Relanit turns 30:
Three decades of success

Happy Birthday!
Relanit machines from Mayer & Cie.: Widely used around the world

Since the first Relanit was launched in 1987 Mayer & Cie. has sold over 10,000 machines with relative technology. That is around 25 per cent of all the machines the company has manufactured over the past three decades. Customers in nearly 90 countries all over the world use Relanit machines.

- The Top Ten Relanit countries
- Countries to which Relanit machines have been sold
Applications

Relanit machines knit single jersey fabrics of all kinds. They are extremely versatile. There are many uses for the fabrics they produce, such as sportswear (including for body mapping and mesh), leisurewear, under- and nightwear, home textiles (for instance fitted sheets), lining fabrics, carrier materials and automotive.
Foreword

Thirty years ago a machine was launched in the market that to this day stands for our company and our values like no other: the Relanit.

In 1987 at the ITMA in Paris we unveiled the first production models incorporating relative technology: the Relanit 4, the Relanit 1 and the Relanit S. In doing so, our local newspaper wrote at the time that we had “reached a new dimension in the manufacture of knitwear”. The Relanit was unmatched in production, speed, yarn care and energy efficiency – and still is. We are not aware of any company that has succeeded in replicating the technology. And nobody has developed a better technology that combines all these benefits either, by the way.

Relative technology thus exemplifies the ability of Mayer & Cie. to develop trail-blazing processes – technologies that are here to stay and are still the shape of things to come 30 years after the start of series production. After all, spinitsystems, the latest innovation from Mayer & Cie., would not have been possible without relative technology.

At the same time relative technology is for us a major obligation to be able to offer our customers such innovative, sustainable technologies in the future. Or, in brief, to continue to be a step ahead of the competition. With that in mind we wish our Relanit a very

“Happy Birthday!”

Yours, Marcus Mayer
Managing Director Mayer & Cie.
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Views on Relanit

“Relative technology is a technical masterpiece which only Mayer & Cie. dominates.
(Benjamin Mayer, Managing Director, Mayer & Cie.)

“Relative technology is a Mayer & Cie. USP. It demonstrates our technical lead – and has done so for decades.”
(Marcus Mayer, Managing Director, Mayer & Cie.)

“Relative technology sets our customers apart from the competition and keeps our customers and us always ahead of the rest.
(Axel Brünner, Head of Product Management)

“One Spinit 3.0 E spinning and knitting machine knits a fragile fibre bundle, the roving.
Relative technology deserves much of the credit for it succeeding in doing so.
(Michael A. Tuschak, spinitsystems Marketing and Sales)
Relative technology: Technically fascinating …

In contrast to conventional knitting technology with its horizontal sinkers, relative technology knits by means of a contrary movement of needle and sinker. This movement gives the technology its name: contrary or relative technology, the latter being the term coined by Mayer & Cie. It refers to the fact that, relatively speaking, needle and sinker move toward each other.

Relative technology is based on the division of the vertical movement required to thread the yarn into two contrary, complementary individual movements of the needle and the knock-over sinker. These two movements complement each other to make a gathering movement.

The vertical movement of the needles is always constant in a Relanit machine. Stitch formation and stitch length are both determined by the setting of the vertical movement and the knock-over sinker. In contrast, the needle’s vertical movement determines the stitch length in conventional technology.

In relative technology the sinker moves toward the needle in a kind of circular movement. Images kindly provided by Groz-Beckert, Albstadt.
The stitch formation is the very moment in knitwear manufacture when the yarn is most subject to stress. For single jersey needle hooks pull the thread into the sinker gaps. The needle hooks and sinkers serve as the deflection points via which the yarn is pulled. The moving thread is subjected to tension. Cotton yarns are especially sensitive to this stress and yarn breakages or holes in the fabric can occur as a result.

The fewer the deflection points which the thread passes, the less stress there is on the yarn. For each millimetre of additional stitch length twice the amount of yarn must be pulled round each of the previous deflection points, and every deflection point has a braking effect, putting the yarn under tension.

This is clearly demonstrated by means of a little experiment. If you run some yarn firmly around the outstretched fingers of your hand you can feel the braking effect of each finger on your skin. The fewer the number of fingers involved, the more easily the yarn runs, with less friction on the remaining fingers.

Relanit reduces friction and tension of the yarn as it works with fewer deflection points than a conventional knitting machine producing the same stitch length. This works because in relative technology the sinkers are extended toward the needle movement until the required depth is reached.

As a consequence, the Relanit gets by with four instead of eight deflection points. The result is that the yarn is handled gently.

... and gentle on the yarn

![Relative technology graph](image)

Relative technology with four yarn deflection points (above) and the conventional technology (below).
Relanit is worth it

Ever since it was launched in 1987 the Relanit has been in continuous strong demand. On average, 330 machines with relative technology are ordered every year. That is because they offer customers tangible benefits.

These benefits are based mainly on a single property of Relanit machines: their gentle processing of the yarn. There is less strain on the yarn because, due to the relative movement of the sinker in relation to the needle, there are only a few deflection points for the yarn.

That has many positive consequences:
- Significantly less yarn breakage
- Improved productivity due to fewer machine downtimes
- Safe processing of inferior yarn qualities
- A higher operating speed
- Optimal fabric quality, especially of plated fabrics incorporating elastomer yarn.

Another reason for the low error rate is the Relanit’s special design. Because it has neither a sinker cam nor a sinker cam ring the lint that is often oil-stained falls off in an outward direction. Special air nozzles support this movement so that there is little or no possibility of the lint being knitted into the fabric. That is why there are as good as no oil stains in the fabric any more. The missing sinker cam also makes access to the knitting point easier. In addition, it makes the Relanit a popular striping machine because using the striping attachments is much less complicated.

All in all, the special Relanit combination delivers fabric quality and high productivity using average to less expensive raw material. Or, indeed, difficult or sensitive yarns.

That is why the Relanit has the key cost factor in fabric manufacture – the yarn cost – firmly under control. Practice proves that this is the case. The Relanit recoups its cost within a very short time as a result of the yarn cost saving alone. Further cost-saving factors are the higher operating speed and higher productivity.
Relanit, as up-to-date as ever

The Relanit principle has grown to keep pace with technological development. Today its benefits are unchanged and, indeed, more up-to-date than ever because many a trend of the 1980s has become mainstream over the past 30 years.

**Trend No. 1: Minimisation principle**
Input is minimised to make the production of a given output profitable. That applies especially to the fiercely contested single jersey market and accounts for the Relanit’s timeless, up-to-the-minute advantage: It produces the fabric quality required using an inferior yarn. This would also be possible with a conventional machine, yet there would be a loss in productivity, which is not the case with a Relanit.

**Trend No. 2: Sustainability**
Every new development must be sustainable because it cannot otherwise be profitable. The Relanit has always lived up to this claim — and the latest models do so more than ever. The shorter, flatter course of the needle has a positive overall effect on the machine’s energy consumption. In the case of the Relanit 3.2 HS energy consumption is about 30 per cent lower than that of a conventional knitting machine. And its output is up to 20 per cent higher. That’s what energy efficiency looks like!

The latest Relanit machines can be supplied complete with Mayer & Cie.’s needle oil recycling system. Used oil is reprocessed and recycled — a saving of up to 30 per cent of fresh needle oil per machine.

Because Mayer & Cie. aims over and above these individual aspects to achieve more using fewer resources the company is a member of the VDMA’s Blue Competence sustainability initiative. Mayer & Cie. has thereby undertaken to act sustainably as a company and include its products and employees in this endeavour (bluecompetence.net).
## Tried and trusted technology, the very latest machines

<table>
<thead>
<tr>
<th>Machine type</th>
<th>Description / Advantage</th>
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<tbody>
<tr>
<td>1.6 E</td>
<td>The Relanit 1.6 E is the flagship machine for SJ-full jacquard fabric. In addition to relative technology it uses another characteristic Mayer technology – single needle selection. Thanks to the three-way technology it manufactures structures for body mapping and mesh.</td>
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<td>1.6 ER</td>
<td>The Relanit 1.6 ER is a jacquard machine for striped fabrics. With 1.6 feeders per inch and one striping unit per feeder it can be used universally, especially when it comes to productivity and fashionable patterns.</td>
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<td>1.6 R QCe</td>
<td>The Relanit 1.6 R QCe produces patterns with up to 12 colours. Because the Relanit does not have a sinker cam that blocks access to the knitting point, it is an ideal workplace for producing striped fabrics. This machine also knits single jersey fabrics, crêpe, two-thread fleece and plated single jersey structures.</td>
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<tr>
<td>2.4 E</td>
<td>For fully electronic jacquards there is the popular Relanit 2.4 E. Its three-way technology delivers a wide range of patterns and swift pattern changes that thanks to single needle selection in each system go ahead safely and in a matter of seconds.</td>
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<tr>
<td>2.4 SE</td>
<td>By just pressing a button the Relanit 2.4 SE produces mini-jacquard designs and mesh structures. The machine’s full three-way technology is what enables it to accomplish this feat.</td>
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<td>3.2 HS</td>
<td>The high-performance Relanit 3.2 HS runs at up to 50 rpm with a 30-inch diameter and is one of the most productive machines on the market. It ensures a high level of process safety, especially in processing elastomeric yarns. The Relanit 3.2 HS is exemplary in terms of energy consumption too.</td>
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<tr>
<td>3.2 S</td>
<td>The Relanit 3.2 S is an entry-level Relanit range machine. It offers the advantages of relative technology at an attractive price and can be put to all standard uses, from outer- to underwear.</td>
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<td>4.0</td>
<td>The main focus of the Relanit 4.0 is on productivity and efficiency in plain single jersey. With 120 feeders and 50 rpm, this Relanit knits up to 6,000 stitches per minute at 30 inches. A knit-on help makes it easy for the operator to get the machine back up and running after a downtime. This machine comes in diameters from 15 to 36 inches and roll weights of up to 230 kilograms.</td>
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<tr>
<td>3.2 R</td>
<td>Stripes, stripes and even more stripes, that’s what you get from the Relanit 3.2 R and its unrestrained productivity. It knits up to six colours of stripes, each while making optimum use of the 3.2 feeders per inch.</td>
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spinitsystems: The future potential of relative technology

**spinitsystems** is Mayer & Cie.’s spinning and knitting technology. It combines three previously separate process steps – spinning, cleaning and knitting – in one machine. By combining these three processes it reduces substantially the space, time and energy required to manufacture single jersey. That most definitely makes spinitsystems a technology with future potential.

One of the reasons why spinitsystems works is relative technology. The Spinit 3.0 E processes roving rather than finished yarn. Roving is a much more sensitive raw material than any finished cotton yarn. It is a fibre composite, a thin band of fibres that is only held together by a slight protective turn. Stretching or tearing the band will make it to dissolve.

The Spinit 3.0 E knits this fragile material after it has passed through the machine’s roller drafting system and its spinning unit. That only works because spinitsystems makes use of relative technology. Thanks to the relative movement of needle and sinker, there is less stress on the fibre bundle during stitch formation than would be the case with a conventional knitting machine. Plus the distance the yarn needs to travel in order to form a desired stitch length is much shorter. There are fewer deflection points too.

In short, the fragile fibre bundle can only be knitted into a textile fabric because relative technology’s stitch formation is much gentler than when conventional knitting technology is used. Relative technology is therefore a key component of the Spinit 3.0 E with its future-orientated technology.
Relanit: How it came about

**The idea**

Ernst-Dieter Plath, Head of Development at Mayer & Cie., visits Alfred Buck’s company in Bondorf. Buck has had a patent patented that Plath describes as follows: “While the needles are pulled downward to take up the thread and gather the stitch, the needle bars move in the opposite direction to the needles and assist with the stitch forming movement.”

**Potential**

Plath sees the process’s potential for Mayer & Cie. Innovative single jersey machines are the order of the day, with increasing demand for single jersey fabrics, including cotton blends. After the abrupt end of the jacquard boom in the mid-1970s a new trend in leisurewear is on the horizon.

**Licence purchase**

Mayer & Cie. buys a licence for Alfred Buck’s “contrary technology”. So do Textima, based in the GDR and precursor of Terrot, and the Spanish company Jumberca.

**Advantages**

“那 makes it possible to form the stitches in one gauge and yet to select very flat angles. As a result, a much lower stress on the needles and sinkers and very high revs or speeds can be achieved.”

Original drawings of the conventional needle curve and the Relanit’s needle curve by the developer Ernst-Dieter Plath.

Alfred Buck Senior with a model of his invention.
**Relanit: Run-up to the 1987 ITMA**

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<tr>
<th>1983</th>
<th>ITMA</th>
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<td>Jumberca, Textima and Mayer &amp; Cie. unveil at the ITMA a prototype machine with relative technology.</td>
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<tr>
<th>1985</th>
<th>Technical challenges</th>
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<tr>
<td>Series production is still a distant prospect. In the end, only Mayer &amp; Cie. makes the running. Head of Research Paul Neher faces wear and tear problems because all the knitting components are inside the cylinder. The loop structure is not yet up to standard.</td>
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<tr>
<th>1986</th>
<th>Advantage and difficulty in one</th>
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<td>The Relanit is more compact than conventional machines and reaches higher speeds, but space is limited. Where there used to be a cylinder cam for the needles and another for the sinkers the Relanit has one cam for both the needles and the sinkers. That is why the sinker must guide the needle.</td>
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<th>1986</th>
<th>Successful pre-production series</th>
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<td>The first customers test-run the new machine and are highly satisfied with the results.</td>
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<th>1987</th>
<th>In-house show</th>
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<td>The Relanit 1, Relanit 4 and Relanit S meet with a delighted response at the in-house show in Albstadt. A local daily paper’s headline reads “Mayer &amp; Cie. revolutionises the circular knitting machine” another refers to the “knitting miracle” from Albstadt.</td>
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<th>1987</th>
<th>ITMA Paris</th>
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<td>The new Relanit machines are eagerly awaited in Paris, where the ITMA is an outstanding success for Mayer &amp; Cie.</td>
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After the 1987 ITMA, Head of Research Paul Neher examines a Relanit with customers in Albstadt.
Bull’s eye
The Relanit perfectly meets the spirit of the times and customers are delighted with the machine. A major point in its favour is that it knits difficult grades of cotton without a hitch. That boosts its popularity in cotton-exporting countries in particular.

1987

Clear advantages
The low overall error rate, ease of access to the machine and high productivity also contribute toward the Relanit’s swift success.

555th Relanit
Less than three years from the start of series production Mayer & Cie. delivers the 555th Relanit to the customer.

1990

1,000th Relanit
Barely 13 months later, Relanit sales pass the 1,000 mark.

Teething troubles
Blocked sinker channels and oil stains in the knitwear are an initial headache, but air nozzles to blow away the lint quickly solve the problem and ensure that no lint is knitted into the fabric.

Elastomer plating
Better yarn guides, lower cylinders and segments perfect elastomer plating, which is becoming increasingly standard for single jersey. The Relanit soon handles mesh perfectly too.

Relanit for technical textiles
A machine designed for technical textiles, the Relanit 0.8 knits spun steel fibres, steel and silver wire, glass fibres, carbon fibres and carbon – and does so in combination with cotton and synthetic yarns.

Relanit with compound needle technology
The Relanit C features compound needle technology. That reduces wear and tear on the needles but rules out both elastomer plating and structures.

1998

ITMA 2015
In demand internationally, the Relanit is on show at all major textile trade fairs around the world.

2015

Unceasing success
Since the Relanit was launched in 1987 more than 10,000 machines with relative technology have been delivered to customers, plus around a further 300 every year. And Mayer & Cie. continues to be the only company that uses relative technology.
In 1987 Mayer & Cie. booked the first orders for Relanit machines. Five technicians who were there from the start are still with the company. In this conversation Johannes Bitzer, Axel Brünner, Rolf Gonser, Thomas Maier and Jürgen Müller recall those pioneering days with the Relanit.

How did you first come into contact with the Relanit?
Rolf Gonser: They just put it down at our workplace and said “Right, see that you get that fitted.”
Jürgen Müller: Hold on there! We were given assembly instructions of course!
Rolf Gonser: Yes, it all came from R&D and we knew what we had to bear in mind while assembling it. And, of course, they came round now and then to make sure we were getting it right.
Axel Brünner: There is always the technician who built the machine at the development stage. He is the man to contact if you have any questions. In those days there were no assembly instructions like you have today.
Rolf Gonser: We had to work out by ourselves where the parts fitted.

Did you feel proud once it was clear that the technology was so successful?
Axel Brünner: It’s always a good feeling when things work! One of our competitors was at the same level as Mayer back then. So it was great to see our own machines compared with the competition and to know that the sales figures were good. For me that was certainly quite an experience. If you identify with the firm you identify with the product too.

Thomas Maier: It was also soon clear that the success of the product safeguarded our jobs. For a while, we manufactured nothing but Relanit, nothing else ran off the assembly line. That proves you have got something right and it makes you feel satisfied. It also shows that your job is safe, especially after the lengthy crisis of the 1970s.

Were there uses of the Relanit that surprised you?
Axel Brünner: Difficult yarns, poorer qualities. That was why it was a success in countries where these kinds of yarn were often used.

Did that really come as a surprise to you?
Axel Brünner: Well, it was a surprise for the customers. For us, of course, it was more the objective. The relative movement and with it fewer deflection points was precisely the advantage we wanted to put to good use. That was why we were very successful right away in Egypt, for example. The good cotton – hand-picked – was sold by the state to earn foreign exchange and the local knitters were left to process the rest. That worked extremely well with the Relanit.
Jürgen Müller: It wasn’t only poorer quality yarns but thicker yarns too. Yet the machine ran at full capacity where others would have had to slow down by 50 per cent. The Relanit ran at 80, 90, 100 per cent.
Axel Brünner: That was then a cost benefit for the customer because thicker yarn costs less than finely spun yarn.
Mayer & Cie. GmbH & Co. KG: An overview

Mayer & Cie. has manufactured circular knitting machines for over 111 years. They knit fabrics for home textiles, sports-, night- and swimwear, seat covers and underwear and technical textiles. With over 300 patents the capital goods company from the Swabian Alb has repeatedly changed the course of circular knitting technology. Mayer & Cie. is the world leader in both the technology and the market.

Well over 95 per cent of its products are exported: to Asia from Turkey via India and Indonesia to China and to America, Europe and Africa. In 2016, Group sales revenue totalled around EUR 105 million.

Mayer & Cie. is entirely owner-managed in the fourth generation and wholly family-owned. The company has a world payroll of about 500 employees, including 370 at its head office location in Albstadt, the home of its administration, research and development and production. The company has further locations in China and the Czech Republic.