



ASB
Form Your Vision

PM / CM / HSB Series

PM-170/111M - CM-6000M - HSB-6M

Machines for Hot Fillable Jar Manufacturing



Hot Fillable Jar Production

Once just a dream, now becoming a reality.

ASB's double-blow technology brings hot fillable jars into the mainstream.

Complete system for a full production line to replace glass containers.



For many years it has been the dream of PET container makers around the world to supply jars for product such as jams, marmalade sauces and pickles. The market is potentially huge, and if it can be converted, the PET container market will expand on a scale not seen since the adoption of carbonated drinks bottles nearly 30 years ago. But, many of these filled products are hot filled either as an aid to filling the high viscosity products, or in order to provide pasteurization and long shelf life. The reason why this sector has not taken off yet is because until now, no-one has been able to make a non-glass jar that satisfies the needs of the fillers in terms of heat resistance.

One of the major challenges for hot fillable jars is developing a crystallized neck that remains free from deformation that would lead to leakage. This is something that is relatively easy to do on 28~38mm necks but as the diameter goes up, so does the difficulty.

Nissei ASB has been working in the field of hot fillable container manufacturing for over 20 years, mainly for narrow necked containers for tea and juices. Now we have used our vast experience in heat-set molding technology to develop a series of machines dedicated to the production of PET wide mouth jars that can be hot filled at temperatures of 90 °C and above.

There are three steps in the process – preform molding, neck crystallization and finally, stretch blow molding using ASB's proven double blow heat-set technology. Although ASB is probably best known for its 1-step machines, we have already developed and sold many small scale 2-step machines over the last 20 years. For regular sized containers, the 2-step approach lends itself more towards the requirements of the

double-blow heat-set process, which is why ASB has utilized the PM-CM-HSB machine combination. Together, these can provide the highest heat resistance currently available in the PET container industry.

■ Preform Molding – PM-170/111M

This can be carried out on virtually any injection molding machine but for optimum preform quality we recommend a vertical clamp type machine. ASB has optimized the design of the PM-170/111M machine to match the throughput of the production line. Preforms can either be manufactured for stock / transportation (off-line) or can be molded on-line with the rest of the process using custom designed conveyor and accumulation systems.

For 63mm jars, the PM-170/111M will mold 24 cavities but it can also be configured to mold up to 38mm preforms in 32 cavities.

■ Neck Crystallization – CM-6000M

To provide the necessary heat resistance to avoid deformation of the neck during filling and capping, the preform is passed through a neck crystallizing machine. ASB has already been supplying these machines to the hot-fill beverage industry for more than 10 years for narrow necked bottles. However wide necked jars often use metal caps and the distortion forces can be much higher than for a bottle. In order to produce a stable, consistent container neck it was necessary to completely re-think the process leading to a completely revised machine design for the CM-6000M.

As the name suggests, typical throughput rates will be around 6,000pph for a 63mm neck.

■ PM-170/111M Specifications

Products		Unit		
Cavity		No.	24	(32)
Max. Thread Diameter	T	mm	63	(38)
Max. Neck Diameter	E	mm	60	(36)
Max. Support Ring Diameter	SR	mm	66	(42)
Max. Weight (PET)		g	60*	(45)*
Preform Length		mm	62-155	

• All figures are subject to container configuration • () Optional figure • * - Using 95mm screw

Machine	Unit	(24 cavity jar preform)
Theoretical Injection Capacity	cm ³	1,700 (95mm screw)
Driving Power (Rated)	kW	103
Heater Capacity (Rated)	kW	63.5
Oil Reservoir	L	1,100
Machine Size (L x W x H)	mm	8,550 × 1,990 × 3,579
Machine Weight (inc. mold.)	ton	26

• Specifications are subject to change without any obligation on the part of the manufacturer

■ CM-6000M Specifications

Products		Unit	
Min. Neck Bore Diameter	I	mm	29
Max. Thread Diameter	T	mm	63
Max. Neck Diameter	E	mm	60
Max. Support Ring Diameter	SR	mm	70
Max. Preform Length		mm	83

• All figures are subject to container configuration

Machine	Unit	
Driving Power (Rated)	kW	3.2
Others	kW	3.0
Heater Capacity (Rated)	kW	80
Machine Size (L x W x H)	mm	8,150 × 2,250 × 1,800
Machine Weight (ex. mold.)	ton	8

• Specifications are subject to change without any obligation on the part of the manufacturer

■ Stretch Blow Molding – HSB-6M

The HSB-6M machine is used to re-heat preforms and stretch-blow the jar using ASB's well tested double-blow heat-set technology. The machine exhibited at the K2010 exhibition is molding a PET jar having the following properties;

Weight	-	30g
Thread Dia.	-	63mm
Capacity	-	350ml (fill point)
Fill Temp.	-	up to 92 °C
Production	-	5,800bph approx.

To ensure optimum heating, the preforms are inverted to a neck down position by the specially designed preform unscrambler. In the heating oven, 6 rows of halogen lamps are employed to allow fine control of wall thickness. Lamps can be re-positioned both horizontally and vertically allowing the ideal heating profile to be set up for a variety of preform shapes and sizes.

After heating, the preforms are again inverted, to the upright position and at the same time the pitch is changed to that of the blow mold.

The complete line is matched to approximately 5,500~6,000bph (subject to product specifications and molding conditions)



■ The Double-Blow Process

First blowing is conducted into a mold that is electrically heated to around 180°C. As the blow air is exhausted, the primary container starts shrinking which releases stress from the PET molecules. At the same time, crystals start growing within the material.

Preforms are then rapidly moved to the second blow mold where the shrunken container is blown out to the final container shape into a blow mold heated by MTC units to around 100°C. The temperature of the second mold allows the crystal growth to continue and stress relieving reduces the tendency of the container to shrink after molding.

■ Glass vs. PET

- Changing a 350ml jar from glass to PET results in a weight saving of approximately 170g per container. That represents a huge saving in transportation costs and carbon generation.
- Breakages can be reduced to virtually zero.
- Package volume is reduced, allowing more product to be transported in a smaller space.
- Greater variety of shapes can be molded in PET.

■ HSB-6M Specifications

Products	Unit		
Cavity	No.		6
Max. Capacity	L		0.6
Max. Thread Diameter	T	mm	63
Max. Neck Diameter	E	mm	60
Max. Body Diameter	BD	mm	90
Max. Height	HB	mm	158

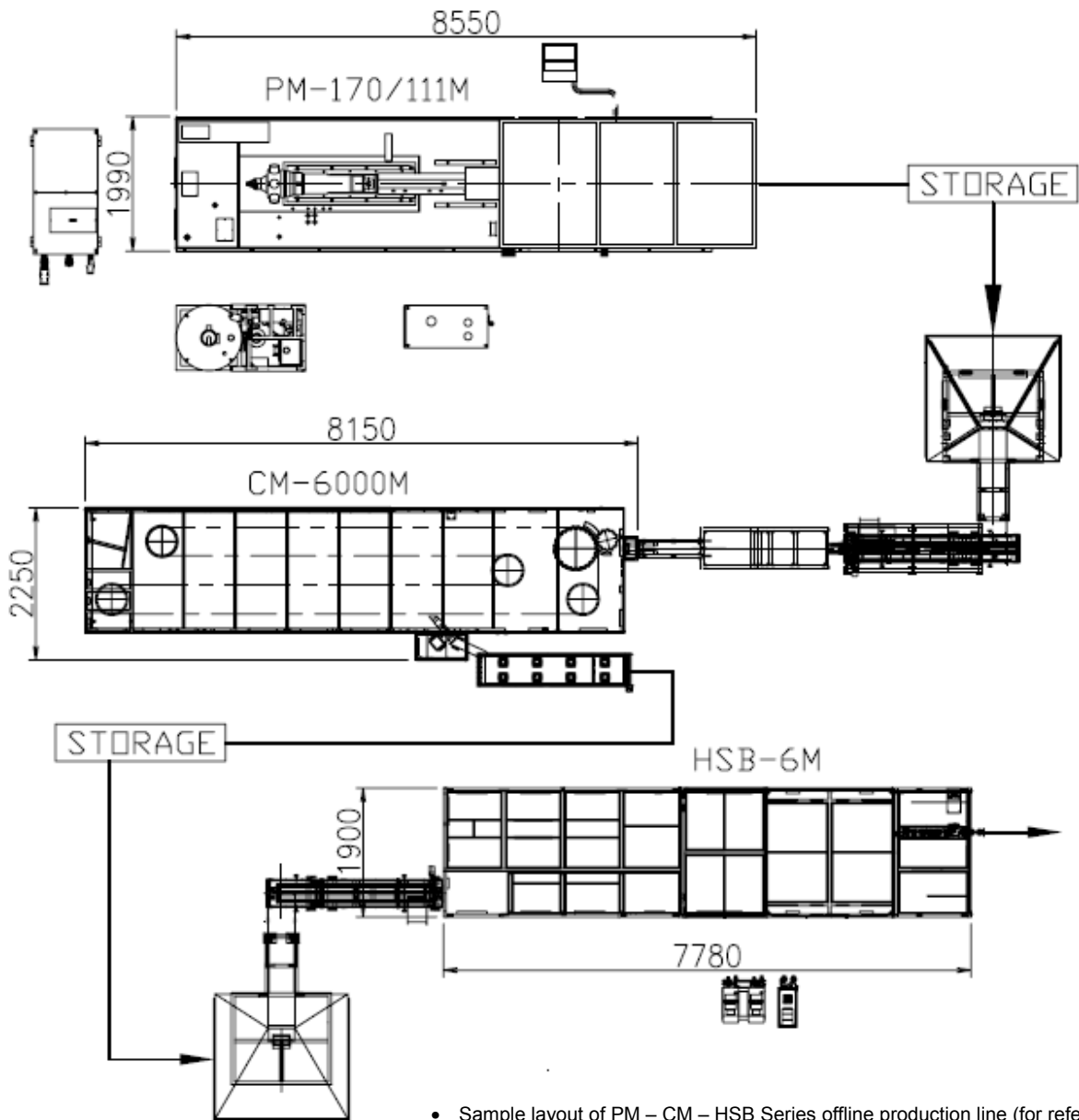
• All figures are subject to container configuration

- HSB-6M machine for hot fillable jar production

Machine	Unit	
Driving Power (Rated)	kW	23.5
Heater Capacity (Rated)	kW	85.6 *1
Oil Reservoir	L	25
Machine Size (L x W x H)	mm	7780 x 1900 x 2990
Machine Weight (ex. mold.)	ton	11.5

• Specifications are subject to change without any obligation on the part of the manufacturer

*1 – Depends on container specification



• Sample layout of PM – CM – HSB Series offline production line (for reference only)

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