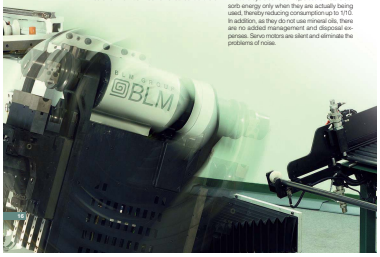
The BLM GROUP "all-electric" tube bender; considerable process advantages thanks to state-of-the-art technology.

"all-electric" bending

Electrically-driven machines to perform heavy machining operations can be found increasingly more in the machine tool sector in place of the classical hydraulically-driven ones. Even the **tube bending sector is experiencing this irreversible process.**
The use of electrical axes, their operating repeatability under various environmental conditions and the extreme reliability of the machine, contribute to making precise estimates on the real output of the unit.

In the "all-electric" machine that have been developed by the BLM GROUP, the position and strength at which tubes and tools have to be manipulated is controlled by electric motors and ball screws. The machine's numerical control therefore goes from the typical 3 or 4 axes to a system that is able to **control from 9 to 15 electrical servo axes, both in position and torque.**
The CNC is able to handle **axis synchronism and interpolation** in order to perform complicated and very accurate set-ups. Moreover, the torque/force control allows to **compensate for the variations in the axis position** given by errors in the pipe geometry of elongation of the material.



Energy consumption and environmental impact

These two aspects are also among the major advantages of an electric machine. Contrary to a hydraulic pump (which is always on, no matter what the cycle condition is), electric motors absorb energy only when they are actually being used, thereby reducing consumption up to 1/10. In addition, as they do not use mineral oils, there are no added management and disposal expenses. Servo motors are silent and eliminate the problems of noise.

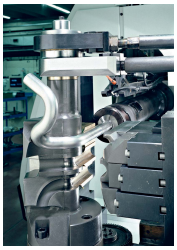
Considering that no fluids are used, electronic control system are not subject to the usual variations caused by different oil viscosity. In an electric machine, all this means that there are reduced downtimes and **increased process repeatability.**

Perfect surface quality

BLM "all electric" machines are equipped with a *Boost* features to push the carriage to produce power exceeding 5.000 kg thereby improving roundness as well as **reducing the wall thickening on the outside edge of the tube.**
The *Boost* also helps to reduce any pipe movements in the clamp jaws and reduces the pressure with a significant benefit on the surface quality of the finished tube. The power can be adjusted on the basis of the final quality of the product.
Similarly, the clamp and the pressure die power on the tube can also be varied by the operator according to the geometry and type of material being worked. These operations, **that are inconceivable on a hydraulic machine,** lead to significant advantages in terms of speed, and surface quality too.

Software

To achieve such results, over the last few years BLM has developed an extremely effective software tool to programme and control its tube benders: VGP automatically implements the machine programme starting simply from the tube's geometric co-ordinates.
The operator can directly simulate the NC machine movements, and safely and easily step in, if needed. The software performance is **enhanced by the perfect correspondence** of the trajectories compiled by the machine devices that use electrical axes.
The VGP software can provide the machine cycle time that can be used when **calculating the cost and productivity of the piece** for estimates.



In addition, special software cycles have been developed to **automatically learn the clamp closing positions** thereby reducing the operator know-how. All the set-up parameters are saved with the programme being implemented. The advantages in time saving and set-up repeatability are unmatchable when it comes to initial set-up of the equipment and production changes.

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