Gesadur Machine Underrollers

Gesadur Machine Underrollers are ideal for supporting large rotating machines. The Gesadur material is practically incompressible and even if left standing under pressure will return to perfectly round form after a couple of rotations.

Gesadur is often supplied as pre-machined blanks with a universal oversize for final finishing at your own site. However, complete underrollers with fitted steel hub can be manufactured if required.

Why supporting rollers are made of Gesadur WN®?

A number of machines are equipped with underrollers made of laminated fabric. These are fabrics of sheets impregnated with resin and compressed into plates. The rollers are turned out of these plates with their laminates positioned vertically to the running direction. This type of roller tends to wear quickly, as the material eventually delaminates. Due to the laminated structure of the material an adequate surface finish can not be attained. During long non operating times of the machine these rollers develop flats on the surface and these remain flat when the machine is restarted. The result is high noise and machine vibrations.

Gesadur WN® is a homogenous material with a good surface quality. By changing to Gesadur WN® the rotational speed of the machine can often be increased, while the running noise is decreased. Due to the memory properties of the material the rollers are not subject to developing flats and vibrations are dampened.

Applications

Trunnion or supporting rollers for cable and wire stranding machines, pressure rollers for spinning machines, insulating flanges for annealers, forming surfaces for metal spinning machines.

Advantages

- High impact strength leading to a longer service life.
- Dampening of vibrations/oscillations conserves machine bearings.
- Increase speed, increases output.
- Smooth running surfaces without deposits means rotation without vibration/oscillation.
- Resistant to oil and grease with good electrical insulation characteristics with low water absorption.
- Memory: After an extended period of machine stoppage the flattening of the underroller is removed after a few rotations.

Technical Data

- Pressure Resistance: 350 N/mm^2
- Bending Strength: 80 N/mm^2
- Tensile Strength (crosswise to pressing direction): 45 N/mm^2
- Tensile Strength: 7000-8000 N/mm^2
- Specific Weight: 1.4 g/cm^3
- Water Absorption: 80 mg

Types of available Rollers

- Pre-machined with universal oversize, this means extra material of 2mm remaining on outer-Ø, inner-Ø and width. Final machining can be carried out yourself.
- Finished inner-Ø and width, extra material of 2mm remaining on outer-Ø. Final machining of outer-Ø to be carried out by yourself.
- Complete finished machined with steel bush and/or steel sleeve, outer-Ø turned with diamond tools, concentricity max. 0.01mm.

Maintenance

As workshops are dusty, dirt may collect on the surface of the underrollers. This can lead to the underrollers being overloaded on small pressure points of the surface (where the dirt is) and this can cause the surface to burn. To clean the underrollers we recommend our special cleaning system and our cleaning fluid Gesaclean.

Design and Machining Instructions

Underroller Design

The size of the bore, whether of large or small diameter, has no influence on the price of the underroller. We therefore recommend a small bore and a steel bush having a small wall thickness.

The specific weight of Gesadur WN is 1.4 g/cm³ compared with approx. 7.8 g/cm³ for steel.

The weight of the underroller can consequently be reduced. A small steel bush also results in a lower price.

We recommend mild steel for the bush. Cast iron can also be used but this can shrink with age leading to deterioration in the fit.

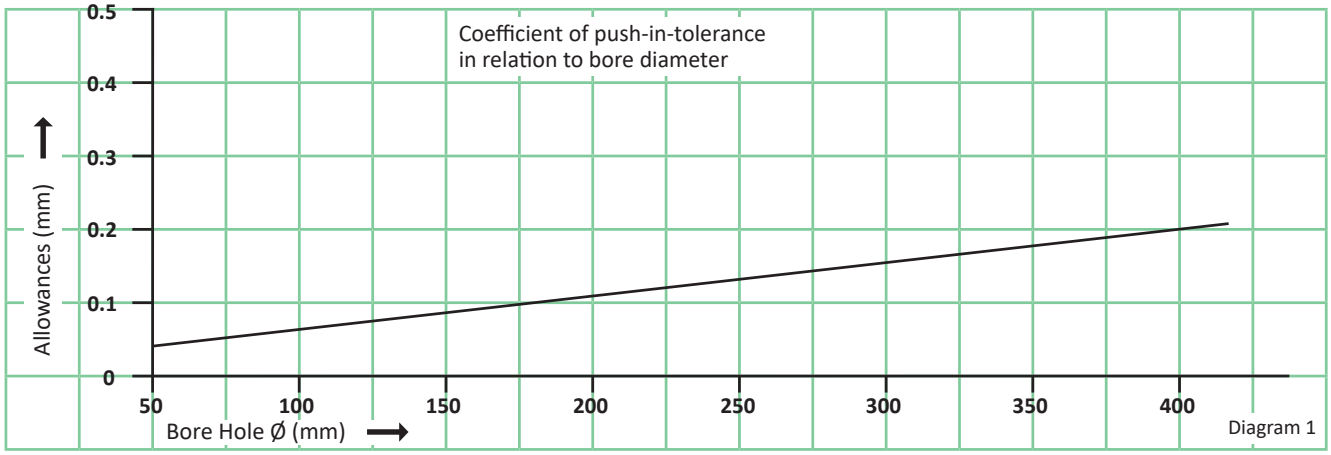

Diagram 1

Production of Underrollers

Underrollers are manufactured as follows and we recommend the same process to you in the event that you purchase underroller blanks from us.

The steel bush should be pressed in with an interference fit in line with Diagram 1. This fit is normally sufficient. However we recommend additional fixing with three roll pins between the bush and the underroller sleeve as Diagram 2.

To achieve optimum concentricity, we recommend the following procedure:

The steel bush is manufactured with an extra length of 20mm (see Diagram 3). After press-fitting the steel bush and pinning with the 3 roll pins, the roll is taken to the lathe and chucked from outside on its protruding extra length. In this way, both outer and inner diameters can be turned in one chucking operation. The extra length is then removed in a further operation and the concentricity should be maintained to within 0.01 mm. We recommend turning the outer diameter (running surface) with a natural diamond tool as the best surface finish and accuracy is obtainable in this way. Standard tungsten (hard metal) tools can wear during the fine machining process causing the roll to become slightly conical.

Machining Instructions: Turning

Use only tungsten (hard metal) or diamond cutting tools.
Clearance angle ~ 5°
Rake angle 0 - 10°. v = 200 - 250 m/min.
First rough turn and then finish turn.
s = Roughing ≃ 0.25 - 0.5 mm/rev.
s = Finishing ≤ 0.15 mm/rev.
As far as possible use a setting angle of 45°.

When machining the outside diameter of a roll, the adjoining side of which has already been machined, first chamfer the edge with the edge of the cutting tool before proceeding to final machining. This prevents material breakage at the run-out side.

Surface Finishing

To achieve the best surface finish a feed of s = 0.03 mm/rev. should be used.

The very best surface finish is achieved by turning with diamond tools.

Boring

Only operate the lathe with twist drills or tungsten tipped drills, cutting angle ~ 90°. V = 40 m/min. With SS twist drill V = 15 - 20 m/min.

If using twist drills, drill intermittently.

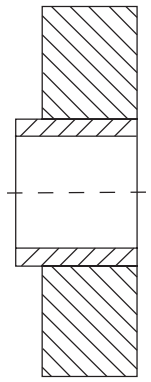

Diagram 3

Underroller Ø (mm)	Roll Pin Ø (mm)
up to 400	12
400 - 500	16
more than 500	20

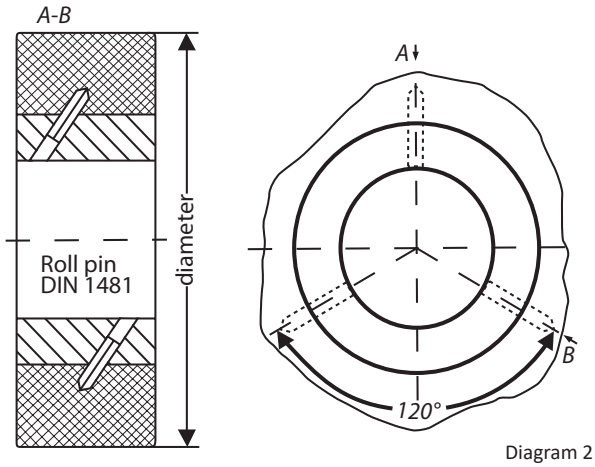

Diagram 2