

Manifold Cleaning

When using an injection mould tool with a Hot Runner System it is sometimes necessary to clean the system due to misuse.

Typical examples of situations that result in the manifold requiring cleaning are as follows:

Manifolds Left With Power On For Extended Periods

Many older moulding machines will not power down the heaters when the machine is shut-off, so manifolds are left to overheat. This will result in two things:

1. The overheated plastic is significantly reduced in viscosity causing the resin (weepage) to migrate into tooling clearances.
2. The tooling overheats, causing the manifold to over-expand and hob sealing surfaces, reducing the ability to seal when the manifold temperature is brought back down into range.

If the plastic resin that is being processed is sensitive to heat, an engineering grade or a filled material then serious overheating can result in the material crystallising inside the melt channels of the Hot Runner System and is unable to be re-melted.

Process Habits

Failing to reduce shot size when blocking cavities, not using back pressure when filling empty manifolds, running temps to high, reversing valve pin sequence and forgetting to turn on the cooling are just a few of several processing conditions that contribute to leaking systems.

Lack of Preventative Maintenance

Worn valve pins and bushings seem to be a major contributor, particularly where manifolds are long overdue for thorough maintenance. Also lethal are hobbled manifolds, spacers and other tooling where combined dimensions are under the recommended cold stack height. This also includes stressed/stretched bolts.

Cleaning Processes

There are many processes available to assist you with thorough cleaning of a manifold. Depending on the complexity of your manifold it is often impossible to properly clean the channels inside a manifold simply by removing plugs and removing the plastic.

Some of these cleaning processes are explained on the following page.

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smart hot runner solutions
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Ultrasonic cleaners

Ultrasonic cleaners drive ultrasound waves into a liquid creating millions of microscopic bubbles within the liquid. This ultrasonic 'cavitation' provides the cleaning energy, and the 'soil' is literally driven off the part surfaces which are immersed in the liquid. The liquid medium is usually water (although more aggressive solvents are available for Hot Runner manifold cleaning), with an inexpensive industrial detergent type cleaning agent added. The process is fast, has very low running costs, and is environmentally friendly. Ultrasonic's provides superior precision cleaning compared to other processes. It works on virtually all rigid surfaces - and is commonly used by jewellers, hospitals, dentists, and in electronics, automotive, and aircraft industries. New applications for ultrasonic cleaning are continuously being found. A major advantage of ultrasonic cleaning is its ability to penetrate tiny cracks and crevices, often without the need to dismantle parts.

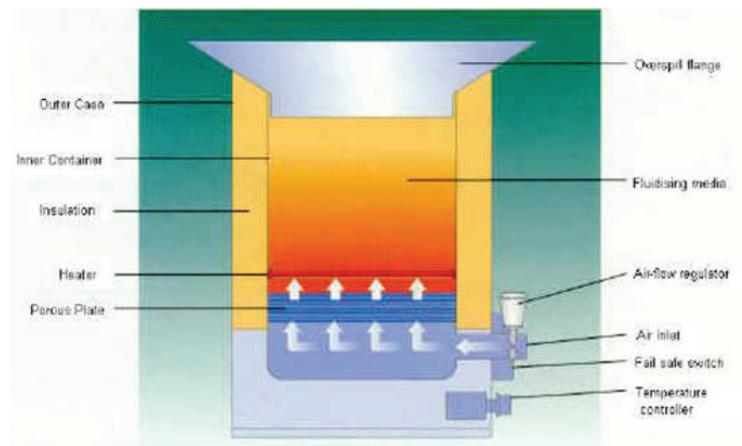
You will need to speak to the supplier to ensure that the equipment you are using is capable of internal cleaning of resin from the melt channels as some units are not able to use the required liquid solvents to remove plastics.



Fluidized Baths

The Fluidized Bath is a thermal process that degrades the plastic residue into carbon which comes away from the bath as CO₂. Fluidized Baths offer outstanding advantages of being dry, inert, and noncorrosive as well as being non-abrasive to anything placed in them.

Aluminium oxide particles serve as the heat transfer medium and have no affect on shape or size of immersed objects. This medium consists of a loosely-packed mass of solid particles which are agitated by a vertical flow of gas or compressed air. In the fluidized state, the aluminium oxide particles become mobile and the bath as a whole displays many of the properties of a liquid. Visually when fluidized the aluminium oxide looks like liquid boiling vigorously or molten lava bubbling. The bed of levitated particles presents a very large surface area through which heat is transferred to immersed objects. Here you can see the cutaway diagram of a fluidized bath.



Purging Compounds

Purging additives and compounds can be used to remove degraded material from inside your Hot Runner System. By visiting the website below you can see details of one brand (there are many available) and some useful procedures.

<http://www.asaclean.com/purging-procedures/injection-molding/hot-runner-cleaning.html>

The following links are to companies that offer Hot Runner cleaning services. Mastip New Zealand does not currently have access to this technology. If your system requires thorough cleaning then locating an agent (such as the companies below) local to your customer would be the best solution.

<http://www.thermal-tech.com/index.html>

<http://www.polymercleaning.com/eng/>

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