

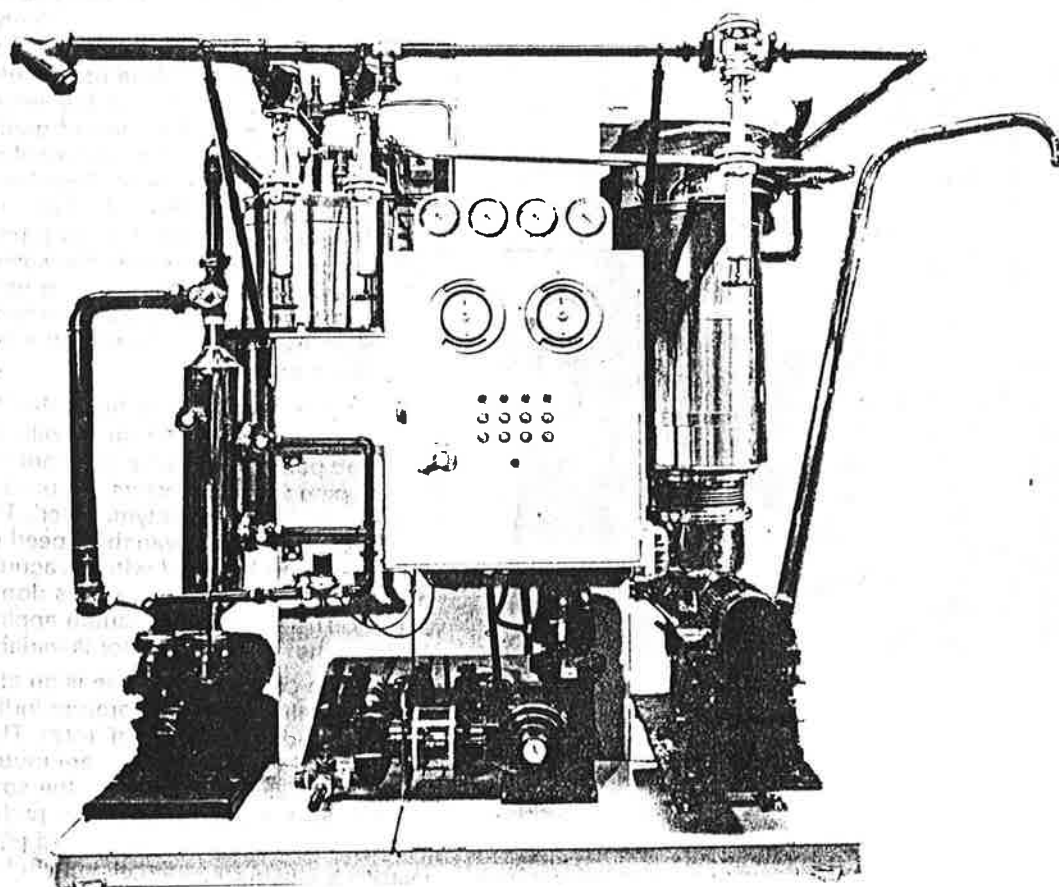


Data sheet 138/139

138 'Microfilm' cooker (size 20)

139 'Microfilm' cooker (size 27)

Application The continuous cooking of high boiled candy, butterscotch, milk boils, toffee or other sugar confectionery.



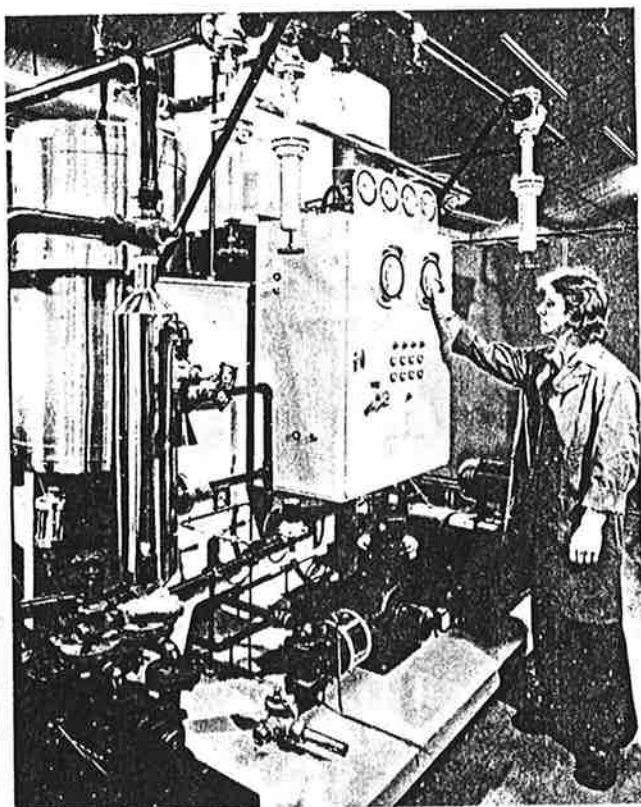
138 'Microfilm' cooker (size 20).

139 'Microfilm' cooker (size 27)

Introduction

The 138 and 139 'Microfilm' cookers are available as atmospheric or vacuum cookers. They are suitable for all types of high boilings and can also be used for low boilings. They are very efficient cookers using the scraped film principle, which results in extremely rapid cooking. This reduces process inversion to a minimum. The scraped film also means that confectionery containing milk products can be handled on this machine without the risk of burning or the need for frequent cleaning.

The principal uses of this machine are for feeding depositing plant or continuous cooling bands. In the case where a depositor is to be fed, a vacuum cooker should be chosen.



Description

The plant starts with a free-standing stainless steel reservoir for dissolved syrup. This has a total capacity of 250 kg (550 lb) and is fitted with inlet and outlet filters.

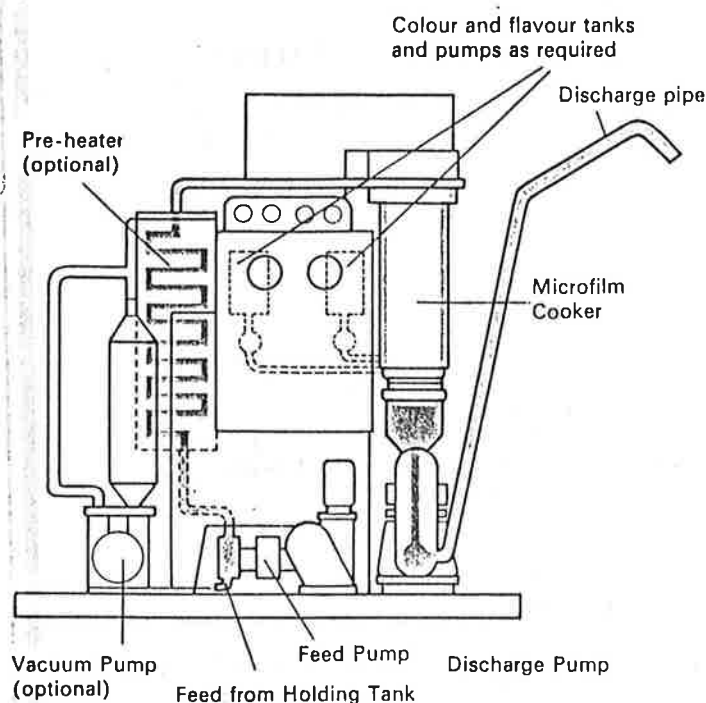
The syrup is pumped from the holding tank into the cooker by an infinitely variable syrup feed pump which has a manually adjusted throughput control. The following items, when included in the specification, are all mounted on a common framework—the preheater, 'Microfilm' rotor, syrup feed pump, discharge pump, vacuum pump, metering pumps, electrical control panel and steam controls.

On some models a preheater unit is included to precook the syrup before it enters the 'Microfilm' rotor. This initial cooking increases the output of the 'Microfilm' cooker. The precooker is an insulated steam-heated cylinder with an internal copper coil.

The principal component of this machine is the 'Microfilm' rotor assembly. The 138 'Microfilm' is fitted with a size 20 rotor, the 139 with a size 27. The rotor is a scraped film evaporator, made up of a bronze steam jacketed tube with a high speed rotor fitted inside the centre. The rotor has hinged blades which wipe the inner surface of the tube. The sugar is spread in a very thin film and is moved through the cooking tube by a combination of gravity and the design of the hinged blades. The cooked sugar is discharged from the 'Microfilm' cooker in one of two ways, either by gravity from the base of the rotor or by a discharge pump and delivery pipe. Gravity discharge can only be used in the case of atmospheric cooking. Where vacuum cooking is used a discharge pump is necessary to withdraw the sugar from the vacuum. A discharge pump can also be used with an atmospheric cooker.

When a discharge pump is fitted the 'Microfilm' rotor discharges into a stainless steel collecting chamber above the pump. The pump is steam heated as is the delivery pipe which transfers the product to the next machine, such as a 'Candymoulder'. The discharge pump has an infinitely variable speed drive. The cooker can be fitted with a vacuum pump and condenser unit so that cooking is done under vacuum. The amount of vacuum applied to the centre of the 'Microfilm' rotor is variable.

On the side of the main frame is an electrical control panel with electronic temperature indicators for the preheater and the 'Microfilm' rotor. The steam pressure and vacuum gauges are mounted above this panel. There are valves for the control of steam pressure for the 'Microfilm' rotor, preheater and jackets of the discharge pump and pipe. The necessary steam traps are also included.



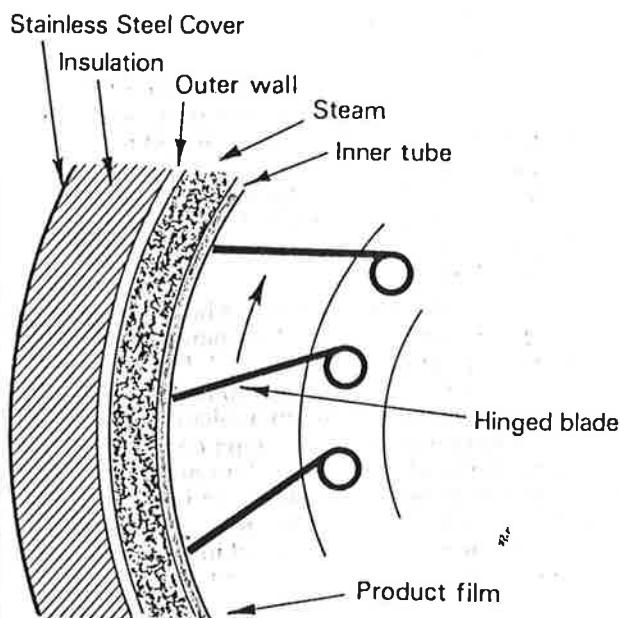
Operation

The syrup feed pump is set to the required output for subsequent processing, for example, depositing. The syrup then passes via the preheater, if one is fitted, to the 'Microfilm' rotor. Steam pressure for the preheater and 'Microfilm' rotor are individually set to give the required cooking temperatures. There is one control to adjust the required vacuum, where vacuum is used.

Where a discharge pump is fitted the syrup in the collecting chamber can be observed through windows and the discharge pump adjusted to keep a constant level.

Once the cooker is in production only occasional supervision is required by the operator.

The use of vacuum cooking is recommended where a depositing plant is being fed. Cooking under vacuum results in lower cooking temperatures for an equivalent residual moisture content when compared to atmospheric cooking. This lower temperature gives better process control and a better end product.



SCRAPED FILM

Output

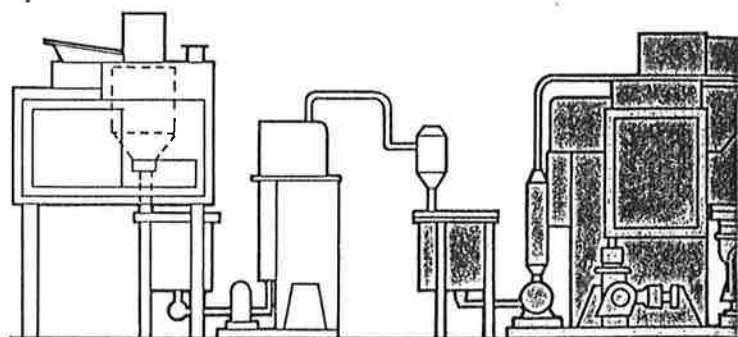
Output figures are given in the chart below. These figures are made on the following assumptions:

The product is hard candy with a ratio of 60/40 of sugar to glucose.

The syrup fed to the machine has been dissolved to 110°C (230°F).

The steam pressure is nine atmospheres (120 psi). The cooking temperature is 146°C (295°F), with 250 mm (10 in.) vacuum or 157°C (315°F) for atmospheric cookers.

Under normal circumstances the minimum output for any of the 138 models is 135 kg per hour (300 lb per hour). For the 139 it is 270 kg per hour (600 lb per hour).



141-CDP or 148-AF8MP plus 150-63JF

138/139-Microfilm

Products

Candy

Hard candy recipes vary according to the end product required and the available raw materials. The usual recipe is 60 parts sugar to 40 parts of 42 DE glucose. If less glucose is used the recipe must be balanced by added invert sugar or the use of acid to create invert sugar. Up to 100% glucose can be cooked.

Butterscotch

It is usual to add butter at the dissolving stage. The plant requires the fitting of a stirrer in the reservoir tank. This is available as an extra.

Milk Boils

We recommend that condensed milk is used. However if fresh milk is used it should be pre-treated to avoid frothing. The swept surface of the 'Microfilm' cooker ensures that there is no need for frequent cleaning due to burning or build-up on the heated surface. Where a preheater is fitted the output of the plant should be reduced to avoid the risk of burning in the preheater.

Toffee

The 'Microfilm' cooker can be useful in the production of toffees by its use to evaporate the majority of the moisture. However, the 'Microfilm' cooker would not normally be used on its own for toffee production; since the product discharged from the machine would be pale in colour and lacking in caramel flavour. The machine should be followed by a carameliser such as the 147 Toffee Cooker. The use of the 'Microfilm' cooker has the advantage of reducing the total cooking and caramelising time so that the space required and cost of the equipment can be reduced.

Normal cooking range

118°C to 160°C (245°F to 320°F) atmospheric, or 138°C to 160°C (280°F to 320°F) with 0-250 mm (0-10 in.) vacuum.

Residual moisture

Using a recipe of 60 parts sugar to 40 parts glucose we would expect the following results:
146°C (295°F) with 250mm (10 in.) vacuum or, 157°C (315°F) with atmospheric cooking would give a residual moisture of 2.5% Karl Fischer (approximately 1% vacuum oven).

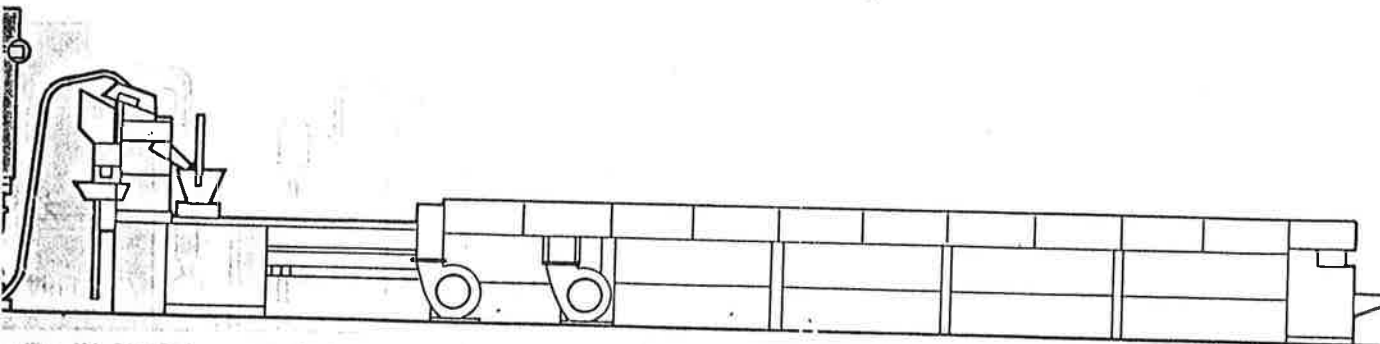
Feed requirement

The machine must be fed with fully dissolved syrup, preferably dissolved to 110°C (230°F) or higher.

Optional extras

A patented stainless steel mixing cone can be supplied with feed and washout chutes to suit a CD depositor (156 'Candymoulder'). These parts are necessary to link the cooker and depositor and to incorporate flavour into the cooked sugar. The mixing cone is electrically heated for warming up before starting the depositor and has its own drive. There are four possible speeds of rotation so that the optimum can be chosen.

One or more liquid additive systems can be supplied. These are for colour, flavour or acid. A minimum of two of these systems is normally required. Each system consists of a plastic container complete with filter and taps, connected by pipe to a micro-adjustable metering pump. A further pipe connects the pump to the point of addition. Colour and acid are normally premixed and added together in the collecting chamber of the 'Microfilm' rotor. Flavour is normally added in the mixing cone, and in this case a jet nozzle assembly is provided to inject the flavour in a fine stream into the cone.



153-CDRG Candymoulder

Machine designation

The basic machines are designated 138-20 or 139-27. To this is added one or more of the following suffixes:

- PHC — refers to the case where a preheater is fitted.
 A — refers to atmospheric cooking.
 V — refers to machines fitted with a vacuum system.
 P — refers to machines fitted with a discharge pump.
 N.B. Vacuum cookers must have this pump.

The available models are listed below:—

138-20A atmospheric 'Microfilm' cooker with a size 20 rotor.

138-20AP similar to the previous machine but with a discharge pump.

138-20/PHC/A similar to the first machine but with a preheater.

138-20/PHC/AP—similar to the previous machine but with a pump discharge.

138-20VP—'Microfilm' cooker, size 20, with a vacuum system and discharge pump.

138-20/PHC/VP—similar to the previous machine but with a preheater.

139-27A atmospheric 'Microfilm' cooker with a size 27 rotor.

139-27AP similar to the previous machine but with a discharge pump.

139-27/PHC/A similar to the 139-27A but with a preheater.

139-27/PHC/AP—similar to the previous machine but with a pump discharge.

139-27VP—'Microfilm' cooker, size 27, with a vacuum system and discharge pump.

139-27/PHC/VP—similar to the previous machine but with a preheater.

Example: a 139-27/PHC/VP is a 'Microfilm' cooker with a size 27 rotor, a preheater, a vacuum system and discharge pump.

Additives for deposited sweets

Buffered lactic acid (80% solids) is added in the collecting chamber of the cooker. A typical proportion is 2%.

Colour is normally mixed together with the buffered acid and added in the collecting chamber. The capacity of the additive pump for the acid and colour is 0 to 19 litres per hour.

Flavour is added in the mixing cone. The quantity is generally in the range 0 to 4.7 litres per hour.

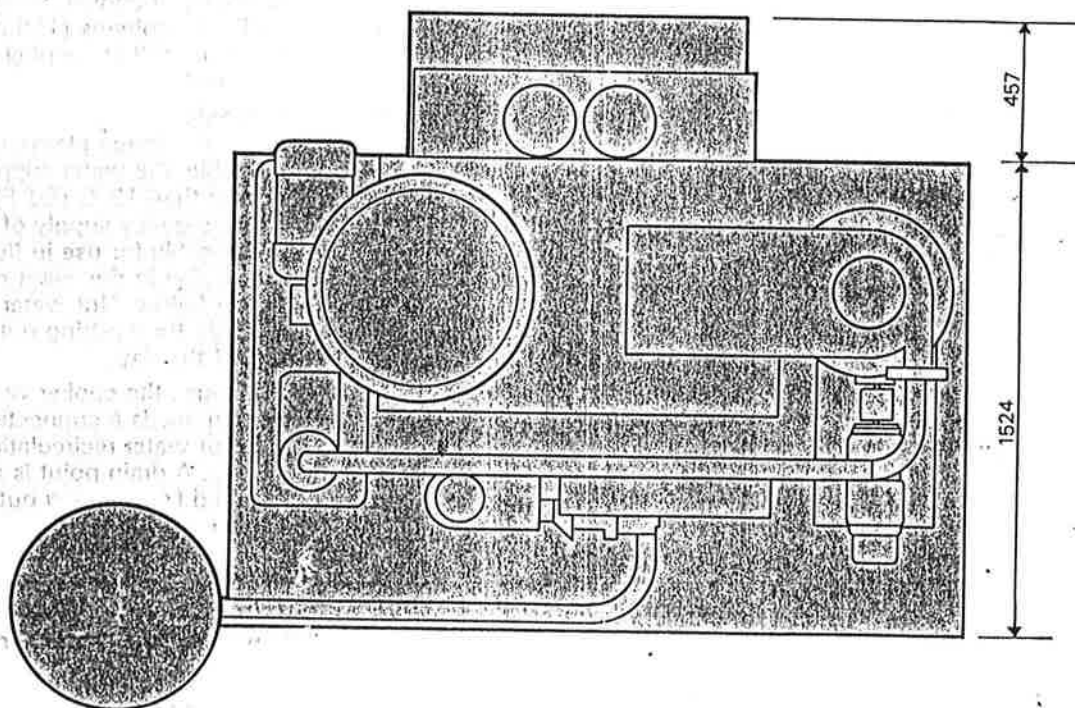
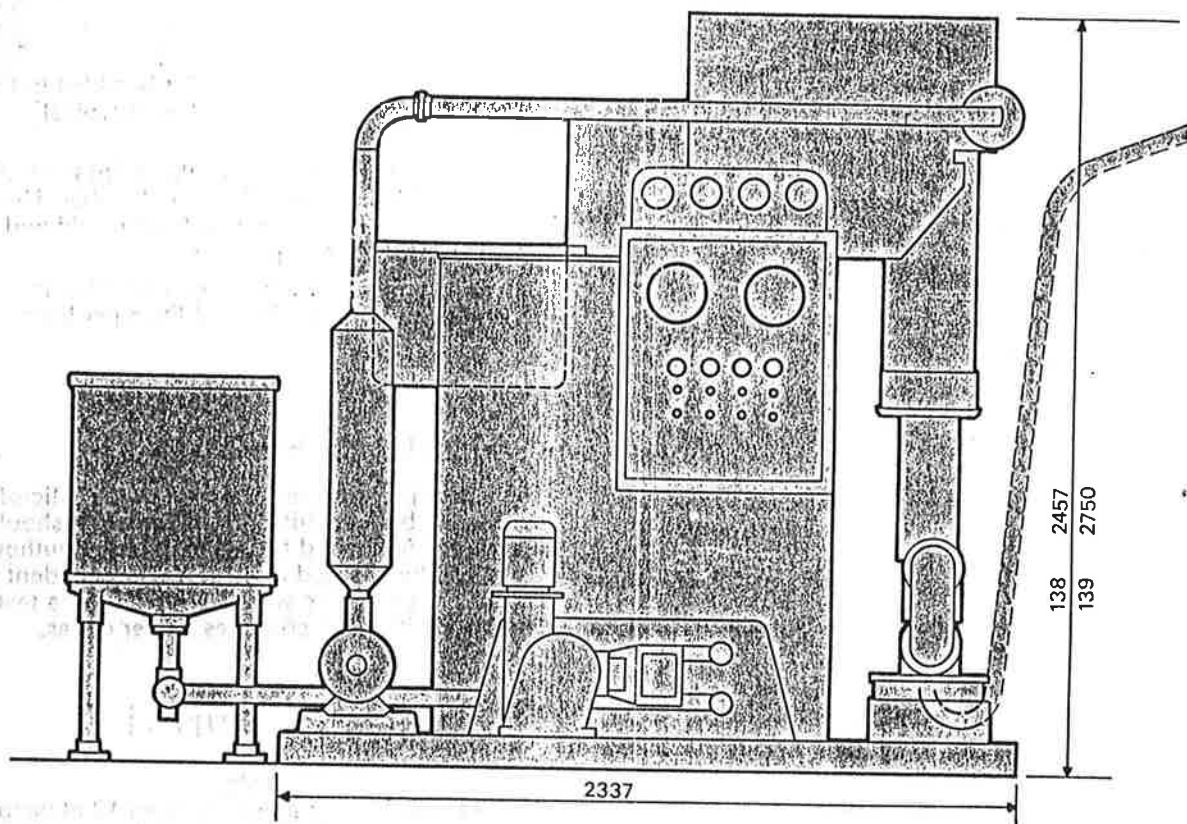
Pressure testing

The steam pressure vessels used in the 'Microfilm' cooker are built to British Standards and should drawings be required to satisfy different authorities, these will be charged at cost. An independent testing authority's certificate will be supplied for a test that complies with most countries' boiler codes.

Services required

Power	see table
Steam pressure	at line, maximum 12 atmospheres (170 psi) at cooker, maximum 10.5 atmospheres (150 psi) minimum 6.8 atmospheres (100 psi).
Steam usage	see table
Water	For water usage please refer to the table, the water supply should be less than 15°C (60°F). An emergency supply of hot water is advisable for use in flushing out the cooker in the event of a power failure. Hot water is required for washing out at the end of the day. Drainage: the cooker vacuum system needs a connection to drain or water recirculation system. A drain point is also required for washing out the cooker.

Model	Output		Power		Steam usage		Water usage	
	kg/hr	lb/hr	kW	hp	kg/hr	lb/hr	litres/hr	gal/hr
138-20A	180	400	8.2	11	65	145	—	—
138-20AP	180	400	10	13.5	65	145	—	—
138-20/PHC/A	400	880	8.2	11	140	310	—	—
138-20/PHC/AP	400	880	10	13.5	140	310	—	—
138-20VP	225	500	15.6	21	80	175	900	225
138-20/PHC/VP	400	880	15.6	21	140	310	1500	375
139-27A	360	800	15.6	21	130	290	—	—
139-27AP	360	800	19.4	26	130	290	—	—
139-27/PHC/A	900	2000	15.6	21	320	720	—	—
139-27/PHC/AP	900	2000	19.4	26	320	720	—	—
139-27VP	450	1000	26.8	36	160	360	1800	450
139-27/PHC/VP	1000	2200	26.8	36	360	800	3600	900



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