

Z CLEAN® S60

High Purging Power and Broadest Coverage for Resins

Technical Bulletin

NISSHO Corporation, Inc.

1. Introduction

Polymethylmetacrylate (**PMMA, Acrylic resin**) and Polycarbonate (**PC**) are widely used as transparent or tinted types of plastic resins. When purging resins are used for color changing and material changing on these types of plastics, some trace amounts of the purging resin can remain in the processing machine after purging, and affect the transparency or color of the next product. Occasionally, large quantities of following production resin have to be consumed or run through the machine before the purge is completely removed from the barrel. Chisso Corporation has developed “**S60**” for these applications, which has more powerful cleaning action to clean and replace current resin and is also easily replaced by the next resin without deteriorating the new resins overall transparency or color. This grade of purge is also recommended for **POM, ABS, PS, AS, PPO, Nylon 66 & Nylon 6, PBT and barrel cleaning of flame Retardant materials and other types of polypropylene.**

“**Z CLEAN S60**”, is a functional type of purging compound, characterized by its easy handling, strong cleaning or stripping power to remove the resin in the barrel and rapid replacement capability by the next production resin.

2. Features

- Strong cleaning power coupled with high melt viscosity.
- “No mineral fillers” which prevent bleeding after purging.
- Rapid replacement by next production resin.
- Strong “peeling power” to purge preceding resins through a unique foaming action.
- “Ready-to-use Pellet Form” for safe and easy handling.
- Non filler formulation, to prevent abrasion in the screw, barrel and die areas.
- Wide processing temperature range of **180°C - 320°C (356°F - 608°F)**

3. Applications

- “**Transparent**” or “**Tinted**” type plastics (i.e. **PMMA, PC, PS** etc.)
- **Engineering Plastics** (i.e. **POM, ABS, AS, PA6**, etc.)
- **Injection molding machines, Compounding machines and Extruders**

4. Precautions for Use

- When purging **POM**, an odor can be emitted from the purge patty after the first shot from the nozzle. It is recommended that you put the purged patty into water to cool.
- Purge only within recommended temperature service range of product to avoid excessive heat deterioration of purge.
- For use in extruders and compounding machines, gradually increase screw revolutions, to prevent overload of the motor and/or over-pressure of the barrel due to the purge resins high melt viscosity.
- Since **Z CLEAN S60** is a foaming type purging resin, we recommend that you remove any screen pack in advance.
- In order to speed the replacement of **Z CLEAN S60** with a next production resin, a blend of **S60** and your following resin system should be used; however, the cleaning power of the blended material is generally proportional to the mixing ratio. Actual cleaning power depends on the kind of resin and processing conditions.
- After using **Z CLEAN S60**, please re-seal the bag so product remains fresh. **Z CLEAN S60** is a

purging resin for plastic processing machines and should not be used for other purposes.

- Z Clean is not FDA compliant and is not recommended to be used for food contact applications, without independent testing for specific applications.

5. General Operating Procedure

A. INJECTION MOLDING MACHINE

1) Preparation

No need to change the processing temperature when current conditions are within the processing temperature range of **Z CLEAN S60 (356° F - 608° F)**.
Retract the barrel from the mold.
When dry color pigments are used, clean the hopper carefully.

2) Charge the system with Z CLEAN S60 Purging Compound.

Generally, an amount of **Z CLEAN S60** equal to five (5) full measure shots in your injection machine is sufficient for a complete color or material change.
(This will depend on the concentration of color pigments used.)

3) Purging

Purge with high injection speed.
When the temperature required of the next production resin is higher or lower than that of the current resin; adjust the temperature after completing replacement with **Z CLEAN S60**.

4) Charge of next Production Resin

Same procedure as above

5) Purging

Same as above procedure

Adjust heats to the processing temperature of the next production resin.
Increasing the nozzle temperature by **20° - 30° C** will accelerate replacement to the next production resin.

6) Machine Confirmation

Please adjust to the production conditions.
Check nozzle and succeeding resin to insure that all of the **Z CLEAN S60** has been removed from the barrel.

7) End of Purging

Standard Quantity of Z CLEAN S60 to use for a Molding Machine:

Clamping Force (tons)	80	200	650	1300
ZCLEAN S60 (kg)	0.8 - 1.4	1.0 - 2.0	2.0 - 4.0	4.0 - 8.0
Z CLEAN S60 (lbs)	0.9 - 1.8	2.2 - 4.4	4.4 - 8.8	8.8 - 17.6

B. EXTRUDING

1) Preparation

No need to change the processing temperature when current condition are within the processing range of **Z CLEAN S60 (356°-608° F)**.

Remove the screen pack.

When dry color pigments are used, clean the hopper carefully.

2) Charge of Z CLEAN S60

Generally, the amount of **Z CLEAN S60** to be loaded into the hopper should be enough to extrude for 10-15 minutes.

(This will depend on concentration of color pigments used)

To accelerate the cleaning process, divide the charge of the purging compound into three equal portions and extrude them intermittently.

Adjust the screw revolution to about 2/3 of a normal conditions, then increase the revolutions during purging while watching the motor load.

3) Charge of next Production Resin

When the temperature required of the next production is higher or lower than that of the Current resin; adjust the temperature after completing replacement with **Z CLEAN S60**.

4) Extrude next Production Resin under normal conditions to replace Z CLEAN S60)

Adjust Extruder to new production conditions.

Check die and following resin to ensure that all **Z CLEAN S60** has been completely removed from the extruder.

5) Molding Confirmation

Replace the screen pack and clean the die, when necessary.

6) End of Purging

6. Typical Procedure for Polyoxymethylene

Polyoxymethylene (**POM**) is characterized by its high crystallinity of 80-90% and good mechanical properties including impact resistance and is widely used as a “metal-replacement” resin for automotive parts, electronic parts and others. The processing temperature of **POM** is in a relatively narrow range of **180°-220°C**. Color changes between **POM** grades is rather easy when the using a low temperature type purging compound. However; when changing from another engineering plastic (e.g. **PC, PA6**) to **POM** or from **POM** to another type of resin, the temperature has to be changed during purging process, due to different processing temperatures of the resins, can make the purging process complex and time consuming. In addition, we have found that a strong base purging compound and a purging compound based on an **acrylic** resin alone; cannot be used for **POM**, due to **the heat decomposition of the POM in the barrel**.

Z CLEAN S60, which was developed for engineering plastics and transparent type plastics, has an excellent ability to clean **POM** from your equipment.

Examples of color and resin changes of POM are shown below:

(1) Purging for color changes only:

Material: From **POM (Black)** to **POM (Natural)**

Molding Machine Type: **80 Ton – Injection molding machine**

Molding Temperature: **N / 220°C C1 / 220°C C2 / 210°C C3 / 190°C**

	Z CLEAN S60	Without Z CLEAN S60	
Z CLEAN S60	4	-	# of Shots
Next Production Resin (non-colored POM)	2	16	# of Shots

Injection Volume: “Full Measure shots”

(2) Purging for color and resin changes:

Material: From **POM (Black)** to **PS (Natural)**

Molding Machine Type: **80 Ton - Injection molding machine**

Molding Temperature: **N / 220°C C1 / 220°C C2 / 210°C C3 / 190°C**

	Z CLEAN S60	Without Z CLEAN S60	
Z CLEAN S60	4	-	# of Shots
Next Production Resin (Non-colored PS)	3	14	# of Shots

Injection Volume: “Full Measure shots”

7. Other Examples

(1) Purging for colored PC

Material: **PC (Black)** to **PC (Natural)**

Molding Machine Type: **80 Ton – Injection molding machine**

Molding Temperature: **N / 300°C C1 / 280°C C2 / 270°C C3 / 250°C**

	Z CLEAN S60	Without Z CLEAN S60	
Z CLEAN S60	7	-	# of Shots
Next Production Resin (Non-colored PC)	3	20	# of Shots

Injection Volume: “Full Measure Shots”

(2) Purging for color change (PMMA to PS)

Material: **PMMA (Black)** to **PS (Natural)**

Molding Machine Type: **80 Ton**

Molding Temperature: **N / 250°C C1 / 240°C C2 / 220°C C3 / 200°C**

	Z CLEAN S60	Without Z CLEAN S60	
Z CLEAN S60	5	-	# of Shots
Next Production Resin	3	19	# of Shots

(3) Purging for ABS color change

a) Material: **ABS (Black)** to **ABS (Natural)**

Molding Machine Type: **80 Ton – Injection molding machine**

Molding Temperature: **N / 250°C C1 / 240°C C2 / 220°C C3 / 200°C**

	Z CLEAN S60	Without Z CLEAN S60	
Z CLEAN S60	4	-	# of Shots
Next Production Resin (Non-colored ABS)	3	12	# of Shots

- b) Material: From **ABS (Black)** to **non-colored PMMA**
Molding machine type: **80 Ton - Injection molding machine**
Molding Temperature(C): **N / 250°C C1 / 240°C C2 / 220°C C3 / 200°C**

	Z CLEAN S60	Without Z CLEAN S60	
Z CLEAN S60	4	-	# of Shots
Next Production Resin (Non-colored ABS)	3	12	# of Shots

Injection volume: “Full Measure Shots”

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