

# A REVOLUTION WEAVING

The Swiss textile machinery manufacturer Sulzer Textil has achieved a quantum leap in weaving technology with a new multi-phase weaving machine for standard fabrics. High precision "Duran" glass mini-tubes ensure problem-free processing of the weft yarn.

The noise in the weaving room is deafening. Standing alongside conventional looms is the revolutionary M8300. It is running on a test basis, but much more quietly than its predecessors. The difference between the conventional looms and the futuristic-looking new development is obvious even to non-specialists.

There has been no change in the basic principle of weaving for centuries. Fabrics are still produced by criss-crossing threads at right angles and all around the world, woven materials are still produced on single phase looms.

## Conventional technology at the limit

Until recently, attempts to improve the technology have been based on increasing the speed of the weaving process. The weft insertion rate has been developed over several hundred years from a few meters per minute to the current rate of more than 2,000 meters per minute. This made ever increasing demands on the mechanics and the yarn. Accelerating and braking stresses the

thread to the very limits of its strength, making further improvements in performance next to impossible. Not so with Sulzer Textil's revolutionary multi-phase system. The multi-phase weaving machine uses compressed air to insert four weft yarns at the same time. The yarn is fed synchronized into the weaving cases at 1,250 meters per minute, an incredibly fast rate. The new technology increases capacity threefold compared to conventional machines and reduces production costs up to 30 percent.

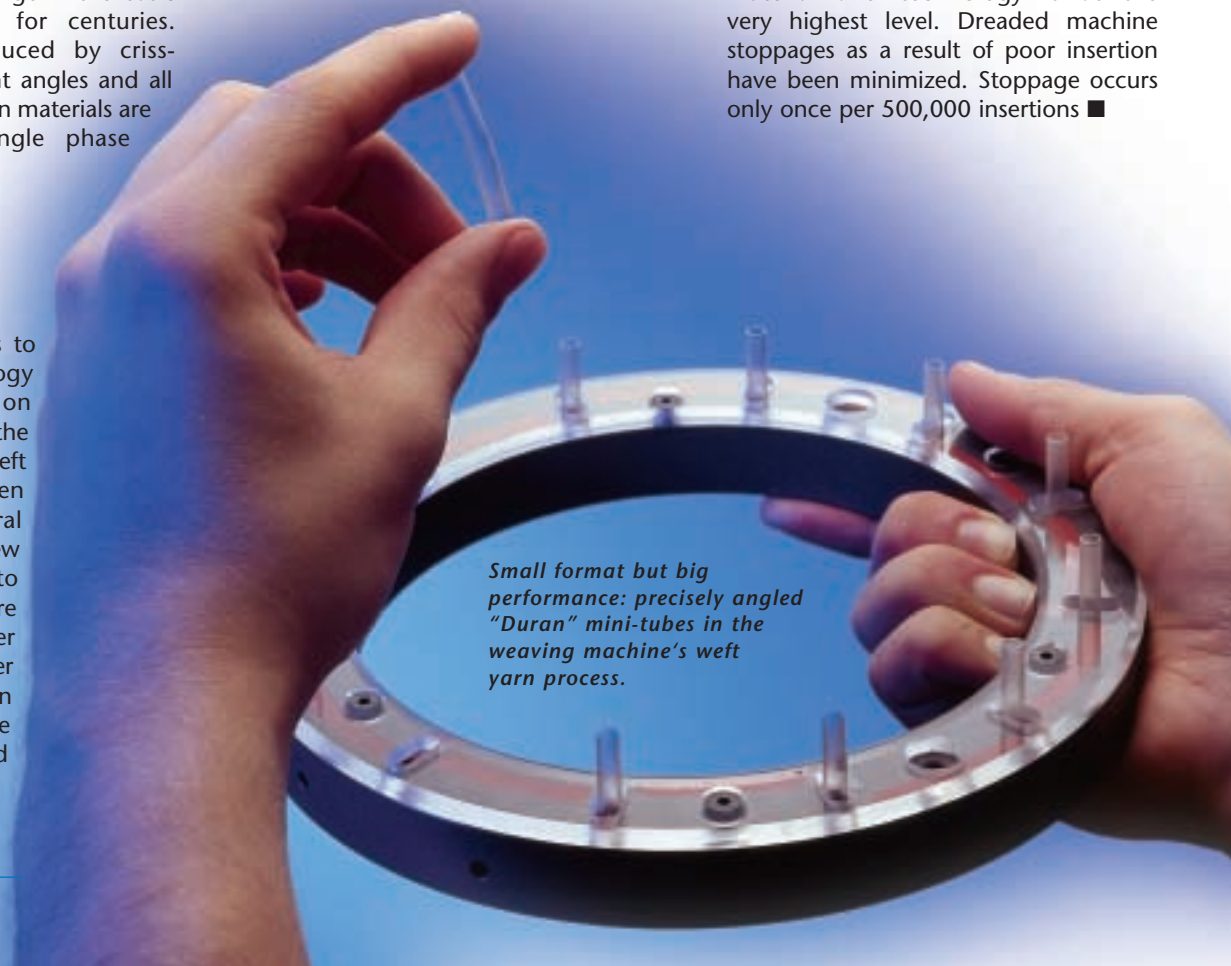
## Special glass for weft yarn processing

One of the machine's core functions is the weft processing. Here, high precision "Duran" special glass mini-tubes by

Schott are a central element. The order was handled by Schott's Swiss sales company Schott Schweiz.

"Duran" proved to be the ideal material because of its good surface structure. Tests were carried out to determine the precision accuracy of curvature and the glass ends required. Another benefit was the fact that Schott is in a position to mass produce the items at a constant level of high quality. The glass mini-tubes are ideal for handling the yarn because, unlike metal or plastic, they have neither edges nor other irregularities which could interrupt the flow.

The threads are carried at high speed on a jet of air through the air channels and are inserted in the weft channels. It is easy to see that the interplay between material and technology is at the very highest level. Dreaded machine stoppages as a result of poor insertion have been minimized. Stoppage occurs only once per 500,000 insertions ■



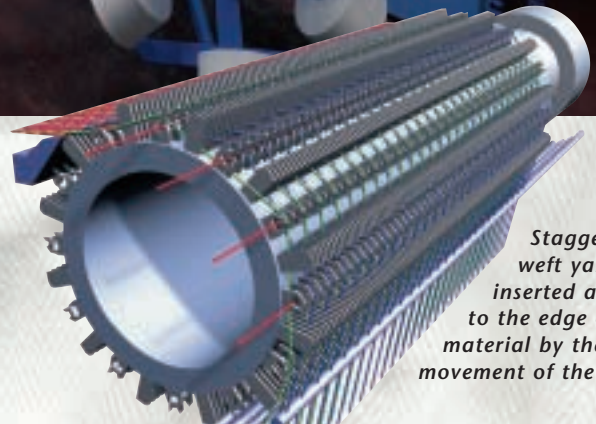
*Small format but big performance: precisely angled "Duran" mini-tubes in the weaving machine's weft yarn process.*

IN

*A view of one of Sulzer Textil's pilot customer's weaving rooms. Several million meters of high quality fabric have been produced so far on a total of 24 M8300 machines.*



*Ergonomic design and user-friendly controls and operation make the work easier for weaving personnel.*



*Staggered, the weft yarns are inserted and fed to the edge of the material by the movement of the rotor.*

**Sulzer Textil:**  
Innovative and local to its customers

The Sulzer Textil technology center in the Swiss town of Rueti is the world's leading research and development facility in the weaving industry and plays a role of central importance. At its heart is the Sulzer Textil Trial Weaving and Weaving Development Center complete with modern laboratory, test and demonstration areas. Here Sulzer Textil, working with its textile industry customers, yarn manufacturers and fabric specialists, develops new technologies and processes for every area of application. Sulzer Textil has a 25 percent share of the world market. It is the only manufacturer supplying all four of the world's leading weaving systems: rapier, projectile, multi-phase and air-jet weaving. The company has 2,000 employees and its sales in the last fiscal year were 685 million CHF, an increase of five percent over the previous year.

**MILESTONES IN WEAVING**

- Origin in the Neolithic Period: first material found at Çatalhüyük, a large Turkish settlement from the early Neolithic Period
- Evidence from bog corpses in the Bronze Age
- Hallstatt Period: weaving of complicated patterns using vertical looms
- Step loom in the 13th Century
- J. Kay's invention of the flying shuttle in 1733 increased the speed of hand weaving.
- E. Cartwright invented the power loom in 1785
- T. Gorton's loom driven by steam power in 1787
- J. M. Jacquard's pattern loom (1805)
- Improvement of the power loom by R. Robert in 1822
- First electrically driven loom by Werner Siemens in 1879
- Round loom by J. and K. Herold (1897)
- Rapier looms by D. M. Seaton (1907) and J. Gabler (1927)
- Projectile ("Sulzer") looms by R. Rossmann since 1928
- 1995: The M8300 multi-phase weaving machine is demonstrated for the first time at the International Textile Machinery Exhibition (ITMA)'95 by Sulzer Textil of Rueti, Switzerland