	Guideline	Asset Management
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1. INTRODUCTION

The correct handling and storage of rolls of conveyor belting is extremely important, as incorrect handling and storage will result in damage to the belt and will lead to reduced life expectancy and operational problems.

2. SUPPORTING CLAUSES

2.1 SCOPE

The scope of this guide is the storage and handling of rolls of conveyor belting.

2.1.1 Purpose

To present good storage and handling practices of rolls of conveyor belting, as collated from various national and international sources.

2.1.2 Applicability

This guide applies to the entire Eskom Holdings Ltd wherever rubber conveyor belt is utilised and stored.

The requirements according to this guide apply primarily to long term storage (generally longer than six (6) months). Handling requirements will apply under all circumstances.

2.2 NORMATIVE/INFORMATIVE REFERENCES

The following documents were used for the compilation of this guide:

2.2.1 Normative

- [1] BS ISO 5285, Conveyor Belts – Guidelines for storage and handling.
- [2] DIN 7716, Rubber Products – Requirements for storage, cleaning and maintenance.
- [3] ISO 2230, Vulcanised rubber - Guide to storage.

2.2.2 Informative

- [4] Goodyear Tycon, Conveyor Belt Maintenance Manual, J.J. Moller.
- [5] How to use conveyor belt properly, Bridgestone.
- [6] Recommended Practice for Troughed Belt Conveyors, The Mechanical Handling Engineers Association, 1986.
- [7] Storage of belting, Anglo American Technical Services (AATS), G.G. Shortt.

2.3 DEFINITIONS

Definition	Description
Long term storage	Storage period that is longer than six months

2.3.1 Disclosure Classification

Controlled Disclosure: Controlled Disclosure to external parties (either enforced by law, or discretionary).

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2.4 ABBREVIATIONS

Abbreviation	Description
AMMechEng	Asset Management Mechanical Engineering
SC	Steering Committee
TC	Technical Committee

2.5 ROLES AND RESPONSIBILITIES

Stores Receiving Clerk and System Engineer – To be fully conversant with the requirements for storage when conveyor belts have been received at site and to ensure that conveyor belting is stored according the requirements herein.

Supplier – To be fully conversant with the requirements of this guideline prior to despatch from the manufacturers premises and ensure compliance to the requirements stipulated in this guideline.

2.6 PROCESS FOR MONITORING

None

2.7 RELATED/SUPPORTING DOCUMENTS

None

3. GUIDE FOR STORAGE AND HANDLING OF CONVEYOR BELTING

3.1 GENERAL

Storage under adverse conditions and improper treatment will change the physical properties of rubber products and influence their service life due to hardening, softening, permanent deformation, flaking, cracking and other surface damage. These changes can be caused by reactions to oxygen, ozone, heat, light, moisture, solvents and storage under tension. Properly stored and treated rubber products will retain their characteristics and remain almost unchanged over a long period of time (several years).

3.2 TRANSPORTATION

The following requirements shall be adhered to when transporting rolls of belting:

- If sea freight is used as transportation medium the roll must be transported in a weatherproof enclosed container,
- The roll of belt will be transported suspended on a suitable trestle or the protective steel frame can act as a trestle if it is strong enough to carry the weight of the roll of belting, and
- The roll will be securely tied down.

3.3 PACKAGING

Each length of belting shall be rolled and so packed as to prevent it from being damaged during normal transportation and storage, with the following minimum requirements:

- Belting (steel cord & plied textile) shall be coiled onto wooden or steel cores or drums of which the diameter shall be a minimum of 60 times the steel cord diameter for steel cord belting with the top- or carry cover facing outwards,
- The coil shall be wound tightly enough to prevent telescoping of the layers in subsequent handling and storage,

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- The coil shall be wound 'square and true', i.e. the top and bottom of the roll shall have a flat profile across the width of the belt. The edges of the belt in each layer of the coil shall be in line and at 90° to the outer surfaces,
- The coil shall be wrapped with weather resistant, waterproof wrapping (Plasticised films should not be used for wrapping), firmly secured by steel or nylon straps. Strapping should have a suitable guaranteed minimum breaking load, be resistant to degradation for the storage life/conditions envisaged and be of sufficient width to prevent damage of the belt surface due to cutting,
- The roll of belting shall be totally encapsulated by an eight (8) sided steel creel with steel side plates with a gap between belt edge and plate of ± 25 mm. This steel creel must be strong enough to protect the roll from any mechanical damage during transportation and support the total weight of the roll during subsequent storage on site,
- A weather resistant means of identification will be securely attached to the packing on the side of the roll with the following information:
 - Total weight of roll, steel creel included,
 - Belt mass in kg/m,
 - Total outside diameter dimensions, steel creel included,
 - Customer order number,
 - Special handling and storage instructions,
 - Roll, serial or identification number unique to endless length (spliceless)
 - Belt class, width and cover thicknesses, and
- The belt reel shall be marked with the direction of unwinding for installation, which shall also be the direction of belt travel during normal operation.

3.4 HANDLING

3.4.1 Correct and incorrect rigging practices

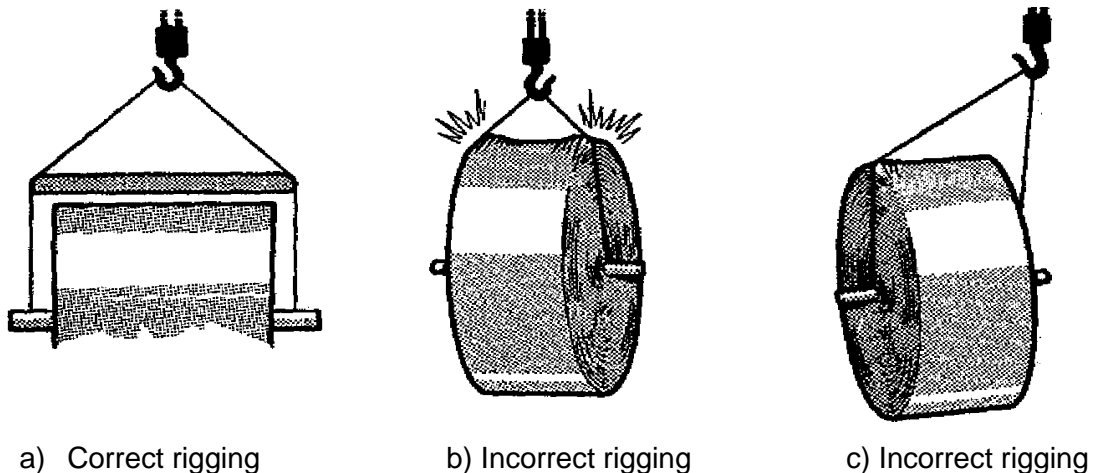


Figure 1 : Correct and incorrect rigging practices

The following shall be adhered to when off-loading and moving rolls of conveyor belting on site:

- Belt rolls should never be thrown from the truck,
- Belt rolls shall not be rolled under any circumstances and
- Belt rolls shall not be turned on the spot.

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When carrying a belt by suspending it, take the following care:

- A steel pipe or iron bar, strong enough to withstand the weight of the belt, shall be inserted through the core hole as shown in Figure 1 above. The weight of the roll of belting should be indicated on the packing to ensure the correct crainage and rigging equipment are utilised,
- The ropes on both sides of the rolled belt should be coiled around the pipe or iron bar one turn and kept as near the belt sides as possible,
- An overhead crane in conjunction with a hanger or spreader bar, with length greater than the roll width, will be used to lift the roll of belting so that the belt roll is not damaged on the edges by the suspending rope. The use of the forks of a forklift truck on a bare roll of belting is not allowed under any circumstances, and
- When lifting or lowering the belt, take special care so that the belt does not collide with any object.

3.5 STORAGE

3.5.1 Storage space

- The storage space should be cool, dry, dust-free and moderately ventilated. Any unprotected, exposed or outdoor storage space is not acceptable.

3.5.1.1 Temperature

- The storage temperature should not be below 0 °C and above 25 °C, with the optimum stock temperature at 10 °C. Excessive heat promotes the oxidation of natural rubber and
- The effects of low temperature are not permanently deleterious to vulcanized rubber articles, but the articles may become stiffer if stored at low temperatures and care should be taken to avoid distorting them during handling at that temperature,

3.5.1.2 Heating

- Sources of heat in storage rooms should be arranged such that the temperature of the stored belt rolls does not exceed 25 °C.

3.5.1.3 Moisture

- Belt rolls should not be stored in rooms with excessive moisture. The ideal relative humidity is below 65 % and care should be taken that no condensation takes place on the belt rolls,

3.5.1.4 Lighting

- The belt rolls should be protected from light, especially direct sunlight and strong artificial lighting with a high ultraviolet content. The windows of storage rooms should be coated with a protective red or orange (under no circumstances blue) coat of paint if there is no other suitable storage area. Any artificial lighting is preferred. Indirect sunlight also promotes oxidation of natural rubber, and
- If a belt needs to be stored outside in emergency circumstances, cover the roll with a heavy-duty tarpaulin or paint the surface and sides with whitewash to reflect the sun's rays.

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3.5.1.5 Oxygen and ozone

- Since ozone is especially harmful and accelerates the aging of natural rubber through oxidation, the storage rooms may not contain any ozone producing equipment, e.g. fluorescent or mercury vapour lamps, high voltage electrical equipment, electric motors, electric welding, electric substations or other devices that can produce electric sparks or silent electrical discharges. Exhaust gasses and organic vapours that can result in ozone production during photochemical processes should also be removed.

3.5.2 Sundry

- Solvents, volatile constituents, oils, greases, fuels, lubricants, chemicals, acids, disinfectants and such like may not be stored in the storage room.

3.5.3 Storage period Guidelines

A protracted period of storage may impair the performance of belts, even if they are stored with particular care. Storage period guidelines for spare belts are shown in Table 1.

Table 1: Storage period guidelines for spare belts

		Storage room	Place other than storage room	
			Direct sunlight	No direct sunlight
Storage period	Maximum	3 years	1 month	1.5 years
	Standard	1.5 years	2 weeks	6 months

3.6 ORIENTATION

- Belt rolls must never be placed directly on the floor and not with the belt edges in contact with the floor since this position permits moisture to accumulate between the layers. Neither should the roll be stored in a leaning position, since this causes difficulties in subsequent belt training,
- The belt roll may not be stored on the side due to the danger of lateral slipping,
- The belt roll shall be freely suspended by means of a transverse shaft parallel to the ground, which is suspended on a trestle,
- The roll shall be rotated through 90° every three (3) months in order that the internal pressure is not constantly exerted in one direction or continuously affect the same area,
- Belts which are to be stored for extended time periods should be kept wrapped in waterproof paper, and
- Belts should be stored in their original packing unless moisture has collected inside the packaging in which case the packaging should be removed to prevent mould from forming.

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5. REVISIONS

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January 2022	3	A R Matlala	Final Rev 3 Document for Authorisation and Publication

6. DEVELOPMENT TEAM

The following people were involved in the development of this document:

- Henk Fourie

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- None

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