

Z CLEAN® E3001

Best Removal of Burnt Low Temperature Resins

Technical Bulletin

NISSHO Corporation, Inc.

1. Introduction

Z CLEAN E3001, a new purging agent for **L-LDPE (Extrusion)** and **PVC**, has been developed by Chisso.

Since **Z CLEAN E3001** is a non-filler, non-foaming type purging agent, purging can be effected without removing a screen pack and interrupting product winding in the extrusion of **L-LDPE**. The purging scraps can also be recycled as a raw material. Its strong purging power is effective to remove burnt and foreign matters stuck to the screw and die, which makes **Z CLEAN E3001**, the best purging agent for **PVC**, which is apt to burn during injection or extrusion operations.

2. E3001 Features

- A Non- Filler, Non-Foaming type purging agent based on **L-LDPE**.
- For **L-LDPE**; purging can be carried out without stopping the machine; the product can be taken up continuously.
- **Z CLEAN E3001** will flow safely through a screen pack of up to 100 mesh.
- Burning and foreign matters stuck on a screw and a die can effectively be removed.
- Working temperatures are: **180° - 250° C** for **L-LDPE**, **150° - 180° C** for **PVC**.
- **MFR: 0.4 – 0.6**
- All the components are registered with the Conference for Japan Hygienic Olefin and Styrene Plastics Association (JHOSPA).

3. Applicable Resins

- Purging **L-LDPE** and **LDPE** in Extrusion.
- Purging **PVC** in Injection and Extrusion.

4. Precautions for Use

- While purging **PVC**, the temperature should not exceed **180° C / 356° F**
- For the initial run, raise the screw rotation gradually, while monitoring increases in motor amperage and resin pressure.

Purging of an Inflation Molding Type Extruder (Operational Procedure)

(1) Finish of preceding resin Extrusion, Start of Purging Process

- No need to change the cylinder temperature setting.
- Cut the vacuum off for vent type Extruders.

(2) Clean the Hopper

- Make sure of the absence of all the preceding resin.
- When dry color is used, clean the area under the Hopper.

(3) Blend Z CLEAN with the succeeding Resin

- Arrange the blending ratio to be **Z CLEAN E3001** / succeeding Resin = 3/7 – 5/5.
- **NOTE:** For an Extruder other than the inflation molding type, 100% **Z CLEAN E3001** may be used as the occasion demands.

(4) Extrude the succeeding resin for 10 – 15 min. for normal extruding conditions

(Discharge of the purging agent)

- Continue replacing until the color of the preceding resin disappears.
- Make sure that there are no remains of the preceding resin or the purging agent.

(5) Confirm the appearance of the film

(6) End of Purging

Standard Consumption of Z CLEAN E3001 Recommended amount of E3001 to use

Screw Diameter (mm)	40	50	65
Consumption (kg)	1.5 – 2.0	3.0 – 5.0	6.0 – 10.0

Example 1: Purging for a Color Change of L-LDPE In an Inflation Molding Type Extruder

Preceding Resin (3 kg)	L-LDPE (Tosoh Corp. F11, MI: 0.8 - - - - 98.0 % MB Pastel - 2.0 %
Purging Agent (Blend)	Z CLEAN E3001 - - - - - - - - - - - - - - - - 30.0 % L-LDPE - 70.0 %
Succeeding Resin	L-LDPE F11

] Purging Time

Machine	40 mm Ø Inflation Molding type
Temperature (°C)	C1: 190, C2: 200, C3: 215, H & D: 220
Screen Pack	80/100/80/40 Mesh

Purging Method	With E3001 / L-LDPE F11 (30/70 blend)	With L-LDPE F11 (conventional method)
* Purging Time (min.)	12.0	24.0
Consumption of purging agent (g)	1500 (blend)	-----
Consumption of succeeding L-LDPE (g)	1,100	5,280

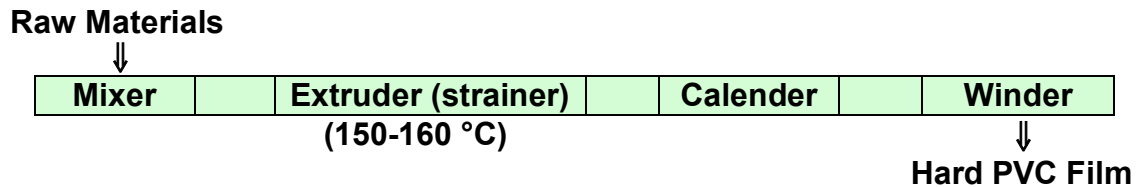
* Time required for the complete extinction of the color and purging agent and replacement with the succeeding Resin.

NOTES:

- (1) The purging time can be reduced by blending 30 – 50 wt. % of **Z CLEAN E3001** with succeeding **L-LDPE** in comparison with the blank (**L-LDPE only**).
- (2) During purging, an inflated tube can be taken up stably.
- (3) Purging is possible even when a 100 Mesh Screen Pack is used.
- (4) A small amount of **Z CLEAN E 3001** is enough for replacing with the succeeding Resin.

Operational Procedure for Purging Hard PVC (Removing Burnt material) in an Extruder

1. Manufacturing Process of Hard PVC Film



2. Purging Process

(1) Discharge of preceding resin Extrusion, Start of Purging

(2) Clean the Hopper

- No need to change the cylinder temperature setting.

(3) Feed Z CLEAN E3001 keeping the process conditions of the preceding PVC

- The consumption of **Z CLEAN E3001** is about 10 kg for an extruder with a discharge of about 60kg/hr.

(4) Exchange the Screen Pack

(5) Clean the Die and the Adapter

(6) Feed the succeeding PVC to replace the Z CLEAN E3001 left in the Extruder

- Extrude the succeeding **PVC** until the preceding **PVC** and **Z CLEAN E3001** are completely removed. The consumption of the succeeding **L-LDPE (g)**

(7) After purging has been completed, Start Rolling

3. Effects of Z CLEAN E3001

(1) The semi-gelatinized **PVC** left in the Extruder can be removed easily, due to the friction effect of the **Z CLEAN E3001** pellets.

(2) **Z CLEAN E3001** can be replaced easily with the succeeding resin.

(3) **Z CLEAN E3001** is soft at melting, so you can operate the Extruder by low load.

Example 2: Purging for Color Change of PVC in Inflation Molding Type Extruder

Preceding Resin	Compound for Hard Joint (black) Degree of Polymerization 700 ----- 1,000 g
Purging Agent	Z CLEAN E3001
Succeeding Resin	Compound for Hard Joint (gray) Degree of Polymerization 700

Machine	150 T Injection Molding Machine
Temperature (°C)	C1: 160, C2: 170, C3: 180, N: 180

Purging Method	Z CLEAN E3001	Purging agent of another company (for comparison)
Consumption of purging agent (g)	900	1,500
Consumption of succeeding Resin (g)	500	500

By using a relatively small amount of **Z CLEAN E3001** - 900g (2lbs., about 4 shots) corresponding to 60 wt. % of another Company's purging agent; the preceding resin can be removed giving a good appearance of the product without burnt or foreign matter.

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