



silbertool®

THE THREAD REPAIR TOOL.

THREAD REPAIR AT A NEW LEVEL





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MADE IN GERMANY
DEUTSCHES
WERKZEUG



Thread production processes

There are two methods of producing a thread

Cutting

(chipping procedure)



Forming / Rolling

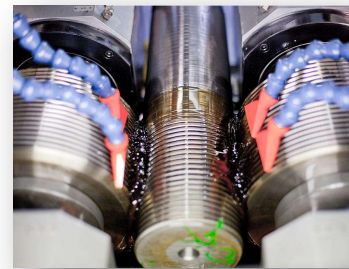
(chipless procedure)

Patented by
silbertool®

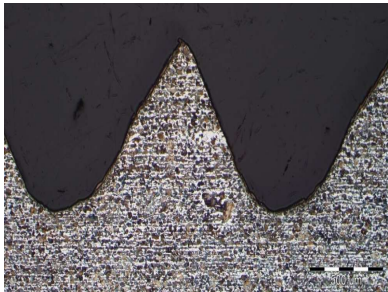
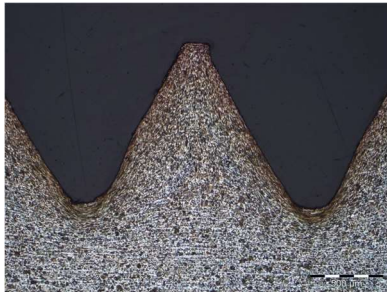


hand

machine



Difference between a cut and rolled thread

	Cut Thread	Rolled thread
Strength characteristics	Lower strength due to cutting through the fiber flow; notch effect at the groove of the thread	Higher strength and hardness due to cold hardening of material. Fiberflow is not destroyed which leads to higher static and dynamic strength (bending strength)
Surface finish	The surface finish depends a lot on the material and the cutting characteristics. The more coarse the surface, the higher the tendency to corrosion.	Very high surface finish as the surface is burnished. Very low tendency to corrosion.
Material	Also non-formable materials can be cut	All cold-formable materials
Micrograph		

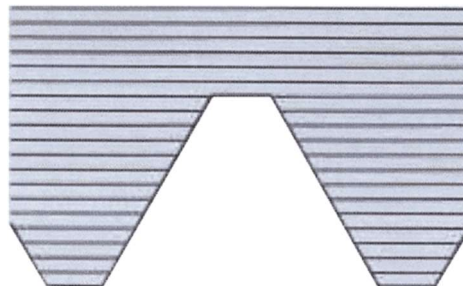
Difference between a cut and rolled thread

Cut Thread



The production process (forming) of especially round metal materials, leads to a specific fibre structure, partially comparable to the structure of a tree. If the fiber flow is cut, the material is weakened.

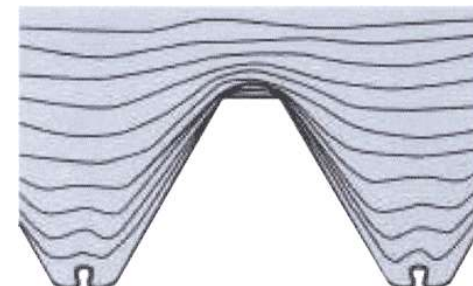
A cut thread will always break in the groove of the thread



Rolled Thread

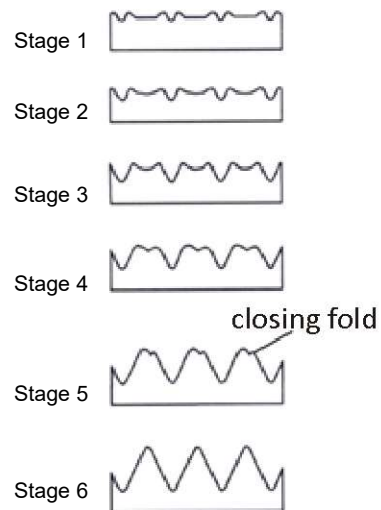
The fiber flow of the material is not cut, but simply diverted. Rolled threads are far more durable than cut threads.

All parts that require durability at high forces must have rolled threads.



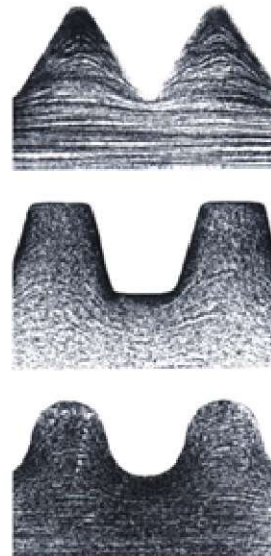
Material flow / positive effects by forming

Material flow when thread rolling



The closing fold does not have a negative effect on the firmness of the thread

Photomicrograph

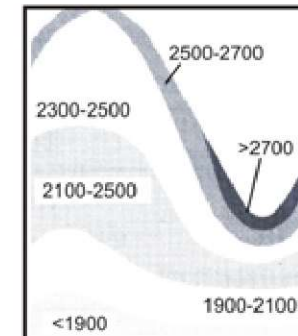


Un-cut fiberflow

Cold hardening

Vickers hardness HVO.2

Core hardness of blank: 1500
Case hardness of blank: 1700
Core hardness of thread: 1600



Thread: M20
Material: E295

The hardness of the thread's surface is increased dramatically due to cold hardening

How have threads been repaired until now?

Die Stock



- + Cleaning of thread
- Damages surface
- Weakens thread by tearing out material
- Useless when beginning of thread is damaged (generally the case)

Thread File

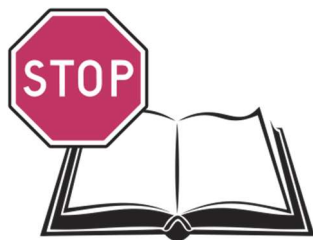


- + For very small damages
- Very time intensive
- Weakens thread by tearing out material

Special thread tool



- + Cleaning of thread
- Damages surface
- Weakens thread by tearing out material
- Useless for heavy damage



Always read instruction manual!

Caution!!!

Cutting procedures remove material and weaken the thread !

Repairing with silbertool®

**A repair with silbertool does not remove material,
but formes it back into its original geometry**



Damaged thread

Repaired with
silbertool®
procedure

Repaired with die stock

Advantages of repairing with silbertool®

- + All cold formable materials
- + Usable for stainless steel
- + Usable up to property class 14.9
- + Procedure can be randomly scaled
- + By simply changing the rollers all threads types and sizes are formable
- + Refinement of cut threads (cold-hardening / burnishing)
- + Thread is not weakened, strength is preserved



Certification of silbertool® procedure



Figure 7: Comparison of fatigue strength of a thread repaired by SilberTool®-procedure with an undamaged thread

Summary and Advisory Opinion

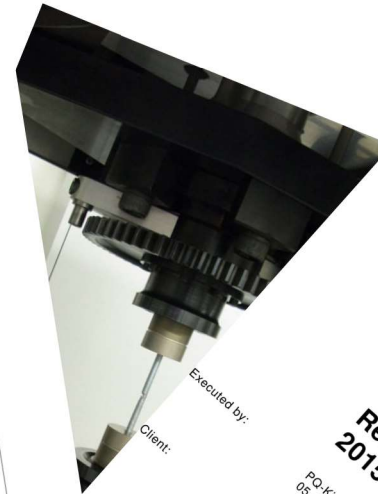
4. A repair by using SilberTool®-procedure does not have a negative effect on the static and dynamic stability of the thread. All obtained results match the required standard values given in DIN ISO 898-1. Threads which have been repaired by SilberTool®-procedure have shown within the tests a higher fatigue limit than new threads. By using the SilberTool®-procedure the threads surface is burnished and the materials surface is cold work hardened. A quantitative conclusion concerning positive effects on fatigue limit has to be ascertained in separate experiments.

Garbsen, 05.10.2015

Dr.-Ing. Andreas Kinzel
Dr.-Ing. Andreas Kinzel
- Managing Director -

Research Report No.: 20151540
Client: F&A Carlton Clemente GmbH

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Research Report 20151540-E

Executed by:
Client:
Subject matter:
Test object:
Sampling:
This research report has a total of 7 pages.
Without written permission of the Materialprüfanstalt Hannover (MPA) the research report (or extracts of it) may not be published.specimen provided by client
threaded stud M6 x 300 made of 1.5510 (28B2)
Comparison of tensile strength and fatigue limit of chipless repaired threads to new threads

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Dr.-Ing. Andreas Kinzel - Geschäftsführer

Where is silbertool® used?



Approved by many partners

→ Axle studs lost warranty if thread was repaired by cutting, due to severe safety issues (thread braking due to 1200 Nm fastening torque).

→ The existing silbertool® procedure was adapted to repair axles and axle studs so safety is *isguaranteed*.

→  instructs all dealers to repair the threads of axles and axle studs in their TSI (technical service instruction) only with the silbertool® R110.

→ A Promotion video was made together with  to show the tool in action.

→  Mercedes-Benz Trucks you can trust started using them for their own service vehicles after internal quality approval. Whithin this year an approval for an obligatory use of the tool is expected.

<https://www.youtube.com/watch?v=b72iqHAutME>



Further approved partners



Mercedes-Benz
Trucks you can trust



LIEBHERR



**Lufthansa
Technik**



VOITH

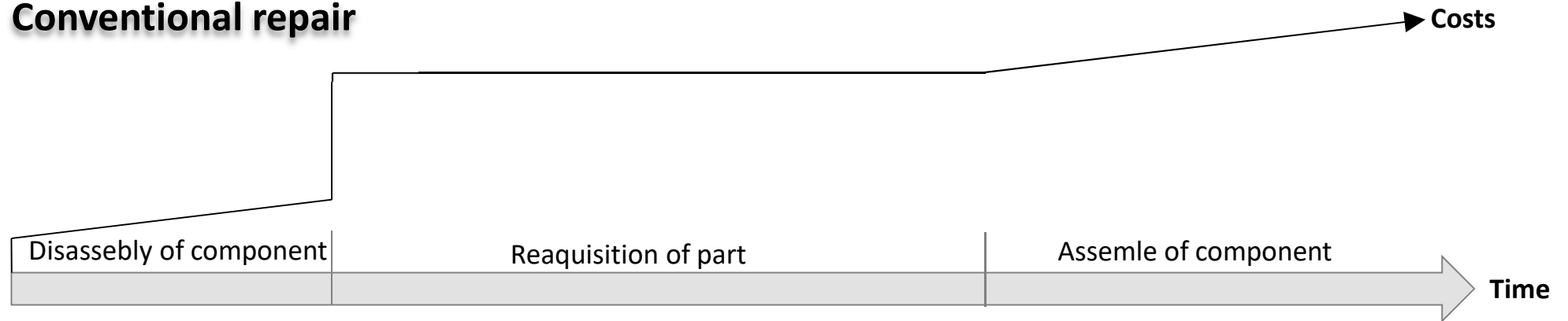


SIEMENS

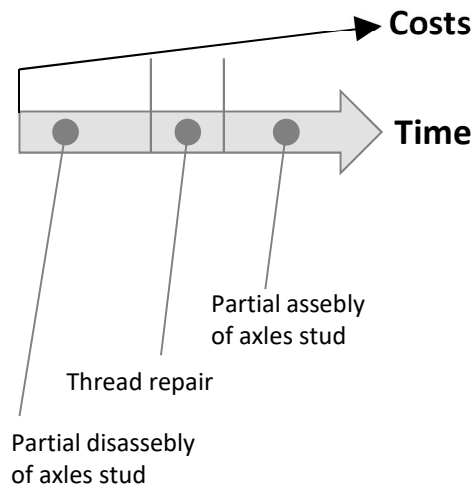


Why use a silbertool®?

Conventional repair



Repair with silbertool®



→ **Reduce your costs!**
→ **Reduce downtime!**

silbertool® in 2018

Certification by



In the future we will provide a certified thread repair service:

- **up to 1000mm thread diameter**
- **within 48 hours anywhere on the globe**

....TO HELP ELIMINATE YOUR DOWNTIMES!

Contact us

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