ACADEMY / TECHNICAL TRAINING SERIES

TOOLS, PPE & KNIFE SKILLS

MODULE 04 / STUDENT TRAINING WORKBOOK

LEARNER NAME _____

DATE _____ TRAINER / ASSESSOR _____

ONLINE TRAINING / VIDEO LINK

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TRAINING SCOPE This resource supports theoretical understanding. Practical tool and knife competence requires supervised assessment by an authorised competent person.

Module Overview

This module introduces the basic tools, personal protective equipment and knife skills used in conveyor belt work.

Before anyone starts preparing, cutting, skiving, trimming, clipping, repairing or splicing a conveyor belt, they need to understand the tools they are using and the risks involved.

Most conveyor belt work is hands-on. It often involves sharp knives, heavy belts, grinders, buffing tools, solvents, adhesives, vulcanising equipment and awkward working positions. Good tool control and safe working habits are essential.

This module is designed for engineers, fitters, belt technicians, maintenance teams, apprentices, supervisors and companies wanting to improve in-house conveyor belt training.

This module can be used as a classroom training guide, toolbox talk, apprentice handout or self-training document.

Important Safety Notice

This module is for general training and awareness only.

Always follow:

- Site safety rules
- Risk assessments
- Method statements
- Permit-to-work systems
- Lock-off and isolation procedures
- Manufacturer instructions
- Tool supplier instructions
- PPE requirements
- Company training requirements
- Local health and safety legislation

No person should use knives, grinders, buffing tools, adhesives or vulcanising equipment unless they are competent, authorised and trained for the task.

If you are unsure, stop and ask a competent supervisor.

Work equipment should be suitable for the task, maintained, inspected where required and used by competent people. PPE should be selected for the risk and used properly, but PPE does not remove the hazard.

Learning Objectives

By the end of this module, the learner should be able to:

1. Identify common tools used in conveyor belt work.

2. Understand the purpose of PPE.

3. Select basic PPE for belt cutting, grinding, buffing and vulcanising work.

4. Understand why tool inspection is important.

5. Use basic knife safety principles.

6. Understand how to cut, trim and skive conveyor belt material safely.

7. Understand the risks of blunt blades, poor hand position and uncontrolled cutting.

8. Understand basic grinder and buffing tool safety.

9. Keep tools, blades and the working area organised.

10. Know when to stop work and ask for help.

1. Why Tools and PPE Matter

Conveyor belt work often involves cutting, stripping, trimming, grinding, buffing, cleaning and joining belt materials.

The quality of the work depends on using the correct tool in the correct way. The safety of the worker depends on understanding the risks and controlling them before work begins.

Poor tool use can cause:

• Hand injuries

• Cuts and puncture wounds

• Eye injuries

• Burns

• Dust inhalation

• Tool kickback

• Damaged belt plies

• Poor splice preparation

• Contaminated splice surfaces

• Poor-quality joints

• Early splice failure

A good belt technician works safely, cleanly and with control.

2. PPE Is the Last Line of Defence

PPE means personal protective equipment.

PPE may include:

• Safety boots

• Safety glasses

- Face shield
- Gloves
- Cut-resistant gloves
- Hearing protection
- Respiratory protection
- Safety helmet
- High-visibility clothing
- Knee pads
- Heat-resistant gloves
- Protective clothing

PPE helps protect the worker if something goes wrong, but it does not remove the hazard.

The first controls should be:

- Make the conveyor safe.
- Isolate and lock off.
- Control stored energy.
- Use the right tool.
- Use the right method.
- Keep hands away from the cutting line.
- Keep the work area clean.
- Use competent people.
- Stop work if unsafe.

PPE supports safe working. It does not replace safe working.

3. Common PPE for Conveyor Belt Work

The PPE required depends on the task, site rules and risk assessment.

Safety Boots

Safety boots protect feet from dropped tools, belt rolls, press parts, rollers and heavy components.

Eye Protection

Eye protection is needed when cutting, grinding, buffing, cleaning, blowing dust, handling solvents or using adhesives.

Face Shield

A face shield may be required when grinding, buffing or handling materials that could flick, splash or break away.

Gloves

Gloves protect against handling damage, sharp belt edges and hot or dirty materials.

Cut-Resistant Gloves

Cut-resistant gloves may be required during knife work. However, gloves must not create extra risk near rotating tools or moving machinery.

Hearing Protection

Hearing protection may be needed when using grinders, buffing tools, cutting tools or working in noisy plant areas.

Respiratory Protection

Respiratory protection may be needed when grinding, buffing, creating dust, using solvents or working in poorly ventilated areas.

Heat-Resistant Gloves

Heat-resistant gloves may be needed when handling hot vulcanising press parts, platens or recently cured splice areas.

4. Common Tools Used in Conveyor Belt Work

Conveyor belt work may involve many different tools.

Common tools include:

- Belt knives
- Safety knives
- Hook knives
- Stanley-type knives
- Skiving knives
- Trimming knives
- Spare blades
- Blade disposal box
- Tape measure
- Steel rule
- Straight edge

- Square
- Chalk line
- Marker pen or chalk
- Belt clamps
- Pulling clamps
- Hand rollers
- Stitcher rollers
- Pliers
- Hammers
- Spanners
- Sockets
- Screwdrivers
- Scrapers
- Buffing tools
- Angle grinders
- Wire brushes
- Cleaning cloths
- Solvent containers
- Adhesive brushes
- Vulcanising press equipment
- Temperature probes
- Control boxes
- Extension cables

The tool must suit the job. Making do with the wrong tool is a common cause of injury and poor-quality work.

5. Tool Inspection Before Use

Tools should be checked before use.

Before starting work, inspect:

- Knife handles
- Blade condition
- Blade security
- Grinders and guards

- Buffing wheels
- Cables and plugs
- Battery tools
- Extension leads
- Belt clamps
- Hand tools
- Measuring tools
- Press cables
- Control boxes
- Hoses
- Connectors
- Lifting points

Do not use damaged tools.

Examples of unsafe tools include:

- Loose knife blade
- Cracked handle
- Damaged grinder guard
- Wrong disc fitted
- Damaged electrical cable
- Broken plug
- Worn buffing wheel
- Bent straight edge
- Damaged belt clamp
- Missing insulation
- Exposed wires

A poor tool can make a simple job dangerous.

6. Work Area Setup

Before cutting or preparing a belt, set up the working area properly.

Check:

- Conveyor is isolated and locked off.
- Stored energy is controlled.

- Belt is clamped where required.
- Belt is supported.
- Work area is clean.
- Lighting is suitable.
- Tools are organised.
- Blades are controlled.
- Offcuts are removed.
- Cables are routed safely.
- No one is standing in the line of tension.
- Weather protection is available if needed.
- Splice materials are kept clean and dry.

A tidy work area helps prevent injuries and improves the quality of the splice.

7. Knife Types

Different knives may be used for different belt work.

Standard Belt Knife

Used for cutting, trimming and general belt preparation.

Hook Knife

Often used for controlled cutting, trimming and pulling through rubber material.

Skiving Knife

Used to remove or taper belt covers and prepare surfaces.

Safety Knife

Designed to reduce the chance of accidental blade contact. Some safety knives use guarded or retractable blades.

Utility Knife

Used for lighter cutting tasks, trimming packaging or small material preparation.

Heavy-Duty Cutting Knife

Used for thicker rubber or heavier belt preparation where suitable.

No single knife is right for every job. The knife must be suitable for the material, cut direction, thickness and working position.

8. Basic Knife Safety Rules

Knife work is one of the highest-risk parts of belt preparation.

Basic knife safety rules:

• Use the correct knife for the task.

• Use a sharp blade.

• Make sure the blade is secure.

• Cut away from your body.

• Keep your free hand away from the cutting line.

• Keep your body out of the line of the blade.

• Use controlled pressure.

• Do not rush.

• Do not cut towards another person.

• Keep blades covered when not in use.

• Never leave open blades on the belt, floor or structure.

• Dispose of used blades safely.

• Do not use a damaged knife.

• Stop if the cut feels uncontrolled.

HSE knife injury guidance supports assessing knife choice for the task and using safer knife designs where suitable.

9. Sharp Blades vs Blunt Blades

A blunt blade is dangerous because it needs more force.

More force can cause:

• Slipping

• Poor control

• Sudden blade movement

• Hand injuries

• Damage to the belt

• Poor-quality cuts

A sharp blade cuts more cleanly and with less effort.

However, a sharp blade is still dangerous and must be controlled properly.

Change blades when they become dull, damaged or difficult to control.

10. Hand Position and Body Position

Hand position is critical during belt cutting.

Always think:

Where will the knife go if it slips?

Keep your free hand:

• Behind the blade

• Away from the cutting line

• Away from the edge of the belt

• Away from pinch points

• Out of the path of the blade

Keep your body:

• Balanced

• Stable

• Out of the line of the cut

• Clear of stored tension

• Clear of other people

Do not cut across your body.

Do not pull a knife towards your stomach, legs or free hand.

11. Cutting Direction

Where possible, cut away from yourself.

Do not cut:

• Towards your body

• Towards your hand

• Towards your leg

• Towards another person

• Across an unstable surface

• On a moving or unsecured belt

• With people close to the cutting path

Some belt cuts require controlled pull cuts or specialist techniques. These should only be carried out by trained people using a safe method.

If the cut cannot be made safely, stop and change the setup.

12. Marking Before Cutting

Good cutting starts with good marking.

Before cutting:

1. Measure the belt.

2. Mark the centre line.

3. Mark the cut line.

4. Check the line is square or at the correct bias angle.

5. Confirm the splice allowance.

6. Confirm the take-up position.

7. Check the mark again before cutting.

Never cut a belt until the measurement and mark have been checked.

A poor cut can cause poor tracking, wasted belt and splice problems.

13. Cutting Conveyor Belt Material

Conveyor belt material can be difficult to cut because it may contain rubber covers, fabric plies, steel reinforcement or other materials.

When cutting:

• Make several controlled passes if needed.

• Do not force the knife too deeply.

• Keep the blade angle controlled.

• Keep the belt supported.

• Avoid twisting the knife.

• Keep hands away from the cut line.

• Replace the blade if it drags.

• Use the correct tool for the belt type.

Never assume all belts cut the same. Heavy rubber belt, PVC belt, chevron belt and steel cord belt all behave differently.

14. Skiving and Cover Removal

Skiving means removing or tapering material from the belt surface.

This may be done during:

• Splice preparation

• Mechanical fastener preparation

• Repair preparation

• Cover removal

• Ply exposure

• Edge preparation

The aim is to remove the correct amount of material without damaging the belt carcass.

When skiving:

• Mark the area clearly.

• Use the correct knife.

• Keep the blade angle shallow.

• Take controlled cuts.

• Do not cut into the fabric plies unless required by the procedure.

• Keep the surface clean.

• Stop if the ply starts to lift or tear incorrectly.

15. Protecting the Belt Plies

The plies are the strength layers in a fabric conveyor belt.

During preparation, avoid:

• Cutting too deep

• Pulling plies unevenly

• Damaging fabric

• Contaminating ply surfaces

• Over-buffing

• Leaving loose rubber

• Creating uneven steps

Damaged plies can weaken the splice and reduce belt life.

A good splice depends on clean, controlled preparation.

16. Blade Changing and Blade Disposal

Blade changing must be controlled.

When changing blades:

• Use the correct replacement blade.

• Retract or cover the blade where possible.

• Keep fingers away from the sharp edge.

• Do not leave old blades loose.

• Put used blades into a sharps container or approved blade bin.

• Do not put loose blades in pockets, toolboxes or rubbish bags.

• Check the new blade is secure before use.

Loose used blades are a serious hazard.

17. Grinder and Buffing Tool Safety

Grinders and buffing tools are used to prepare belt surfaces.

They may be used for:

• Removing rubber

• Cleaning surfaces

• Preparing repair areas

• Buffing splice surfaces

• Removing contamination

• Tapering edges

Risks include:

• Eye injury

• Dust

• Noise

• Vibration

• Burns

• Tool kickback

• Flying particles

• Fire risk

• Damage to belt plies

• Damaged discs or wheels

Before using a grinder or buffing tool:

• Check the tool.

• Check the guard.

- Check the disc or wheel.
- Confirm the speed rating.
- Check cables and plugs.
- Wear eye protection.
- Wear face protection where required.
- Wear hearing protection where required.
- Wear respiratory protection where required.
- Keep both hands on the tool.
- Keep sparks away from flammable materials.
- Do not over-buff into the carcass.

18. Buffing Quality

Buffing is not just about removing material.

Good buffing should:

- Remove contamination
- Create a suitable bonding surface
- Avoid burning the rubber
- Avoid polishing the surface
- Avoid damaging fabric plies
- Avoid leaving loose material
- Produce an even prepared area

Poor buffing can cause bonding failure.

Over-buffing can damage the belt carcass.

Under-buffing can leave contamination or poor bonding surfaces.

19. Hand Rollers and Stitcher Rollers

Hand rollers and stitcher rollers are used to press materials together during repairs and splice building.

They help:

- Remove trapped air
- Improve contact between layers
- Press rubber into place
- Improve bonding
- Flatten repair materials

• Control edges

Use firm, even pressure.

Work from the centre outwards where possible to push out trapped air.

Keep rollers clean. Dirty rollers can contaminate the splice.

20. Belt Clamps and Holding Tools

Belt clamps are used to hold and control the belt.

They may be used during:

• Belt cutting

• Belt replacement

• Splicing

• Pulling-in work

• Tension control

• Belt alignment

• Emergency repair

Before using belt clamps:

• Check the clamp rating.

• Check clamp condition.

• Check bolts, jaws and surfaces.

• Make sure the belt is gripped evenly.

• Do not overload the clamp.

• Keep people out of the line of tension.

• Use a safe pulling method.

• Never rely on damaged clamps.

21. Solvent and Cleaning Tool Control

Cleaning is part of good belt preparation.

Cleaning may involve:

• Cloths

• Approved solvents

• Scrapers

• Brushes

• Cleaning pads

• Containers

• Disposable wipes

Basic rules:

• Use only approved cleaning products.

• Read the safety data sheet.

• Keep containers closed when not in use.

• Use ventilation.

• Keep away from flames, sparks and hot surfaces.

• Do not soak the belt.

• Let surfaces dry properly.

• Keep cleaning cloths controlled.

• Dispose of waste correctly.

Contamination can ruin a splice.

22. Vulcanising Press Tool Safety

Vulcanising press equipment may include:

• Platens

• Beams

• Airbags

• Pressure bags

• Bolts

• Hoses

• Control boxes

• Temperature probes

• Power cables

• Cooling hoses

• Release cloths

• Packing plates

Before use:

• Inspect all equipment.

• Check cables and connectors.

• Confirm voltage and phase.

• Check pressure requirements.

• Check temperature settings.

• Check platen size.

• Keep hands clear when tightening beams.

• Use correct lifting technique.

• Use heat protection when required.

• Allow cooling before dismantling.

Only trained and competent people should set up and operate vulcanising equipment.

23. Tool Storage and Control

Tools should be stored and controlled properly.

Good tool control means:

• Knives are sheathed or retracted.

• Blades are stored safely.

• Used blades go into a sharps bin.

• Grinders are stored with discs protected.

• Cables are coiled safely.

• Measuring tools are protected.

• Solvents are sealed.

• Adhesives are stored correctly.

• Press parts are kept clean and dry.

• Tools are counted before restart.

Before the conveyor is returned to service, check that no tools, blades, offcuts or materials have been left on the belt or structure.

24. Good Working Habits

Good belt technicians develop safe habits.

Good habits include:

• Stop and think before cutting.

• Keep hands clear.

• Keep tools clean.

• Change dull blades.

• Measure twice before cutting.

• Keep the splice area clean.

• Control dust and contamination.

• Keep blades covered.

• Keep the work area tidy.

• Communicate with the team.

• Stop if something feels wrong.

The best technicians are not the fastest cutters. They are the most controlled and consistent.

25. When to Stop Work

Stop work if:

• The conveyor is not isolated.

• Belt tension is not controlled.

• The belt is not clamped correctly.

• The knife feels unsafe.

• The blade is slipping.

• The tool is damaged.

• The grinder guard is missing.

• PPE is not suitable.

• The work area is unsafe.

• The splice area is contaminated.

• The wrong materials are being used.

• You are unsure of the method.

• People are standing too close.

• The task has changed.

Stopping work to check is the correct decision.

Practical Exercise

Use a belt sample, training bench, conveyor photo or controlled workshop area and complete the following exercise.

1. Identify Five Tools Used in Belt Work

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2. Identify Five Types of PPE

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3. Inspect a Knife Before Use

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4. Explain Why a Blunt Blade Is Dangerous

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5. Show a Safe Hand Position

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6. Mark a Straight Cut Line

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7. Explain How to Dispose of Used Blades

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8. Inspect a Grinder or Buffing Tool

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9. Explain Why Buffing Quality Matters

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10. List Three Reasons to Stop Work

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Knowledge Check

Question 1

Why is PPE important during conveyor belt work?

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Question 2

Why should tools be inspected before use?

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Question 3

Why is a blunt knife dangerous?

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Question 4

Where should your free hand be when cutting?

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Question 5

Why should you think, “Where will the knife go if it slips?”

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Question 6

Why should a belt be marked before cutting?

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Question 7

How should used blades be disposed of?

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Question 8

Name three risks from grinders and buffing tools.

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Question 9

Why should belt plies be protected during preparation?

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Question 10

What is the purpose of a hand roller or stitcher roller?

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Question 11

Why are belt clamps important?

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Question 12

What should you do if a tool feels unsafe or the cut feels uncontrolled?

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Self-Assessment

Tick each statement once you understand it.

- I can identify common conveyor belt tools.
- I understand why PPE is important.
- I understand that PPE does not remove the hazard.
- I can inspect a knife before use.
- I understand why blunt blades are dangerous.
- I can describe safe hand position during cutting.
- I understand why the cutting direction matters.
- I understand why the belt should be marked before cutting.
- I understand basic skiving safety.
- I understand why belt plies must not be damaged.
- I understand basic grinder and buffing tool safety.
- I understand why used blades must be disposed of safely.
- I understand why tools must be controlled before conveyor restart.

• I know when to stop work and ask for help.

LEARNER SIGNATURE _____ DATE _____

Module Summary

Conveyor belt work involves sharp tools, heavy materials, dust, heat, pressure and awkward working positions.

The correct tool must be selected, inspected and used with control. PPE must be suitable for the task, but it does not replace safe working methods. Knife work should be slow, controlled and planned. The worker must keep hands and body out of the blade path and stop if the cut feels unsafe.

Good tool control improves safety, splice quality and long-term belt performance.

This module provides the foundation for practical belt preparation, surface cleaning and splice work.

Learner Completion Record

Learner: _____ Date: _____

I confirm I have completed the learning activities and understand that this online workbook alone does not authorise practical knife or powered-tool work.

Learner signature: _____