



Seen and commented for you

Know-how for deep-drawing

Deep and very deep drawing processes require an equally deep knowledge of sheet metal behaviour. For over 50 years, F.lli Nava has been developing presses with the ideal characteristics to meet the challenges of this complex type of application.



In the world of mechanical processing, the technological content of the production machines is the key element that determines the success of a company. In the world of sheet metal, in particular, the ability of a machine tool manufacturer to develop a solution that transforms flat sheet metal into a three-dimensional object that meets stringent specifications in terms of dimensional tolerances and surface quality translates into a significant competitive advantage for the customer. For this reason, it is important to always rely on suppliers having in-depth knowledge of the behaviour of sheet metal during machining, but which are also able to understand the production situation in which the machine is placed and configure it accordingly to make it as efficient as possible for that specific application. For more than 50 years, F.lli Nava has been manufacturing hydraulic presses and systems for forming metals and various materials, which are distinguished by their high technological content, coupled with the company's ability to always find the best possible response to the different requirements of national and international customers in various industrial sectors.

Tradition and technology

«The hydraulic press for deep and very deep drawing has historically been our core-business, particularly when it comes to stainless materials. – begins Eng. Andrea Nava,

Presses



Above:
Very deep-drawing
press, with traditional
function and deep-
drawing from below

Below: Deep and very
deep drawing for stainless
steel tanks dedicated to the
food and medical industries

one of the partners at F.lli Nava - Here our solutions provide
a competitive advantage in terms of moulded part quality,
tool life, productivity and equipment reliability. In addition to
these aspects, which are the most traditional elements,

there is IT verticalisation thanks to specialised software developed to meet the requirements of Industry 4.0. In order to guarantee this performance, the very first step is to establish a direct dialogue with the end-user, in order to identify the planned production mix and the type of business carried out by the customer, starting with whether it is its own production or contract work». According to the answers from the end-user, F.lli Nava develops a project that can have different levels of complexity, starting from a basic solution equipped with a ram and blank-holder to control sheet deformation, in order to avoid defects such as wrinkles or tears, and gradually increasing in technological content by adding, for example, technological functions for checking parallelism, the third forming effect or shock absorbers/load offset balancers on the moulds. It is also possible to integrate a more complex management of several moulds operating at the same time and having different adjustment requirements, all of which are monitored by the press control. Automation is also a major consideration in the projects developed by F.lli Nava, both in terms of parts handling solutions and systems for rapid production changeovers.

The right solution

«Once we have understood the production context in which the press or line will be installed, the next step is to define the most suitable production technology," continues Eng. Nava. For example, if deep-drawing operations are involved in the production process, with significant blanking of the part to be moulded, and the deep-drawing operation is particularly challenging, the specialised hydraulic press is almost always the best choice. Production volume and production rate also have an impact on the technology to be used. The choice of specialised hydraulic presses prevails in the case of heavy production and deep drawing, as they allow less fragmentation of the forming steps and consequently lower tooling costs. In addition, the blank-holder of the specialised hydraulic press is an indispensable element in applications where depth and complex forming are critical aspects. «In addition to the machining quality, which is always essential, also operational flexibility must be considered. - emphasises Eng. Nava - Historically, our presses have been designed to ensure great versatility of use, thus adapting both to the production of a few batches with high volumes and high production rates, and to activities characterised by medium to small volumes, perhaps without the automated loading/unloading of the press. This is the case for customers



who operate in very technologically advanced market niches, and who need to combine the high complexity of forming moulded parts with low production volumes without this having a heavy impact on the unit cost of the individual part."

Presses with high rigidity since the beginning

F.lli Nava is therefore able to develop a wide range of solutions, among which the line of presses equipped with both conventional deep-drawing and deep-drawing from below is one of its flagships. In particular, the 2MI 800/600 deep-drawing press is one of the leading models from the Lombard company. This press has a maximum ram force of 8,000 kN, a lower blank-holder force of 6,000 kN, a third top action of 1,500 kN, a working table of 1,800 x 1,500 mm and both passive and active blank-holder control, which incorporates innovative undercut processing functions. Configurations to achieve a drawing depth of 700 mm are available if required. In keeping with the tradition of all F.lli Nava presses, the 2MI 800/600 model has an extremely rigid structure to ensure the highest quality of the moulded part and to extend the life of the moulds. The ram has an adjustable maximum force, and is conveyed by guides featured by a high ratio between the guide height and the size of the plates. This technical solution ensures the best result with regard to the eccentric forces that can be developed in the mould when making asymmetrical parts. The 2MI 800/600 presses have been designed with these features to successfully meet the challenges associated with deep and very deep drawing of stainless steel tanks in the food and medical industries. This is a market segment in which the quality of the press has a significant impact



F.lli Nava completes the presses with software for Industry 4.0 that has been developed specifically for deep and very deep drawing

both on the quality profile of the finished product and on the efficiency of the process and therefore on end user's competitiveness. For this purpose, it features a third effect with a very high force compared to what is required for the simple extraction of the piece, in order to obtain pre-drawing to recall the material to be used in subsequent phases of the process. In addition, the lower blank-holder works both actively and passively, extending the range of parts that can be moulded with the same nominal press force. This advanced technology is easy to manage thanks to the man/machine interface, designed to facilitate the operator in the diagnostics and correct management of the system. A series of support pages make it easier to recognise and identify a certain criticality, such as an unsuitable parameter setting or a missing step in the cycle. In order to streamline the time taken to set up the mould and to set the correct parameters required to obtain the desired part, there are graphic pages that illustrate the trends of the process values as they evolve during the pressing. This simple yet powerful process tracking function allows the user to monitor the evolution of the moulding process step by step while it is taking place, especially in the key phases that are carried out when the mould is closed and are therefore more difficult to monitor from the outside.



Above: Eng. Andrea Nava, one of the partners at F.lli Nava

Left: F.lli Nava offers solutions tailored to the specific application