

19 August 2022

NISSEI ASB MACHINE CO., LTD.  
(TSE Prime Section Code Number 6284)

## Nissei ASB to Demonstrate Four Molding Technologies at K 2022 with Focus on Packaging Sustainability & Efficiency

Nissei ASB Machine Co., Ltd. (Head office: Komoro-shi, Nagano-ken, Japan - President: Junichi Miyasaka), a world leading manufacture of machines and molds for injection stretch blow molding of PET and other plastics, will demonstrate live molding of four separate technologies at the K 2022 exhibition (Hall 14 Booth B38), to be held in Düsseldorf, Germany from 19<sup>th</sup> to 26<sup>th</sup> October 2022.

### Global Debuts

Three of the four machines being demonstrated will be making their global debuts at the K 2022 exhibition.

1. **HSB-4N** – Double Blow Heat-Set Reheat Blow Molding + 1-liter Returnable & Refillable PET Bottles for sparkling water – lightest in the industry with exceptional performance.
2. **PF36/9-12000** – 1.5-Step Injection Stretch Blow Molding + 12-liter Bag-In-Box super light-weight container for water server. (global debut)
3. **ASB-12M-2INJ** – 1-Step Double Layer Injection Stretch Blow Molding + 300ml Airless Pump bottle with PET outer & PP inner layer. (global debut)
4. **PM-100/111N** – Vertical Clamp Compact Preform Injection Molding + 13.5 gram preform at 14,700pph. (global debut)

## K 2022 Live Molding Samples by Nissei ASB



*Image 1 - K 2022 Molding demonstrations by Nissei ASB.  
1) 1-liter Returnable & Refillable, 2) 12-liter Bag-In-Box, 3) Double Layer Airless Pump bottle & preform, 4) 13.5 gram preform*

## 1. HSB-4N + Returnable & Refillable PET Bottles

### MACHINE

- HSB-4N : Double Blow Heat-Set Reheat Stretch Blow Molding

### MOLDED PRODUCT

- Type : 1-liter Returnable & Refillable PET Bottle
- Weight : 53 grams (lightest in its class)
- Output : 3,060 bph
- Application : Sparkling Water pressurized at 1.5 gas vol.
- Reusability : Greater than 25 times.

Returnable & Refillable PET Bottles are typically 90% lighter, with a 30% lower carbon footprint than their glass counterparts, and despite weighing around twice as much as a single use PET bottle, Returnable & Refillable PET Bottles only consume around 8-10% of the PET material during their lifetime of around 25 refills, that may extend up to 6 years in the future when considering a typical 3-month re-use cycle.

At K 2022, using its well-established Double Blow Heat-Set Process via its HSB Series Reheat Stretch Blow Molding machines, Nissei ASB will demonstrate live molding of a Returnable & Refillable PET Bottle on an HSB-4N machine that surpasses current industry standards in all respects;

- 1 Liter Sparkling Water with 1.5 gas vol. (design compatible with popular German industry standard for sparkling water)
- Weight: 53 grams (current industry standard 62 grams)
- Reuse Cycles: *Greater than 25 times* (current industry practice “up to 25 times”)
- rPET Content: Up to 30% without reduction in performance  
(in laboratory testing ASB’s R&R bottles with 30% RPET actually achieved in excess of 30 times washing and pressurization cycles)

The Double Blow Heat-Set process that is the main feature of the HSB Series machines, generates higher crystallinity (density) of the material together with less stress in the molded bottle which combine to provide improved thermal stability and greater resistance to environmental stress cracking, ensuring high reusability rates even at much lighter weight than current industry standards.

In a typical production scenario, a single HSB-4N machine will produce up to 20 million Returnable & Refillable PET Bottles per year, and with each having a lifetime of more than 25 cycles, represents the equivalent of 500 million single use bottles.

At end of life, Refillable PET Bottles can be bottle-to-bottle recycled or converted into

rPET for other new products, typically reducing their carbon footprint by an additional 25%.

ASB is no stranger to the Returnable & Refillable PET Bottle industry, the company developed and launched the first Returnable & Refillable PET Bottles for juices and soft drinks in the German market during the country's first "green wave" way back in 1989.

With the resurgence in interest and public demand for refillable packaging, not only in Germany but also globally, ASB is well placed to take advantage by utilizing its broad packaging expertise as well as its capable molding equipment.

## Returnable & Refillable PET Bottles & HSB-4N Image Gallery

(high resolution images also available separately)



*Image 2 - HSB-4N Double Blow Heat-Set Reheat Stretch Blow Molding Machine from Nissei ASB.*



*Image 3 – 1-liter Returnable & Refillable PET Bottles as demonstrated at K 2022, seen here with ASB developed preforms.*



*Image 4 – Various designs of Returnable & Refillable PET Bottles, all moldable by the HSB-4N machine.*

## 2. PF36/9-12000 + 12L Bag-In-Box for Water Server

### MACHINE

- PF36/9-12000 : 1.5-Step Injection Stretch Blow Molding

### MOLDED PRODUCT

- Type : 12-liter Bag-In-Box
- Weight : 120 grams
- Output : 1,540 bph
- Application : Collapsible container for domestic water server

The Bag-In-Box water delivery service is already an established market in Japan where Nissei ASB has been a key player, providing molding solutions for the popular sized 12-liter and 9-liter light-weight PET water containers. This packaging concept provides a wide range of benefits at the point of delivery, for consumer safety, and contributes to sustainability by reduction of resin consumption;

- Easily ordered for direct home delivery via major online shopping services.
- Easily stackable and secure, cube shaped outer cardboard carton is fully recyclable.
- No special delivery or collection trucks required.
- Full protection of water from airborne contamination, including bacteria and viruses. As water is dispensed from a conventional solid bottle, the familiar glugging of air bubbles into the bottle indicates it is being replaced with potentially contaminated ambient air. With the Bag-In-Box container, the thin wall collapses as water is dispensed, eliminating entry of air into the container.
- Lightweight PET inner container reduces material usage and is easily crushed for collection through municipal recycling programs. The 12-liter bottle weighs in at just 120 grams – 10 grams of PET per 1 liter of water – roughly half the plastic-to-water ratio compared to distribution via “light-weight” 500ml, 1.5L or 2L bottles.

The PF36/9-12000 machine is a further development of ASB's well established PF36 Series that operates on the company's original 1.5-Step principle – combining the best elements of 1-Step and 2-Step molding techniques into a highly efficient and compact system. Due to the inherent efficiency and compact nature of the 1.5-Step process, when compared to previous molding methods and assuming an equal production rate, the 12-liter Bag-In-Box container can now be molded using around;

- 35% less equipment cost
- 70% less floorspace
- 60% less energy consumption at the machine

All models in the PF36 Series work on the basis that injection molding typically takes around three times longer than stretch blow molding – in the case of the PF36/9-12000 this means that nine preforms are molded per injection cycle with bottles being blown three at a time.

Existing models in the PF36 Series are ideally suited for high volume production of PET bottles covering the range from 100ml up to 5-liters, while the all new PF36/9-12000 variant expands this range to include PET bottles in the 5-liter to 12-liter range.

## Bag-In-Box Container & PF36/9-12000 Image Gallery

(high resolution images also available separately)



*Image 5 - PF36/9-12000 1.5-Step ISBM from Nissei ASB*





*Image 6 - 12-liter Bag-In-Box bottle at only 120 grams*



*Image 7 - 12-liter Bag-In-Box bottle before filling and after use on water server.*



### 3. ASB-12M-2INJ + Airless Pump Double Layer Container

#### MACHINE

- ASB-12M-2INJ : 1-Step Double Layer Injection Stretch Blow Molding

#### MOLDED PRODUCT

- Type : 300ml Airless Pump
- Weight : 28.5 grams (PET : 22.8 grams + PP : 5.7 grams)
- Output : 410 bph
- Application : Liquids requiring no, or minimal contact with headspace air after initial opening.

ASB's patented Double Layer molding process enables containers to be molded with an inner and outer layer in the body and/or neck section in a variety of thicknesses, configurations, molding order, or resins as required to provide additional flexibility and value to the molded product.

The ASB-12M-2INJ is based on the company's best-selling ASB-12M model, re-engineered with twin injection units and a six-station rotary table that comprise two separate injection and cooling stations. These additions make it possible to dramatically enhance either visual or physical properties using various materials for inner or outer layers.

By adding two sets of lip-plate assembly and a replacement hot runner, mold sets manufactured for standard molding on ASB-12M machines can also be installed and operated, adding flexibility and backward compatibility.

Applications are wide and varied, a few examples include;

#### [Air-Less Pump Container](#)

(as demonstrated at K 2022)

The bottle is designed such that, as the contents are dispensed by a pump-spray that prevents air re-entering the bottle, the inner layer of polypropylene resin is allowed to delaminate from the outer PET layer and collapse with the product. As a result, virtually no headspace develops inside the bottle making it suitable for any liquid products that need protection from air after initial opening of the container.

#### [Ecological Container Using Recycled Flake PET as Outer Layer.](#)

Current production of food grade containers using recycled PET may be limited in many countries due to food safety regulations. This container is molded with an inner layer of virgin PET while the outer layer comprising of up to 70% of the container's body weight and that never contacts the filled product, can be molded using almost any quality of

recycled flake PET.

## Moisture Barrier Container

Polypropylene has higher moisture barrier characteristics compared to PET. Either the inner or outer layer, can be enhanced for mascara and other cosmetic containers where the contents require careful protection against moisture loss.

## Glass-Like Thick Base Container

The process can be used to fully simulate visually stunning, glass-like containers for premium quality cosmetics. The complex eye-catching colors and extra thick wall and base are available either in bottles or jars.

## Unique Design Containers

Integrated stripes, view-stripes, internal ribs, gradation etc.

Additional decorative features such as integrated stripes, internal ribs or gradation etc. can be added to the container design for maximum marketing impact or special functionality.

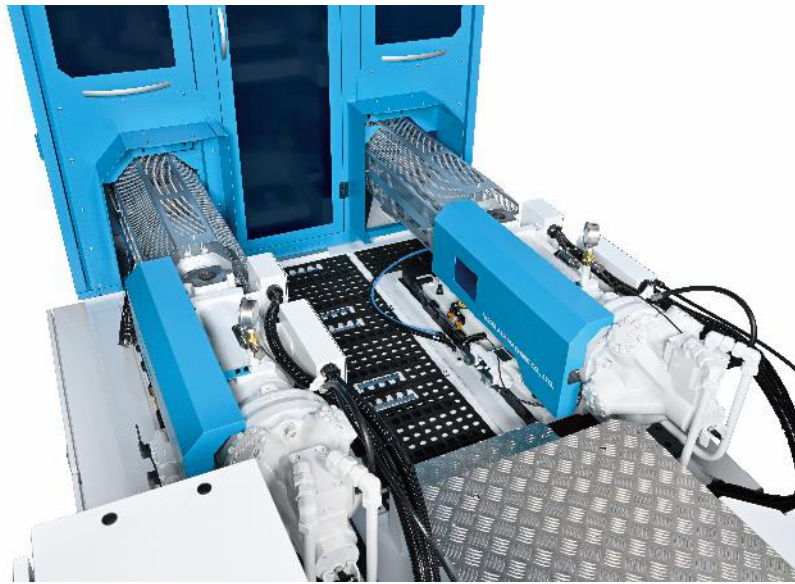
The great flexibility of the molding method offers untold possibilities and ASB will continue to develop the process and hardware including various capacity machine models according to the requirements and feedback of the market.

## Double Layer Molding & ASB-12M-2INJ Image Gallery

(high resolution images also available separately)



*Image 8 - ASB-12M-2INJ Double Layer, One-Step ISBM machine from Nissei ASB*



*Image 9 - Twin injection units mold inner & outer layers of the preform*



*Image 10 - Inner liner of Airless Pump bottle collapses during use to protect contents from excess headspace (K 2022 demonstration).*



*Image 11 - Double Layer Molding may also be used with a variety of materials and techniques to create stunningly unique, premium or sustainable packaging.*

## 4. PM-100/111N + Preform Molding

### MACHINE

- PM-100/111N : Preform Injection Molding

### MOLDED PRODUCT

- Type : Based on “28mm Alaska Neck” (T dimension 26.75mm)
- Weight : 13.5 grams
- Output : 14,700 pph
- Application : Mineral Water

K 2022 marks the global debut of ASB’s brand new PM-100, compact injection machine, ideal for preform manufacture where small to medium scale production of high quality preforms is required.

In keeping with ASB’s design philosophy, the PM-100 utilizes vertical clamping with mold indexing being conducted by a rotary table traversing through injection, cooling and eject stations with operations being carried out simultaneously in each station.

A complete set of lip cavities is mounted at each station so that molded preforms remain held by the neck until final ejection from the machine.

- Injection molding is conducted in a three-row configuration with a choice of 18, 24 or 36 cavities depending on preform specification.
- In the cooling station, preforms are actively cooled on both the inner and outer surfaces.
- After arriving at the eject station, further cooling can be conducted before the preforms are finally ejected from the lip cavities. On the next cycle, the now empty lip cavities complete their movement back to the injection station to start the process again.

Depending on customer requirements, preforms may be ejected from the machine via an optional conveyor or by more complex robot handling, while two injection screw diameter options, and two machine daylight options allow a wide range of preforms to be molded including those for Returnable & Refillable PET Bottles in a compact floorspace of only 13 m<sup>2</sup>.

## Preform Molding & PM-100/111N Image Gallery (high resolution images also available separately)



*Image 12 - PM-100/111N preform molding machine from Nissei ASB*



*Image 13 - Eject station of PM-100/111N showing rotary table with 36 cavities per station.*

## Additional Information

The machines will be displayed at K 2022 with a full line of matched molding ancillary equipment that the company is able to supply, such as preform unscrambler, chillers, compressors, mold temperature controllers, etc.

ASB's booth will also be exhibiting an exciting range of developments and packaging technologies including; Zero Cooling, heat resistant PET containers, bag-in-box, canted/tilted neck bottles, HDPE bottles by ISBM, thick wall / base cosmetic bottles, etc.

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NISSEI ASB MACHINE CO., LTD.

NISSEI ASB MACHINE CO., LTD. is a major stretch blow molding machine manufacturer for the production of plastic containers including PET bottles.

Head Office Address: 4586-3 Koo, Komoro-shi, Nagano-ken, Japan

Foundation: 8th November 1978

Employees: 2,099 staff (Consolidated: March 2022)

Capital: 3.8 billion Japanese yen

Sales: 35.9 billion Japanese yen (Consolidated accounting: September 2021)

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Inquiries:

NISSEI ASB MACHINE CO., LTD.

Sales Coordination Group

Sales Department

Mr. Paul Atkin

4386-3 Koo, Komoro-shi, Nagano-ken, Japan 384-8585

Tel : +81 (0)267 23 1565 Fax : +81 (0)267 23 1564

E-mail: [sales@nisseiasb.com](mailto:sales@nisseiasb.com) URL: [www.nisseiasb.co.jp](http://www.nisseiasb.co.jp)