

Performance Days

Flexible Seams

Munich, 4th November 2014



Gütermann

- 1864 Foundation of the company and construction of the factory in Gutach
- 1920s Expansion: the start of globalization
- 1935 Innovation: the quick-sale box is patented
- 1950s Innovation: manufacturing of polyester threads
- 1971 Innovation: revolutionary dyeing technology
- 1990 Presentation of goods: the Gütermann Corner comes into existence
- 1995 Art: Christo veils the German Reichstag our threads were part of it
- 1995 DIN EN ISO-Certification (expansion in 2002)
- 2000 Portfolio with engineering: Zwicky joins up with Gütermann
- 2008 Expansion: foundation and construction of the production in India
- 2008 Innovation: Micro Core Technology
- 2010 Presentation of goods: new quick-sale box technology
- 2013 Innovation: Elastic Threads
- 2014 Anniversary: 150 years Gütermann

Today's Situation

Demand on flexible clothing is fast growing in all segments of the clothing industry

The interests are 

The Clothing industry as a whole

Fit optimisation

The end-user

Body shaping

Children, Aged or disabled people

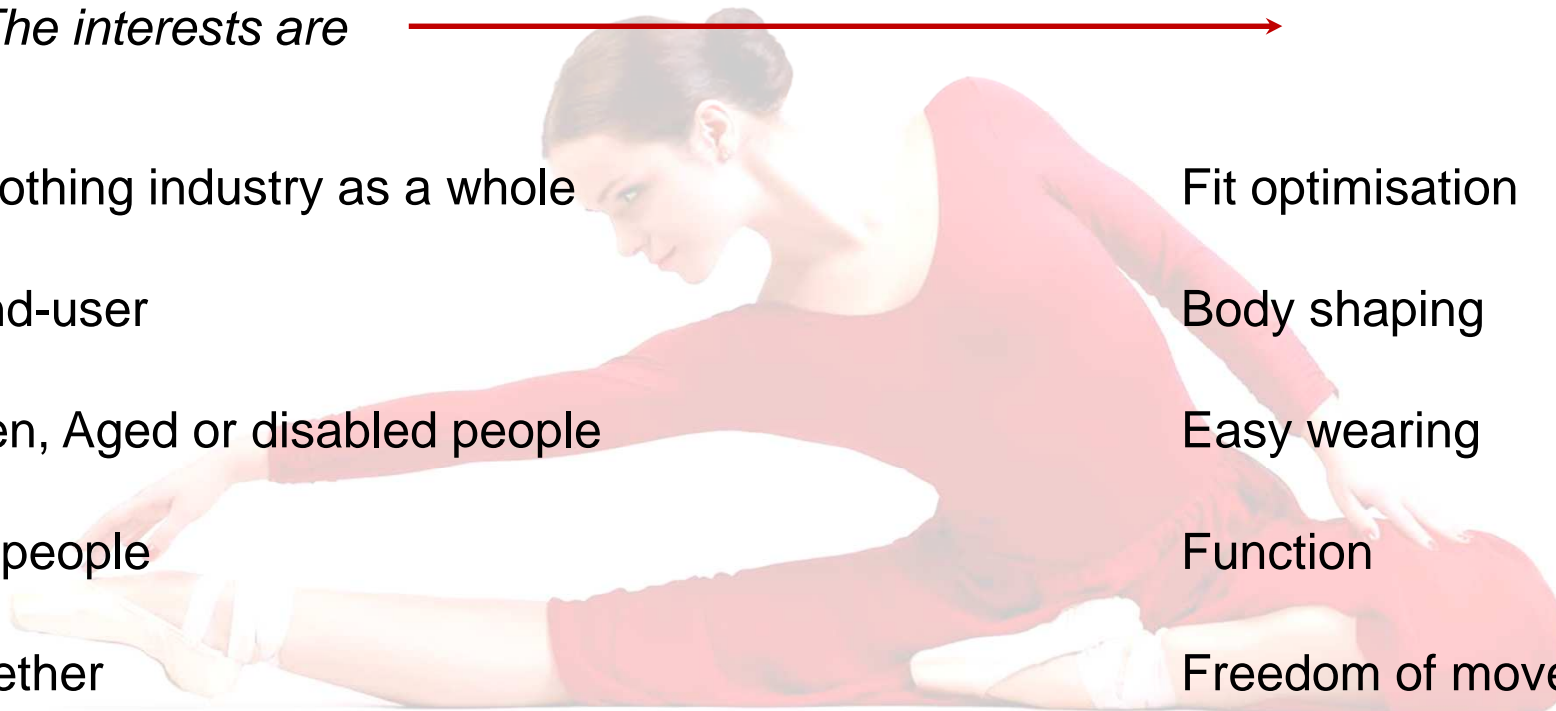
Easy wearing

Active people

Function

All together

Freedom of movement



Today's Situation

Fabrics are changing from non-elastic to extremely" flexible.
The main direction to gain more fabric flexibility are:

new fabric constructions

Increasing the proportion of elastic filaments
actual between 1 % up to 20 %

Together this could produce..

A fabric elasticity of up to 200 %



Today's Situation

The opportunities to sew stretchable fabrics

To limit the seams elasticity

By using the following..

stabilizing tapes
thicker threads
multiple seams

...to name a few..

Modifying the manufacturing process

By using the following...

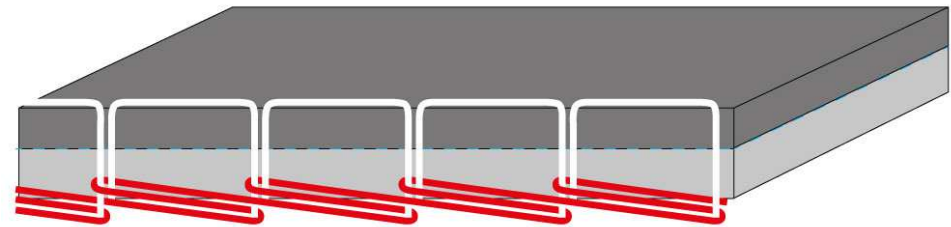
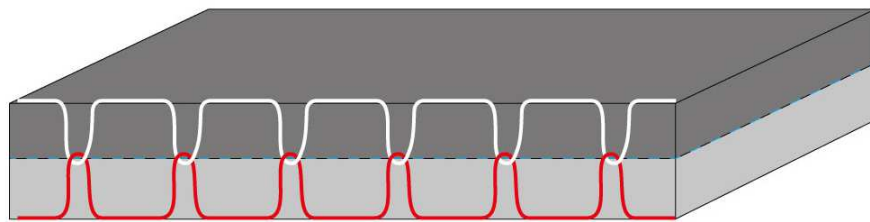
Adopting different stitch types like..
Chain-, cover-, overlock
Increasing stitch density
Stretching fabric during sewing

...to name a few..

All the above incur restrictions inc. Design, Fit and Function

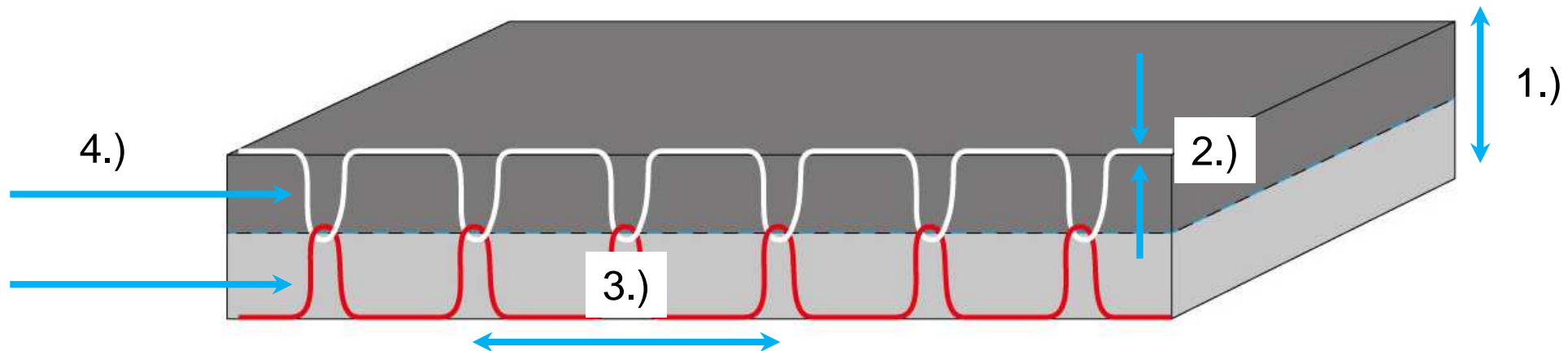
Seam elasticity – today's knowledge

The quantity and placement of the sewing thread in the seam determines the seam elasticity



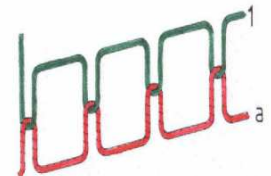
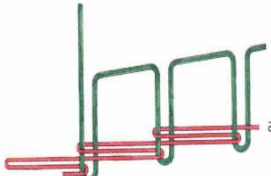
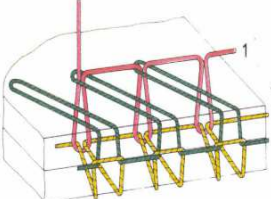
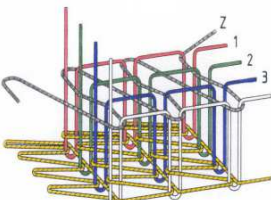
Seam elasticity - today's knowledge

Deciding factors for quantity and placement of sewing thread in the seam

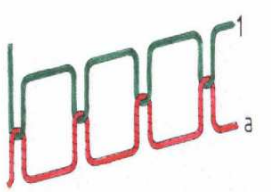
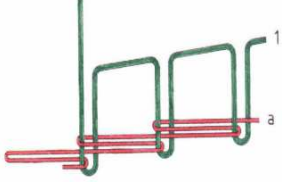
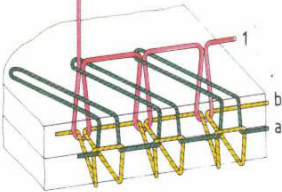
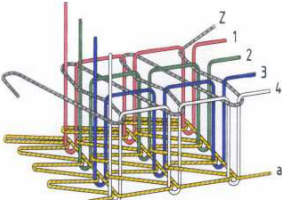


- > 1.) Material Thickness
- > 2.) Sewing thread Diameter
- > 3.) Stitch density
- > 4.) Thread distribution in the seam

Seam elasticity - today's knowledge

Tread consumption per stitch type	Needle	Looper	Cover	Total	Seam elasticity
 301 lock stitch	1,25 m	1,25 m	-	2,50 m	≈ 25 %
 401 chain stitch	1,60 m	3,40 m	-	5,00 m	≈ 35 %
 504 overlock stitch	1,60 m	9,60 m	-	11,20 m	≈ 100 %
 607 cover stitch	6,30 m	12,40 m	5,60 m	24,30 m	> 100 %

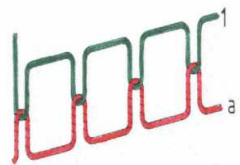
Seam elasticity - today's knowledge

		Seam elasticity	
	301 lock stitch	≈ 25 %	Most used machine for closing and top stitching
	401 chain stitch	≈ 35 %	Mainly used in the shirts and trousers business
	504 overlock stitch	≈ 100 %	Just used for serging
	607 cover stitch	> 100 %	Only used in the lingerie industry

Seam elasticity - today's knowledge

We have...

a general seaming thread



301 lock stitch

≈ 25 %

We want ...

a general seaming thread



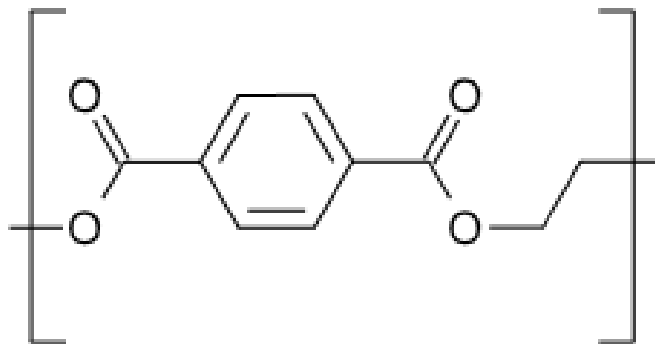
301 lock stitch

≈ 100 %

Seam elasticity – Its time for a change

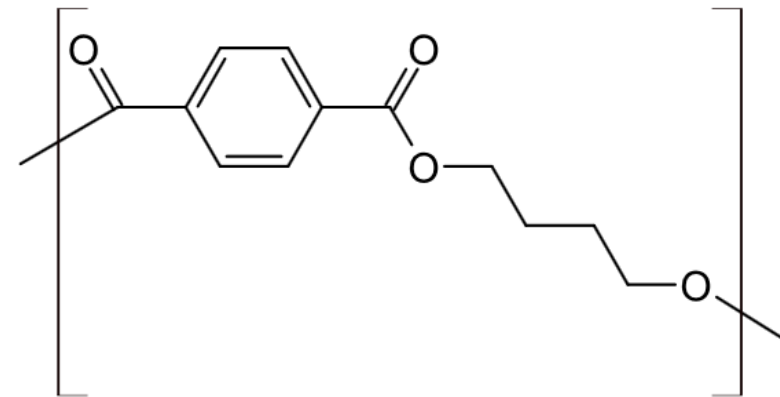
From

Non elastic Polymer



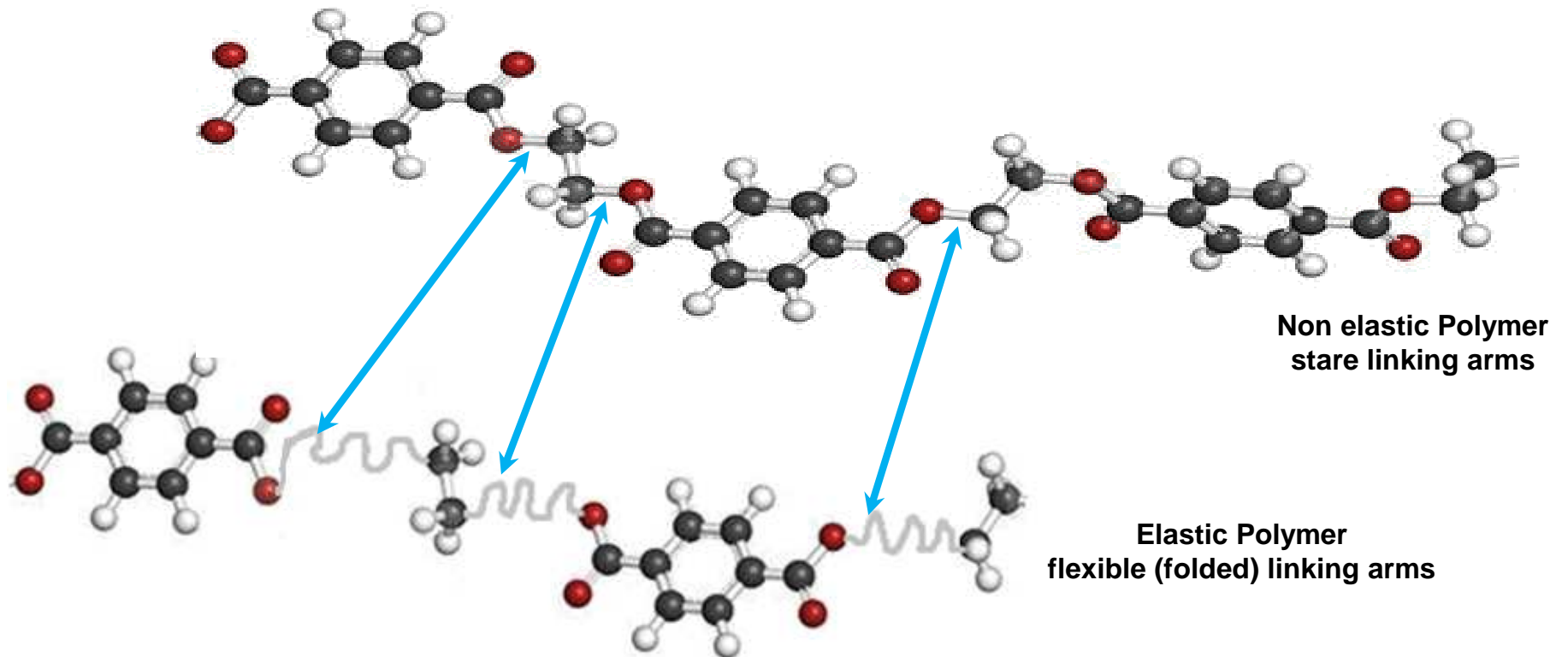
To

Elastic Polymer



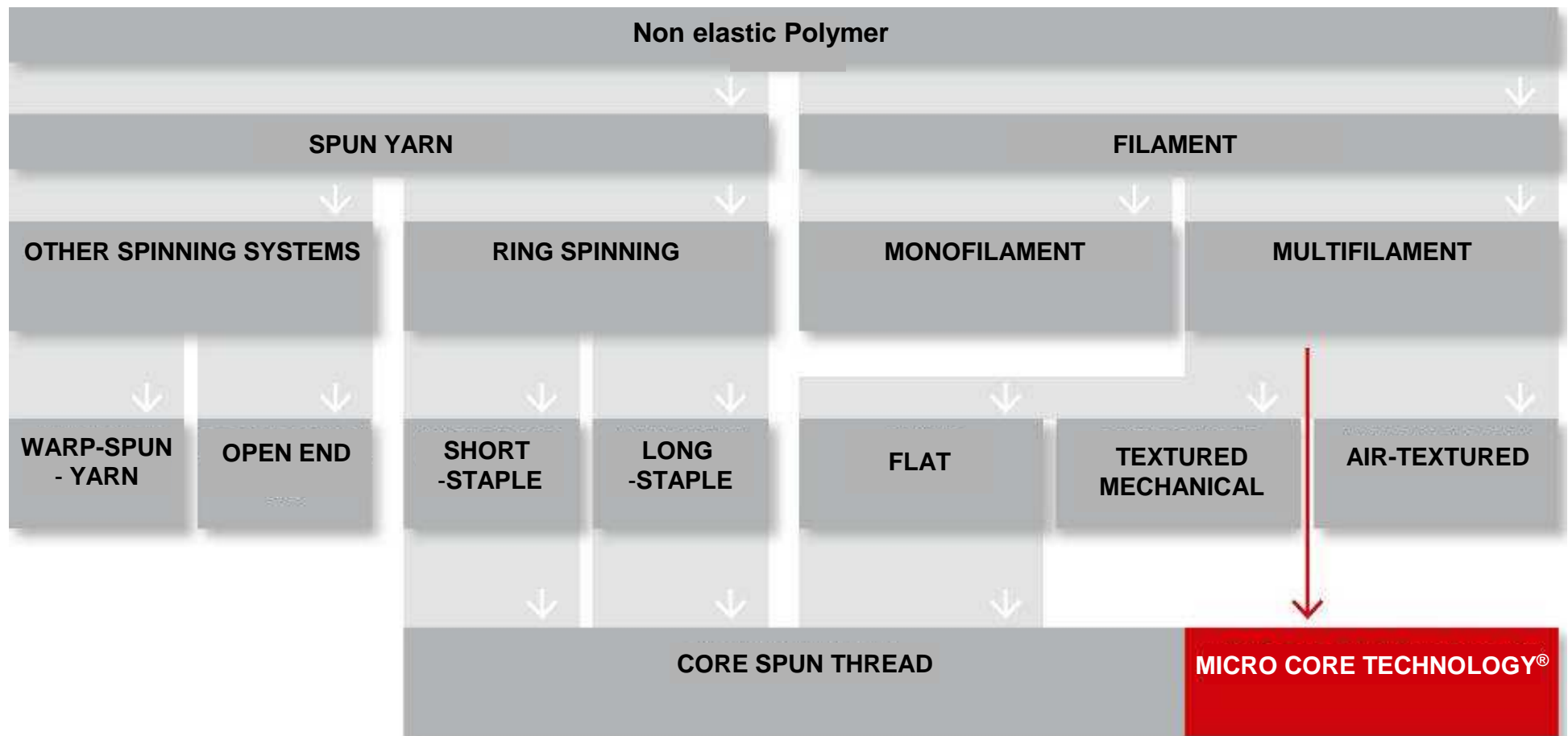
Introduction of a high elastic polymer

Difference in the chemical structure are the design of the linking arms between the single Polyester molecules



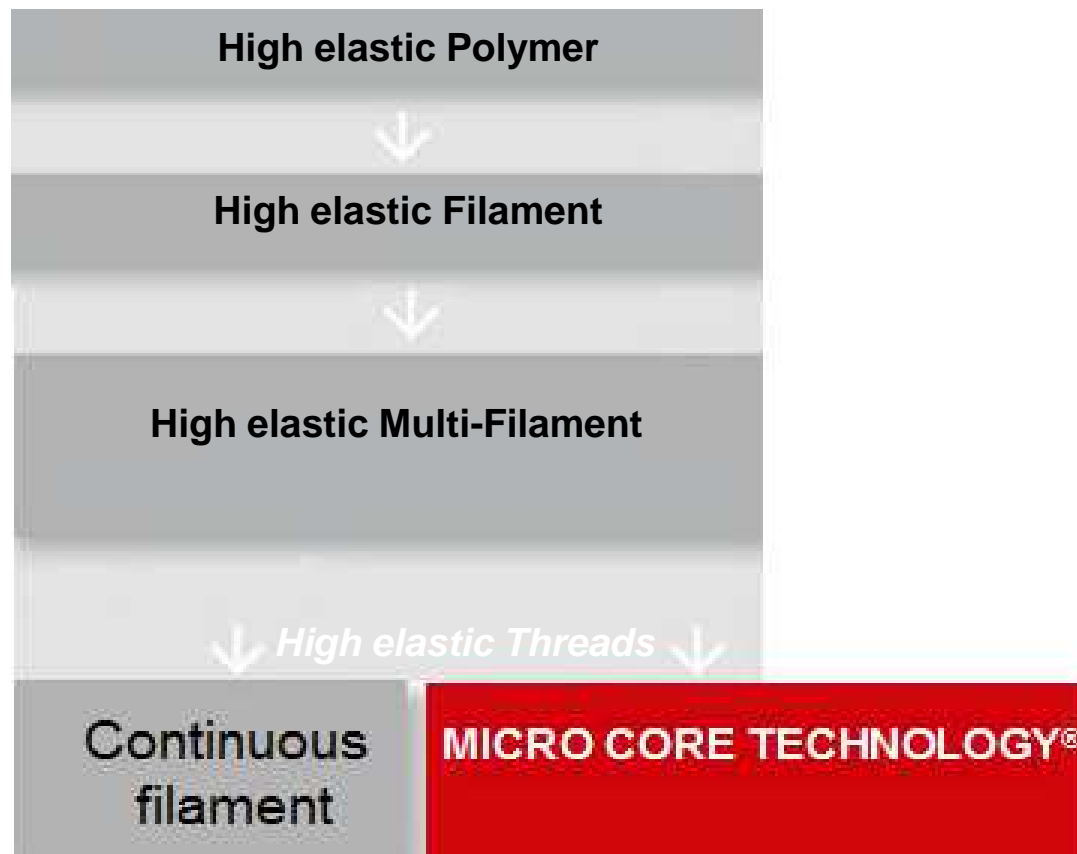
Seam elasticity - today's knowledge

Raw material used for today's sewing threads



Introduction of a high elastic polymer

Raw material used for elastic sewing threads



Flexible Seams

High elastic sewing threads

Continuous filaments



Main Difference

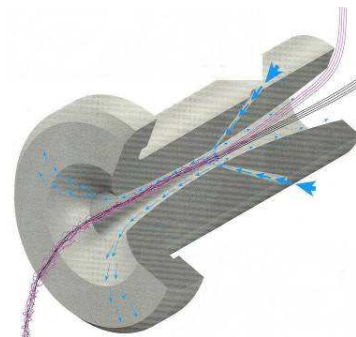
Raw material

MCT Process

Twisting

End product

Micro Core Technology®



High elastic sewing threads

Continuous filaments



Limitations by multidirectional sewing applications

Main Difference

End product

Micro Core Technology®



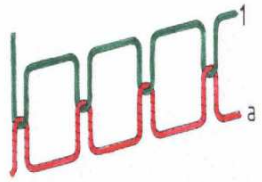
Outstanding Sewing performance



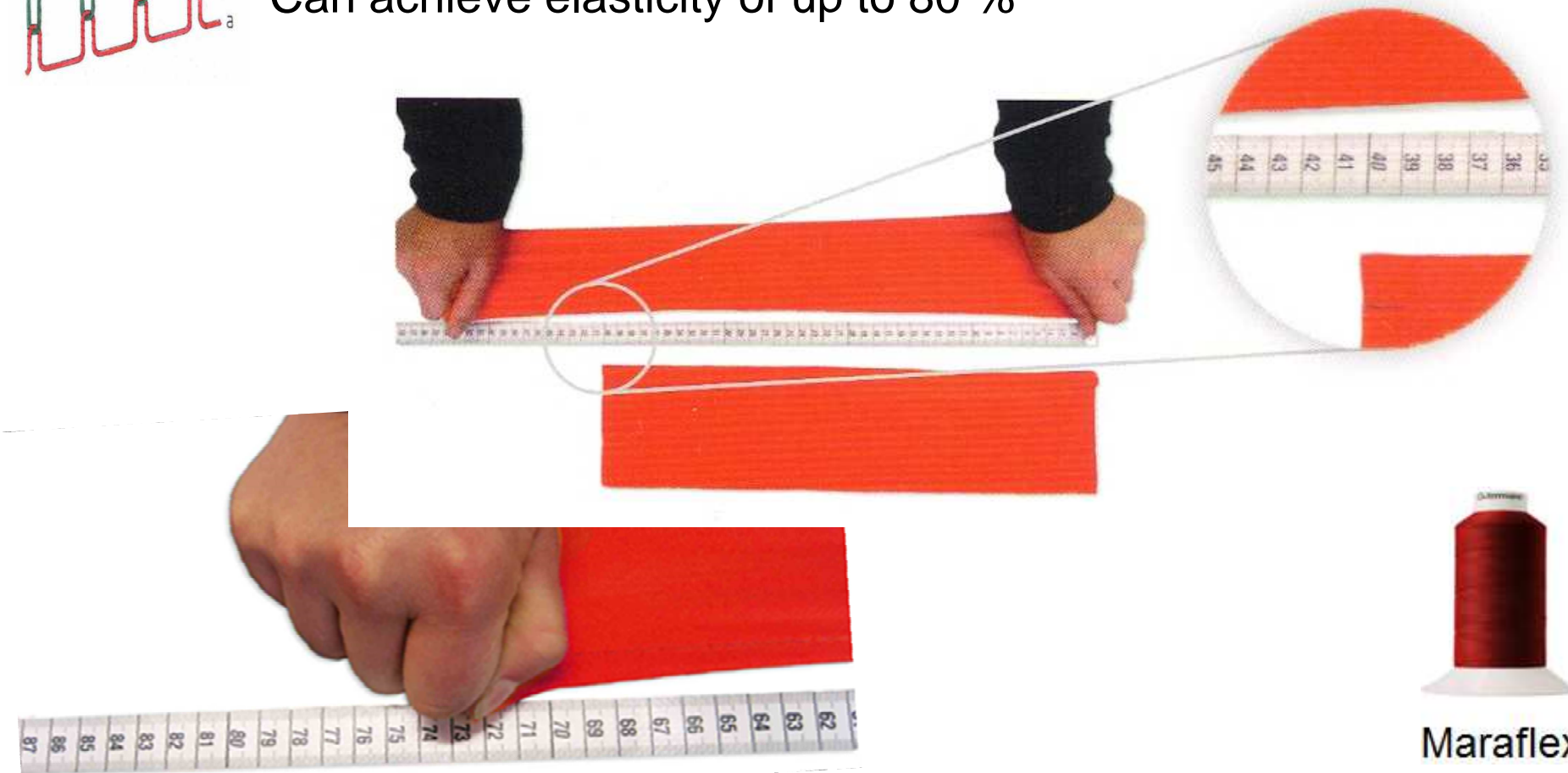
Maraflex

Flexible Seams

High elastic sewing threads

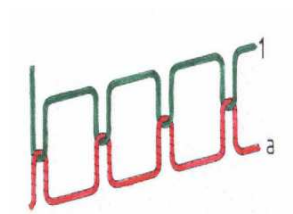


Can achieve elasticity of up to 80 %

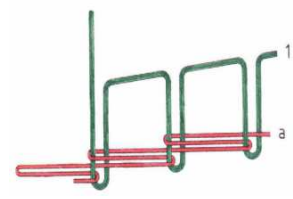


Maraflex

High elastic sewing threads



Gütermann Maraflex

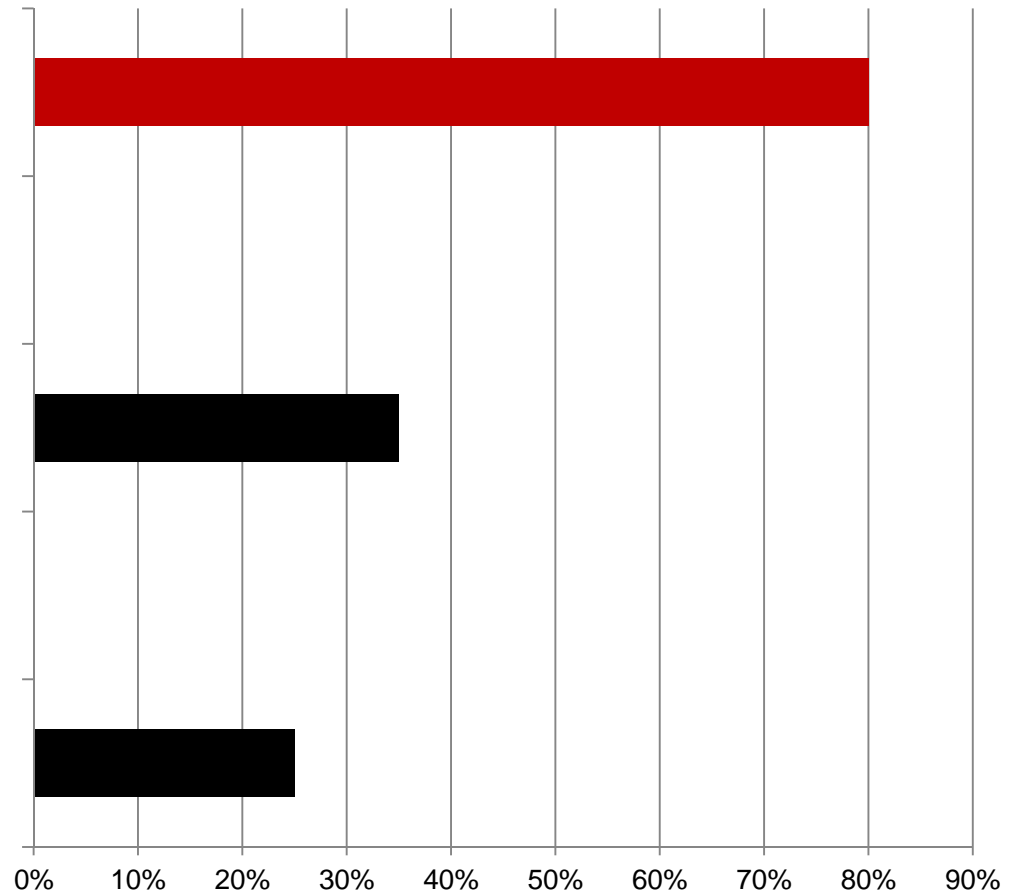


Gütermann Mara



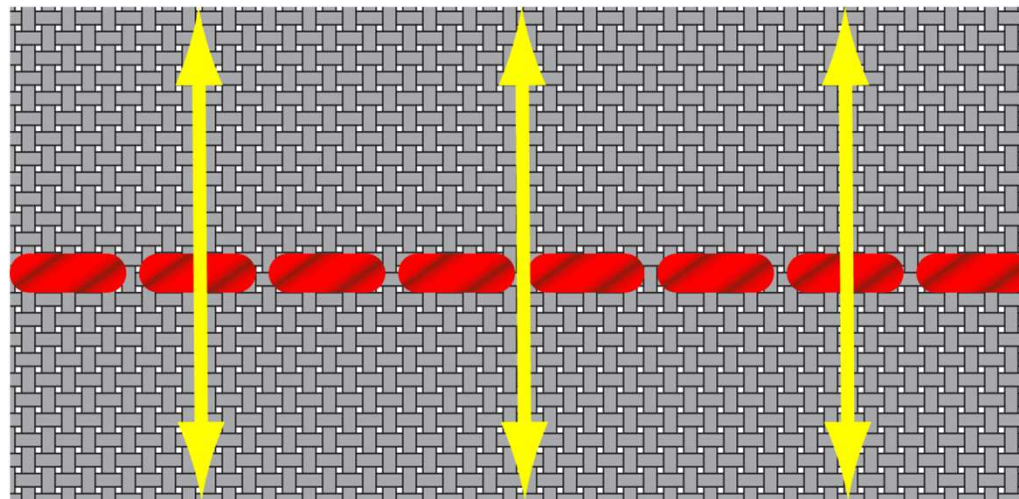
Gütermann Mara

Elasticity



High elastic sewing threads – seam strength in the parallel direction

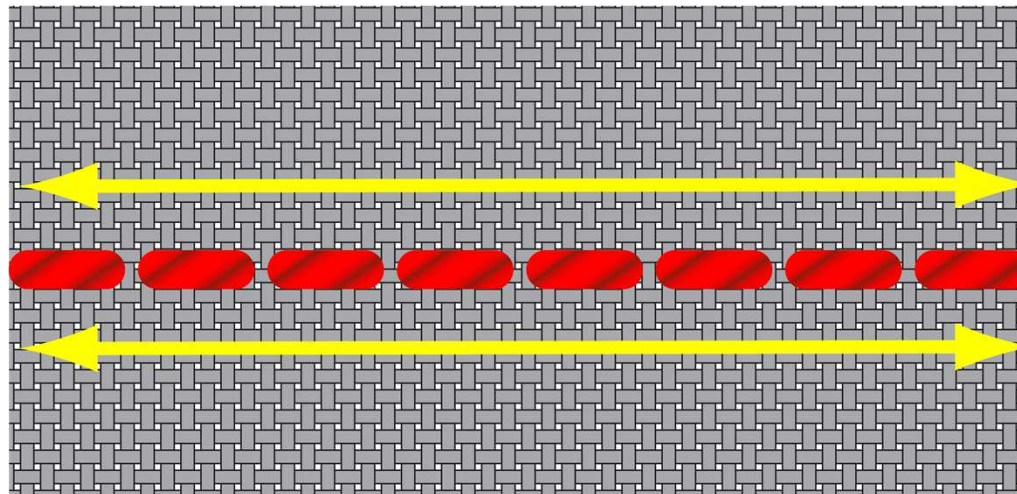
This is defined by the stitch density plus the tenacity of the sewing thread



Across the seam direction

High elastic sewing threads – seam strength in the seam direction

This is defined only by the breaking strength of the sewing thread

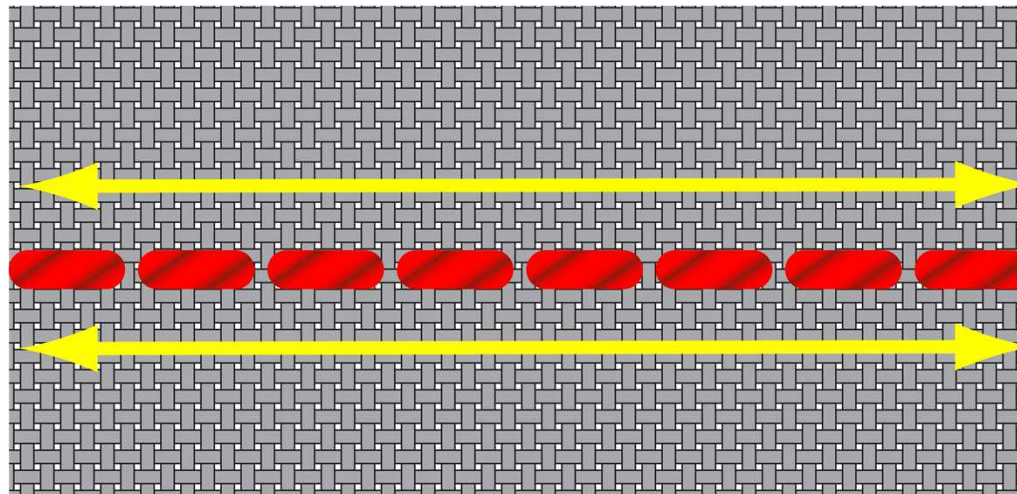


seam direction

This can be roughly calculated:- Breaking strength of the sewing thread x 2,5

High elastic sewing threads – seam strength in the seam direction

...but !



seam direction

This is only important if the seam elasticity is lower than the fabric elasticity !
...otherwise the fabric absorbs all the occurring forces !

High elastic sewing threads



None elastic Polyester

By comparable thickness in Tkt....

By comparable thickness in Tkt....

By comparable thickness in Tkt....

Differences



Elastic Polyester

...much thicker diameter

...much higher weight

...much less strengths

High elastic sewing threads



...a much thicker diameter affects

Elastic Polyester

Choice of sewing machine

Choice of sewing needle size

Required space in the fabric

Seam optic

High elastic sewing threads



...a much higher weight affects

Elastic Polyester

The known relation between tex Number and physical thread thickness

High elastic sewing threads



... much less strengths affects

Elastic Polyester

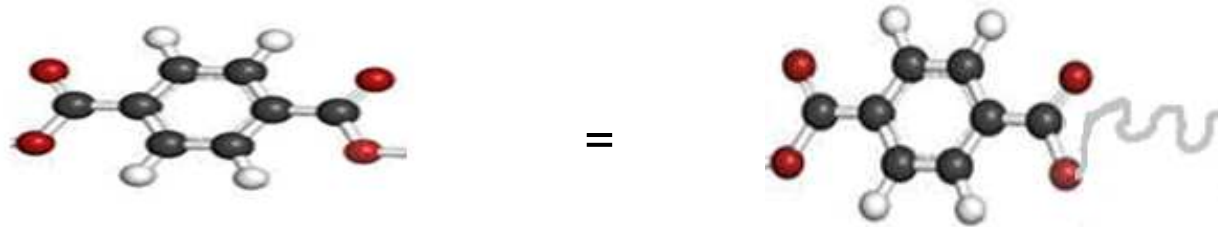
Seam strengths *

*

Compensated by the thicker diameter (across)
and replaced by the high elasticity (inline)

High elastic polymer

Absolutely no differences between the two types of polymers in respect to achievable fastnesses and care properties

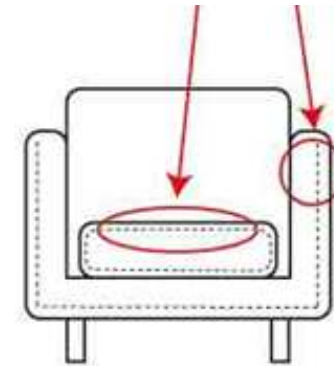
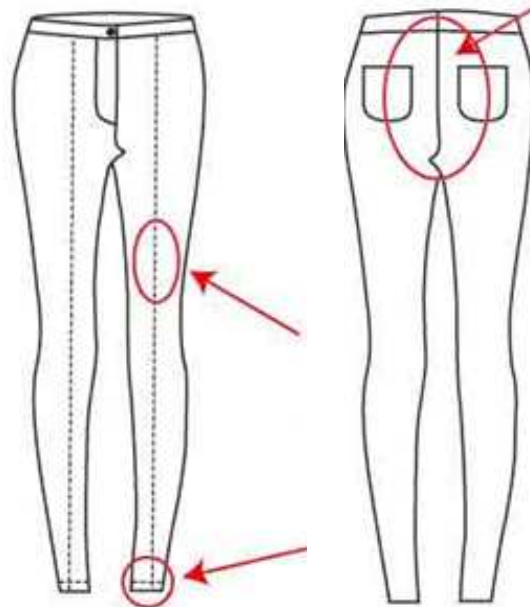
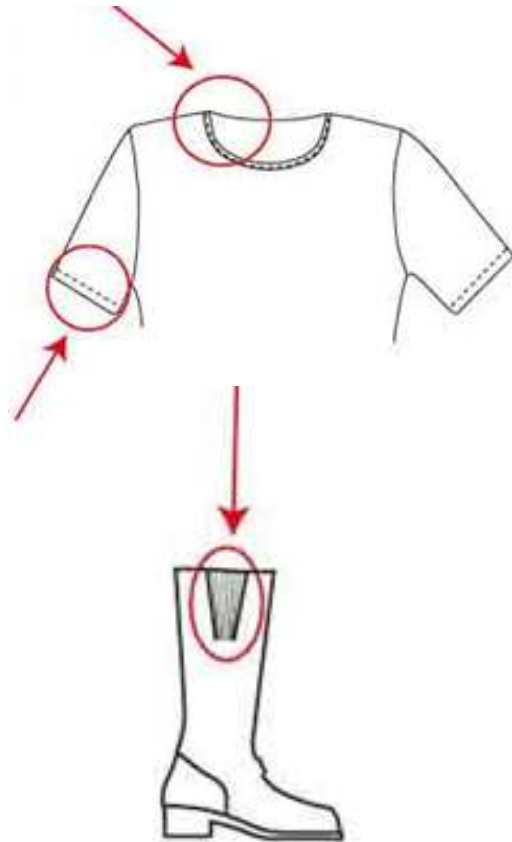


Wash fastness	in accordance with ISO 105 C03 – grade 4 or better
Water fastness	in accordance with ISO 105 E01 – grade 4 or better
Rub fastness	in accordance with ISO 105 X12 – grade 4 or better
Hypochlorite fastness	in accordance with ISO 105 N01 – grade 4 or better
Dry cleaning fastness	in accordance with ISO 105 D01 – grade 4 or better
Perspiration fastness	in accordance with ISO 105 E04 – grade 4 or better
Light fastness	in accordance with ISO 105 B02 – grade 4 or better



High elastic sewing threads

Application areas



Selected seams



Maraflex

Flexible Seams

High elastic sewing threads

Application areas



General Seaming Thread



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Thanks for your attention



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