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## WHAT IS NOVAPURGE?

Novapurge is a chemical purging agent that dissolves and reduces the residue of old, oxidized and carbonized thermoplastics on cylinder walls, screws, runners and dies. It chemically depolymerizes the plastic materials to produce fragments of lower molecular weight. The other products of this chemical process are nitrogen, carbon dioxide, water vapor and a small amount of ammonia.

## INSTRUCTIONS FOR USE IN INJECTION MOLDING EQUIPMENT

***Novapurge Purging Compound will work effectively for all thermoplastic resins and all processing equipment:***

- Instructions for screw-type injection molding machines *without* hot runner systems or vented barrels, *with* removable hoppers or feed systems, processing all thermoplastics *except* temperature sensitive materials are on Page 2.
- Instructions for temperature sensitive materials such as PVC, ABS, acetal (Delrin, Celcon, etc.) TPR's, SARAN, EVOH (Eval), EVA, etc. are on Page 3.
- Instructions for high temperature materials like PEEK, Ultem or Torlon are on Page 7.
- Instructions for Hot Manifold Systems are on Page 4.
- Instructions for Plunger Machines are on Page 6.
- Instructions for Injection Blow Molding machines are on Page 6.
- Further instructions for Fixed Hoppers or Feed Systems are on Page 8.
- Further instructions for Vented Barrels are on Page 8.

**BASIC INSTRUCTIONS**

1. **EMPTY** the machine of the production resin; raise nozzle and front zone heats about 50°F (30°C) above production temperature. Do not exceed the safe processing temperature of the production resin. Remove the hopper or feed system and make sure all production material is cleaned out of the feed area.

2. **FLUSH** the machine by running clean natural HDPE (at least a full system volume of material – but no more than 4 system volumes) to push most of the residual production resin out of the machine. Run the machine empty again.

3. **LOAD** the machine with a full system volume of Novapurge, feeding it directly into the throat. Fill the system until Novapurge extrudes from the nozzle; keep the throat opening filled with Novapurge. Keep the heats up – Novapurge is Heat Activated!

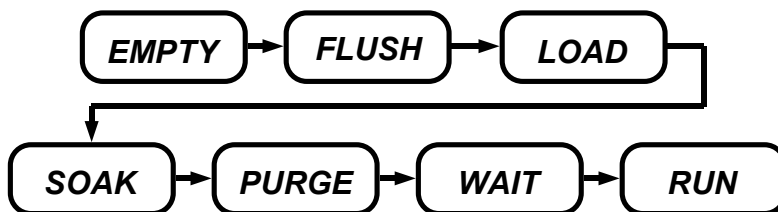
4. **SOAK** the system with the screw stopped for 10 to 20 minutes. Keep the throat full, reciprocating screws forward and the heats up! Novapurge will "drool" from the nozzle (the gas pressures of the chemical reaction are pushing it out). If the drooling stops, jog the screw to restore drooling, top off the throat with Novapurge, and keep reciprocating screws forward. If throat temperatures are high (above 250°F (120°C)) operate the screw at very low RPM during the soak to prevent bridging.

5. **PURGE** the system empty of the Novapurge material. If the machine was heavily contaminated, and visible contamination or black specks are seen as the last of the Novapurge empties from the machine, another purge is needed. Raise the nozzle and front zone heats about another 100°F (55°C). Repeat steps 3,4 and 5.

6. **WAIT** 5 minutes after emptying Novapurge from the machine, so that the last residues of Novapurge's chemical ingredients can break down. While you're waiting, clean the throat of any remaining traces of Novapurge, and replace the hopper or feed system. If this is a shutdown purge, stop now and cut the heats. Otherwise, reset temperatures for normal operation.

7. **RUN** the new production material through the system until all traces of Novapurge are removed. Then, begin normal production.

*If your operation is not as described on the previous page, please refer to the appropriate sections on the following pages for additional specific instructions.*



### INSTRUCTIONS FOR TEMPERATURE SENSITIVE MATERIALS

For temperature sensitive materials such as PVC, acetal (Delrin, Celcon, etc.), ABS, TPR's, etc., proceed as follows:

T-1. **EMPTY** the machine of the temperature sensitive production resin. Keep your heats at operating temperature. Remove the hopper or feed system and make sure all production material is cleaned out of the feed area.

T-2. **FLUSH** the machine by running clean, natural HDPE (at least a full system volume of material – but no more than 4 system volumes) to push most of the residual production resin out of the machine. Run the machine empty again. (If you've been running PVC at low temperature, raise the heats in all zones except the throat to 380°F (195°C).)

T-3. **LOAD** the machine with a full system volume of Novapurge, feeding it directly into the throat. Fill the system until Novapurge extrudes from the nozzle; keep the throat opening filled with Novapurge. Keep the heats at operating temperature.

T-4. **SOAK** the system at operating temperature with the screw stopped for 10 to 20 minutes. Keep the throat full, reciprocating screws forward. Novapurge will "drool" from the nozzle (the gas pressures of the chemical reaction are pushing it out). If the drooling stops, jog the screw to restore drooling, top off the throat with Novapurge and keep reciprocating screws forward.

T-5. **PURGE** the system empty of the Novapurge material. If carbon is present, a second purge will be needed (otherwise, finish up with steps 6 and 7 of the Basic Instructions on Page 2).

T-6. **RAISE** the nozzle and front zone heats about 100°F (55°C). Best results will be obtained between 500°F and 600°F (between 260°C and 315°C). Perform steps 3 through 7 of the Basic Instructions on Page 2.

**INSTRUCTIONS FOR HOT MANIFOLDS**

Use a pelletized Novapurge (Ready-Mix or NP-600 Concentrate) in hot runner machines that have gates smaller than 0.035 inch (0.09mm). (It is difficult to maintain even distribution of the chemical mix in hot runners with a powdered product.)

At the end of the production run, the following procedure applies for most materials, but not for temperature sensitive materials like PVC, acetal, ABS, etc. (See Page 5 for instructions for these materials.)

M-1. **RAISE** mold heat and probe heats to the maximum temperature allowable for the mold. Intense heat is needed to melt the buildup of insulating polymer that has accumulated in the probe wells. If permissible, shut off cooling water to the stationary (hot) half of the mold. Cap any barrel vents. While the mold is heating, continue with the following steps.

M-2. **EMPTY** the screw and barrel. Raise nozzle and front zone heats about 50°F (30°C). Remove the hopper or feed system and make sure all production material is cleaned out of the feed area.

M-3. **SHOOT** 5 to 10 parts using natural PE. This will remove most of the residual production material from the system.

M-4. **EMPTY** the screw and barrel.

M-5. **RETRACT** the screw and barrel from the mold. This is very important – the screw and barrel must be pre-purged before you can clean the mold.

M-6. **PRE-PURGE** the screw and barrel with Novapurge, using steps 3 through 5 of the Basic Instructions (Page 2). Then move the screw and barrel forward to the mold once again. Verify that mold temperatures have lined out at their maximum.

M-7. **LOAD** the machine with Novapurge. Mold shots with Novapurge until all parts contain fresh Novapurge material (4 to 6 shots ought to suffice).

M-8. **SOAK** the mold 10 minutes with Novapurge in all cavities. The mold should be full and clamped, with the screw stopped, and the nozzle forward against the mold. Keep mold temperatures at maximum.

M-9. **EMPTY** the machine by making shots. Check the appearance of the parts for the presence of contamination that would indicate the need for another purge.

M-10. **REPEAT** steps M-7 through M-9 a second time. (In rare cases a third time may be needed.)

M-11. **REDUCE** nozzle and front zone heats to operating temperature; clean feed area of all residual Novapurge. Uncap barrel vents. These actions can be started during the final mold heat soak but keep mold heats up.

M-12. **RUN** parts with the next production material. When new parts are clear of Novapurge, reset mold heats to operating temperature and restore cooling water flow.

### **INSTRUCTIONS FOR TEMPERATURE SENSITIVE MATERIALS IN HOT MANIFOLDS**

For temperature sensitive materials like PVC, acetal (Delrin, Celcon, etc.), ABS, TPR's, etc. in hot manifold systems, proceed as follows:

MT-1. Cap any barrel vents and perform steps M-2 through MS (Page 4) without raising mold heats or cutting water flow. Raise nozzle and front zone heats only about 25°F (15°C). (If heavy barrel contamination remains, a second pre-purge (step M-6) may be run at higher temperature, but operating temperature should be restored before proceeding.)

MT-2. If permissible, shut off the flow of mold cooling water. Perform steps M-7 through M-9 (Page 4) with the mold heats set at operating temperature. This will remove the temperature sensitive material from the system.

MT-3. **RAISE** mold heat and probe heats to the maximum temperature allowable for the mold. Intense heat is needed to melt the buildup of insulating polymer that has accumulated in the probe wells.

MT-4. **REPEAT** steps M-7 through M-11 (Page 4-5) after mold temperatures line out at maximum.

MT-5. **RESET** temperature controllers to operating temperature. When mold temperatures are down to the safe processing range of the production material, perform step M-12 (Page 5).

**INSTRUCTIONS FOR PLUNGER MACHINES**

P-1. **EMPTY** the machine of the production resin; leave at production temperature.

P-2. **FLUSH** the machine by running 3 to 7 shots of clean, natural HDPE with the plunger  $\frac{1}{4}$ " to  $\frac{1}{2}$ " (6 mm to 13 mm) back from its original set point. This will push most of the residual production resin out of the machine. Run the machine empty again.

P-3. **LOAD** the machine with a full system volume of Novapurge, feeding it directly into the throat. Fill the system by operating the plunger until Novapurge extrudes from the nozzle; keep the throat opening filled with Novapurge.

P-4. **SOAK** the system with the plunger back for 10 to 20 minutes. Novapurge will "drool" from the nozzle (the gas pressures of the chemical reaction push it out). Keep cooling water supplied to the throat.

P-5. **PURGE** the system empty of the Novapurge material. If the machine was heavily contaminated, and contamination or black specks are seen as the last of the Novapurge empties from the machine, another purge is needed. Raise the heats in all melt zones about 100°F (55°C) and repeat steps P-3 and P-4.

P-6. **WAIT** 5 minutes after emptying Novapurge from the machine, so that the last residues of Novapurge's chemical ingredients can break down. While waiting, clean the throat of any remaining traces of Novapurge, and replace the hopper or feed system. Then, clean off the end of the plunger thoroughly. If this is a shutdown purge, stop now and cut the heats. Otherwise, reset temperatures for normal operation.

P-7. **RUN** the new production material through the system until all traces of Novapurge have been removed. Then, begin normal production.

**INSTRUCTIONS FOR INJECTION BLOW MOLDING**

Follow the instructions given for cleaning injection molding systems equipped with hot manifolds (Page 4).

## **INSTRUCTIONS FOR HIGH TEMPERATURE RESINS**

For such high temperature engineering resins as Ultem, Ryton, Torlon, PEEK, Polysulfone and TEFLON, proceed as follows:

H-1. **EMPTY** the machine of the production resin; maintain all heats at the operating temperature. Remove the hopper or feed system and make sure all production material is cleaned out of the feed area.

H-2. **FLUSH** the machine by running clean natural HMWPE or the stiffest PE available (at least a full system volume of material – but no more than 4 system volumes) to push most of the residual production resin out of the machine. Run the machine empty again.

H-3. **LOAD** the machine with a full system volume of Novapurge purging compound, feeding it directly into the throat. Fill the system until Novapurge material extrudes from the nozzle; keep the throat opening filled with Novapurge. Keep the heats up – Novapurge is Heat Activated!

H-4. **SOAK** the system for 10 to 20 minutes. Do not stop the screw. During the heat soak, keep the screw turning at minimum RPM. Keep the throat full of Novapurge!

H-5. **PURGE** the system empty of the Novapurge material. If the machine was heavily contaminated, and visible contamination or black specks are seen as the last of the Novapurge empties from the machine, another purge is needed. Maintain the same system temperatures. Repeat steps H-3 through H-5.

H-6. **WAIT** 5 minutes after emptying Novapurge from the machine, so that the last residues of the Novapurge's chemical ingredients can break down. While you're waiting, clean the throat of any remaining traces of Novapurge, and replace the hopper or feed system. If this is a shutdown purge, stop now and cut the heats.

H-7. **RESET** temperature controllers if the new production material is processed at lower temperature. Allow the machine to line out at the new operating temperature.

H-8. **RUN** the new production material through the system until all traces of Novapurge are removed. Then, begin normal production.

**INSTRUCTIONS FOR FIXED HOPPERS AND FEED SYSTEMS**

Feeding Novapurge directly into the throat of the machine is recommended because any traces of the material left on the hopper walls or in feed ducts will have to be thoroughly cleaned before restarting production. Otherwise production parts may be contaminated with Novapurge.

If direct access to the throat is not available, introduce Novapurge as close to it as possible. For example, remove a hopper magnet and introduce Novapurge through the magnet drawer opening.

Before resuming production, thoroughly clean any traces of Novapurge from the hopper or feed system.

**INSTRUCTIONS FOR VENTED BARRELS**

Because the gases released by Novapurge are important to its cleaning action, barrel vents should be capped. The following steps should be taken:

V-1. **CLEAN** vent opening manually and close the vent with a cap.

V-2. **RAISE** the decompression zone heats about 25°F (15°C).

V-3. Perform steps 1 through 7 of the Basic Instructions, Page 2. In step 3, **VARY** the speed of the screw while running Novapurge in the machine. This changes the speed of the material as it flows past the vent opening and ensures complete and even filling.

**CAUTION:** Novapurge releases gases during the cleaning process, and these gases can cause pressure build-up under improvised vent caps. Use caution in capping vents and in keeping clear of vent caps during the purge.

**IF THERE ARE ANY QUESTIONS ABOUT USING  
NOVAPURGE, CALL NOVACHEM TECHNICAL  
SUPPORT, TOLL FREE AT:**

**1-800-762-3984**

**WRITTEN INQUIRIES CAN BE FAXED TO US AT  
1-203-367-0647.**