



BMB ENTERPRISES, INC.

NEW BB2, 260 MM BAND CONTINUOUS AUTOCLAVE FOR HEAT SETTING/ DYE FIXATION



The all-new BB2 Continuous Autoclave for heat-setting carpet yarns offers significant advantages over current heat-setting methods.

Our standard machine includes three, three meter heating sections, for a total of nine meters of heat setting, but an additional 3 meter section can be added, for a total of twelve meters, if longer dwell times for adequate heat setting times are required. A CBS recirculation system is included for constant homogenation of the steam/air mixture, as well it's ability to force this mixture through the coil of yarn on the transport belt to insure thorough heat-setting, Both sealing heads (entrance and exit) have shifting frames and compensator bellows with very simple hydraulic pumping systems for each end, to seal the tightening head assemblies. These hydraulic pumps are controlled by pressure sensors that activates them only when necessary, insuring that there is no unnecessary energy usage and the associated heat built-up that would be seen if the pumps ran constantly as they have in previous versions. The machine also includes tightening rollers from Day International that can be re-covered when necessary. Lamellas and side plates are constructed using a Teflon/graphite composite for longer wear life in this redesigned head.



Pre-Bulking Chamber

The stainless-steel, forced air pre-bulker unit operates with either live steam injection or a water bath. Changing from live steam to sump mode is fast and easy. Opening one valve and closing another is all that is required. No mechanical changes to the machine are required to switch from one to the other.



BB2 Cooling Chambers

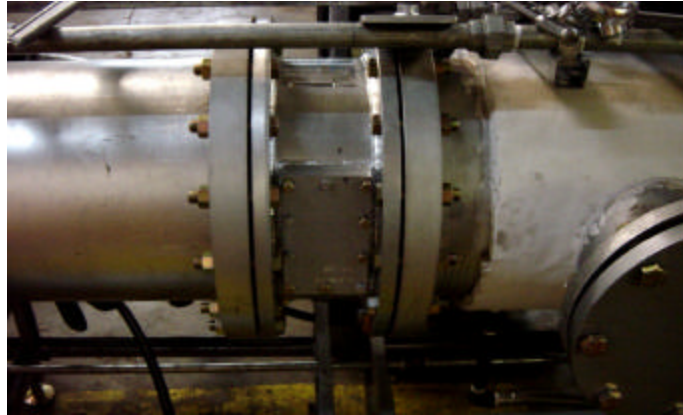
Possibly the most innovative components of the BB2 Continuous Autoclave are the cooling chambers. Both of the entrance and exit cooling zones are designed to operate in a similar fashion as the CBS system. An external blower draws the hot air from the top of the cooling chamber and forces it through a shell-and-tube heat exchanger. The now cool and dry air then re-enters the cooling chamber and is directed into an internal diffuser tray and up through the yarn coil. The advantages of the external blower and cooling device include:

- More space for the transport belt and yarn mass to pass through the cooling chamber without interference.
- Elimination of any concern regarding leakage of the cooling water and subsequent contact with the yarn. Cooling water that leaks or is sprayed on the yarn in the entrance chamber before heat-setting will nearly always result in off-quality yarn.
- Cooling efficiency is very high because of the condition of the air after exiting the heat exchanger. This very cool, very dry air is pushed through the yarn coil with a blower that has a much higher static pressure than could be achieved with a blower that is mounted internally in the tunnel. The high percentage of moisture that is removed from the cooling chamber environment along with the effects of the cooler air enables higher transport speeds and belt densities, which of course provides higher production rates.



Transitions Zones

The transition zones that separate the entrance and exit cooling chambers from the heat-setting chamber have been re-designed. Our U.S. patented cooling chamber requires no offset in height between the cooling and heat-set chambers, so the transition zone is a straight-through design. In the past, the off-set was necessary to accommodate the internal cooling coils of the original design and limited the overall thickness of the yarn that was to be heat-set, but since the BB2 cooling mechanism is outside of the tunnel, the level of the transition zones are not required to change. The result of this change means that there is much more room for the yarn to travel through the transition zones, as well as within the cooling chambers, which can allow more yarn height and width on the transport belt, consequently providing the potential for higher belt mass and productivity. Also, our patent allows for an increased depth of water within the tunnel that results in more stable running conditions during yarn processing due to the total increase in the mass of the water.



Other Features

The system also includes a Belmont coiling head and overfeed designed specifically to accommodate the 260 mm BB2 tunnel. Solid stainless-steel super cool-out fans for the entrance and the exit ends, which feature much higher air velocities and more efficient operation, and a 260 mm conveyor band, with an aperture size that is the customer's choice, along with complete frame work and cabinet covers.



Also included in this system is a yarn accumulation system, capable of 48-end operation. It is similar to the standard market design for this type of equipment.

Motor Control Centers

Motor control centers for each tunnel are housed in two 36" x 30" partitioned panels that have been linked together, isolating all controls 49 volts and less on one side and all high voltage on the other. This allows for ease of troubleshooting while remaining in compliance with the NFPA 70E rule. This enclosure will include invertors with remote keypads for the following motors: yarn-feed and belt drive. PLC's will be utilized on all machines. All necessary electrical components including current monitors, contactors, relays, and overload protection will be included. Schematic and ladder logic diagrams will be provided for each machine. The tilt-tray operator panel will house start, stop, and e-stop push buttons, and speed control pots for the operation of the tunnel.



Every control component is CE compliant. In addition, hardware components are off-the-shelf and available in most locations. Our desire is that our customers will be able to run our equipment 24-7. To compete with the rest of the world, we must provide our customers with the ability to source failed components as quickly as possible. Therefore, we attempt to specify components that are easily and quickly available from sources other than ourselves, with the only exception being our proprietary software. Regarding our software, our technicians are available by telephone or email and the majority of our electronic products are capable of online access. This allows our technicians to diagnose and correct problems online, without the necessity of costly and time consuming visits. It's just another advantage of working with BMB Enterprises.



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