

~Injection Molding Machine Upgrade~

Measures Against Black Specks and Discoloration Defects in Injection-Molded Products

To ensure our customers can use UBE injection molding machines safely and securely, we offer a variety of maintenance service menus.

In this issue, we introduce **black speck and discoloration defects, a common molding defect, and the corresponding countermeasures.**

➤ What Are Black Speck and Discoloration Defects?

Black speck and discoloration defects refer to unintended black or brownish spots or areas visible on the surface of a molded product, resulting in a defective part. These defects are generally caused by the thermal degradation of resin due to material stagnation.

According to *JIS K 6900:1994 (Plastics – Vocabulary), “burning” is defined as:

“Traces of localized thermal decomposition resulting in color changes that may progress to blackening. Such defects may cause surface distortion or destruction of molded parts.”

*JIS : Japanese Industrial Standards

➤ Main Causes of Thermal Degradation Due to Resin Stagnation

Thermal degradation caused by resin stagnation occurs when resin remains in locations with poor material replacement, such as the bottoms and corners of screw flights, screw head components, nozzles, and flow passage walls inside the screw barrel. Resin adheres to these surfaces, remains exposed to heat for extended periods, and eventually decomposes. When the degraded and discolored resin detaches and mixes into the molded product, black speck and discoloration defects occur.

● Thermal Degradation of Resin (Deterioration Due to High Temperature)

If resin is heated to temperatures higher than necessary or remains in the barrel for an extended period, excessive thermal energy accumulates in the material. This can cause the resin to decompose and produce charred degradation products.

● Oxidative Degradation of Resin

When molten resin meets oxygen in the air, oxidation reactions may occur, leading to the formation of degradation products.

To prevent stagnation-related burning defects, it is important to:

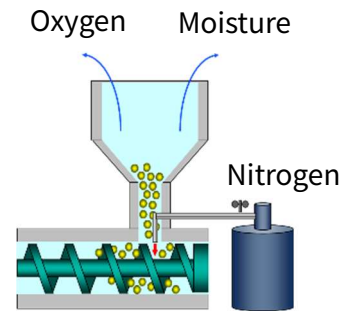
- Properly manage processing temperatures to avoid excessive heat.
- Purge and replace resin regularly to prevent long residence times.
- Perform equipment maintenance to eliminate resin buildup and adhesion.

➤ Nitrogen Purging

Nitrogen purging is an effective method for reducing oxidative degradation by replacing the oxygen inside the barrel with nitrogen gas.

➤ What Is Nitrogen Purging?

Nitrogen gas is introduced into the barrel, forcing out oxygen and moisture that contribute to resin degradation.



➤ Nitrogen Gas Generation Unit

This system extracts nitrogen from the atmosphere and supplies it to the barrel.

By replacing oxygen inside the barrel with nitrogen, oxidative degradation of resin can be significantly reduced.

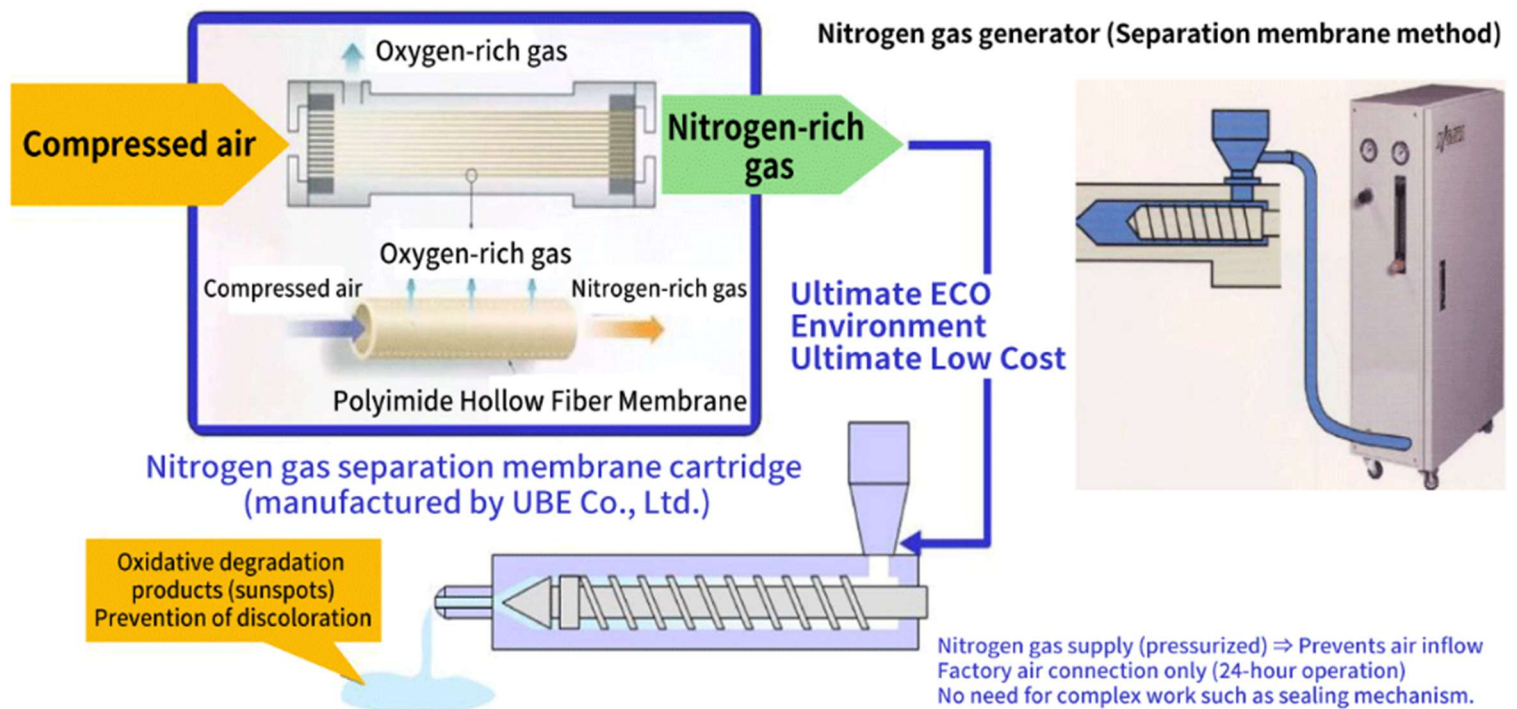


Figure.1

We offer a wide variety of maintenance services. If you have any questions or concerns, please feel free to contact your nearest UBE office or service center.
You can also contact us via the "Inquiry Page" on our website.

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