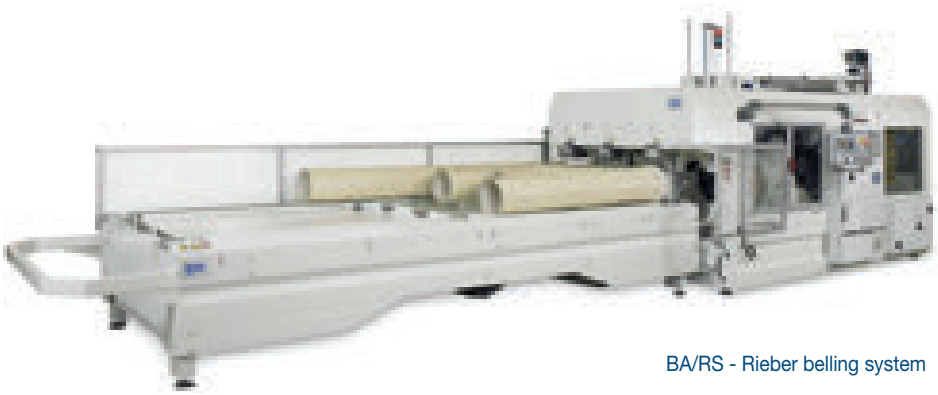
MEETING PROCESSORS' NEEDS

SIDE-BY-SIDE DEVELOPMENT OF BELLING MACHINES

YEARS OF EXPERIENCE AND CONTINUOUS RESEARCH IN THE FIELD OF PIPE SOCKETING HAVE ALLOWED IPM TO OBTAIN SIGNIFICANT RESULTS IN THE TECHNICAL IMPLEMENTATION OF BELLING MACHINES AND, ABOVE ALL, IN THE FINAL PRODUCT. THE HUGE GROWTH IN DEMAND FOR BELLING MACHINES BY PIPE MANUFACTURERS WORLDWIDE COMES AS A CONFIRMATION OF THE ABOVE STATEMENT. THE MOTTO OF THE COMPANY IS "MEET CUSTOMERS' NEEDS AND SATISFY THEIR REQUESTS BY DEVELOPING EACH PROJECT SIDE BY SIDE, TAKING CARE OF ALL THE SPECIFIC NEEDS OF EACH CUSTOMER"

In fact, the range of belling machines for PVC pipes developed by IPM is able to meet all the specific requirements of the customers. To obtain smooth or sewer o-ring sockets on pipes with diameters up to 200 mm with small wall thicknesses (thin walls), IPM produces the BA belling machine model - a fully automatic in-line working machine with pneumatic motion. The socket is made by a smooth or blowing o-ring mandrel from inside and moulds/clamps from outside. Cooling is provided by water circulation inside the clamps/moulds and inside the mandrel. Simplicity, elegance and high output are the main features of this machine. Among BA belling machine models, a version for bi-extrusion lines, which can maintain very high production rates, is also available.



BA/RS - Rieber belling system

The BA/ME model is a belling machine able to produce either the socket types mentioned above for the BA model or sockets produced by a mechanical mandrel with expandable sectors (both sewer and pressure o-ring sockets). This type of mandrel ensures high- precision inner diameter measurements, normally difficult to obtain, in particular with pipes with great wall thicknesses (thick walls). This is an important factor if the processor wants to obtain a sealed connection, particularly when it comes to pressure pipes. In this case, the forming takes place in the high-pressure chamber using a mechanical mandrel with expandable segments inside the pipe (i.e. inner calibration). Also the cooling occurs in the high-pressure chamber, by nebulised spraying of water containing the coolant. The hydraulic movement of the forming station allows more precise motion and gives enough strength in case of thick walls. This model covers a range of pipe diameters from 32 mm up to 1200 mm.

In order to fully respond to market needs, IPM

has created BA/RS - Rieber belling system, to manufacture the same types of sockets produced by BA/ME, but which main feature is the possibility of making sockets for high-pressure pipes with a rigid seal (Forsheda type or alike). The forming and cooling occur as with BA/ME, but the main difference is the presence of a fully automated system dealing with the whole management of rigid seals (taken from storage, lubricated, brought to the forming station, and inserted on the special mandrel). This model covers a range of diameters from 32 mm up to 1600 mm.

The Italian company has also distinguished itself in the field of BIAX (belling of bi-oriented PVC pipes). The bi-oriented extrusion material ensures a level of resistance which is higher than usual with a smaller pipe wall thickness. IPM belling machines for BIAX pipes have been developed specifically for this particular kind of material. The heating process occurs within two ovens. This model covers a range of diameters from 50 mm up to 630 mm.

For those pipe producers who need semiautomatic solutions, IPM has developed semiautomatic versions of the machines described above:

- BS: the semiautomatic version of the BA model;
- BS/ME: the semiautomatic version of the BA/ME model;
- BS/RS: the semiautomatic version of the BS/RS model;
- BSR: a semiautomatic belling machine for short pipes, up to two metres long, mostly useful for the production of sleeves with smooth or sewer o-ring sockets.

IPM's significant experience in the field of heating and cooling is the pillar of the success of its belling machines, ensuring top quality and allowing pipe manufacturers to obtain high outputs.

SOME IMPORTANT SPECIFICATIONS

Standard models have two infrared ovens (with ceramic resistances), but can be supplied with just one oven upon request (if a lower output is required). In case of very thick wall pipes, it is possible to install a shortwave oven upon request. This system exploits the principle of shaking pipe material molecules with shortwaves during irradiation, so as to shorten heating time (increasing the output as a consequence). This allows the achievement of homogeneous heating on the whole thickness of the pipe, whereas, with standard ovens, the heating time needs to be prolonged in case of thick wall pipes, which could lead to burning the pipe outer layer and, therefore, damaging its surface. During the heating process, the temperature of the part of the pipe being heated is constantly kept under control by sensors allowing the monitoring and control of the entire heating process, so that the heater is turned off when the desired temperature is reached, which means significant savings. To guarantee uniform heating in all the points, the pipe rotates around its own axis by means of specific rollers.

The BS model is BA semiautomatic version

Before entering the oven, the pipe passes through a blowing phase that frees it from chips; this operation prevents any marks on the socket during the forming phase, which would affect its appearance, and any damage to the forming equipment. When the heating process is over, the pipe is shifted to the forming station. Forming takes place as described above: in BA, by a smooth or blowing mandrel from inside and moulds/clamps from outside; in BA/ME, BA/RS and BA/BIAX, in the high-pressure chamber by means of a mechanical mandrel with expandable segments inside the pipe and high pressure compressed air from outside. With regard to cooling, IPM has been using, and constantly improving, a water-cooling system for over 20 years. This important process occurs during the forming cycle by water spraying (with coolant) inside the high-pressure chamber. Also, the water circulates in a closed circuit, which leads to considerable savings in terms of water consumption.

Easiness of operation and maintenance are among the features of the IPM belling machines:

- the video terminal of the machines allows the setting and control of the parameters so that production cycles can be followed continuously; it is provided with an articulated diagnostic system that helps to solve operational problems in a simple and effective way;
- the pneumatic, hydraulic and water circuit segregation (separate blocks) allows a more comfortable use of the machine;
- internal parts are easily accessible from a front door or a side window.

The BSR model is a semiautomatic belling machine for short pipes up to two metres long

A new system of automatic regulation of the cooling time, developed by IPM, can be installed upon request. The system detects the temperature of the pipe at the end of the forming cycle; then, the machine adjusts the forming and cooling times to fit the pipe temperature, based on a value set by the user. The advantages of this system are:

- correction of the "shrinkage" problem, an alteration of the size of the socket as a result of the cooling after the belling cycle, due to the different temperatures (which may vary each time at the exit of the pipe);
- greater homogeneity and repeatability of the finished product, with fewer defective pipes and, therefore, reduced waste combined with improved quality;
- reduced influence of variable environmental conditions, since the machine is able to adapt progressively to obtain the desired result;
- reduced need for operators to control the quality of the finished product;
- possibility of upgrading existing belling machines (only for machines with shortwave ovens).

In order to offer a higher level of automation for these machines, IPM developed the IG automatic seal inserter (available upon request), to withstand high production speeds and which can also integrate a quality control system (also available upon request) to ensure the correct insertion and good sealing of the gasket.

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