

GERMANY

100 Years of LOOMIS

Shaping Machines to Meet the Highest Quality Standards

LOOMIS was founded in 1917 as LOOMIS Products by David Loomis in USA. Karl Kahlefeld, who still deals with business at the USA location, established LOOMIS PRODUCTS Kahlefeld GmbH in Kaiserslautern in 1990. This was acquired by his daughter in 2001. Its core business is to provide full support to the company's customers, starting with defining and finding solutions for the customers manufacturing requirements, through project development and sales, installation and aftermarket sales of piston extruders and wet and dry bag isostatic presses, which are manufactured at both locations. Milestones in the company's history are reviewed in the text box. We spoke to Managing Director Pia Kahlefeld (PK) about the company's philosophy and developments in recent years.

CA: *The user industries technical ceramics, refractories and powder metallurgy have been your customers for years now. Are you also engaged in finding new applications for your wide portfolio of piston extruders and wet and dry bag isostatic presses, which spans laboratory- to industrial-scale machines?*

PK: In the meantime, we have references in the plastics-processing industry. Back in 2007 we delivered the first fully automatic PTFE extrusion system with loading system and billet production. Furthermore in cooperation with SiCo-Solutions, a rheometer was developed for fast determination of material properties and die design optimization. We have equipped a laboratory piston press with this rheometer. In technical ceramics, new applications and material developments are constantly required. Here it's helpful to be able to determine the properties of a new material with the efficiency of the RheoPress®. Over the last few years, we have made excellent progress especially in the dental, carbide and SiC ceramic segments.

CA: *Guiding principle for your company is expressed in the slogan "Buy the original, buy quality". How do you set yourself apart from the competitors in the market to underline this message?*

PK: We combine proven solutions, which we can draw on thanks to the company's long history and the associated



Fig. 1
Full automatic dry-bag press with automatic filling and tool/green part handling system
(Source: Loomis)

market and field experience, with a wide array of special bespoke designs. For instance we incorporate a decompression system developed back in 1960, because this is perfect even from today's perspective. On top of that is our extremely high depth in production. That doesn't just mean our in-house machine manufacture, it includes our electrical system en-



Fig. 2
Isostatic wet bag press (modul design)
(Source: Loomis)

gineering, the production of complete decompression and hydraulic systems, which guarantee extremely high process reliability. These systems aren't commercially available in this specific form. As we are so well-equipped in our production, we can also supply such components externally or undertake contract work (e.g. for the automotive and laser industry). Because of this fact, we can deliver maintenance and replacement parts without having to call on external know-how.

CA: The system mentioned earlier for PTFE production is a production line. Have you transferred this approach to other areas of application?

PK: We prefer to supply production lines as then we aren't just responsible for the quality of our machines, but stand by our customers to help them achieve optimum product quality with our know-how. Accordingly, we have to get intensively involved with the individual technologies. Only last year, we further improved and automated our precompactor for piston extruders, which is used for deairing billets. Its use depends on the material and the method applied to prepare the material mixes as well as the quality requirements for the finished product.

CA: In the producing industries, Industry 4.0 is becoming increasingly important. Especially user industries such as automotive engineering are taking this topic to their suppliers. That also applies to powder metallurgy and technical ceramics. How are you preparing for this?

PK: I would like to go into more detail about our RheoPress®, which is equipped with Rheolog® analysis software. It comprises a piston extruder and a measurement die. All necessary body pressures at different positions in the inflow geometry, the piston velocity, the column speed, the compacted volume and the length of the extruded column are determined. With Rheolog®, the characteristic material parameters (yield strength, Bingham viscosity, wall slip and K factor) as well as the wall slippage rate are determined. A description of the tribology of the die with the K factor is also integrated. The



Fig. 3
Isostatic wet bag press (compact design) (Source: Loomis)



Fig. 4
RheoPress® 232 – 25 RM – NW80/25 x 500
piston extruder 232 – 40 DT 80 x 750 CL/LH for hard metal
(Source: Loomis)

forming properties are described clearly and this enables the simulation and optimization of the forming process in forming tools. RheoPress®/Rheolog® systems are used for the development of new materials, process and quality control, inspection of incoming goods, development of optimized extruder dies and in many other bespoke process applications. If in a next step we don't just use it offline, but integrate it in the production process, we get continuous quality monitoring. We can analyse and immediately intervene to adjust a process if this becomes unstable. We archive measurement data, which can be used not only for production monitoring, but also for development work.

CA: Marking your company anniversary, you are also presenting your new logo – what was important to you in the design of this logo?

PK: Our talisman, the LOOMIS elephant had, of course, to be part of it, but it also had to express our international activities. In addition, we wanted to show with the logo that we in Germany at LOOMIS PRODUCTS Kahlefeld GmbH can provide valuable solutions for the user industries with our independent, innovative developments. We recently received gratifying external confirmation of this when we were awarded the certificate for reaching the second stage of the nominations for the "Grossen Preis des Mittelstandes" (Grand Prize for SMEs), so we are still in the running to win.

CA: Thank you for talking to us.

KS

LOOMIS Successes 1917 to 2017

1917 David Loomis founds LOOMIS PRODUCTS
Loomis starts production of laboratory platen presses

1917 – 1960

1934 First dry bag isostatic press for spark plug insulators
1951 First single-tilt piston extruder is built to enable adjustment of the extrusion position
1954 First patent for a single-tilt piston extruder
1960 First automatic isostatic dry bag press: the Isomatic®
1960 International patent on sealing isostatic dry bag presses to 4000 bar (~60 000 psi)

1960 – 1980

1962 First controlled high-pressure decompression valve
1962 First pressure-relief HP – check valve for a working range to 1400 bar (~20 000 psi)
1962 First carousel-type dry bag press, allowing the automatic production of several parts differing in shape, size and material composition
1965 First patent on a “Master Bag” (Inner HP seal for an isostatic dry bag press)
1966 LOOMIS builds the largest wet bag isostatic press of its time
First double-tilt piston extruder is built to enable adjustment of two tilt axes for the extrusion position and lift-out of the material cylinder
1972 LOOMIS is responsible for the design and manufacture of the first production equipment to extrude the honeycomb substrate for the automotive catalytic converter
1975 First patent for a double-tilt piston extruder

1980 – 2000

1985 First isostatic dry bag press allowing the filling of three different materials into one mould and subsequent compaction
1990 Karl Kahlefeld establishes LOOMIS PRODUCTS Kahlefeld GmbH in Germany to supply the European market
1995 The largest isostatic dry bag press is built. A total of six pressure vessels. For fully automatic production of large flue pipes and shaped pieces

2000 – 2010

2001 Pia Kahlefeld acquires LOOMIS PRODUCTS Kahlefeld GmbH
ASME certification
2007 LOOMIS PRODUCTS Kahlefeld GmbH acquires the CNC machining company
Ludwig Kahlefeld GmbH
2009 Fully automatic PTFE extrusion system with billet production and loading system

2010 – 2017

2014 LOOMIS PRODUCTS Kahlefeld GmbH works with SiCo-Solutions to develop a rheometer for fast analysis of material parameters. Connected to a LOOMIS laboratory piston extruder
Introduction of robots for demoulding and handling of the pressed parts as part of an isostatic dry bag press
Fully automatic piston extruder with automatic mould / filling and removal with the use of an industrial robot
Improved precompactor for the production of high quality deaired billets for qualitatively optimized extrusion