WF

FORMING EXCELLENCE

SUCCESS STORY: WF MASCHINENBAU & GLENN METALCRAFT, INC.

THE WORLD´S MOST POWERFUL SPINNING MACHINE FOR THE LEADING PROVIDER IN METAL FORMING

DEVELOPMENT AND CONSTRUCTION OF THE WORLD´S MOST POWERFUL SPINNING MACHINE TO EXPAND THE PORTFOLIO OF THE LEADING PROVIDER IN METAL FORMING IN THE USA

Glenn Metalcraft Inc.
It's only impossible until we do it.®
A DIVISION OF ELEMET GROUP

Background

Glenn Metalcraft, Inc. (GMI) was founded in Princeton, Minnesota, in 1947 and has since evolved into the leading service-sector company in the USA in the fields of metal spinning and flow forming. Building on these core capabilities, the third-generation family-managed enterprise has grown further into the Elemet Group. Together with sister companies Minnesota Industrial Coatings, Glenn Metalcraft Texas and Elemet Manufacturing, the Group provides a unique range of other services, including, for instance, the turning, cutting, welding, machining, production and refining of heavy and large metal components.

Under the leadership of CEO Joe Glenn and President Dan Patnode, GMI was one of the first US companies to invest in CNC metal-spinning technology. The company continues to lead the industry in heavy, high-quality spun-formed metal components. Ultra-modern high-tech equipment and many years of expertise form the basis for GMI's unceasing innovation.

GMI's customer-base is extremely diverse, consisting of well-known industrial and agriculture companies along with regionally based small and medium-sized enterprises. The company takes on both small orders up to and including mass production work. The number of requests for information about extremely thick-walled metal parts, which it was not possible to produce on the existing spinning machines, has greatly increased in the recent past.

The problem

GMI currently operates a range of machines composed of twelve large spinning machines. It has, however, not been possible to fulfill metal-spinning orders with particularly demanding requirements for material thickness using any of the existing machines. Specifically, a machine that could form steel discs of up to over 32 mm in thickness under cold conditions was needed. GMI therefore undertook a survey of mechanical-engineering companies that feature more powerful and more productive machines in their range. Up to this time, however, no machine of the necessary forming forces and torque ratings had been constructed anywhere in the world. For this reason, GMI then began searching for a supplier that would design and build a suitable machine.

The solution

WF Maschinenbau was the only mechanical-engineering company in the world prepared to take on the challenge of making reality of the previously impossible. The customary configuration of existing series of machines would not suffice to meet GMI's requirement profile. WF Maschinenbau then designed an entirely new vertical machine concept offering previously unknown forming forces and exceptional machine-frame robustness.

Following the initial draft concept, GMI stated in more detail its already demanding list of requirements, with even more increases in force, an automated tool-changing system for tools ranging up to 4.500 kg (10,000 lbs) in weight and a facility for the performance of chip-removing turning operations.

All this presented WF Maschinenbau's development experts with major challenges; they nonetheless designed an optimized concept that incorporated all of the customer's requirements.

Following intensive development work, producibility tests, constructive cooperation between the two companies and mutually trusting interaction between all those involved, construction of the world's heaviest and most powerful vertical two-roller spinning machine could finally start at WF Maschinenbau in Sendenhorst, Germany. GMI's highly individualized requirements were made reality.

The machine

The VUD 1500-2 S is capable of forming a steel blank (Grade 50) of 1¼” (32 mm) in thickness. Maximum formable workpiece diameter is 1.500 mm (60’’). The vertical-type machine features two separate forming supports exerting forming forces of 1.000 kN axially and 800 kN radially. The use of triple roller-changing mechanisms per forming support in each case makes it possible to use up to six different forming rollers at any operating angle.

An automatically ratio-changing gearbox enables the extremely freely running main spindle to rotate at two speed and torque levels. Speeds of either up to 300 rpm at a torque of 28.000 Nm or speeds of up to 750 rpm at a torque of 5.600 Nm can be selected.

The cooling-lubricant pump’s delivery rate of 1.600 l/min assures reliable removal of the heat unavoidably generated during the forming process. Two turning-tool mountings permit turning immediately prior to, during or after forming. Contamination of the cooling-lubricant with (turning) swarf is minimized by means of a complex swarf-trap system. Tools weighing up to 4.500 kg (10,000 lbs) can be quickly and safely changed using the integrated tool changer.

Why did GMI select WF Maschinenbau?

WF Maschinenbau was the only company in the world capable of developing and manufacturing such a heavy and powerful metal-forming machine. Furthermore, GMI was also impressed by the high flexibility and extensive experience, as well as the in-house R&D-Center.

Quick facts

Formable workpiece diameter	max. 1.500 mm (60“)
Formable workpiece thickness	max. 32 mm (1¼“; Grade 50)
Forming supports	2 cross supports
Roller turrets	2 (1 per each cross support)
Forming rollers	2 x 3
Roller operating angle	any, in 5° increments
Spindle gearbox stages	2, automatic ratio-changing
Integrated turning-tool mountings	2
Integrated centering unit	1
Installed cooling lubricant pump delivery rate	1.600l/min (400 gal/min)
Tool changing system	

„The collaboration with WF Maschinenbau was extremely constructive right from the start. Every single team member put their heart and soul into the project - we all had one big goal: to realise the most powerful spinning machine in the world!“

Joe Glenn, CEO of Glenn Metalcraft Inc.

Development & construction: WF Maschinenbau

WF Maschinenbau develops and builds highly customized machines for chipless forming of metals; the company employs 120 people. A large range of patents and the company's dedicated R&D Center, combined with maximum possible in-house depth of production, permit the development of machines tailored precisely to each customer's specific needs and wishes. The company, with production based in Germany, supplies well-known customers throughout the world, including NASA, Kawasaki Industries, Johnson Controls, Hanwha Aerospace and Schaeffler Group.

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The customer: Glenn Metalcraft

GMI is the leading service-provider in metal forming throughout the USA. The company produces individually tailored end products of any batch size and sees its task as supplying innovative single-source solutions for the OEM industry. With 110 employees, GMI has been producing at its new state-of-the-art site in Princeton, MN since January 2024.

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