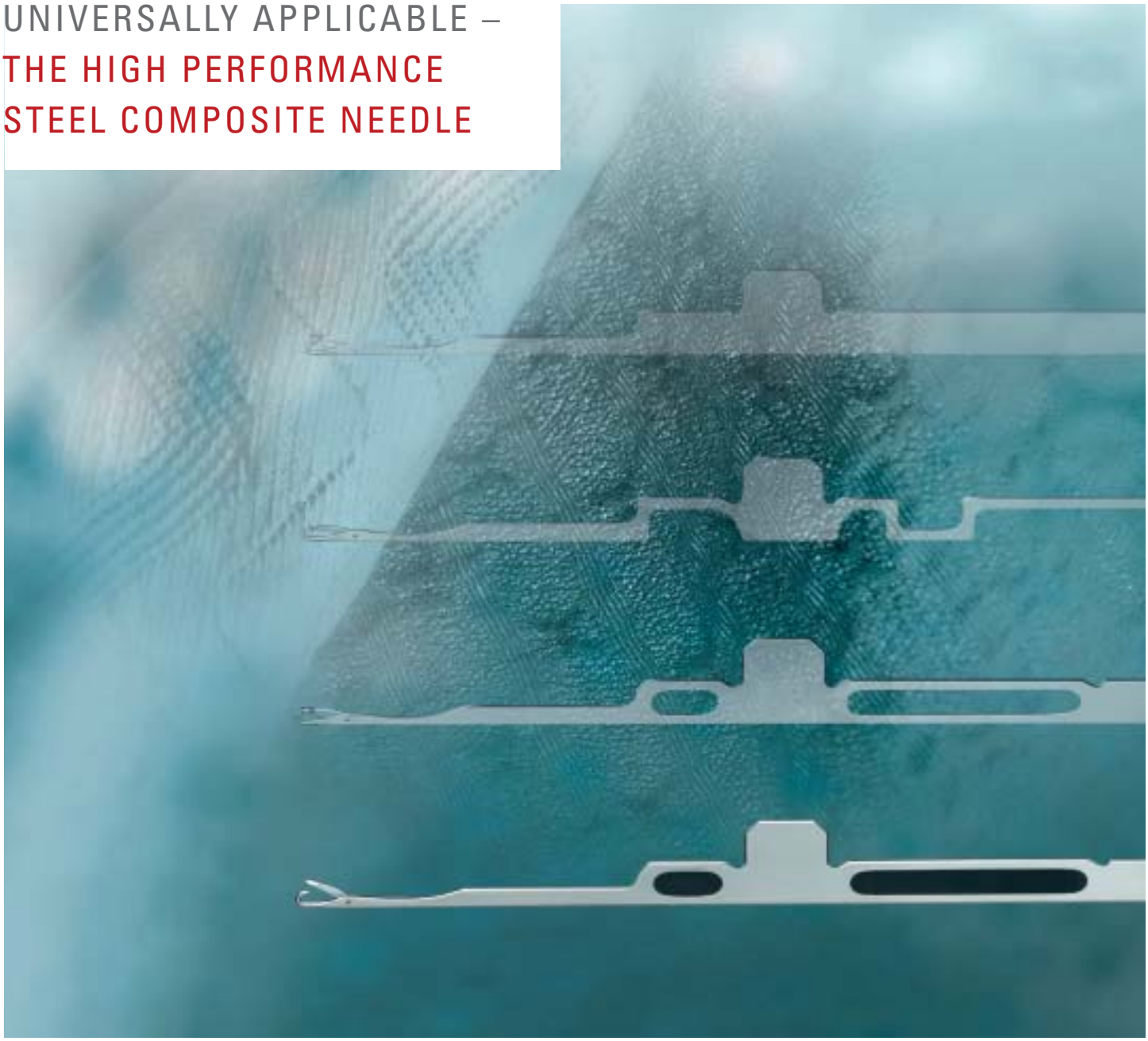
GROZ-BECKERT®

UNIVERSALLY APPLICABLE – THE HIGH PERFORMANCE STEEL COMPOSITE NEEDLE



Makers of knitted fabrics and machine builders alike value Groz-Beckert for the high quality of its products and its innovative capabilities. Groz-Beckert is acknowledged to be a dependable supplier of improved and new products. One such is its patented, maintenance-free high performance steel composite needle, characterized chiefly by maintenance-free and levels of productivity conforming precisely with customers' needs.

These needles are as insusceptible to contamination as conventional full shank needles. At the same time, they have all the productive advantages and capacity of low profile meander shape needles.

They have proved successful in service with leading manufacturers for a number of years.

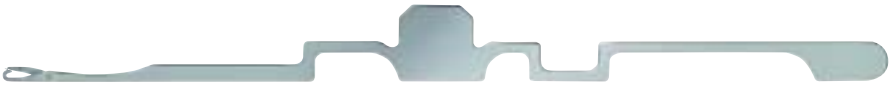
GROZ-BECKERT-PATENT
DE 19729145, 4442943, 3843420, 3706647, 3314809, other patents pending.

CONTAMINATION IN COMPARISON

STAGES OF DEVELOPMENT

Full shank needles are used in circular knitting machines for maintenance-free production while low profile meander shape needles ensure high productivity.

FULL SHANK NEEDLE



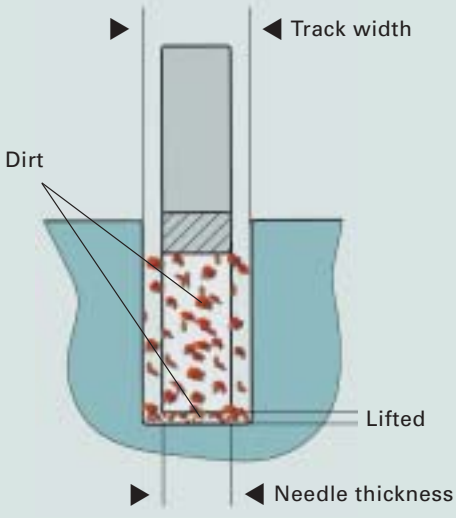
LOW PROFILE MEANDER SHAPE NEEDLE

So far double low profile needles have been used when there is a need for both criteria to be met.

DOUBLE LOW PROFILE NEEDLE

Although these combine low maintenance with high performance, complete maintenance-free has not yet been achieved.

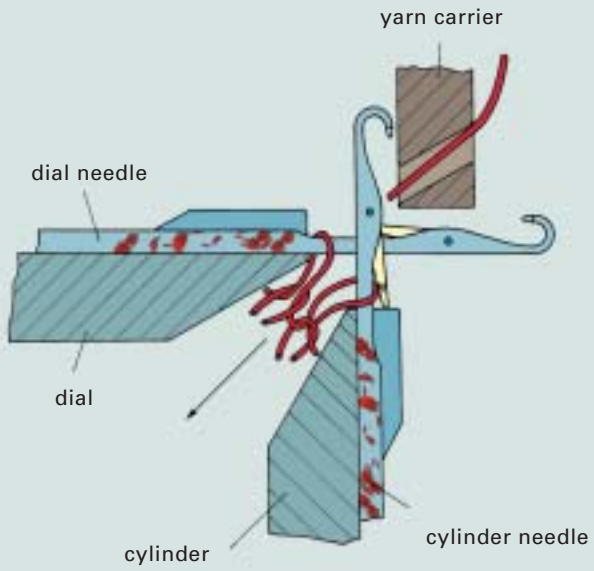
Strong contamination with the low profile meander shape needle



CROSS SECTION: NEEDLE IN NEEDLE TRACK

Thanks to their productive capacity, low profile meander shape needles are now used as standard on modern, high performance machines. Nevertheless, they are susceptible to contamination. When spun yarns are being processed, dirt collects in the cut outs, necessitating machine cleaning 4-8 times a year, depending on the degree of contamination.

Position in the knitting machine

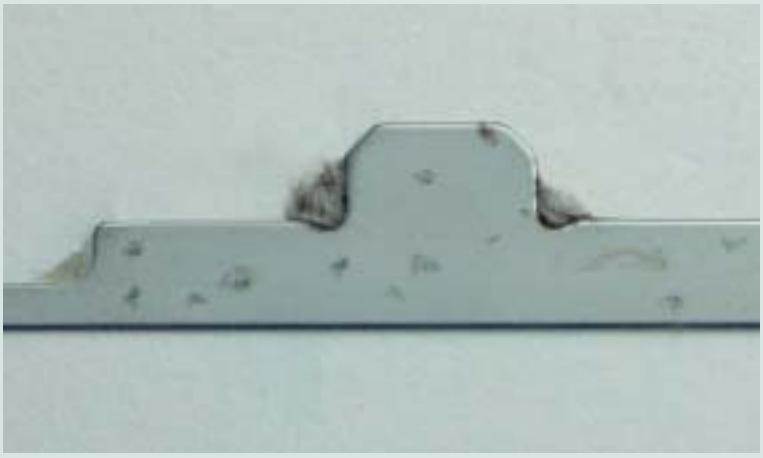


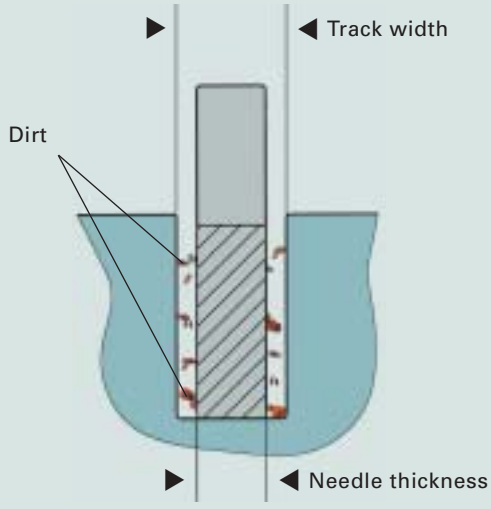
During knitting operations, particularly when spun yarns are being processed, fiber fly, dust and dirt collect in needle cut outs and needle tracks, where they are contaminated with oil and abraded metal fines. In the course of time, this mixture becomes compacted and securely lodged. The build-up of contamination reduces the width of the needle track and increases friction. The needles are slowed and lifted, with the result that they touch parts of the cams.

Consequences of the contamination

Severe friction	• Needle and machine wear • Damaged needles • High machine temperature • Excessive energy consumption
Varying degrees of friction	• Lines in the knitted fabric • Poor fabric quality
Frequent machine cleaning	• Machine stoppages • Low productivity • High manpower needs and costs

Insusceptibility of full shank needles to contamination





CROSS SECTION: NEEDLE IN NEEDLE TRACK

The long-established full shank needles used on low speed machines are not subject to the problem of contamination. Machines seldom need to be cleaned during the service life of the needles.

THE STEEL COMPOSITE NEEDLE

GROZ-BECKERT® PATENT
DE 19729145, 4442943, 3843420, 3706647, 3314809, other patents pending.

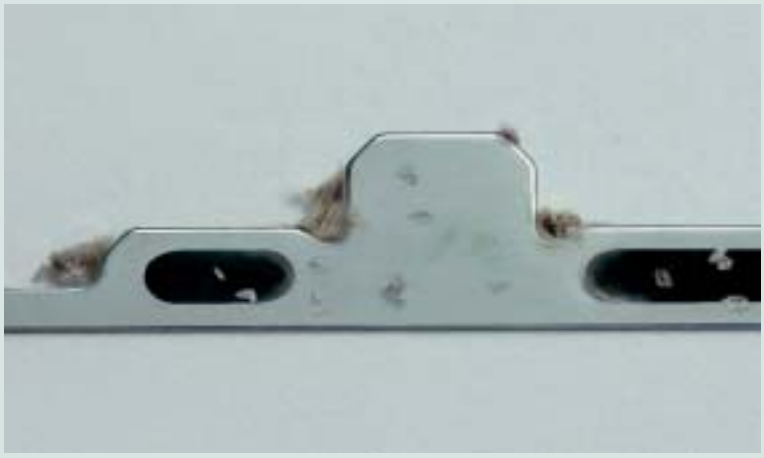
The steel composite needles effectively combine the advantages of low profile meander shape needles with those of full shank needles.

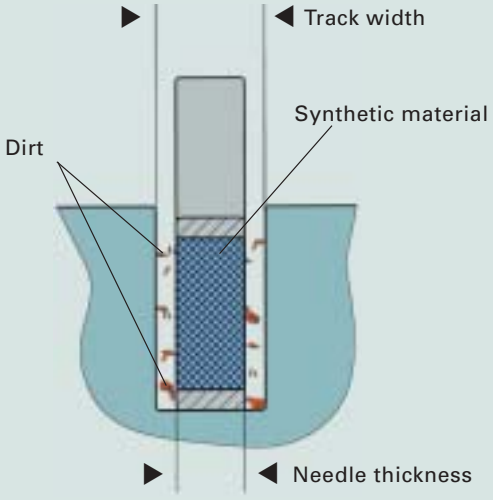
Practical experience reveals that steel composite needles, like full shank needles, require no maintenance, yet can operate at the same time high speeds as proven low profile meander shape needles.

Advantages of steel composite needles

- **High operation reliability**
- **Improved product quality**
- **High productivity**
- **Reduced needle consumption**
- **Reduced costs of machine maintenance**
- **Less needle and machine wear**

The maintenance-free high performance steel composite needle





CROSS SECTION: NEEDLE IN NEEDLE TRACK

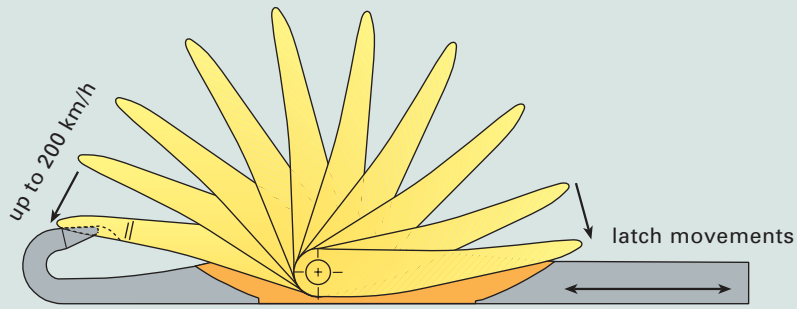
Steel composite needles feature a double low profile, giving them the same efficient cushioning characteristics as low profile meander shape needles. The cut outs are filled with synthetic material, preventing dirt from collecting and eliminating the problem of contamination.

STRESS ON THE LATCH

During the knitting process, needles are subject to severe stress, particularly the loop forming parts. When the butt hits the cam, it receives a shock which is transmitted to the hook, causing vibrations which can lead to frequent breakages.

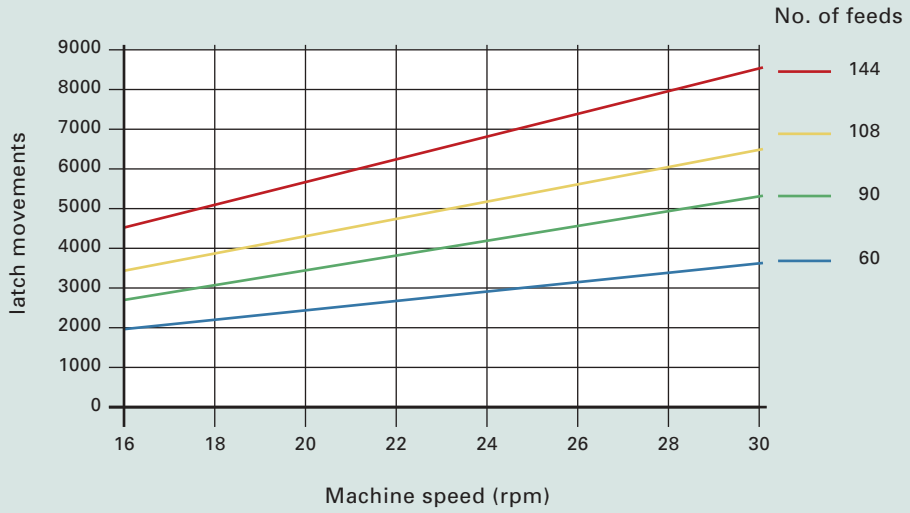
The latch head strikes the hook at high speed when closing, likewise the latch seat in the shank when opening. The tip of the latch may reach speeds of up to 200 km/h.

Latch movement



The stress on the needles increases in proportion to the number of feeds and the operating speed (rpm) of the machine.

Relationship between latch movements and machine speed/No. of feeds



APPLICATION OF THE STEEL COMPOSITE NEEDLE

- **Suitable for the use with spun and filament yarns**
- **No need for needles to be replaced when yarn and loop formation are changed**
- **For use when knitted fabric is required to meet the highest quality standards**
- **To improve production reliability**
- **To reduce costs**

Lubricating instructions for steel composite needles

- The needles must always be adequately and properly lubricated with tested and approved needle oil.

- The only lubricants must have been specially developed for use as knitting machine oils. The recommendations of the knitting machine builder should be followed. The service life of needles and cam components depends on correct lubrication. In the case of steel composite needles, provision must also be made for the characteristics of the synthetic material. Only needle oils compatible with synthetic materials may be used. This requirement is comparable with that which applies to the latest knitting machines with electronic needle selection systems. Needle oil must not have any chemical or thermal effect on the geometry or resistance characteristics of the synthetic insert.

- Our development partners, who have been using steel composite needles with great success for a number of years, have obtained trouble free service with various oils from different manufacturers. The oil manufacturer must be involved in the selection process, so that he can guarantee the suitability of his products. If necessary, Groz-Beckert can supply the oil manufacturers with appropriate test specifications.

- The requisite quantities of oil are to be taken from the operating manual supplied by the knitting machine manufacturer.

- In general, the chemical composition of cleaning oils makes them more harmful to synthetic materials than needle oils. They must therefore be guaranteed harmless by the supplier.

• Cleaning fluids should not be used under any circumstances!

Experiences of our development partners

Mayer & Cie., Inter Rib 1.6 Ø30", E 20
Cotton, cotton viscose/elastane, wool silk in various structures

Quote (1 July 1998):
"As I have mentioned to you personally, we have had no problems whatsoever during the entire production period. In our estimation, these needles are particularly effective in preventing heavy contamination in the dial. This results in considerable savings on maintenance and cleaning with, needless to say, corresponding improvements in productivity.

Furthermore, one other positive aspect is that, as a result of minimal machine contamination, the finished product is free of needle lines. Even at high speeds, no problems of any kind occur."

Terrot, I 1108, Ø30", E 28
Polyester

From a field test at
Riedel + Tietz, in 2002:
- Increase of performance on a Terrot I 1108 from 30 rpm with low profile meander shape needle to 33 rpm when using a steel composite needle
- Less vibration failures
- Only low increase of temperature (cylinder and dial) and constant oil consumption, thus increasing the machine speed by 10 %
- No problems with higher machine temperature when using synthetic yarns

Our product range includes high performance steel composite needles for Mayer & Cie., Terrot, Orizio and Mecmor machines.

Further information is available from your Groz-Beckert sales representative.

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