Designers and manufacturers of special machinery

Metalforming

“Creative solutions for metalforming problems”
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**Fontijne**

Starting 1909 with servicing, repairing and later installing engines in ships, the company over the years became a nationally well-known manufacturer of equipment for the rubber industry, such as presses, mixers, etc. Eventually metalforming machines were added, particularly for the production of barrels and drums for the oil industry in the Rotterdam area, where the Fontijne works are located. In 1964 Machinefabriek Fontijne signed a license agreement with Grotnes. Under the terms of the agreement, the technology for wheel-production machinery became available for the European market. Fontijne Holland, the former Machinefabriek Fontijne, became a leading supplier of wheel and rim manufacturing systems.

**Grotnes**

The original company, Charles Grotnes Machine Works, was founded in 1898, in Chicago, Illinois, U.S.A. Soon thereafter, Mr. Grotnes developed a machine that could stretch and shape metal rings. The Grotnes machine, which came to be known as an expander, allowed rings to be fabricated from simple cylindrical blanks that were expanded to size while setting the desired shape. This new machine and process resulted in considerable cost savings compared with other known processes. Grotnes also developed other technologies for the coldforming of metal. Grotnes machines found their way to many industries like the aircraft industry, the pipe industries and wheel industry. It was the wheel industry that brought Grotnes and Fontijne together.

**Fontijne Grotnes**

The two companies’ relationship developed over the years to the point that in the year 2000, Fontijne Holland acquired Grotnes Metalforming Systems. After the acquisition of Grotnes, it was decided to change the name of the company to “Fontijne Grotnes”.

Combined the company now has nearly 200 years of experience in metalforming, which created a unique name for a unique company as a manufacturer of various equipment, such as:
- Equipment for the Wheel Industry;
- Sizing Equipment;
- Nuclear Supercompactors;
- Laboratory Platen Presses;
- Services.

With this organization, the Company will be able to serve its customers better worldwide.
Expanders

Fontijne Grotnes expanders size and/or form a wide range of hollow components having a continuous cross-section, such as cylinders, cones, squares and polysided shapes. Even pipes with a length of 12 meter or 18 meter can be expanded over their full length by the Fontijne Grotnes full length pipe expander. Expanders perform any number of sizing and forming operations, limited only by the properties of the metals used.

The part to be expanded is positioned around the outer periphery of the forming dies. By the movement of the cone the dies are pushed outwards and stretch the metal part beyond its yield point and form it to the desired shape and size.
Applications

The types of parts that can be manufactured by the expanding process, range from small and light-gauge metal parts such as appliance housings, bearing retainer rings, blower and fan housings and metal containers to heavy jet engine rings, motor and generator frames and pipe couplings.
Shrinkers

Shrinking is primarily used to size parts requiring outside diameter accuracy. The shrinking process is exactly opposite to the expanding process. The part is positioned in the shrinker, its outer diameter facing the shrinker tooling. The dies are forced inward and press the metal part beyond its yield point and form it to the desired size and shape.

Applications

Fontijne Grotnes shrinkers are used in many forming and sizing applications such as pipe couplings, jet engine parts, motor frames, conveyor pulleys, bearing races and similar parts.
Rollformer

Fontijne Grotnes rotary roll forming is a cold rolling process capable of forming profiled configurations to close tolerances in cylinders, conical shapes, hoops and rings. This process is desirable when good surface finish and fine detail are required. When producing parts of different diameters having the same profile, tooling costs and setup-time are minimized.

Blanks from tubing, pipe, or coiled and welded flat blanks are placed on the lower roll. Both the upper and lower roll starts rotating as the lower roll moves upwards. As soon as contact is made between the rolls and the blank the required profile will be formed through several revolutions of the piece.

Near Net Shape rotary roll forming of circular parts is a precision process in which thick-walled rings are formed between dies that displace material both axially and radially to attain the desired shape. This process greatly reduces and, in many cases, completely eliminates machining.
Applications

Rotary Roll Formers have been found practical for many applications. Jet engine rings, pipe couplings, appliance parts, blower rings and similar parts are being manufactured by this uncommon approach of metalforming.
Special metalforming processes

For many applications the size and shape of the product and the characteristics of the materials used varies, resulting in custom made machinery. At Fontijn Grotnes an innovative and experienced engineering department takes care of a well thought-out design resulting in reliable equipment adapted to the specific requirements of the customer.

Sometimes customer conditions require equipment to be integrated into a production line. Fontijn Grotnes also provides solutions for those requirements. Fontijn Grotnes has a vast experience in designing fully automatic manufacturing lines for the domestic appliance industry and automotive industry as well as automated loading and unloading units for stand-alone machines.

Special expanders

Some products require complex shapes or sharp contours. Shallow contours can be obtained by expanding or shrinking alone. To obtain those more complex shapes or sharp contours, Fontijn Grotnes can provide machines designed to force the metal to flow in specific directions. Fontijn Grotnes has three general solutions in case sharp contours and complex shapes are required.

- Expander with collapsable outer die
- Shrinker with collapsable inner die
- Expander / Shrinker Combination

Certain exotic alloys have only a small difference between their tensile strength and yield strength. In case these exotic alloys are expanded, they could easily crack or even explode. By heating the product a larger difference between tensile strength and yield strength can be achieved. For these applications Fontijn Grotnes designs expanders with heated dies which enable sizing and forming operations on high value alloys.
Seaming is a production process by which a mechanical connection is formed between two metal parts by rolling the flanges of both parts tightly together. Through this method thin panels can be connected together to obtain a partly or even totally closed finished product.

Fontijne Grotnes seaming machines are in use in the production of dishwasher, cookers and washing machines.