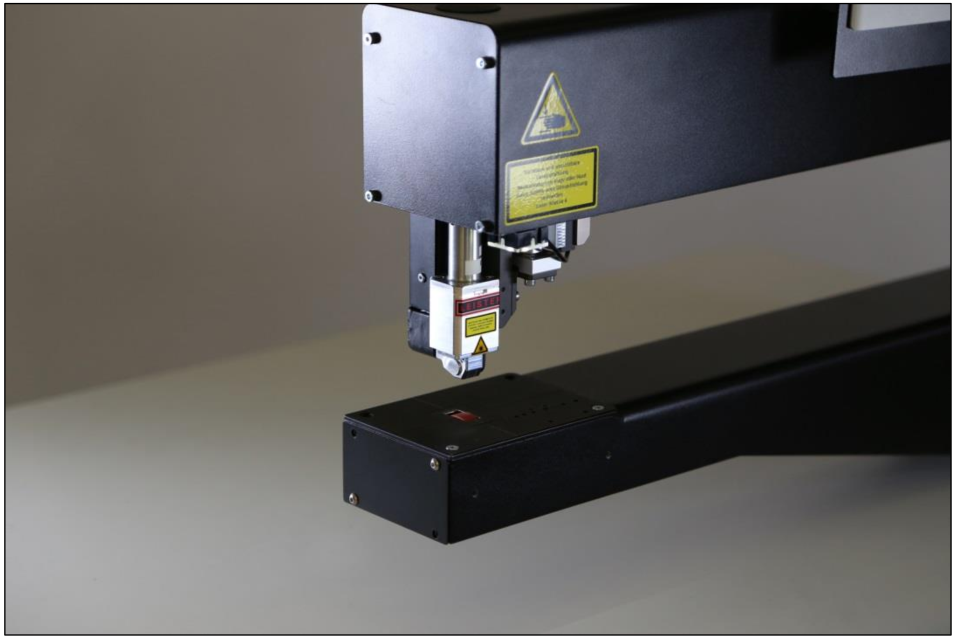
Future of textile welding – A new seam technology

Leister Technologies AG, Frederike Lehmeier, 11/2016

We know how.

Overview



1. Introduction to Leister: Leister Group

- Corporate structure with holding company and 11 subsidiaries
- More than 60 years of experience:
  - Development
  - Fabrication
  - Worldwide sales and marketing for technical products
- Strong competence in technique and application
- Innovative company culture
- Niche market player
- Worldwide market leader of plastic welding equipment
- 670 employees in eight countries
- 98 % export
- Market presence in 125 countries

LEISTER

1. Introduction to Leister: Leister Group

Locations

Leister AG
Corporate Center
Weldy AG
Kägiswil / Switzerland

Leister Technologies AG
Sarnen / Switzerland

Axetris AG /
Leister Technologies AG
Kägiswil / Switzerland

LEISTER China
Sales & Service
Production
Engineering

LEISTER Germany
Sales

LEISTER USA
Sales & Service

LEISTER Japan
Sales & Service

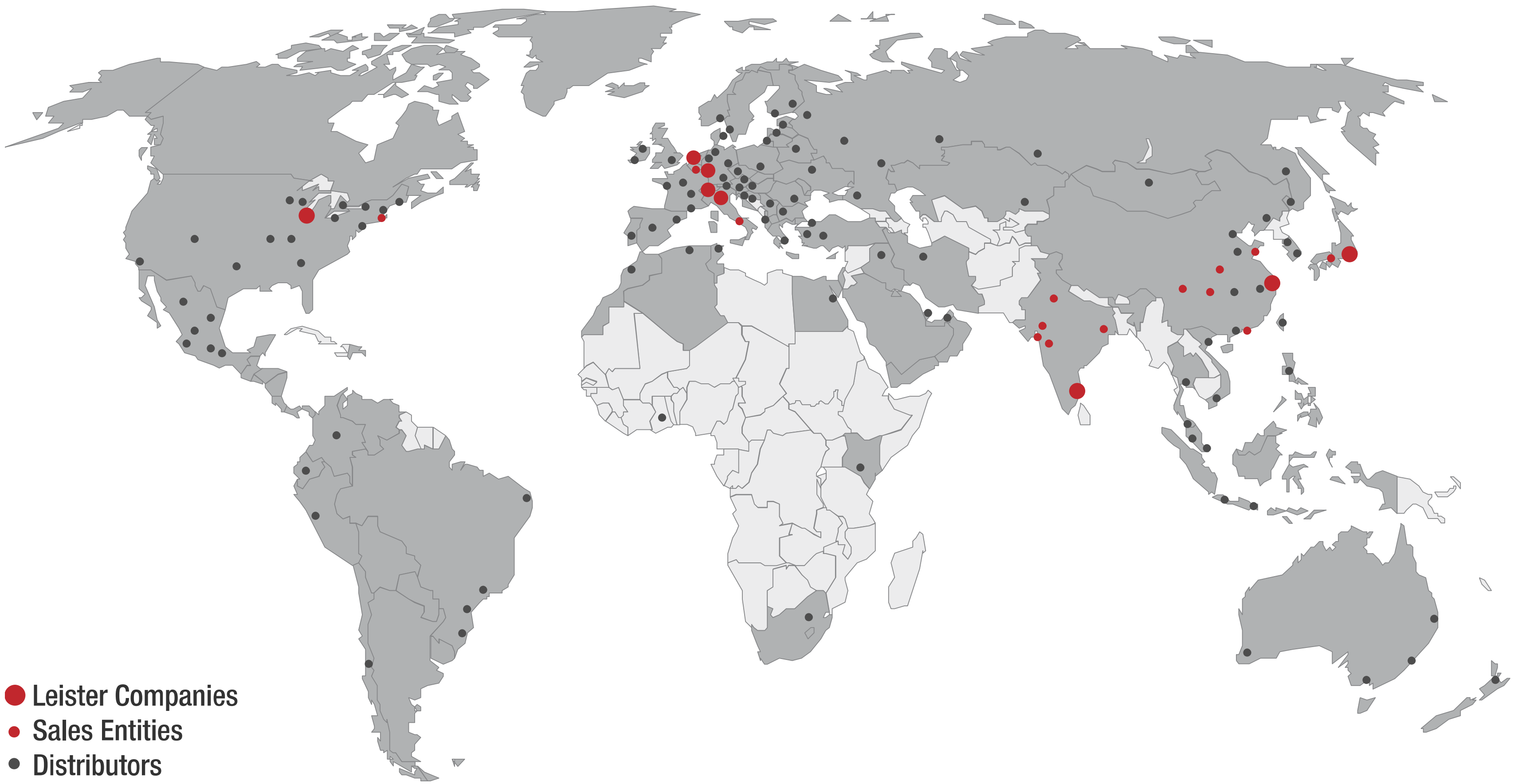
LEISTER India
Sales & Service

LEISTER Benelux
Sales & Service

LEISTER Italy
Sales & Service

1. Introduction to Leister: Leister Group

Worldwide Market Presence – We are local. Worldwide.



1. Introduction to Leister: Leister Group

Business Activities

LEISTER

- Quality
- Innovation
- Technology
- Service
- Application Know-How

Plastic Welding

1949

Process Heat

1967

Laser Plastic Welding

1998

axetris

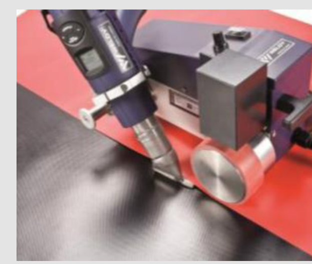
- Competence and Technology
- Value-Added Products
- Reliable Partnership

Gas Detection
Micro Optics

1998

WELDY

- Simple
- Good
- Affordable



DIY / Private Labels
Functional Products

2004/2006

Plastic Welding

Applications

LEISTER

Process Heat Applications

LEISTER

Laser Plastic Welding Applications

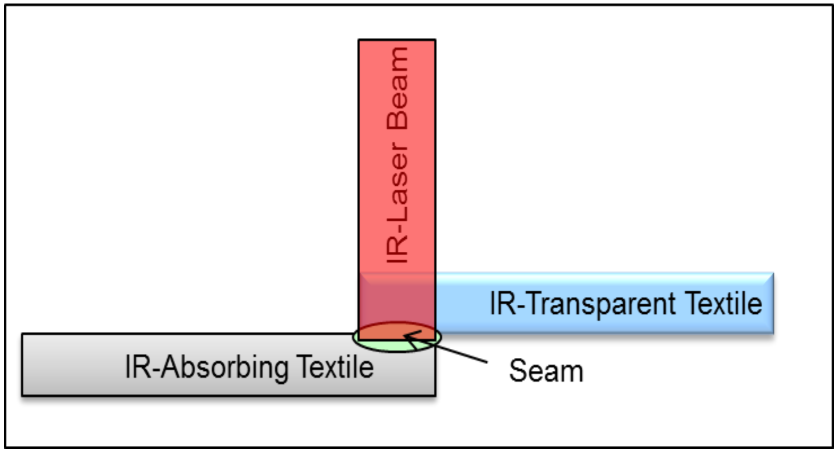
axetris

- Automotive
- Optical Encoders
- ROADM
- Gas Detection
- Anesthesia
  Gas Monitoring
- Material Analysis
- Thin Film Deposition
- Oceanography

2. Laser Welding – Basic knowledge

Good quality seams require a not IR-absorbing textile AND a IR-absorbing textile.

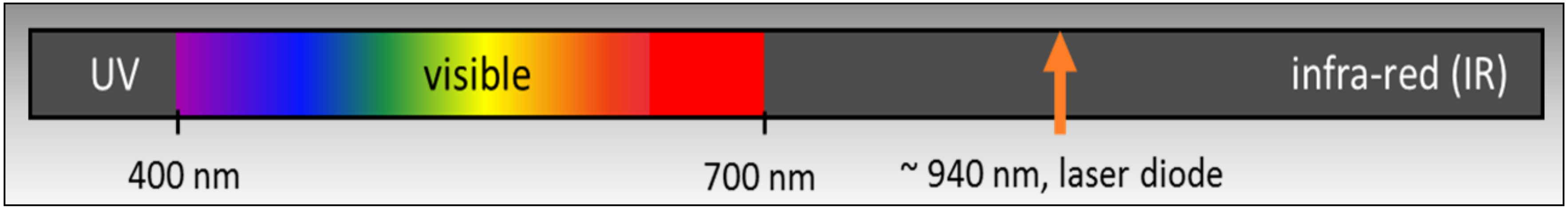
During the laser welding process the laser energy percolates the not absorbing textile layer and transformed in the absorbing textile to energy. Both layers are melted together on a molecular level.



2. Laser Welding – Basic Knowledge

Material properties for laser welding

a) optical requirements: IR absorbing / IR not absorbing



explanation optical properties influencing welding Process

b) equal thermoplastics

Polyester / Polyester; Polyamid / Polyamid; Polypropylene/ Polypropylene

3. Materials for Laser Welding

Method overview for getting absorbing fabrics

- Applying absorber in process or before
- Textile printed with IR absorbing ink
- Dying fabrics with Absorber
- Fabric itself is IR absorbing

→ material catalog

4. Laser Seam Welder

Prototype

Technical specification	
Laser	Diode fiber-coupled laser on 940 nm
Power	40 W
Laser optic	patented Roller optics
Weld width	4 – 6 mm
Speed	0.25 -10 m/min
Dimensions (L x W x H)	1170 x 700 x 1110 mm

further developments ongoing

5. Seam Properties

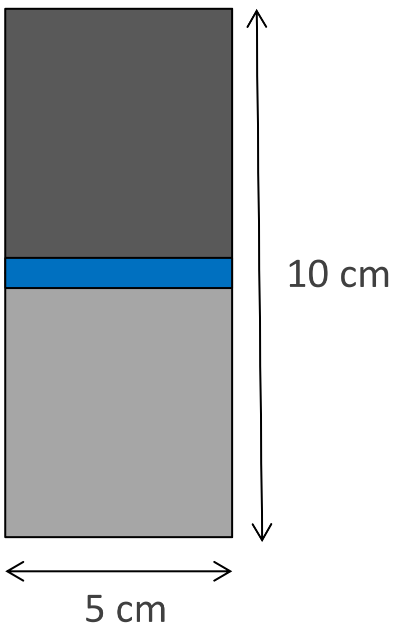
Tensile strength

Example: Elastic Knitwear 80% PES, 20% EL, 240 g/sq.m

a) Lab Test

	Force max (N)	Elasticity (%)
bonded seam	214	159
ultrasonic seam	82	120
laser seam	200	156
flat seam	340	178.3

	Force max (N)	Elasticity (%)
bonded seam	154	240
ultrasonic seam	50	131
laser seam	140	230
flat seam	260	198



3 x 60°C

5. Seam Properties
Wearing comfort

Example: Elastic Knitwear 80% PES, 20% EL, 240 g/sq.m

b) Practical Test: Handball team, former Swiss running champion, Fitness

6. Product Development
of a laser welded product

- Product
- Production Technology
- Textile Decision
- Design & Workflow
- Pattern Design
- Production

7. Fields of Application
Examples

8. Outlook

- Developing a good network with textile producers
- Locking for partners who want to develop a product with us which includes laser seams
- Development of a new laser Seam Welder which fulfills all production requirements
- https://youtu.be/bKuAOwTKiAg

contact:
project@leister.com

Leister Technologies AG, Frederike Lehmeier

We know how.