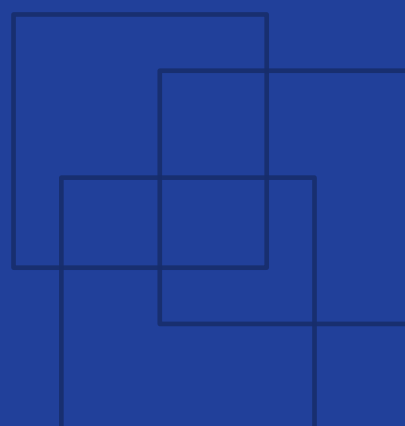




International  
Labour  
Organization

# Inspecting materials

Storeroom operations



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# Factory Improvement Toolset

The Factory Improvement Toolset (FIT) is an innovative self-facilitated, activity-based learning approach designed by the International Labour Organization (ILO) to create more decent and sustainable employment. FIT supports manufacturers in global supply chains to improve productivity, competitiveness and working conditions by upgrading production systems and factory practices.

FIT has been developed to be a sustainable, time- and cost-efficient option for supporting factories to enhance productivity through improved business practices and working conditions. FIT focuses on areas of production improvement and actions to be taken specific to each participating factory. It can be utilized as stand-alone learning tools or to complement other training programmes.

With each module lasting no more than 2.5 hours, FIT enables factories to train personnel, whilst minimizing interference with production realities. The easy-to-use methodology makes it possible to rapidly scale the implementation to reach a large cohort of trainees across multiple production facilities.

Working in small groups, participants review real-life situations and engage in discussions to determine improvements to be made in factory without an external trainer or specialist. This self-facilitated, activity-based and highly participatory learning approach positions participants as both student and teacher and makes the toolset self-tailored to the needs and interests of each group.

## About this module

This FIT module on Inspecting materials is a training for garment manufacturers to improve storeroom operations. Participants will work on inspecting materials in a more detailed, systematic way. This module takes about 2 hours to complete.

## Upon completion of the training, participants should have:

- Learnt to use the 4-point system to inspect fabric defects.
- Learnt how to use this system to make the reject/accept decision.
- Discussed different types of fabric tests to verify fabric quality.

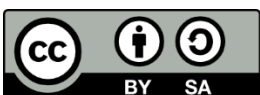
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The **Factory Improvement Toolset** of the **International Labour Organization (ILO)** are developed and provided by the ILO's **Enterprises Department**.

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# Guidelines for successfully using the training tool

## Read out-loud

The FIT tool is designed for participants to take turns reading the instructions in the modules out loud to the group. At least one member of the group should be selected in the beginning of the session to take this responsibility.

## Work as a group

Always work in groups of 5-7 during a FIT session. The programme will not be successful if participants work independently or do not collaborate with each other.

## Be active

Encourage everyone in the group to actively contribute to the discussion. Ensure that no group member dominates the discussion or does not participate at all.

## Monitor the time

Select one member of the group to monitor the time for each activity and remind the group when it is time to move to the next exercise.

## Complete the action plan

Complete the action plan at the end of the session. This will help ensure that FIT results in improvements in the factory. Review the plan a while after the session to make sure that actions in the plan has been completed accordingly.

# Icons

A set of icons is used throughout the modules to provide easy to recognize reference points for different tasks within each session and activity.



## Read out loud

One member of the group should read out loud to the rest of group.



## Knowledge link

Knowledge and skills are linked to other FIT learning resources and support.



## Time allotted

Indicates how much time each sessions and activity should take.



## Supplies needed

Indicates that supplies may be necessary to complete the session.



## Begin step-by-step instructions

Indicates that the step-by-step instructions for an activity are beginning.



## Think about it

Indicates additional information for the participants to think about.

# Measuring your performance

Measuring operational efficiency is a key aspect of running a productive factory. The box(es) below guides you in understanding which measurement indicator(s) can be used to measure and evaluate the performance of your factory in relation to the topics covered in the FIT series on storeroom operations.

<b>Indicator 1</b>	<b>Space utilization (%)</b>
<b>Definition</b>	The proportion of space (floor + shelf surface) that is occupied by materials and other items (carts, machines, etc.) in your storerooms.
<b>Purpose</b>	To understand how efficiently space is used in your storerooms, and identify how you could improve storage efficiency while ensuring employees' safety. Both very low and very high space utilization is inefficient. It should not go above 85%.
<b>Calculation</b>	$\left( \frac{\text{\# surface occupied in sqm}}{\text{total surface of the stores in sqm}} \right) \times 100\%$ <p>Surface occupied = floor surface + shelf surface occupied by materials or others            Total surface = floor surface + shelf surface available in the stores            Shelf surface: e.g. a 3sqm shelf with 4 levels counts for 12sqm!</p>
<b>Frequency</b>	Calculate every 6 months, or once a year.
<b>Responsible</b>	Storeroom manager

<b>Indicator 2</b>	<b>Average material retrieval time (Mins)</b>
<b>Definition</b>	The average time (in minutes) that it takes for a storeroom worker to find, retrieve and prepare materials from the stores for issuing.
<b>Purpose</b>	To understand how well-organized and orderly your stores are (or how good your storage system is), and begin to identify how you could further improve organization and make storeroom operations faster and more efficient.
<b>Calculation</b>	Time how long it takes for a worker to locate, retrieve and prepare all items for a specific requisition. Record this for each requisition (trims and fabric separately) and calculate the average weekly, then monthly.
<b>Frequency</b>	Calculate monthly.
<b>Responsible</b>	Storeroom manager





Session 1

# Business case study

## Goals

**Preparing you for the type of discussions you will have with other group members throughout the learning module and understanding the benefits of being exposed to different perspectives.**

**Understanding better why inspecting materials systematically is important in the factory.**

# Session 1

## Overview



One member should read the full session out loud to the rest of group



15 minutes



Learning manual, pens, markers and poster paper

A business case study presents a real-life situation for learners to reflect on and discuss with other group members. By discussing the case, students learn from others' ideas and perspectives, and develop an understanding of the topic at hand within the workplace.



One group member reads the case study out loud



The whole group discusses the case study



Everyone develops a deeper understanding of the topic

# Activities

Activity

1



15 minutes

## Case study review and respond

The case study below presents a situation that could happen in real life.



### Instructions:

- 1) As a group, listen to one member read the case study below while following along in your learning module.

Sita is a new storeroom manager at the HS garment factory. She has spotted several problems. First, the factory does not carry out any inspection of the new materials delivered to the stores. So, defects are first noticed during cutting or sewing, when it is too late and whole pieces have to be thrown away. Secondly, the factory does not test fabric to see whether it is up to buyers' quality standards. So, sometimes, shipments of completed garments that are not defective are rejected because they shrink or lose colour too quickly. This wastes workers' time, and makes the factory lose a lot of money, as fabric is very expensive.

Sita decides to make some changes. First, she sets up an inspection unit and teaches workers how to use the "4-point fabric inspection system". Then, she talks with merchandising to better understand the buyers' quality standards for fabric. Based on this, she decides that the inspection unit will also carry out shrinkage, colour fastness, and strength tests on fabric.

Now that fabric is inspected right after receiving materials, defects can be identified on time, and defective fabric rolls are sent back to the suppliers. The buyers are also happier with the quality and start placing more orders, as the shipments now all meet their criteria. This helps the factory gain a lot of time and avoid fabric waste.

- 2) Together, discuss Sita's situation by answering the three questions in table 1 on the next page.

**Table 1. Questions about Sita's situation**

1. What problems has Sita identified? What impact do these problems have on the factory and its workers?

2. What does Sita do or change in order to solve these problems?

3. What are the results of Sita's solutions for the factory and its workers?

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## Session 2

# Learning about the topic

### Goals

**Discussing and understanding the inspection process.**

**Learning to use the 4-point inspection system to record fabric defects.**

**Learning to use the 4-point inspection system to make the decision to accept or reject a roll of fabric.**

**Identifying and understanding different common types of fabric testing.**

# Session 2

## Overview



One member should read the full session out loud to the rest of group



90 minutes



Learning manual, pens, and markers

This training module aims to help you improve the way your storerooms operate by focusing on the inspection of incoming materials. Inspecting materials is very important for quality and productivity, as it helps you reduce waste by identifying defects before production starts. Throughout this module, you will go through the three steps of inspection below.

**Recording** fabric defects

**Accepting / rejecting** the fabric

**Testing** accepted fabric

First, you will discuss your inspection process, and why it is important in the stores. Then, you will learn how to use the 4-point inspection system to record fabric defects and make the decision to accept or reject the fabric. Finally, you will discuss different fabric testing methods.



# Activities

Activity

## 2a



20 minutes

## Inspecting materials

After materials have been received, unloaded and tagged, and before being stored, new materials need to be **inspected**. In this activity, you will discuss the inspection process and its importance.



### Instructions:

- 1) Together, discuss the five questions in table 2 below. Then, have a participant read aloud the text box at the bottom of the page.

Table 2. Inspecting materials

<b>What?</b>	What are the things to check / inspect during an inspection (fabric <u>and</u> trims)?
<b>Who?</b>	Who is responsible for or involved in your inspection system?
<b>When?</b>	Why should inspection take place after receiving, before storage?
<b>Why?</b>	Why is it so important to carry out materials inspection?
<b>How?</b>	Is there any standardized inspection system in place in your factory? Is there clear criteria for accepting and refusing materials?



You should **randomly inspect** at least 10% of new materials! If a problem arises in a specific material / fabric, inspect 10% more of that material or fabric type.



After inspection, accepted materials are stored appropriately. To learn more about this, ask your facilitator for the “**Storing materials**” module!

Activity

# 2b



25 minutes

## Recording defects

The **4-point system** is often used for visual fabric inspection. Points are assigned for every defect found in the fabric. This helps you record why type of defects are found during inspection, and how many. In this activity, you will learn how to use the 4-point system.



### Instructions:

- 1) Together, read through the four steps in table 3 below.
- 2) Together, look at the scenario in table 4. Then, together, use the 4-point system to fill in the second line in table 5 and find the total number of points for Lot # 73694. An example has been provided to guide you for Lot # 43485, with explanations under the table.

Table 3. The 4-point system

- **Step 1: Assign** points for each defect.  
Points are assigned in function of the length / width of each defect and each hole.
- **Step 2: Record** defect points using a 4-point inspection form.
- **Step 3: Calculate** the number of defect points per 100 square yard.  
 $\text{Points} / 100 \text{ square yards} = (\text{Total points} \times 36 \times 100) / (\text{Fabric width} \times \text{Fabric length})$
- **Step 4: Decide** whether to accept / reject the fabric roll.  
Many factories allow up to 40 points per 100 square yards.

Table 4. Scenario

**Scenario:** A fabric roll (120 yards long, 46 inches wide) contains the following defects.

- 4 stains up to 3 inches long
- 3 abrasion marks between 3 and 6 inches wide
- 2 floats between 6 and 9 inches wide
- 1 oil stain over 9 inches long
- 1 hole over 1 inch

Points are assigned to each defect/hole in the following manner:

Size of defect (width/length)	Point
Up to 3 inches	1
3~6 inches	2
6~9 inches	3
Over 9 inches	4

Size of hole (area size)	Point
Up to 1x1 inch	2
Over 1x1 inch	4



Activity

# 2c



25 minutes

## Rejecting or accepting

Based on the 4-point system, you can make an informed decision about whether or not to **reject** the fabric roll. In this activity, you will learn how to use points to make this decision.



### Instructions:

- 1) Do you remember the four steps of the 4-point system? Together, read through the four steps again in table 6 below.
- 2) Together, discuss the two questions in table 7. Solutions are at the bottom of the page.

Table 6. The 4-point system

- **Step 1: Assign** points for each defect.
- **Step 2: Record** defect points using a 4-point inspection form.
- **Step 3: Calculate** the number of defect points per 100 square yard  
 $\text{Points} / 100 \text{ square yards} = (\text{Total points} \times 36 \times 100) / (\text{Fabric width} \times \text{Fabric length})$
- **Step 4: Decide** whether to accept / reject the fabric roll.  
Usually, up to 40 points per 100 square yards is acceptable.

## Table 7. Rejecting / Accepting

**Step 3:** What was the total number of points found in step 2 (the one that you filled in on the form on the preceding page)? Total points = \_\_\_\_\_

Now, based on your results in step 2, fill in the formula below.

$$(\text{_____} \times 36 \times 100) / (46 \text{ inches} \times 120 \text{ yards}) = \text{_____} \text{ points} / 100 \text{ sq. yds.}$$

**Step 4:** Based on your results in step 3, would you accept or reject this roll of fabric? Circle the right answer below.

Accept - Reject



After making the decision to accept or reject materials, you can use colour coded tags/stickers to avoid mixing rolls up. For example:

- Green → Accepted materials
- Orange → Accepted, with defects
- Red → Rejected

Solutions: Total points in step 2 = 24; Step 3 → 15.65 pts/100 sq. yds.; Step 4 → Accept

Activity

2d



20 minutes

## Fabric tests

After inspecting the fabric for defects, you might want to carry out several **tests** on it to see whether it is up to your quality standards. In this activity, you will discuss different types of testing.



### Instructions:

- 1) Together, read through the different types of tests in table 8 and match each one with its correct description on the right.
- 2) Together, discuss the following questions:
  - Do you do any of these tests in your factory? Which ones do you think are most important and why?
  - Do you have clear criteria for passing / not passing a test?

Table 8. Fabric testing

Test name	Description
Shrinkage test	The fabric is washed then checked for shrinkage.
Colour fastness	Bowing and skewing in the textile yarns is calculated to check for alignment.
Colour variation	The fabric is rubbed, sometimes flexed and bent to check how fast it wears off.
Strength	The fabric is washed with a white piece of cloth attached to it, then the white piece is checked for coloration.
Abrasion resistance	The fabric is rubbed with another fabric, then the pills are counted.
Bow & skew	The fabric is creased with a weight, then recovery is timed.
Pilling	Stress is applied to the fabric or seams to check for resistance to tension, tearing, or bursting.
Crease recovery	Pieces of the fabric are cut from different lengths of the fabric, then assembled in a random order to check for colour consistency.

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## Session 3

# Action items

### Goals

**Summarizing and revising the new knowledge gained.**

**Identifying concrete applications of the new knowledge that benefit your factory.**

## Session 3

# Overview



One member should read the full session out loud to the rest of group



20 minutes



Learning manual, pens, and markers

Throughout this module, you gained new knowledge on how to inspect materials in a more detailed and systematic way.

**Recording fabric defects**

**Accepting / rejecting the fabric**

**Testing accepted fabric**

In this session, you will think of ways to apply your new knowledge to improve the way you record defects, accept or reject materials, and test fabric by reviewing best practices and drafting your own action plan.



A 4-point inspection form template is available online for you to print out and use in your own factory. To obtain it, contact your factory's FIT coordinator!

# Activities

Activity

# 3a



5 minutes

## Best practices checklist

In this activity, you will review best material inspection practices as a next step for evaluating your own and implementing improvements.



### Instructions:

- 1) Together, look at the list of best practices in table 9, and put a ✓ in the column on the right if you use these practices in your factory.

Table 9. Inspecting materials

Best practices	✓
1. There is a clear inspection system in place for fabric and trims. Inspection takes place after tagging, before storing.	
2. There is an inspection unit (team of inspectors / checkers) and a marked out inspection area with signage set up in the storerooms.	
3. At least 10% of all materials received is inspected.	
4. The 4-point inspection system is used to record fabric defects and to make the reject / accept decision.	
5. Fabric tests are conducted to verify fabric quality and whether it is up to standards.	

Activity

# 3b



15 minutes

## Your action plan

In this activity, you will think of ways to apply your new knowledge to improve material inspection in the stores by drafting your own action plan.



### Instructions:

- 1) Together, fill in the action plan (table 10) on the next page. Identify a key problem that you want to solve and write down the solutions you identified while working on this module.

**Table 10. Inspecting materials – Action Plan**

<b>Problem identified</b>				
<b>Solutions identified</b>	<b>Action(s) to be taken</b>	<b>Person responsible</b>	<b>By when?</b>	<b>How will improvements be measured?</b>

# Inspecting materials

The Factory Improvement Toolset (FIT) is an innovative self-facilitated, activity-based learning approach designed by the International Labour Organization (ILO) to create more decent and sustainable employment. FIT supports manufacturers in global supply chains to improve productivity, competitiveness and working conditions by upgrading production systems and factory practices.

FIT is being piloted in Asia under the regional Decent Work in the Garment Sector Supply Chains in Asia project funded by the Government of Sweden.

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