, which has previously been dried by a desiccant dryer, through the chips for a defined period of time. The air, typically has a dewpoint below -40 °C. Following this process, the chips are transferred into another hopper which feeds the molding machine directly.

The drying process is not infallible and if it fails it may be some time before falling product quality, caused by feed stock which has a higher water content than permitted is noticed. This kind of failure can be very expensive if finished product of reduced quality is passed on further in the production chain in which the molded part is an essential element.

Failures may be caused by, amongst others; blocked air filters, return air cooling, heater failure, leakage of ambient air.



Plastics driers are therefore best monitored to ensure that low dewpoint is maintained. This can be done continuously on each drier by installing a STORK DewCom transmitter with a display monitor and making use of its alarm features.

Alternatively, a lower cost solution is to spot check each drier at intervals using a **STORK DEW*Ranger*** portable dewpointmeter. This easy to use hygrometer allows logging of measurements for each drier, with each station identified so that after downloading to a pc, a full record exists for an entire production facility containing many molding and extruding machines.

The 5 micron sintered stainless steel filter, fitted as standard to the **DEW*Com*** transmitter, and also used in the **DEW*Ranger*** portable, protects the detector from particulate contamination such as drier desiccant or polymer dust.

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