Sanforizing products
Shrinkage belts

Accotex

DAYTEX Shrinkage Belts

Technical information

How to use in finishing applications

Legal notes / Copyright note / Adress
This manual must be handed out to persons using the described equipment. Wrong use of the equipment can only be avoided if the manual is always available!

Always establish routine inspections and proper grinding cycles to maximize belt life. Please contact your local sales office for further assistance and for ordering replacement belts as needed. For specific mechanical settings please reference your machinery guide or contact the Original Equipment Manufacturer.

Contents

OUTSTANDING
ADVANTAGES

Good tear resistance

Truly seamless

Outstanding heat and chemical resistance

Can be installed in either directions

Resist cracking even under heavy load

Excellent physical properties

Unique homogenous belt structure for constant shrinkage results

1 Safety

1.1 Safety warnings and notes

Warnings and notes in these operating instructions are identified by the following symbols:

Warning
This symbol indicates a potential risk for the health of personnel.
Non-compliance with these directions can result in severe harm to health or property.

Warning
This symbol indicates a potential risk for the health of personnel.
Non-compliance with these directions can result in severe harm to health or property.

1.2 Important recommendations

Warnings and notes in these operating instructions are identified by the following symbols:

Warning
Never touch the rubber belt near the squeeze roll (compression roll)!
Never place your hands inside a moving rubber belt!

Note
Periodic and careful inspections of the belt surface are necessary to achieve maximum rubber belt life.
The most important circumstances that will reduce belt life are:
1. Lack of proper water application at all times.
2. Excessive heat from the steam cylinder.
3. Excessive pressure on the rubber belt.
4. Improper grinding procedures – remove 1.0 to 1.5 mm at each grind.

2 DAYTEX Shrinkage Belts

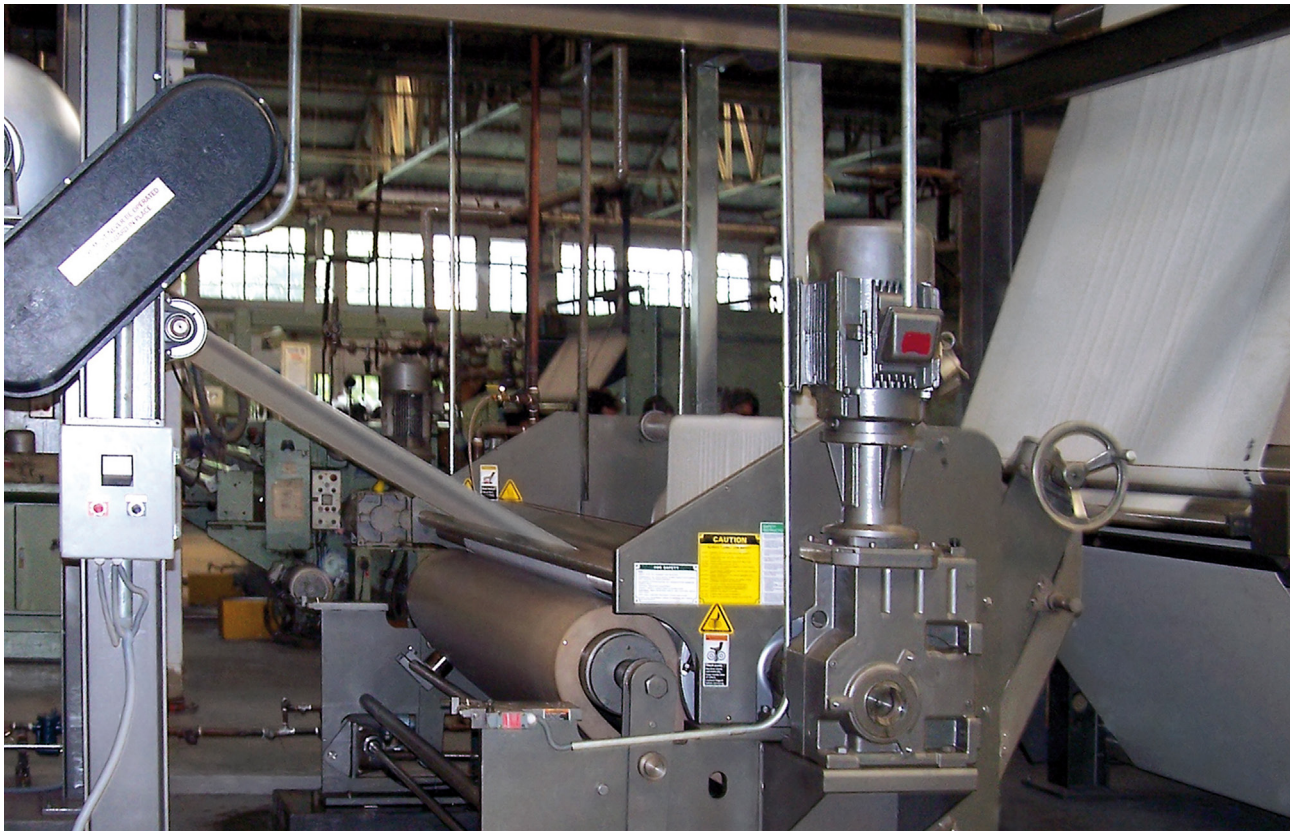


Fig. 1: Use of the Shrinkage belt at Opex & Sinha Textile Group

2.1 Use and application

Shrinkage, also called Sanforization, was patented in the US in 1954. This process is extremely important to the textile fabrics produced in today's industry. Almost 80 % of all cotton fabrics are subject to the Sanforizing process. The remaining 20 % are chemically treated for fabric appearance and/or softness.

Daytex Shrinkage Belts are engineered to produce the best quality for all different types of fabrics like all Sanfor types, Comfit, knitted goods and of course, open-width knits. This includes fabrics from light to heavy weight. Besides this it can also be used in compactors, which use an endless rubber belt with a standard inside circumference of 3 962 mm (156").

2.2 Sanforization

Sanforizing is a method of shrinking and fixing the cloth in both length and width before cutting and producing, to reduce the shrinkage which would otherwise occur after washing. The shrinking process takes place between the shrinkage (rubber) belt and the heated cylinder. The pressure roll squeezes the belt against the heated cylinder and thereby the fabric is stabilized. Leaving this nip point, the pressure is relieved and the belt contracts. The fabric between the shrinkage belt and the heated shrinking cylinder has to follow this contraction
of the belt and the fabric is thereby shrunk. Changing the shrinkage belt pressure changes the percentage of the fabric shrinkage. The higher the pressure, the greater the shrinkage.

Today about 80 % of all textiles, which are sold on the market, undergo shrinking. The main application still lies in the area of heavy fabrics such as denim for example. However, today sheeting products, dress shirt fabrics and woven bottom weight fabrics get shrunk. The majority of knitted fabrics and open-width knits are systematically protected from shrinkage with the aid of this process. A growing field of application is surface treatment, mainly for synthetic fabrics. To optically improve the surface or optimize the feel of the textile, a process similar to the classic shrinkage process is applied. It is a method of stretching, shrinking and fixing the woven cloth in both length and width

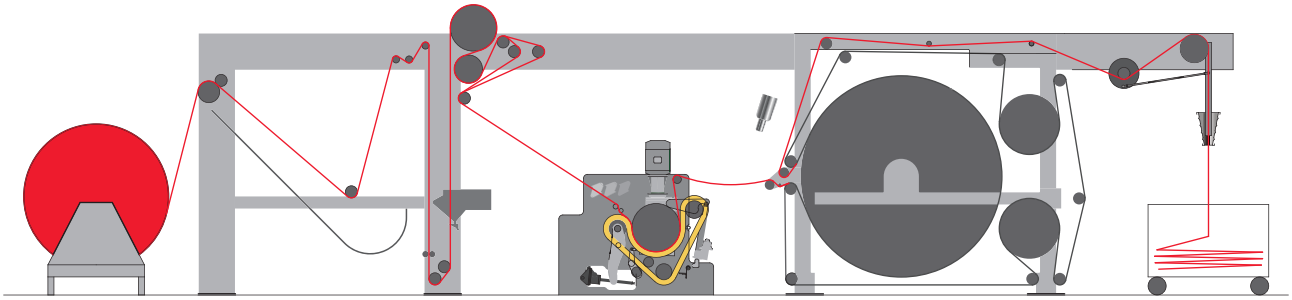


Fig. 2: Illustration courtesy of Morrison Textile Machinery Inc.

2.3 General data

- Material: Natural Rubber
- Color: Light Tan
- Shore Hardness: 38 – 40 ShA
- Surface: Finished ground
- Application: From heavy to light fabric including comfit and knitted goods

2.4 Dimensions

- Inner Circum: 3 962 mm
- Thickness: 50.8 – 70 mm
- Width: Customized
- Edge: Daytex Curved

Fig. 3:Image courtesy of Morrison Textile Machinery Inc.

3 Scope Of Supply And Model Designation

3.1 Technical information

- Compound: Daytex 768
- Material: 100% natural rubber
- Colour: light tan
- Shore hardness: 38 – 39 °
- Surface: finished ground
- Application: from heavy to light fabric including comfit and knittegoods
- Inner circumference: 3 962 mm
- Thickness: 51 to 70 mm
- Total width and working width: customized
- Edges: curveda.

3.2 Dimensions

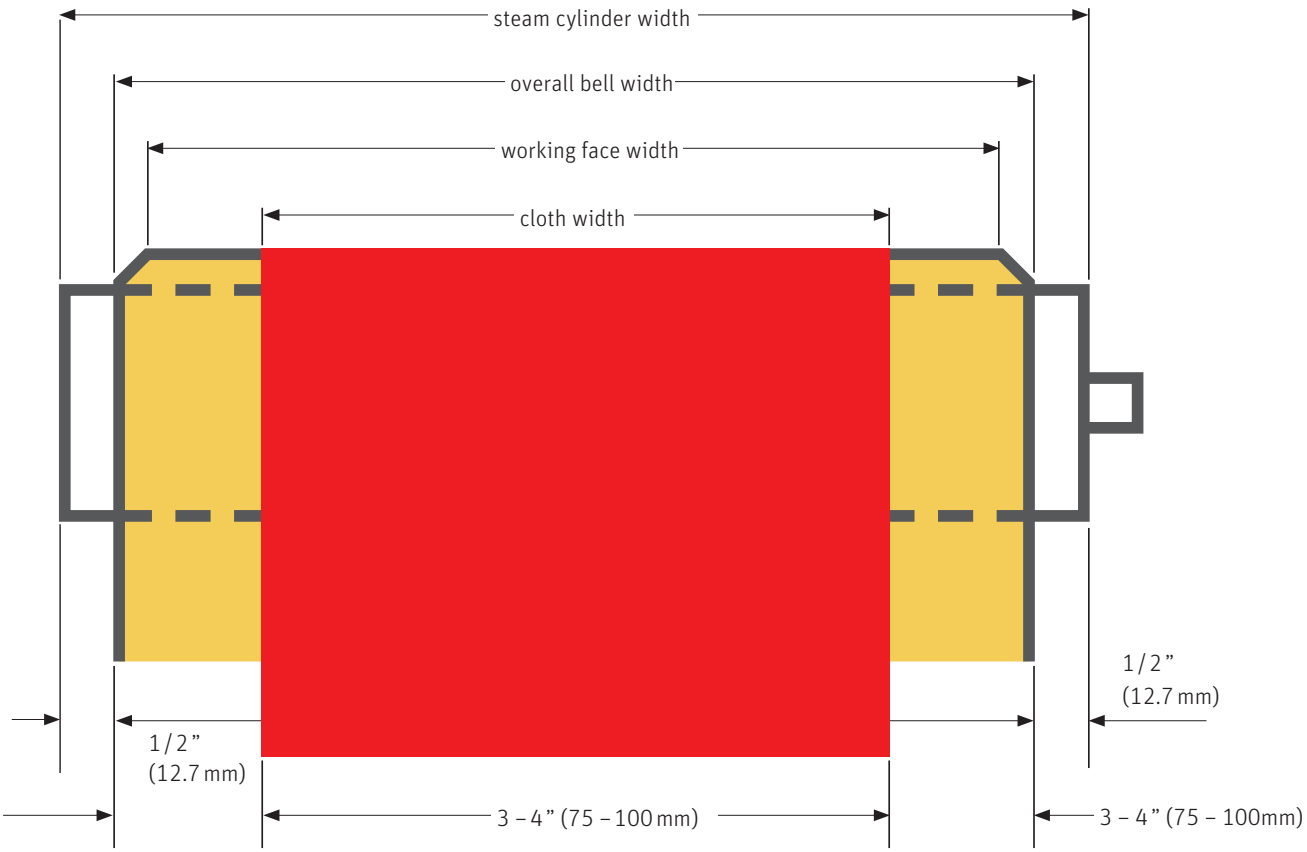
When ordering, it should be clearly specified whether the width ordered, is the belt's working face width, or the belt's overall width. For example, a shrinkage belt with a short bevel will have an overall belt width of 25.4 mm (1") greater than the rubber belt's working face. To determine the ideal shrinkage belt width for any specific operation please take into consideration the following criteria:

3.3 Cloth width

It is recommended that the rubber belt should have a working face width which is at least 75 mm (3 ") on each side wider than the widest cloth to be processed. The belt width should not be more than 100 mm (4 ") on each side wider than the widest cloth to be processed.

3.4 Overall belt width

If at all possible, on narrow sanforizing machines, the overall belt width needs to be at least 25.4 mm (1”) less than the width of the shortest roller or steam cylinder.



4 Installation

4.1 Tension

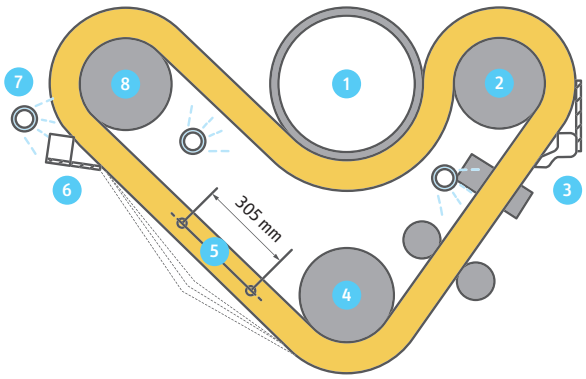
It is extremely important that the rubber belt is not stretched excessively when installed. It is important that the rubber belt be run for at least one hour under the proper 2% tension and heat before the fabric is run on the sanforizer.

During transportation and subsequent storage, a degree of “shape-set” will occur within the shrinkage belt. The recommended standard stretch is 0.25 “ (6.35 mm) maximum for a 2.625” (67 mm) thick belt and 0.5 “ (12.7 mm) for a 2 “ (51 mm) thick belt. In order to determine the exact amount of stretch draw 12 “ (305 mm) lines on each side of the belt. Please see reference chart below for recommended stretch (based on 12 “, 305 mm, starting point) throughout the rubber belt life cycle.
Run the belt several revolutions and measure the marked line to determine the actual amount of stretch before starting the machine to ensure proper tension is obtained. Be sure to repeat these steps after each grind

Note
In case of an outside storage it is important that the belt is brought into the room where it will operate. Before installation the belt needs to acclimatize for a period of 48 hours. This is of particular importantace where the storage of the belt has been in a cold or unheated location.

4.2 Recommended stretch

Belt thickness		Start		Stretch to	
inch	mm	inch	mm	inch	mm
2.625	67.0	12	305	12.25	311.0
2.59	65.5	12	305	12.28	311.9
2.52	64.0	12	305	12.31	312.7
2.46	62.5	12	305	12.34	313.5
2.40	61.0	12	305	12.38	314.3
2.34	59.9	12	305	12.41	315.1
2.28	58.0	12	305	12.44	315.9
2.22	56.5	12	305	12.47	316.7
2.17	55.0	12	305	12.50	317.5
2.11	53.5	12	305	12.50	317.5
2.05	52.0	12	305	12.50	317.5
1.99	50.0	12	305	12.50	317.5
1.93	49.0	12	305	12.50	317.5
1.87	47.5	12	305	12.50	317.5
1.81	46.0	12	305	12.50	317.5
1.75	44.5	12	305	12.50	317.5
1.69	43.0	12	305	12.50	317.5



1 Heated cylinder
2 Compression roll
3 Water removal felt
4 Drive roll
5 Tension adjustment
6 Felt doctor blade
7 Water spray
8 Tension roll

5 Maintenance

5.1 Installation

The rubber belt internal surface can be severely damaged if the 5 rolls are not properly wrapped with cloth.

Note

In case of an outside storage it is important that the belt is brought into the room where it will operate. Before installation the belt needs to acclimatize for a period of 48 hours. This is of particular importantace where the storage of the belt has been in a cold or unheated location.

5.2 Tracking

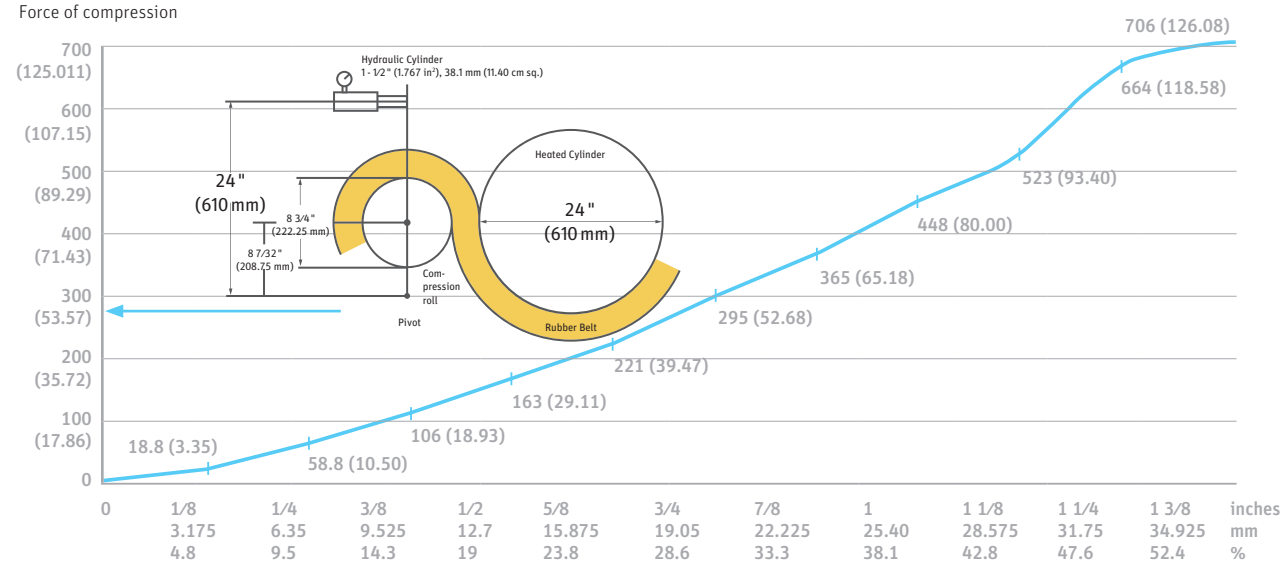
The guide rolls should be set at 90 degrees in relation to the belt edge and approximately 2 “ (51 mm) from the edge. This will allow the belt to track properly during operation. After the belt reaches operating temperature it may be necessary to further adjust guide rolls to the proper proximity to the belt edge.

Warning

Never touch the rubber belt near the squeeze roll (compression roll).

5.3.1 Determining correct compression for each fabric weight

in PLI, ( ) = metric



5.4 Cooling

It is vital to maintain water sprays on both sides of the belt during operation in order to keep the belt cool.
The water sprays on the inside of the rubber belt lubricate and cool the belt to reduce the friction with the rollers. The water on the outside cools the rubber belt to avoid overheating and cracking. All water holes/nozzles must be kept open and free of contaminant in order to maintain adequate water flow on the rubber belt. Water filters may be added to the water lines before the machine in order to reduce the chance of materials clogging the spray system and impeding water flow to the cooling.

The felt doctor blade needs to be in complete and continuous contact with the working surface of the belt, thus collecting a reservoir of water across the entire working surface of the belt. This action contributes to the cooling of the belt and aids in the prevention of surface cracking. It is important to inspect the felt doctor blade for damage or excessive wear and replace the blade when needed or on an established preventative maintenance cycle.
In addition, the water reservoir formed by the blade should be flushed at the beginning of each shift.

When the machine is being stopped it is important to ensure that the steam supply is shut off and the belt continues to rotate with an ample supply of water until the steam cylinder cools down to room temperature. If this is not done the belt can develop cracks.

Note
The water spray pipe inside and outside the rubber belt must be checked and cleaned each day to ensure proper water flow.

5.5 Operating temperature

It is important that steam temperature is regulated so that the belt may operate at the lowest suitable temperature. Both the steam cylinder temperature and the belt compression should be held to the minimum required for the fabric being processed. Remember, during machine stoppage, to minimize continuous belt contact with the heated cylinder. Prolonged contact of the belt with the steam drum will result in shortened belt life due to premature cracking.

Material	PSI	Bar	Temperature °C	°F
Heavy wt. fabric	52.5	3.62	140	284
Medium wt. fabric	39.2	2.70	130	266
Light wt. fabric	24.5	1.69	115	239

5.6 Steam drum cleaning

Resins from fabrics being processed build up on steam cylinders and must be removed periodically with a suitable detergent. In addition, heated rubber may form a deposit on the steam cylinder, which will cause increased surface temperature. It is recommended that a soft (brass or copper) brush should be used to remove any rubber build up on the cylinder.

Warning
Avoid using materials that may scratch or damage the steam cylinder.

5.7 Belt grinding

Daytex Shrinkage Belts have been developed to provide maximum life under the tremendous loads put on rubber shrinkage belts by the tough mechanical loading and high temperatures normally found in compressive fabric shrinking operations.

However, even the finest shrinkage belt requires continued precise care to insure maximum reliability and peak performance. Even the smallest cut or crack in the belt must be removed promptly. Water accumulating within a crack is subjected to tremendous hydraulic pressure while passing under the nip.
This pressure forces the crack to expand and will lead to the rapid deterioration, and perhaps the premature failure of the belt. Therefore, it is essential that cracks be ground out or repaired as soon as they are discovered.
It is important to establish a routine grinding maintenance program in order to regain an unaged surface with the original Shore A hardness for the maximum shrinkage action.

The following table is based on generally accepted standards within the industry in regards to belt regrinding:

Material Grind	Grinding Time	Meters	Sandpapers	Suggested Grinding Depth
Heavy weight fabric	Every 2 weeks	500 000 to 600 000	60 Grit	1.2, 1.1, 1.4, 1.0, 1.3, etc.
Medium weight fabric	Every 3 weeks	750 000 to 900 000	80 – 100 Grit	1.1, 1.0, 1.2, 1.0, 1.2, etc.
Light weight fabrics	Every 4 to 5 weeks	1 000 000 to 1 200 000	100 – 120 Grit	239

The re-grind procedure should be closely monitored. It should not be necessary to remove more than 0.0625 " (1.6 mm). However, keep in mind the important factor of regrinding a belt to re-establish the original Shore A hardness.
Avoid excess speed and pressure during grinding, and remember to use an adequate amount of talc to reduce the friction between the belt and grinding surface. The excess talc and rubber dust must be thoroughly removed from the inside circumference of the belt before machine operation resumes. It may be necessary to remove this build up of talc and rubber dust during the actual regrinding process. Approximately every forth regrind the bevelled edge should be re-established by using a hand-sander or sandpaper. This will aid in the prevention of edge cracking.

6 Grinding Instructions

6.2 Reasons for grinding

A rubber belt needs grinding as soon as the surface becomes sticky, rough or damaged. Grind the rubber belt if the hardness drops by 20%. Example: new rubber belt measures 40 and a used rubber belt measures 32 Shore A.

- Improper grinding can cause the following issues:
- Orange peeling outside the selvage lines
- Reduced time or meters between grinds
- Loss of cloth shrinkage
- Chatter marks on the rubber belt surface

6.2 Material removal

The depth of rubber to be removed at each grind should just be adequate to obtain fresh rubber on the surface (see page 11 for the suggested grinding depth).

Note
Only removing 0.5 to 1.0 mm each grind reduces the life of the rubber belt.
Old rubber on the surface will cause low shrinkage issues as the rubber belt gets thinner.

6.3 Preparation

During the grinding process, care should be taken to avoid undue pressure and friction between the grinding roll and the rubber belt surface. Always apply at least 1% rubber belt tension on the rubber belt during the grinding process. This prevents the grinder from removing more rubber on the outer edges. Use the highest quality Synthetic Resin Bonded Abrasive Cloth to prevent the grinding paper from stretching during the grinding process. Be sure ample amounts of talc are used on both the inside and outside the rubber belt during the grinding process. Talc improves the grinding process and keeps the COF low between the rubber belt and the grinding roller.

Note
Before applying the grinding paper to the grinding roll inspect the roll surface. Remove all rust spots or imperfections on the roll surface. Polish the grinding roller with your sand paper.

Note
It is very important to correctly install the grinding paper with no gaps or overlaps.

It is also recommended to test the rubber belt hardness before and after each grind.
It is also recommended to measure the thickness on the rubber belt before and after each grind. Record the hardness and thickness on your permanent records for each rubber belt.

Note
If the rubber belt measured 40ShoreA new out of the box, the rubber belt will also measure 40 Shore A after a proper grind.

6.4 Grinding

Grinding should be done with the AMP meter on the sanforizing machine. During the grinding process, the AMP meter will increase as the pressure increases. During grinding, the AMP meter will vary from 5 to 17 AMPs. The grinding process is occurring when the meter reads between 8 and 17 AMPs. The rubber belt is being polished when the AMP meter reads between 3 and 8 AMPs. Most grinding rollers are turning at 1 700 RPM. The rubber belt should be turning between 5 and 8 meters per minute to avoid chatter marks on the new fresh rubber belt surface.

Note
Remove small amounts of rubber during the grinding process. Do not exceed 17 AMPs per each adjustment.

To insure proper grinding, Mark 100% of the rubber belt surface with an ink pen. If the grinding roll is parallel, the ink marks will disappear on 100% of the rubber belt surface within the first few minutes of the grinding process.
It is also recommended to use parallel gages as you set up the grinding roller.

Note
Be sure the steam cylinder and the pressure roll are parallel. Be sure the grind roll and the pressure roll are also parallel.

Note
Approximately every forth regrind the bevelled edge should be re-established by using a hand-sander or sandpaper. This will aid in the prevention of edge cracking.

The excess talc and rubber dust must be thoroughly removed from the inside circumference of the belt before machine operation resumes.

7 Washing Instructions

7.1 Reasons for washing

How often do you wash a rubber belt and clean a steam cylinder?
This depends on the weight and construction of the fabric being processed. Also, the amount of rubber directly exposed to the hot steam cylinder without cloth needs to be considered.

Note
A clean steam cylinder extends the life of a rubber belt!

7.2 Preparation

- Return rubber belt to room temperatures.
- Reduce all pressure from the squeeze roll.
- Turn the rubber belt at the lowest speed possible.

7.3 Wahing of the belt

Apply to a wet damp rubber belt your cleaning soap. Normally, 20 Mule Team Borax or any other glandular soap.

Note
No chlorine or any cleaning solvent that contain the following, gasoline, kerosene benzene or any oil base liquids.

After applying a good coating of soap to the rubber belt, begin washing the rubber belt.
As the rubber belt turns begin to add small amounts of water and scrub the surface with a Scotch Brite Pad or a soft brush to remove any residue on the rubber belt surface.

Note
If the rubber belt measured 40ShoreA new out of the box, the rubber belt will also measure 40 Shore A after a proper grind.

7.4 Cleaning of the steam cylinder

Also clean the steam cylinder using a brass or cooper brush.

Note
No steel brush or scraper blade to be used on the steam cylinder.

7.5 Rinsing

Turn on all water inside and out to rinse thoroughly the residue from the rubber belt and steam cylinder after the washing.

Note
It is very important to wash down the rubber belt inside and out after grinding.

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