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WHAT IS **SUPERNOVA**™

SuperNova™ is NOVACHEM's brand of ammonia-free and powder-free chemical purging compound. It removes the residue of old, oxidized and carbonized thermoplastics from cylinder walls, screws, runners and dies. The FDA regards all of the ingredients in *SuperNova* purging compound as "Generally Recognized as Safe". The by-products of the *SuperNova* chemical process are carbon dioxide, and water vapor.

INSTRUCTIONS FOR USE IN INJECTION MOLDING EQUIPMENT

***Supernova*™ 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 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 6.
- Instructions for Hot Manifold Systems are on Page 3.
- Instructions for Plunger Machines are on Page 5.
- Instructions for Injection Blow Molding machines are on Page 6.
- Further instructions for Vented Barrels are on Page 7.

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. 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.

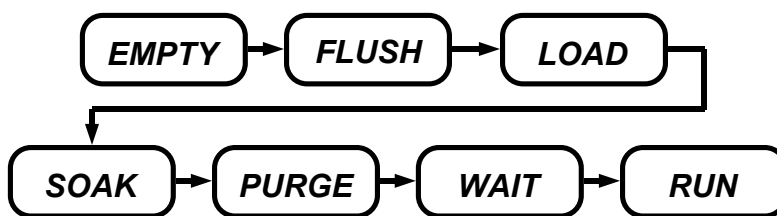
3. **LOAD** the machine with a full system volume of *SuperNova* purging compound. Fill the system until *SuperNova* material extrudes from the nozzle; keep the throat opening filled with *SuperNova* purging compound. Keep the heats up – *SuperNova* is Heat Activated!

4. **SOAK** the system with the screw stopped for 10 to 20 minutes. Keep the throat full, reciprocating screws forward and the heats up! *SuperNova* material 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 *SuperNova*, 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 *SuperNova* material. If the machine was heavily contaminated, and you can see visible contamination or black specks as the last of the *SuperNova* purging compound 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 *SuperNova* material from the machine, so that the last residues of the *SuperNova* chemical ingredients can break down. 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 *SuperNova* material are removed. Then, begin normal production.



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.

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 *SuperNova* purging compound. Fill the system until *SuperNova* material extrudes from the nozzle; keep the throat opening filled with *SuperNova*. 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. *SuperNova* material 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 *SuperNova* purging compound and keep reciprocating screws forward.

T-5. **PURGE** the system empty of the *SuperNova* 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

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. Melting the buildup of insulating polymer that has accumulated in the probe wells will require intense heat. 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).

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 *SuperNova* purging compound, 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 *SuperNova* material. Mold shots until all parts contain fresh *SuperNova* material (4 to 6 shots ought to suffice).

M-8. **SOAK** the mold 10 minutes with *SuperNova* material 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 and uncap barrel vents.

M-12. **RUN** parts with the next production material. When new parts are clear of *SuperNova* residues, 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 (Pages 3 - 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. Melting the buildup of insulating polymer that has accumulated in the probe wells requires intense heat.

MT-4. **REPEAT** steps M-7 through M-11 (Page 4) 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 4).

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 1/4" to 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 *SuperNova* purging compound. Fill the system by operating the plunger until *SuperNova* material extrudes from the nozzle; keep the throat opening filled with *SuperNova*.

P-4. **SOAK** the system with the plunger back for 10 to 20 minutes. *SuperNova* material 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 *SuperNova* material. If the machine was heavily contaminated, and you can see visible contamination or black specks as the last *SuperNova* purging compound 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 *SuperNova* material from the machine, so that the last residues of the *SuperNova* chemical ingredients can break down. While waiting, 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 *SuperNova* residues 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.

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 *SuperNova* purging compound, feeding it directly into the throat. Fill the system until *SuperNova* material extrudes from the nozzle; keep the throat opening filled with *SuperNova*. Keep the heats up – *SuperNova* 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 *SuperNova*!

H-5. **PURGE** the system empty of the *SuperNova* material. If the machine was heavily contaminated, and you can see visible contamination or black specks as the last of the *SuperNova* material 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 *SuperNova* material from the machine, so that the last residues of the *SuperNova* chemical ingredients can break down. 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 *SuperNova* residues are removed. Then, begin normal production.

INSTRUCTIONS FOR VENTED BARRELS

Because the gases released by *SuperNova* are important to its cleaning effectiveness, barrel vents should be capped. Take the following steps:

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 *SuperNova* material in the machine. This changes the speed of the material as it flows past the vent opening and ensures complete and even filling.

CAUTION: *SuperNova* purging compound releases carbon dioxide and water vapor 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
SUPERNOVA™, CALL NOVACHEM TECHNICAL
SUPPORT, TOLL FREE AT:

1-800-762-3984

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