

INFILT-V[®]

Inert Gas Dissolution Injection Moulding System

Supercritical Fluid/ Inert Gas Dissolution Injection Moulding

Substances have three states, solid, liquid, and gas, depending on temperature and pressure. However, states above the critical pressure and critical temperature are called supercritical fluids, which combine the properties of gases (high diffusivity) with those of liquids (high solubility).

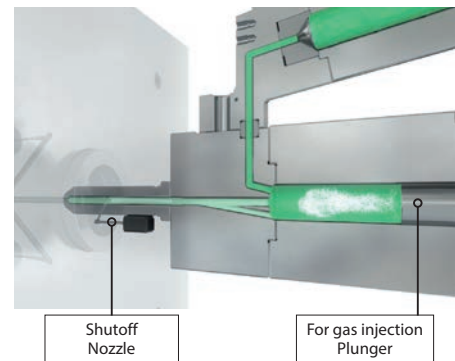
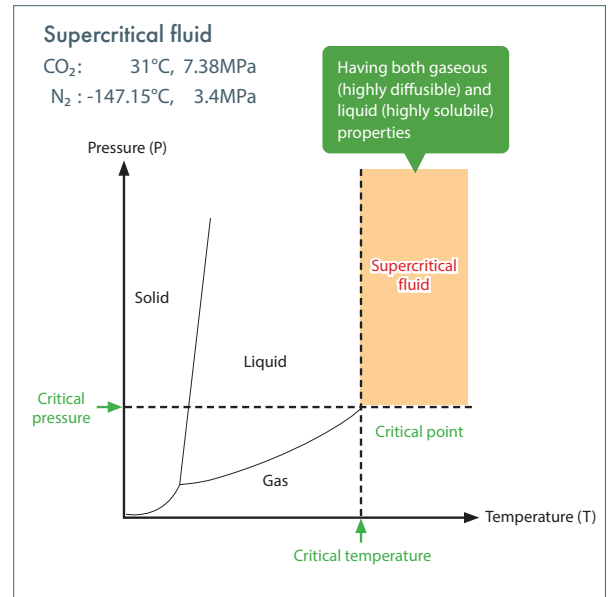
When an inert gas (N₂, CO₂) is dissolved in a molten resin in a critical state, diffusivity like a gas and solubility like a liquid act, and function as a plasticizer is generated. Inert gas dissolving injection moulding utilizes such functions as moulding technology.

Inert Gas Dissolution Injection Moulding of INFILT-V[®]

INFILT-V[®] is Sodick's proprietary technology. It generates supercritical fluid by compressing eV-LINE[®] after injecting gas at a gas cylinder pressure.

Inert gas is injected directly into the injection cylinder via the injection plunger, thus enabling accurate delivery of inert gas.

Stable injection moulding is achieved by stable plastic weighing with eV-LINE[®] and complete control of the optimum mixing ratio with inert gases.

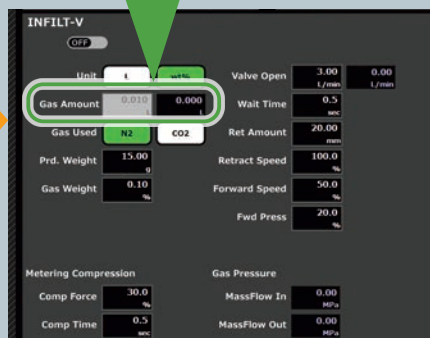


INFILT-V[®] Operation



Injection moulding machine operation panel

By adjusting the amount of gas injected (dissolved amount), the fluidity (viscosity) of the plastic can be changed. Actual quantity (L) and dissolution rate (wt%) can be selected for the setting.



- INFILT-V[®] conditions can be set on the Injection Setting display and can be recorded in the same way as other condition items.

- When INFILT-V[®] is not used, you can switch to normal moulding simply by turning it off on the control panel.

- For each setting item, the recommended condition is assigned as the default value in advance.

By adjusting them, more precise control can be performed.

Effectiveness expected by INFILT-V[®]

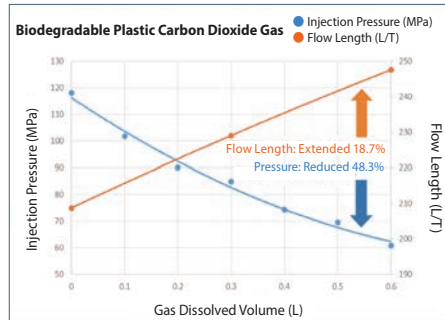
1 Effect as a plasticizer

- The viscosity is reduced by intrusion of an inert gas in a supercritical state into a molecular arrangement of plastics.

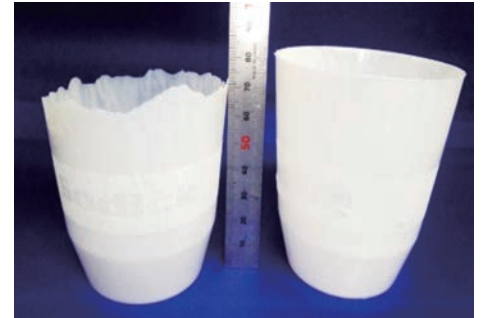
Examples of Effects Stretching the flow length and making products thin wall

Product Example Containers of thin-walled deep items, such as drinking cups

[Thin wall cup (thickness: 0.4mm, length: 105 mm)]
Graph of pressure and flow length of biodegradable plastic when carbon dioxide is dissolved



Comparison of flow conditions of thin cups Fill with INFILT-V[®]



Standard Moulding INFILT-V[®] Moulding

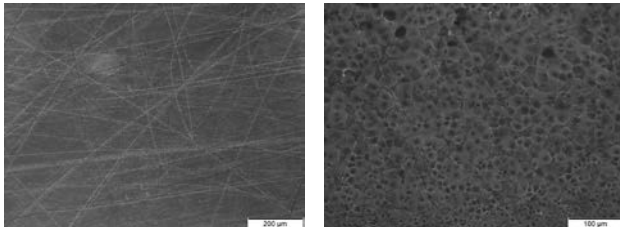
2 Effect of fine foaming

- When filling, the inert gas released from the compressed state is finely foamed (10µm or less) to suppress the shape change, so that the pressure holding process is shortened or not required.

Examples of Effects Reduction of warping, weight reduction, and reduce of cycle time

Product Example Mechanical components with mixed thin and thick walls, such as connectors

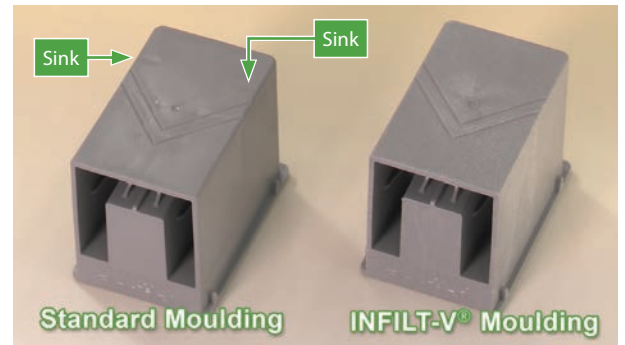
Comparison of foaming conditions in the vicinity of the skin layer of the wall-thinning portion



Standard Moulding

INFILT-V[®] Moulding

Comparison of sinks in the uneven thickness of mechanical parts (ink cartridges)



Standard Moulding

INFILT-V[®] Moulding

3 Environmentally conscious moulding by physical foaming

- After moulding, inert gas is released into the atmosphere, so there is no residue in the product and it can be recycled.
- Contributing to a Decarbonization Society through Environmentally Friendly Moulding Using Bioplastics

Product Example Food containers made of biodegradable plastic

Examples of moulded products of food containers made of biodegradable plastics



Sodick Co., Ltd.

Sodick Head Office / Research and Technology Center

3-12-1, Nakamachidai, Tsuzuki-ku, Yokohama, Kanagawa 224-8522 Japan

TEL: 81-45-942-3111

Printed in Japan

<https://www.sodick.co.jp/en/>

● The export of Sodick's products and its related technologies (including softwares) is regulated under Japan's Foreign Exchange and Foreign Trade Law. In addition, because some of these products may be subject to re-export restrictions under the Export Administration Regulations (EAR) of the United States, please contact Sodick before exporting/supplying these products overseas. ● eV-LINE[®] and INFILT-V[®] are registered trademarks of Sodick Co., Ltd. ● Due to ongoing research, specifications are subject to change without prior notice. ● This catalogue contains illustrations and drawings, and some may include certain options. ● The machining data in this catalogue is based on conditions, machining environment, and measurement standards that have been specified by Sodick. ● The information in this catalogue is current as of October 2023.

R1020201.2023.12<01>