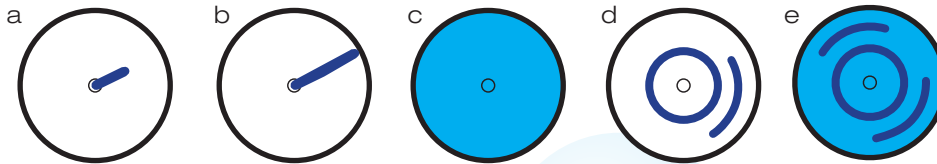


Tips for colour changing Hot Runners

When changing colour on hot runners it is always important to determine where the colour is being held up.



- a) Colour in the tip
- b) In tip and manifold
- c) Staining on the screw
- d) Colour hang up in the nozzle, check valve, screw and end-cap
- e) Colour caught everywhere

Fig 1

The cleaning of a hot runner should always be carried out one step at a time in the correct order: housekeeping, screw and barrel, manifold and finally tips.

Housekeeping

Always start from the beginning and it always starts with housekeeping; ensure hoppers, granulators and conveying systems are immaculately clean. This should never be taken lightly especially when using purging compounds. The faster results expected from a purging compound can be seriously hampered by reintroducing colour from poor housekeeping.

Screw and Barrel

The screw and barrel are sometimes mistaken as being clean when colour changing hot runners because purging the screw and barrel is done at low and constant pressure and low speed (Fig 2). This can give a purging that looks clean yet can show up in your mouldings as is depicted in c, d and e (Fig 1). Aquapurge's mechanical purging compounds like Barrel Blitz Universal that use the natural compression of the screw to clean can be effective to clean under low pressure and speed conditions especially when encountering colour plate-out (Fig 2) or carbon.



Fig 2

All further details from the company.

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Tips for colour changing Hot Runners

Manifold

Now comes the hot runner, a key point to remember is multi – cavity hot runners are made up of many channels, negative flow areas and are a constant battle between heating and cooling. But once understood, all these points can be used to aid the colour change process.

In hot runner channels, a polymer’s velocity is laminar; its maximum speed is in the centre (Fig 3) and is almost zero at the side walls. Purging compounds try to increase the velocity at the side walls, products like Poly Clear HR 8 and HR 20 do this through polymer manipulation, foaming and induced turbulent flow.

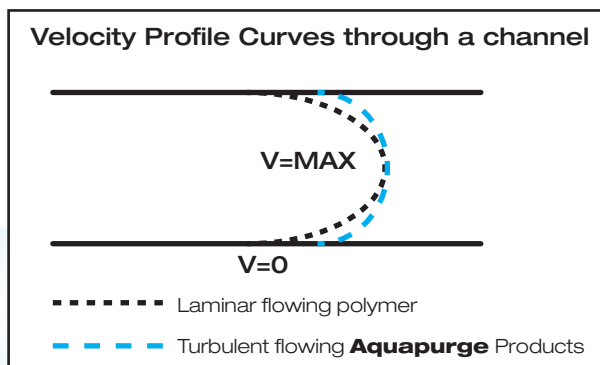


Fig 3

Tips

Negative flow areas are points such as insulated tips; where the first polymer to enter the tip can only be fully removed by manually splitting the tool. Raising the Heating Element temperature (Fig 4) while moulding may allow similar colour changes to be “got away with” without the need to remove the front plate.

If you are going to split the tool and manually remove the tip ensure the moulding looks like type “a” (Fig 1). If the mouldings are in any other state you will only put more coloured material back into the cleaned tip.

A final trick to aid colour changes without splitting the plate is to manipulate the cooling. This process should only be carried out by qualified technicians as moulding issues and tool damage may occur.

By turning off the water to the tool (for short periods until drool or dragging almost starts) this will allow the insulated tip to become fully molten. This will not cause the polymer to completely flow into the negative flow area but will flow “more-so” into that area. A good rule of thumb is always to try it on a tool and if no extra colour becomes evident in the mouldings then it will not be aid colour changes for that tool.

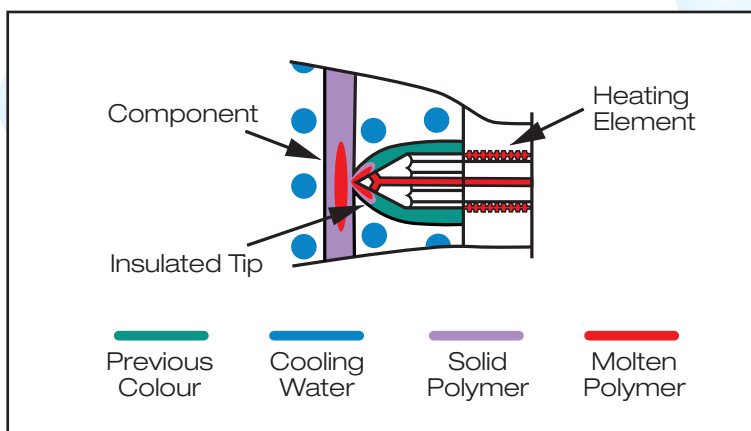


Fig 4

‘In the past, colour scheduling was set in stone and many moulders could only organize orders around it. Waiting in line became the norm for customers. Not so now,’ says Steadman.

‘A moulder that regularly purges its equipment is now able to reduce costs per part, increase turnover and reduce scrap. It also indicates a business that is commercially flexible and able to supply new business as soon as it comes along.’

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