

► CONVEYOR BELT SYSTEMS AND STS FRICTION –  
**THE COMBINATION FOR YOUR SUCCESS!**

*Ceramic pulley linings manufactured by STS Friction –  
sophisticated technologies for optimum economy*



# LATEST EVOLUTION – STS 4000 INDUSTRIAL CERAMICS.

## STS 4000

Ultimate economy, productivity and maximum system availability are the basic requirements for operating successfully in the market. Particularly when it comes to material handling technology, it is important to match a high throughput capacity with maximum operational reliability and to minimise maintenance times.

With its **STS 4000** material, STS Friction GmbH is an efficient and creative partner to meet exactly these customer requirements. **STS 4000** ceramic drive-pulley lining is the optimum overall solution for conveyor belt systems and offers the following outstanding properties:

### Specific application characteristics:

- Reduced downtimes enable maximum system availability
- Maximum belt capacity utilisation coupled with extended belt life expectancy on account of reduced belt tension
- Trouble-free operation due to high resistance to atmospheric conditions as well as thermal, mechanical and chemical influencing factors
- Optimum robustness prevents belt slippage and overheating

### Our RenoLin® process also permits a marked reduction in servicing times. The key advantages are as follows:

- We deliver a significant reduction in maintenance and operating costs
- Your conveyor system runs smoothly and extremely efficiently – including in the mining industry
- We have extended the life expectancy by up to three times in comparison with rubber linings

### STS 4000 – a summary of the application profile:

- Particularly high coefficient of friction
- Enormous wear resistance
- High dimensional stability
- Outstanding running properties under emergency conditions
- Extensive application temperature range
- Thermal, mechanical and chemical resistance
- Optimum weather resistance
- Lining repair or replacement using our **RenoLin®** process – can of course also be carried out on site
- With ATEX approval these products can also be relied on for mining-industry applications

This makes **STS 4000** and **RenoLin®** the optimum overall solution for modern conveyor belt systems.

## Reno Lin®

### RenoLin® – the direct repair and maintenance process

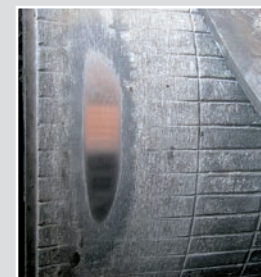


We combine the knowledge and experience of our engineers with the **STS 4000** material and the innovative and cost-efficient **RenoLin®** process – a milestone in terms of economy and productivity.

At STS Friction we have developed our own system of partial or complete reconditioning to deliver pulley linings that are as good as new. With this system we can guarantee optimum results.

### This is how it works:

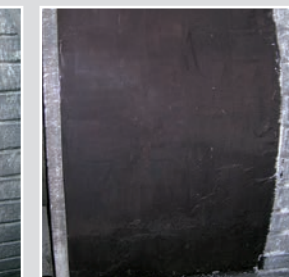
Using a thermal/mechanical process we gently detach the layer of **STS 4000** lining that was directly bonded to the pulley. The complete removal of the lining does not damage or distort the pulley surface.



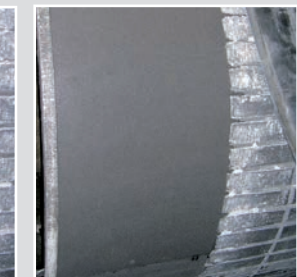
Gentle thermal/mechanical partial detachment



STS Friction bonding agent



Application, compression and texturing of the ceramic compound



### The key advantages are as follows:

- Complete lining can be replaced without removing the drive pulley
- Partial repairs are also possible

Only the perfect interaction between the high-performance **STS 4000** material, the innovative **RenoLin®** reconditioning process and the decades of experience of our engineers working on site at major gravel quarries, potash mines and opencast lignite mines guarantees a perfect result.

We would be pleased to make this high-capacity system available to you as well.



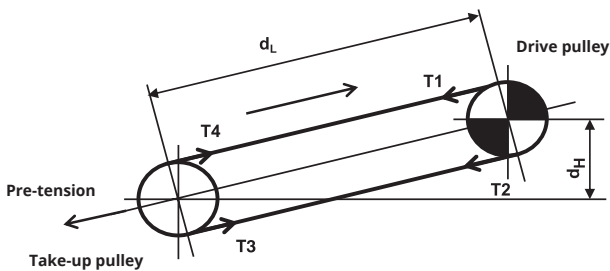


# INNOVATIVE TECHNOLOGY FOR A POWERFUL DRIVE

## Influence of the pulley lining's coefficient of friction

### Basic data for this sample calculation:

Conveying length = 740 m  
Conveying capacity = 720 t/h  
Conveying height = 120 m  
Conveying speed = 3.80 m/s

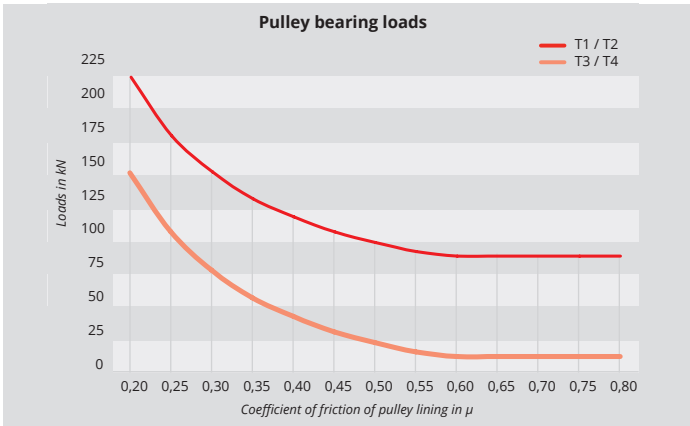
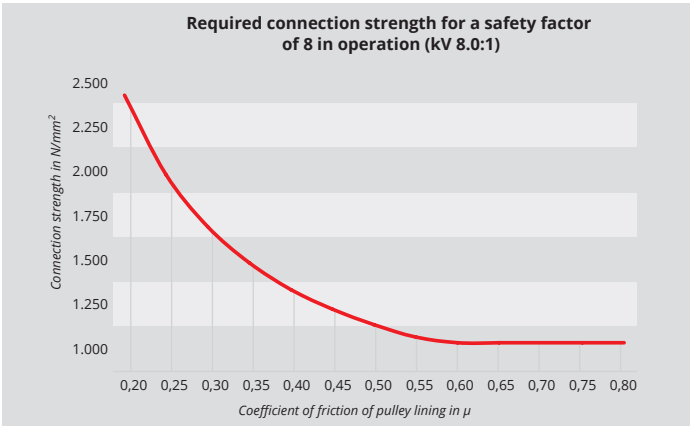
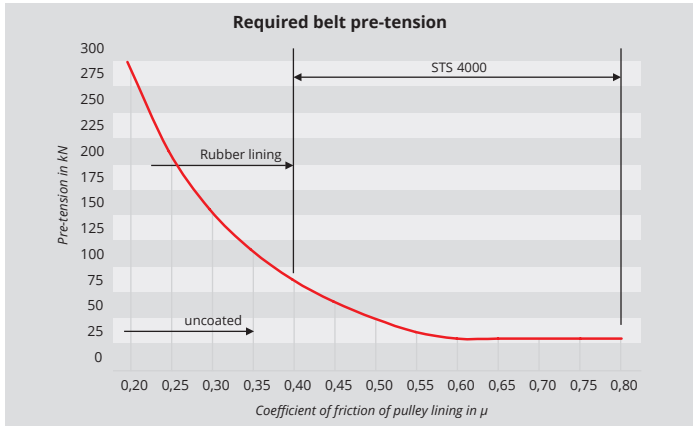


**Explanations:**  
 $d_L$  = conveying length  
 $d_H$  = conveying height  
**T1 to T4** = belt tensile force  
**Pre-tension** = Required belt pre-tension

### Coefficients of friction between rubber belt and drive pulleys:

Operating conditions	Uncoated steel	Rubber lining	STS 4000
dry	0.25 $\mu$ to 0.35 $\mu$	0.30 $\mu$ to 0.40 $\mu$	0.80 $\mu$ to 0.90 $\mu$
wet	0.10 $\mu$ to 0.15 $\mu$	0.20 $\mu$ to 0.30 $\mu$	0.60 $\mu$ to 0.70 $\mu$
loamy-wet	0.05 $\mu$ to 0.10 $\mu$	0.10 $\mu$ to 0.20 $\mu$	0.40 $\mu$ to 0.60 $\mu$

### Results:



### Advantages of STS 4000 for reducing the operating and maintenance costs:

- The service life is up to three times that of rubber linings
- Prevention of belt slippage and overheating
- Pulley life is extended by using **RenoLin®** to repair or replace the lining

### Advantages of the high coefficients of friction of STS 4000.

#### The following features protect the conveyor belts and extend the service life of the belts:

- Reduction of belt pre-tension by up to 87 %
- Reduction of required belt connection strength by up to 51 %
- Reduction of required belt tensile force by up to 87 %
- Increase in bearing life as a result of load reduction by up to 87 %

## Material key data

### Material:

Pulley lining based on industrial ceramics

### Colour:

Anthracite grey

### Technical data:

Average coefficients of friction

dry: 0.80  $\mu$   
wet: 0.60  $\mu$   
loamy-wet: 0.40  $\mu$

### Temperature resistance:

-40 °C to 80 °C

### Compressive strength:

at RT: 30 N/mm²

### Shear strength lining/pulley:

at RT: 4.5 N/mm²  
at 120° C: 3.0 N/mm²

### Specific weight:

2.0 g/cm³

### Resistance:

Oil, salt, weather

### Design:

1. Directly bonded to pulley
2. Indirectly attached by bonding to the lining base, which is screwed or welded onto the pulley
3. Cylindrical or crowned shape in standard thicknesses of 10 mm, 12 mm, 15 mm as well as customised thicknesses starting from 8 mm

### Areas of application:

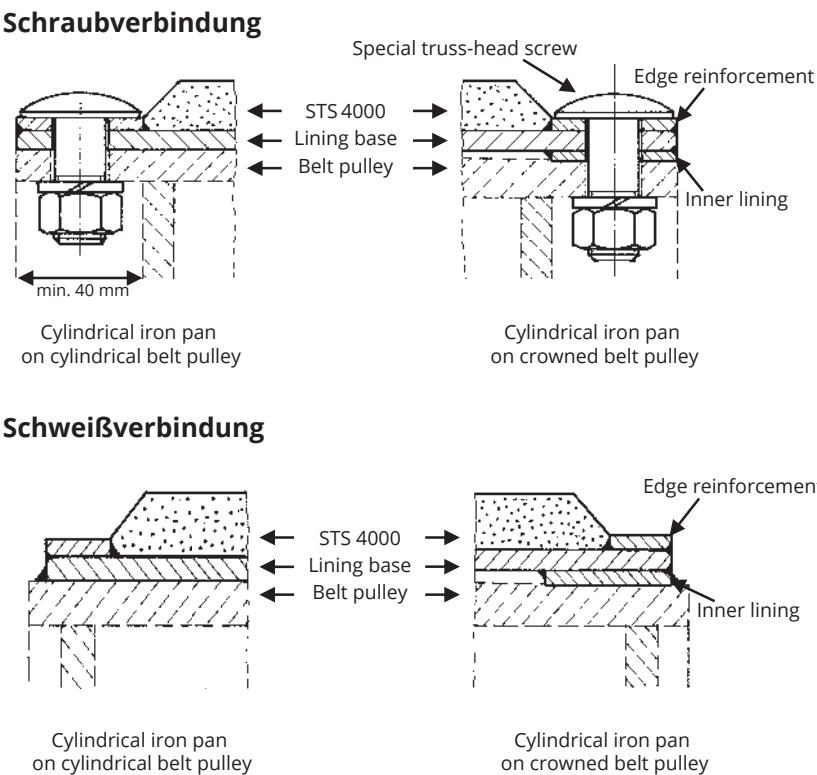
In rubber-belt conveyor systems for all types of drive, take-up and tail pulleys, even under wet and loamy-wet operational conditions

The material key data shown here were ascertained on the basis of STS Friction test methods. In our experience the maximum values shown here cannot always be achieved simultaneously in a particular application. Given the wide range of applications, types of use and technical conditions, we recommend that, if appropriate, the material should be subjected to practical tests to determine its suitability. For technical questions relating to your application conditions please contact our technical advisers and engineers.



# STS FRICTION HELPS YOUR MACHINERY RUN EFFICIENTLY.

## Attachment options and design of lining bases / iron pans



## Design of lining bases / iron pans

Sectioning of iron pans	Thickness of iron pans
Pulley diameter:	Pulley width:
up to 315 mm diam. = 2 sections	up to 1150 mm = 4 mm
315 - 630 mm diam. = 2 - 3 sections	1150 - 1400 mm = 5 mm
630 - 1000 mm diam. = 3 - 4 sections	1400 - 1600 mm = 5 - 6 mm
1000 - 1400 mm diam. = 4 - 5 sections	more than 1600 mm = 6 mm
more than 1400 mm diam. = 5 or more sections	

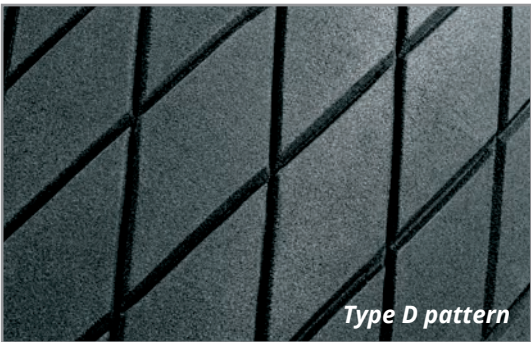
On request we can also provide other sectioning options and thicknesses, if technically feasible.

Edge reinforcements	
for screwed iron pans	for welded iron pans
Pulley width:	Pulley width:
up to 1150 mm = 40 x 4 mm	up to 1150 mm = 20 x 4 mm
more than 1150 mm = 50 x 4 mm	more than 1150 mm = 50 x 4 mm

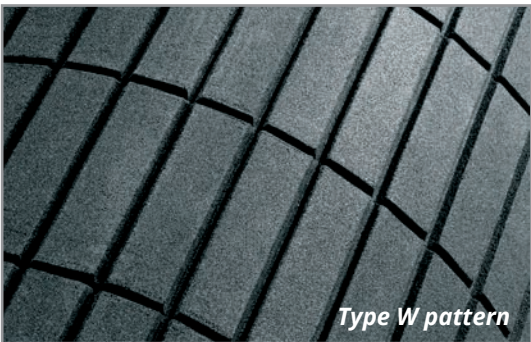
## Common patterns



Type H pattern



Type D pattern

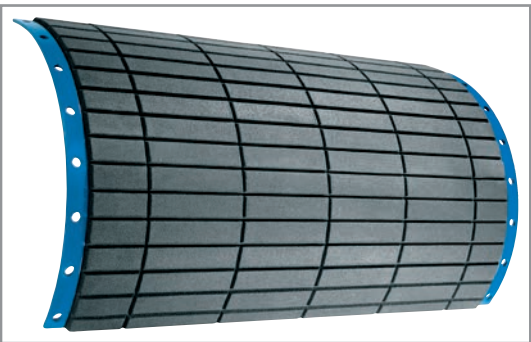
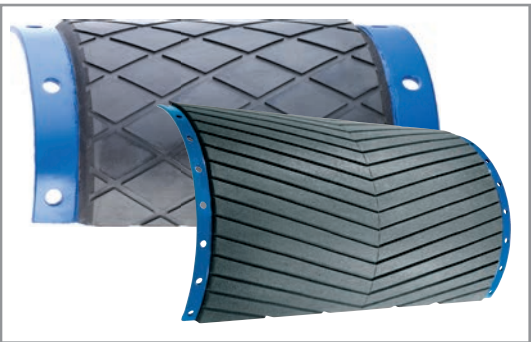


Type W pattern



No pattern

STS 4000 directly or indirectly bonded with and without lining bases





## STS FRICTION – PERSONAL, INDIVIDUAL, EXPERIENCED

**STS Friction GmbH considers itself to be a medium-sized business in the best sense of the word.**

**Three terms in particular define the company:**

**Personal** – We are an owner-managed business and part of a large family company based in the Ruhr region of Germany. The owner of a company is motivated by securing jobs in the long term and by achieving sustained growth. While this may often sound like a cliché, it does reflect the facts as far as we are concerned. Many of our employees have been with us since the company was founded over 20 years ago and our labour turnover is very low. A company progresses well when the whole team identifies with its objectives – and that accounts for the success of STS Friction GmbH.

**Individual** – To operate successfully in our various industries we have to provide a rapid and individual response to our customers' demands. Knowing the written and unwritten laws goes hand in hand with the use of branded raw materials. From our headquarters in Moers we can give our customers the support they need with regard to their requirements. Fast response times, direct availability of the relevant colleagues and short communication paths: in other words, a medium-sized business at its best!

**Experienced** – Our company has been operating at our site in Moers for over 20 years and our employees identify with the business and the region. Experienced, motivated employees who are familiar with our customers' industries; exclusive use of branded raw materials – entrepreneurial thinking at every level. What could be better for modern customers than to work with STS Friction?

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