

# INSTAPURGE



InstaPurge Commodity-Grade Cleaning Compound from PTS is a mechanical purging agent that dislodges the residues of previous production colours and resins that remain on cylinder walls and screws after the barrel is run empty. It permits these residues to be quickly removed from the machine and is then readily purged from the barrel by the next production colour or resin. The machine is back to producing good parts with minimum downtime. See Fig 1 for a comparison of the effect of InstaPurge during a cleaning cycle.



## How does InstaPurge work?

InstaPurge gains its purging effectiveness from three factors:

1. The proprietary formulation works in combination with a high level of agitation during the purging process to dislodge contaminants.
2. The formula includes resins and other ingredients that are effective in providing mechanical "push" over a wide temperature range.
3. An exclusive ingredient in InstaPurge causes it to have lower adhesion to metal surfaces than other resins of similar viscosity.



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## **Where can I use InstaPurge?**

PTS recommends InstaPurge for use in conventional reciprocating screw injection moulding systems. It may also be used in conventional screw-type extruders and is available in filled and unfilled forms. The product is intended for use with thermoplastic resins processed between 175–330°C, a range that includes all commodity resins and many engineering materials.

## **What can InstaPurge do for me?**

InstaPurge cleans processing equipment thoroughly, providing quick, trouble-free changeovers that allow moulding shops to operate at peak efficiency. Here's how:

1. Pelletised InstaPurge handles and feeds easily, like production material.
2. No mixing = No mess.
3. InstaPurge is stiff enough to displace production resins effectively at normal operating temperatures.
4. No waiting around for temperatures to come up.
5. InstaPurge does its job in a straightforward way. No complicated multi-step procedures; no soak period required.
6. When the job is done, all residues of InstaPurge are flushed from the system quickly by the following production resins.
7. Thanks to its unique formulation, the compound doesn't adhere to the screw and barrel walls.

## **What kinds of purging compounds are available and what kind of purging compound should we use?**

There are two classes of purging compound available – "High-Performance" and "Commodity-Grade". High-performance products (such as SuperNova Chemical Purging Compound from PTS) are intended for use in difficult purging situations. These involve very challenging materials like PEEK, fluoropolymers or Ultem, or very large and complex equipment including hot-runner installations and many extrusion or blow moulding systems.

In contrast, commodity-grade products (such as InstaPurge Cleaning Compound from PTS) are useful across a very broad range of common purging situations. They are effective with commodity resins like PE, PP, styrene and PVC as well as first-generation engineering resins like ABS, Nylon, acetal and even polycarbonate. These products are most appropriate for use in injection moulding systems (including many equipped with hot-runner) and in some simple extrusion systems.

High-performance purging compounds provide the maximum in purging effectiveness, but are more expensive and tend to be somewhat more difficult to use. Commodity-grade purging compounds provide ample purging effectiveness for most situations and are economical and easy to use. You should choose the class of purging product best suited to the materials and equipment that you work with. Remember – *don't pay for more purging performance than you need!*

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## **How do we decide what InstaPurge grade is right for us?**

InstaPurge is supplied in two grades – Unfilled and Filled. The Filled grade contains a chopped glass fibre material that provides additional "scrubbing" effectiveness for difficult purges.

Here are a few cases where you should **NOT** use the Filled grade:

- In hot runner systems.
- In extrusion systems *unless* the die and any screens or filters are removed.
- In systems that have internal flow passages of less than 1.0 mm.
- In cases where the follow-on resin is of low viscosity (such as flexible PVC or LDPE) and might have difficulty displacing residues of the filled purging compound.
- In any case where the added abrasiveness of the filler causes concern about wear on soft or polished metal finishes.

In these cases, only the *Unfilled* grade should be used. In other cases, either grade may be used.

## **How much purging compound will we need to clean my system?**

In most cases, between one and two barrel volumes of InstaPurge material will be needed to effectively purge the system. Start with one barrel volume and increase if necessary.

## **What's the bottom line?**

In summary, if you are a plastics processor that does not work with "exotic" resins or operate very large or highly complex equipment then you probably do not need (and should not pay for) a "high performance" purging compound. You need a hard-working "commodity-grade" purging material – InstaPurge is that material. But don't just take our word for it! Free samples are available so you can prove it for yourself. InstaPurge Cleaning Compound is just what you need.

# INSTAPURGE

## Instructions for use in Injection Moulding Equipment

InstaPurge Cleaning Compound from PTS is recommended for the following situations:

- Conventional reciprocating screw injection moulding systems. If equipped with hot runner systems, refer to the separate instructions on page 6.
- All thermoplastic processed at temperatures between 175–332°C. For elevated temperatures - see note 1

- 1. Verify** that the temperature of each heating zone is at an appropriate level (at least 175°C) but not above 330°C – see note 1
- 2. Empty** the machine of the production resin as thoroughly as possible; if backpressure and screw speed are adjustable you can use maximum backpressure and high screw speed to empty the barrel most effectively. Results may be enhanced by pre-flushing the machine with clean natural resin. If you choose to pre-flush – see note 2
- 3. Load** the hopper with the required amount of InstaPurge Cleaning Compound. In a typical purging situation, about one to two barrel volumes of InstaPurge should be needed. More or less material may be required, depending on such things as the difficulty of the application and the condition of the equipment. Start with one barrel volume and adjust as conditions dictate.
- 4. Fill** the barrel with InstaPurge Cleaning Compound by rotating the screw. For best results, keep reciprocating the screw forward and keep the backpressure at maximum. Use normal screw RPM until InstaPurge begins to emerge from the nozzle – then increase to maximum safe RPM.
- 5. Purge** the system empty of InstaPurge when the material emerging from the nozzle is almost clean. Do this by dropping the backpressure (if raised) to normal level and performing high-velocity purge shots. If the machine was heavily contaminated and contamination is visible as the last of the InstaPurge empties from the machine, repeat steps 3 through 5. If nozzle or check-ring hang-up is suspected – see note 3
- 6. Run** new production material through the system until all traces of InstaPurge are removed. Removal will be most thorough and efficient if maximum safe screw RPM are used. Then, begin normal production.

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## Instructions for use in Extrusion Equipment

InstaPurge Cleaning Compound is recommended for the following situations:

- Conventional screw-type extruders. If equipped with a vented barrel - see note 7
- All thermoplastics processed at temperatures between 175-332°C. For elevated temperatures - see note 1

- 1. Verify** that the temperature of each heating zone is at an appropriate level (at least 175°C, but not above 330°C – see note 1). It may prove helpful to raise the temperature of the die and any downstream plumbing about 30°C above operating temperature *provided that this can be done without exceeding temperature limitations of the equipment or the materials involved*. Otherwise, leave heats at operating temperature.
- 2. Empty** the machine of the production resin as thoroughly as possible. Ensure that the hopper and feed throat are free of all production resin. Results may be enhanced by pre-flushing the system with clean natural resin. If you choose to pre-flush – see note 2
- 3. Load** the hopper with the required amount of InstaPurge. In a typical purging situation, about one to two barrel volumes of InstaPurge should be needed. More or less material may be required, depending on such things as the difficulty of the application and the condition of the equipment. Start with one barrel volume and adjust as conditions dictate.
- 4. Fill** the system with InstaPurge by rotating the screw. Use normal screw RPM until InstaPurge begins to emerge from the die – then increase to maximum safe RPM.
- 5. Purge** the system empty of InstaPurge. If the system was heavily contaminated and contamination is still apparent as the last of the InstaPurge empties from the system, repeat steps 3 through 5.
- 6. Run** new production material through the system until all traces of InstaPurge are removed. Removal will be most thorough and efficient if maximum safe screw RPM are used. Then, begin normal production.

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## Instructions for use in Hot Runners

- 1. Empty** the system of the production resin as thoroughly as possible. Results may be enhanced by pre-flushing the machine with clean natural resin. If you choose to pre-flush – see note 2. Retract the screw and barrel from the mould.
- 2. Raise** the runner temperature 30°C to increase flow *provided this can be done without exceeding temperature limitations of the equipment or the materials involved*. Otherwise, leave at operating temperature.
- 3. Pre-Purge** the screw and barrel (while retracted from the mould) using steps 3 through 5 of the basic instructions shown on page 4. Then move the screw and barrel back to the mould.
- 4. Load** the hopper with the required amount of InstaPurge. Start with ½ of the barrel volume and adjust as conditions dictate.
- 5. Inject** InstaPurge through the runner, ejecting the parts immediately (while warm). De-moulding of the purge material may be easier if a mould release is used and the shot size is reduced (see note 4 for an alternative method). Continue until InstaPurge parts are visually free from colour and/or carbon contamination. Then, inject parts until the system runs empty.
- 6. Purge** the residual InstaPurge from the system by running the next production resin, moulding parts until no InstaPurge can be seen. Then restore any changed temperature settings and resume normal production.

## Additional Notes and Information

### **Note 1 – Elevated Temperatures**

It is recommended that you avoid subjecting InstaPurge to temperatures above 330°C. In this thermal environment some polymers used in InstaPurge may begin to decompose and release irritant vapours. This should not be an issue if exposure to temperatures near 330°C is brief (a few minutes). For regular use with materials processed above 332°C, contact PTS to discuss alternative products.

### **Note 2 – Pre-Flushing**

For some difficult changeovers, results may be enhanced by pre-flushing with clean natural resin before loading the cleaning compound. This will push most of the residual production resin out of the machine. If you choose to pre-flush, use resin as stiff as, or stiffer than the production resin that is being displaced and of a resin type similar to either the initial or succeeding production resin. Flush at least one full barrel volume of material – but no more than 4 barrel volumes – through the system.

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## **Note 3 – Nozzle and Check Ring Hang Up**

Occasionally colour or degraded resin particles will hang up stubbornly in the nozzle or check ring area. This should be addressed with modest use of heat and increased agitation. If the nozzle is the problem, raise the temperature of the nozzle 30°C. If the check ring is the source of the problem, drop the backpressure and with the screw rotating, retract it in quick “pulses” to lift the check ring and dislodge the contamination. In both instances, follow up with short high-pressure purge shots to complete cleaning.

## **Note 4 – Open-Mould Purging of Hot Runners**

If system design permits, a hot runner may be purged by extruding InstaPurge through the mould at a safe velocity with little or no backpressure, using maximum safe screw RPM.

## **Note 5 – Grade Selection**

InstaPurge is available as a filled or unfilled product. The filler gives the product additional “scrubbing” effectiveness for difficult changeovers, but extensive use over a long period may cause wear in soft metal finishes. PTS recommends use of the unfilled grade where:

1. The more aggressive nature of the filled material may cause concern.
2. The equipment has narrow passages (less than 1.0mm), that might become blocked.
3. The next production resin is of such a low viscosity (eg flexible PVC, LDPE etc) that removal of a filled cleaning compound could be difficult.

Otherwise, the filled grade can be used. *Use of the filled grade is not recommended for hot runners.*

## **Note 6 – Operating Principles**

InstaPurge gains its purging effectiveness from three factors:

1. The proprietary formulation incorporates ingredients that work in combination with the high level of agitation induced during the purging process to dislodge contaminants.
2. The formula includes resins and other ingredients that are effective in providing mechanical “push” over a wide temperature range.
3. An exclusive ingredient in InstaPurge causes it to be much less tenacious than other resins of similar viscosity in its adhesion to internal metal surfaces.

## **Note 7 – Vented Barrels**

In the case of extrusion systems equipped with vented barrels, the vents should be manually cleaned and closed with a cap. While filling the extruder with InstaPurge, the screw RPM should be varied to ensure complete cleaning of decompression zones.