P1
RAPIER WEAVING MACHINE
READY FOR THE FUTURE

“Quality creates value” – the DORNIER rapier weaving machine has set the technological standard in the high quality home textiles market for decades. Practically everything which can be wound on bobbins is efficiently converted into high quality woven fabric on this machine. Its success story is consistently continued with the new DORNIER P1 rapier weaving machine.
Immediate reaction to market requirements – in this respect the new P1 rapier weaving machine opens up every possibility. Thanks to its ease of operation and reduced maintenance cost, it can be adapted even more quickly to any fabric. Its setting consistency provides for rapid production starts on new articles, enabling optimum fabric quality to be achieved in the shortest possible time – even when using complex yarns. Its unsurpassable processing reliability guarantees high productivity at the same time as maximum flexibility.

The new DORNIER P1 – a universal talent
With up to 16 filling colors, the P1 is able to produce technical textiles, home textiles and clothing with flexibility and precision, whether in combination with a Jacquard machine with up to 20,000 lifting hooks, a 28-shaft dobby, cam motion or the DORNIER EasyLeno® unit.

Its unique, positively controlled center transfer plus a wealth of patented components, such as the DORNIER MotoLeno® or DORNIER AirGuide® for example, guarantee processing reliability.

The P1’s versatile application range runs from high quality silk fabrics for 16 filling color furniture upholstery fabrics, via highly imaginative ladies wear through to carbon, glass or coated geotextiles with the coarsest yarn counts in warp and weft and densities of 0.5 ends/cm or even lower.
The human hand as the model
With positive center transfer, the rapier motion is precisely controlled via complementary cam gear boxes. The open left-hand clamp of the left hand rapier grips the yarn presented by the filling selector needle before entering the shed. After controlled closure of this clamp, scissors cut off the filling at the fabric side. Filling transfer from left-hand to right-hand rapier is effected positively in the center under full control. Following the pick transfer, the taker rapier brings the filling to the right-hand fabric edge. The shed remains open throughout the entire insertion phase. The filling is released by the controlled rapier clamp only when it is firmly secured by the catch selvedge. Rapier motion and function during filling insertion are similar to baton changing between two athletes during a relay race.

The DORNIER-specific filling insertion system
1. Yarn pick-up by the left-hand rapier before entry into the shed.
2. Filling yarn transfer in the fabric center.
3. Release of the inserted filling by the right-hand rapier only after being secured by the catch selvedge.

Filling insertion with positively controlled center transfer is the heart of the P1 rapier weaving machine. The filling is picked up and transferred precisely and reliably through the open shed and held securely until bound in.
Immediate machine start after product change
Reliable pick and pick yarn insertion of fine to coarse yarns and positively controlled yarn transfer from left-hand to right-hand rapier in every phase: Indispensable prerequisites for immediate machine start without readjustment after product change, or even on-the-fly pattern change with the machine in operation.

Safety though precision
Two synchronously operating high-precision gearboxes are located on both sides of the machine for filling insertion and reed beat-up. They ensure optimum rapier and reed motion with the proven, reliable center filling yarn transfer. Permanent circulating oil lubrication provides for increased performance, low maintenance and high longevity of the gearboxes’ working life.
Wide application range

Filling insertion controlled at every stage enables an extraordinary range of yarn types and counts to be processed. It runs from fine silk yarns and monofilaments via glass rovings through to the coarsest fancy yarns. Yarn count ranges between 7 den and 4500 tex.

Minimal filling breakage figures, no tension distortion and spring-back picks – the DORNIER rapier system has decisive qualitative and economic advantages in day to day’s operation. Low tensile strength yarns can be processed without difficulty. In other respects, robust filling insertion component construction provides for the reliable processing also of heavy industrial yarns. Better quality brings more profitable orders - Quality creates value.

Open shed filling insertion for minimal friction

Thanks to open shed filling insertion independent of shed closure, the friction of the filling against warp ends is markedly reduced. It provides for fewer yarn breaks, no yarn distortion and no spring-back picks in the case of elastic yarns, with clean selvedges on both right and left, constant insertion lengths and therefore top fabric quality.
**Precision-controlled transfer**
Soft clamps with a hard metal insert and precision-controlled transfer – even coarse 2200 dtex filaments with 450 individual capillaries are securely clamped and inserted.

**Filling yarn tension level: Best by all standards**
The yarn tension level of the DORNIER P1 rapier weaving machine is lowest. Compared to all existing negative rapier weaving machines, the DORNIER positive rapier system remains superior in terms of basic tension level, making the best possible filling yarn breakage figures attainable.
The P1 solves filling insertion component guidance to perfection: The patented DORNIER AirGuide® guides the rapier with precision in the shed, consequently preventing capillary damage in the case of filament warps, and even enabling high warp densities to be woven problem-free.

The ECS electronic color selection system and the electronic yarn brake with integral filling stop motion EFC are based on modern stepping motor technology. Due to the modular construction, individual modules can be quickly and easily added. In this way, a single-color machine can be upgraded to a 16 color machine at reasonable cost.

**DORNIER AirGuide®: Perfect filling insertion**

With the DORNIER AirGuide® system, the rapiers slide contact-free on an aerostatic bearing. A guide rail, which feeds air to the rapier, replaces the previous guide rollers. An in-built temperature monitoring system makes automatic self control possible, and provides a high degree of processing reliability, for the first time with mechanical filling insertion systems. This system minimizes maintenance cost, personnel workload is reduced and efficiency decisively improved.

**Easy width adjustment**

Due to the redesign of the yarn presentation unit, handling during width adjustment has been markedly improved: Easy movement of the width-dependent components on the profile traverse whilst keeping the rapier center position stable, allows problem-free symmetrical and asymmetrical width adjustments. Machine setting-up time is reduced and product change efficiency increased. For fashion weavers in particular, this means a significant simplification and a decisive plus in flexibility.
**EFC highly dynamic yarn brake**

The optional electronic EFC yarn brake has an extremely high dynamic action, allowing filling brake tension to be kept incomparably low on yarn pick-up. The new FT control unit provides for automatic filling stop motion sensitivity adjustment with up to 16 colors including ANTI-2.

**Precision, thanks to ECS**

With the new ECS color selector motor technology, yarn presentation is effected in micro step resolution with an automatic yarn needle motion monitoring and correcting function. The needle’s smoothly controlled movement allows gentle yarn presentation with reduced yarn tension peaks.

Low tensile strength yarns and also heavy yarns with high yarn tension, like 2400 tex glass for example, can be processed without difficulty. Different motion profiles can be conveniently selected on the DORNIER ErgoWeave®.
Born out of practice, the new DORNIER ErgoWeave® operating concept enables for intuitive machine handling for the first time. The innovative FT control system newly developed for it forms the foundation stone for significant further improvements in the most diverse variety of sub-assemblies. It guarantees high reliability and efficiency in woven fabric production – with a technology which is open to future developments.

**Fast-Ethernet-Technology control system: Innovative and fit for the future**

DORNIER is again successfully producing a revolutionary innovation in the new weaving machine generation’s control technology. As with the introduction of the CAN-Bus in 1990, DORNIER remains true to its pioneering role, bringing, in the shape of the FT control system, a completely new type of system to the market which makes the reliable transfer of the largest quantities of data possible in real time.

The entire communication structure, with control, process and reference planes, is effected via Fast-Ethernet-Technology bus. This system is also co-responsible for safety on board of the new A380 Airbus. This shows impressively the high status DORNIER places on data transfer reliability. The new control system is a sustainable innovation carrier, also guaranteeing for forthcoming new developments in electronics and drive technology.

**Important innovations**

- Data transfer is effected in real time.
- Short response times guarantee faster reaction of all electronically controlled components at any time during the weaving process.
- The defined time cycles are precisely and reliably observed and automatically corrected to the weaving machine’s operational condition.
DORNIER ErgoWeave®: Intuitively operable touch screen
The software is operated via a spacious, user-friendly designed 15 inch touch screen. Graphic representations of function cycles plus universally comprehensible symbols facilitate understanding of the selection possibilities. Direct access to important settings and to the electronically stored operating manual (BAL) significantly reduces analysis time.

Useful new functions
DORNIER ErgoWeave® provides extensive functions for a quick and perfect fabric quality result to the weaver. Start-mark correction can be limited to one setting, or ideally adjusted whenever necessary. One of the DORNIER ErgoWeave®'s special strengths is the simple production of the statistical evaluations of all weaving functions plus the recording and correction of stoppage causes by means of a system diagnosis tool. With standard articles, automatic settings and high product setting reproducibility reduces personnel workload.

USB and Ethernet interface
The recording of pattern and product data, as also the loading of new configurations and software, is effected simply and conveniently via USB-Stick. The weaving machine can be linked with all customary operating data systems, or connected to a network, via an integrated mass-produced Ethernet interface.

The DORNIER ErgoWeave®'s pattern storage volume records up to one million pick repeats – and can be further extended.
The P1 stands for reliance in all respects. Thanks to the connection of the machine side frames with a robust profile traverse, its sturdy basic framework guarantees low vibration operation – even at high speeds, making it unnecessary to bolt or cement the machine to the floor.
All systems necessary for filling insertion are bilaterally displaceable, making time-saving as well as symmetrical and asymmetrical width adjustment possible. The machine’s new main drive is effected without belts via the maintenance-friendly CompactDrive, forming the ideal combination in conjunction with the new FT control unit.
“Quality creates value” – when it comes down to safety and precision, the DORNIER rapier weaving machine is unequalled. With technical woven fabrics produced from glass, carbon and aramide and also in the airbag field, it has served as a reliable tool for pioneers and market leaders for 40 years.

The new P1 – ready for the key technologies of the 21st century.
A QUALITY SEAL: THE DORNIER SELVEDGE FORMATION DEVICES

The selvedge sells the fabric. The patented selvedge formation devices are one of DORNIER’S strengths. They offer decisive advantages, also as regards further fabric processing: The freely programmable 2-end DORNIER MotoLeno® full-turn leno and the mechanical DORNIER Quick-Set Tuck-in® selvedge tucking device produce unique narrow and clean fabric selvedges. The uniform mounting of the two units makes it possible to change from tuck-in to leno selvedge in the shortest possible time.

Perfect selvedges, thanks to intensive binding:
DORNIER MotoLeno®, DORNIER MotoEco® (option)
Previously unattainable performance potentials can be reliably achieved with the DORNIER selvedge-forming units. The 2-end full-turn DORNIER MotoLeno® is suitable, pattern controlled, for any filling density variant and fabric construction. The firm and solid selvedge securely withstands robust finishing, while warp end breaks in the selvedge zone are markedly reduced. Based on the DORNIER MotoLeno®, the modularly designed, patented DORNIER MotoEco® double-disk leno is available as an alternative. It consists of two full-turn lenos with system-related rotation reversal, which operate side by side for fabric selvedge and catch selvedge. No additional shafts and catch selvedge bobbins are required for the leno. The double-disk leno provides for intensive binding with very short yarn ends and also operates from standard king bobbins. Waste-saving and material recycling are thus optimised with the DORNIER MotoEco®.

Economic tuck-in selvedges thanks to the DORNIER QuickSet Tuck-in® (option)
The DORNIER QuickSet Tuck-in® allows the economical production of label selvedges. Settings of scissors and draw hook are firmly implemented on a setting gauge outside the machine. This unit is subsequently built on to the bearing plate located in the machine. Only through this development is it possible to guarantee the required selvedge quality with tuck-in depths down to 8 mm. Due to its narrow width the selvedge can be easily tailored. Changing from leno to tuck-in selvedge and vice-versa is possible within the shortest time. The tuck-in selvedge unit is also available as a center tuck-in device for multiple fabric weaving.
The P1 has a completely new drive concept which, together with the FT control system, forms an ideal combination. Function and handling have been significantly simplified and the components reduced to the essentials by dispensing with the belt drive and inching motion. With this and the integrated speed control maintenance cost and set-up times are decisively minimized.

**CompactDrive: An all-rounder**
- Overall construction is orientated to the most extreme maintenance-friendliness of the clutch-brake unit, significantly reducing maintenance cost and time.
- The fly-wheel mass which is integrated in the drive motor, facilitates the reliable weaving of the heaviest products with maximum number of heald frames or lifting hooks.
- The air-cooled motor is easily accessible, installed on a mounting platform so that it can be easily shifted without lifting gear.
- Stable running speed is ensured even with heavy pattern changes at dobby or Jacquard machines with high numbers of heald frames or lifting hooks.
The whole is greater than the sum of all components: The matched interplay of the P1’s unique mechanical construction with its new, forward-looking electronics results in an individually configurable machine which operates with reliability, efficiency and reproducibility.

**Electronic fabric take-up and warp let-off**
With its electronic fabric take-up and warp let-off, DORNIER is following up the concept of not only controlling and reacting, but also acting with regard to the future. Patented absolute sensors measure the warp tension – independently of the position of back-rest roller and mechanical element motion – keeping it constant, even when weaving with splitted warp beams. The accuracy of warp beam settings on the display amounts to 1 cN/end with a filling density resolution of 0.01 picks/cm. Exactly reproducible values for filling density, machine speed, warp tension and contraction support start-mark prevention.

Warp tension control is effected via absolute or s-sensor (optional). S-sensor positioning is independent of drawn-in width and dispenses with bothersome fastening components in the warp area.

**Automatic Start mark Prevention ASP and knot-free weaving APMke**
The simple functionality of ASP automatic start-mark prevention with absolutely reproducible functions stands for quality reliability in the event of machine stoppage and restarting. Starting behaviour can be set with dynamic reed beat-up and the starting process is individually programmable.

Electronic control units replace conventional mechanics and consequently mechanical adjustment operations, in the case of yarn brakes, color selectors, selvedge units and scissors.

The automatic knot-free package switching APMke and the knot-free weaving function increase fabric quality and ensure higher productivity.
DORNIER DynamicWarpGuide (DWG):
Ideal tension balance
The highly dynamic warp yarn guide unit, DynamicWarpGuide (DWG), enables to weave with the lowest possible warp tension level leading to a significant warp end break reduction. Through its synchronous movement with the shed motion, this patented, roller-free unit guarantees an ideal tension balance between open and closed shed motion even at maximum machine speed!

DORNIER PLUS
VERSATILE OPTIONS: FROM WARP TO WEFT

With its numerous options and extras, the DORNIER P1 offers you solutions for the widest variety of requirements. Suggestions from the constant dialogue with customers form a valuable input for our product development.
The result: Waste reduction, handling simplification, high productivity and of course perfect fabric quality.

Reduced selvedge waste through DuoColor
Resource-savings through the optional DuoColor unit: The selvedge unit for two freely selectable fillings to be inserted makes it possible to reduce selvedge waste by over 50 per cent depending on yarn type.

Automatic shaft coupling
PSL pneumatic shaft coupling automates shaft engagement and release independently of the shed position, thus decisively reducing setting-up times.
Flexible warp beam support
Warp beam support is flexible and individually adaptable to customer requirements. In addition to the tried and proven universal warp beam mounting system, DORNIER offers the EuroFix mounting for ground, top and split warp beams with flange diameters from 800 to 1,250 mm. The warp beam gear wheel stays in the machine during warp changes.

Mobile, multifunctional axis control
The new mobile warp change key pad significantly facilitates the warp changing process. It can even be carried out by one person on double width weaving machines. The operator can control warp and fabric take-up with it from any point around the weaving machine.

Production-increase thanks to double filling insertion
Unique torsion-free double filling insertion offers a notable production increase without additional energy consumption. The process is most economical particularly in the production of screen fabrics and panama or rep weave. Filling insertion of up to 5 fillings in one pick is possible with the DORNIER rapier.
The P1 combines intelligent solutions which - in their totality - ensure optimised resource usage, making extremely flexible machine operation possible. Diverse main assemblies and their functions obtain decisive feature changes – beginning with the drive, via filling insertion and statistical evaluations, through to quick and reliable product reproducibility. Weaving personnel workload is relieved by short setting-up times and increased maintenance friendliness, through which productivity can be increased.
“Quality creates value” – from “cool wool” via silk and finest linen to coarse boucés à la Coco Chanel.

The DORNIER rapier weaving machine has decisively influenced many of the most important fashion trends of past decades. The new P1 remains the best guarantor of highly valued products and a perceptible and sustainable quality touch.
Lindauer DORNIER GmbH has been producing weaving machines for over half a century. Since the beginning of our technical developments in weaving, our central focus and our unbroken enthusiasm are aimed at perfected technologies for the production of high quality woven fabrics. “Quality creates value” is our creed and we are doing our utmost to continue setting quality standards.

The DORNIER system family: Air-jet and rapier weaving machines
The unique DORNIER system family consists of air-jet and rapier weaving machines based on an identical, robust machine frame and equipped with uniform electronics. The operative and maintenance personnel are therefore working on identically designed machines – despite different filling insertion systems. Accessory exchange-ability and largely identical spare parts reduce inventory and save money.

A technology leader with two supporting pillars
With both its company divisions – weaving machines and specialty machines – DORNIER belongs to the technology leaders the world over today.

In specialty machine construction, DORNIER is market leader for the engineering and production of drying and film stretching plants. In addition to the packaging industry, these films find ever increasing use in high-tech products like semi-conductors, condensers and film displays for mobile telephones and flat screens.

With you in dialogue
A meaningful dialogue with you, the users of our technologies, is pivotal for the success of DORNIER. For us it is matter of concern to provide prompt and competent support throughout the world at any time. You profit simultaneously through the constant exchange of experience with our skilled technicians. Therefore we maintain our own technical textile laboratories including trial machines for weaving trials in Lindau (D), Charlotte (USA) and Shanghai (PRC). Sales teams with technicians are available for you in Mumbai (IND) and Istanbul (TR) too.
**Filling insertion**
Positively controlled in every phase with lowest filling tension with patented DORNIER AirGuide®

**Width reduction**
Symmetrical up to 40%, asymmetrical up to 10%

**Filling insertion rate**
Up to 1,200 m/min, on double picking up to 2,400 m/min

**Yarn Count**
All yarn types from finest 7 den silk, effect yarns and glass rovings up to 4500 tex

**Filling colors**
1-16 colors, any pick and pick color sequence
DuOColor-, UniColor und DuoMix-unit for waste saving (option)

**Filling feeders**
From various manufacturers, controlled by the DORNIER electronic (CAN)
Electronically controlled filling tension devices
Automatic package switching APS, without weavers intervention

**Shed formation**
Positive cam motion, max. 10 harness frames with 12 mm pitch
Rotary dobby for up to 28 harness frames with 12 mm pitch
max. 12 harness frames with 18 mm pitch
Electronically controlled Jacquard machines with up to 20,000 hooks
Leno motion DORNIER EasyLeno®, 2T
Pneumatic Shaft Lock, type PSL (option)

**Selvedge formation**
Leno selvedges with magnetic leno, 2-end disc leno DORNIER MotoLeno®,
Double disc leno DORNIER MotoEco®, thermally sealed selvedges, tucking units (right, left and in the center)
Label selvedges with DORNIER QuickSet Tuck-in® tucker unit (option)
Quick change from tuckeed to leno selvedges and vice versa

**Templets (through and cover)**
Cylinder templets, width-independent full-width temple (option)
Quick change

**Electronic Warp Let-off motion EWL**
Electronically controlled warp let-off with absolute- or s-sensor (option)
Warp beam support universal and EuroFix for beam diameters 800 - 1250 mm, also with split warp beams
Top beam support up to 1,250 mm

**Electronic Cloth Take-up motion ECT**
Electronically controlled, synchronized with EWL.
Cloth roll diameter 540 mm, with off-loom wind-up to 1,800 mm

**Automatic Start mark Prevention ASP**
ASP including harness leveling, high torque start of main motor
Time-dependent start compensation with let-off reversal

**Knot-free weaving and knot-free package switching APMke**

**Lubrication**
Gearboxes with continuous oil circulation
All lubrication points inclusive universal underrunment
AutoLab lubricated via automatic central lubrication

**Electronic control system**
Modern FT-technology with Fast-Ethernet-Technology bus 16" Touchscreen Display DORNIER ErgoWeave®,
Modern safety technology
Software update via USB or online

**DoNet (Global Communication Network)**
Total networking between machine, host computer and DORNIER for spare parts ordering, user manuals, setting instructions, style and performance data, and remote diagnostics by teleservice

**Options**
A large selection of other options is available for many fields of application
Please ask our sales and service personell for further details

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**Machine type code**

DORNIER High Performance Rapier Weaving Machine P1
PTS 12/J 190 C

**Number of filling colors**

**Shed formation**
S: dobby
E: positive cam motion
J: Jacquard machine

**Nominal width cm**
C: CompactDrive

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**Dimensions**

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Larger widths and specially customized solutions on request

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**Overall depth:**
with 800 mm ø warp beam 2,118 mm
with 1,000 mm ø warp beam 2,184 mm

* With more than 4 colors there is a variation in machine width

For precise measurements of each type of machine outlined, please contact DORNIER

Subject to change