



# **SINGLE SAMPLING PLAN FOR NORMAL, TIGHT AND REDUCED INSPECTION USING MIL-STD 105D**

**Topic 1**



# Topic 1-

## Introduction to Single Sampling Plan

# Course Objectives

01

02

## Single Sampling Plan Concept

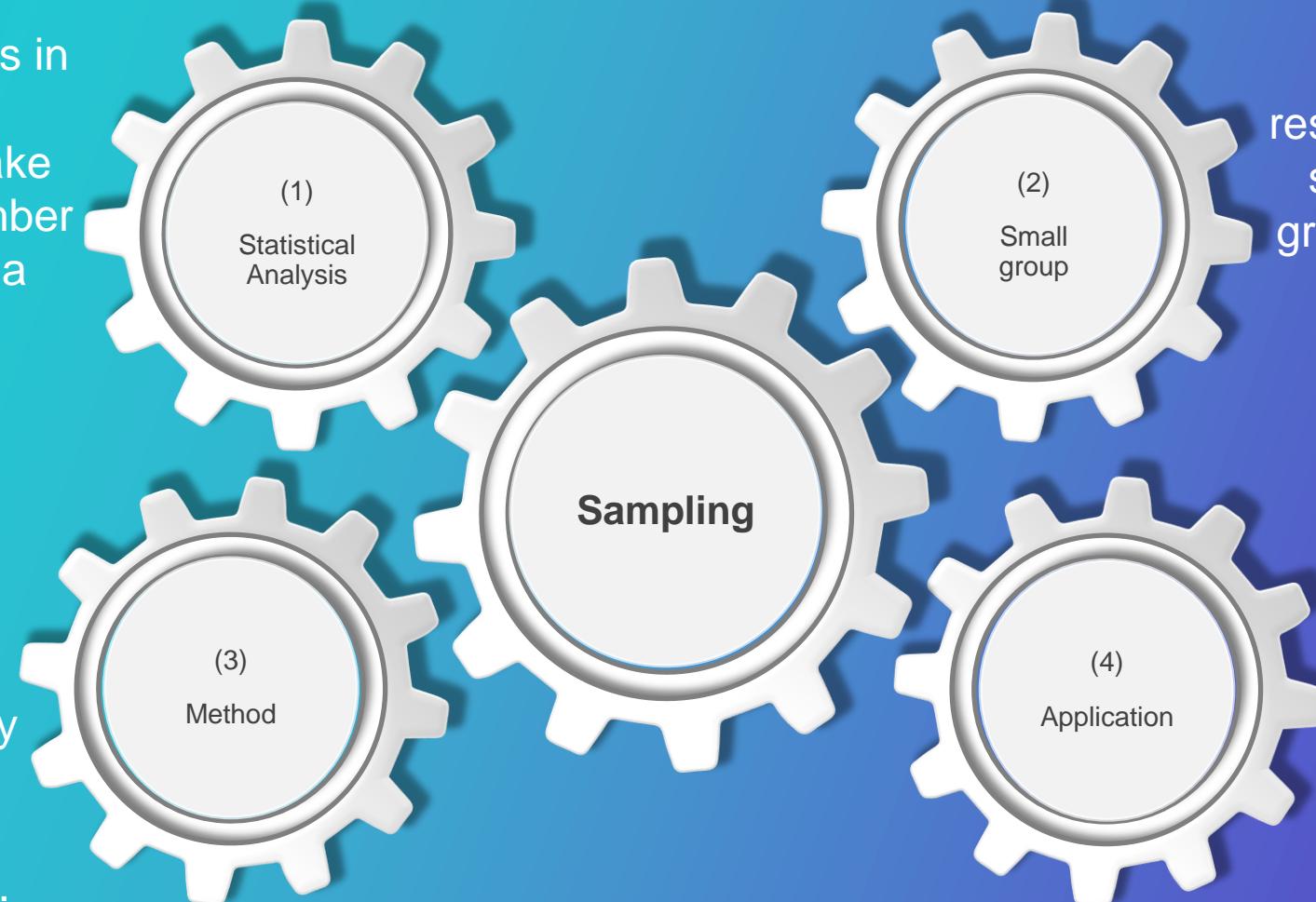
- Understand the basic concept of single sampling plan

## Single Sampling Plan Procedure

- Understanding the basic procedure to conduct a Single sampling plan

# What is sampling in manufacturing?

Sampling is a process in statistical analysis where researchers take a predetermined number of observations from a larger population.



The method of sampling depends on the type of analysis being performed, but it may include simple random sampling or systematic sampling.

Sampling allows researchers to conduct studies about a large group by using a small portion of the population.

Sampling is commonly done in statistics, psychology, and the financial industry.

# SINGLE SAMPLING PLANS



(1)

A sampling plan in which a decision about the acceptance or rejection of a lot is based on a single sample that has been inspected is known as a single sampling plan

(2)

Since the buyer takes the decision about the lot on the basis of a single sample, this sampling plan is a single sampling plan



(3)

A single sampling plan requires the specification of two quantities which are known as parameters of the single sampling plan. These parameters are

$n$  – size of the sample, and  
 $c$  – acceptance number for the sample.

# USING SINGLESAMPLING PLANS



**Step 4:** We take the decision of acceptance or rejection of the lot on the basis of the sample as follows:

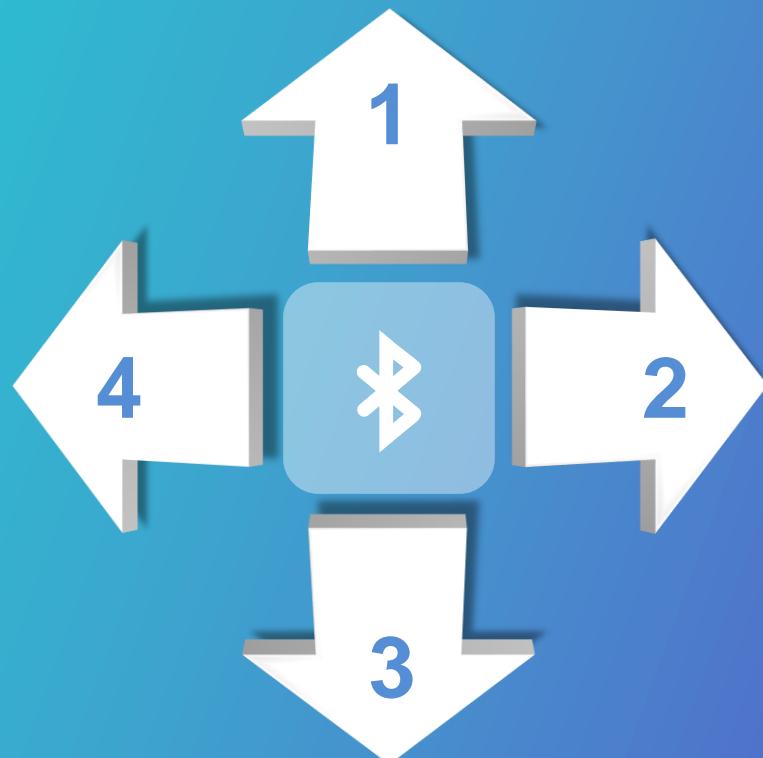
#### **Under acceptance sampling plan**

If the number of defective units ( $d$ ) in the sample is less than or equal to the stated acceptance number ( $c$ ), i.e., if  $d \leq c$ , we accept the lot and if  $d > c$ , we reject the lot.

#### **Under rectifying sampling plan**

If  $d \leq c$ , we accept the lot and replace all defective units found in the sample by non-defective units and if  $d > c$ , we accept the lot after inspecting the entire lot and replacing all defective units in the lot by non-defective units

**Step 1:** We draw a random sample of size  $n$  from the lot received from the supplier or the final assembly



**Step 2:** We inspect each and every unit of the sample and classify it as defective or non-defective. At the end of the inspection, we count the number of defective units found in the sample. Suppose the number of defective units found in the sample is  $d$

**Step 3:** We compare the number of defective units ( $d$ ) found in the sample with the stated acceptance number ( $c$ )

# LET'S LOOK AT AN EXAMPLE

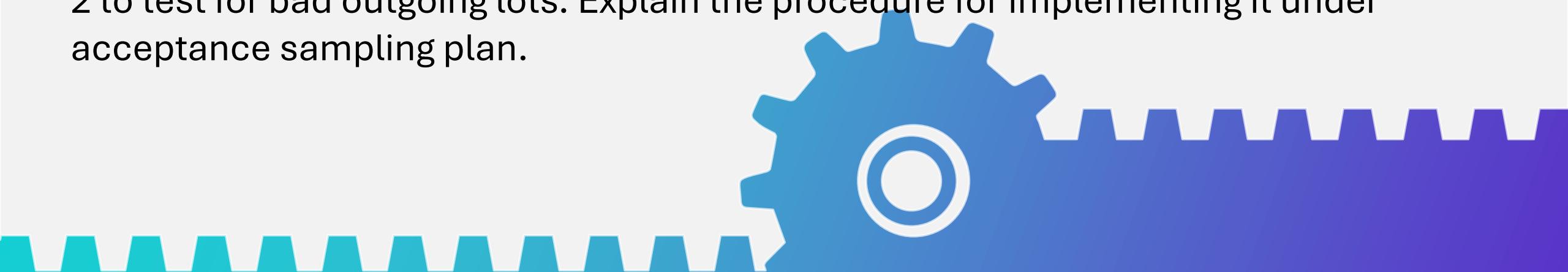
**Example 1** Suppose an electronic company produces earbuds in lots of 100 in a month. To check the quality of the lots, the quality inspector of the company uses a single sampling plan with  $n = 15$  and  $c = 1$ . Explain the procedure for implementing it.



**Solution:** For implementing the single sampling plan, the quality inspector of the company randomly draws a sample of 15 earbuds from each lot and classifies each earbuds of the sample as defective or non-defective. At the end of the inspection, he/she counts the number of defective earbuds ( $d$ ) found in the sample and compares it with the acceptance value ( $c$ ). If  $d \leq c$  ( $= 1$ ), he/she accepts the lot and if  $d > c$  ( $= 1$ ), he/she rejects the lot under the acceptance sampling plan. Under rectifying sampling plan, if  $d \leq c$  ( $= 1$ ), he/she accepts the lot by replacing all defective earbuds found in the sample by non-defective earbuds and if  $d > c$ , he/she accepts the lot by inspecting the entire lot and replacing all defective earbuds in the lot by non-defective earbuds.

# NOW YOU TRY

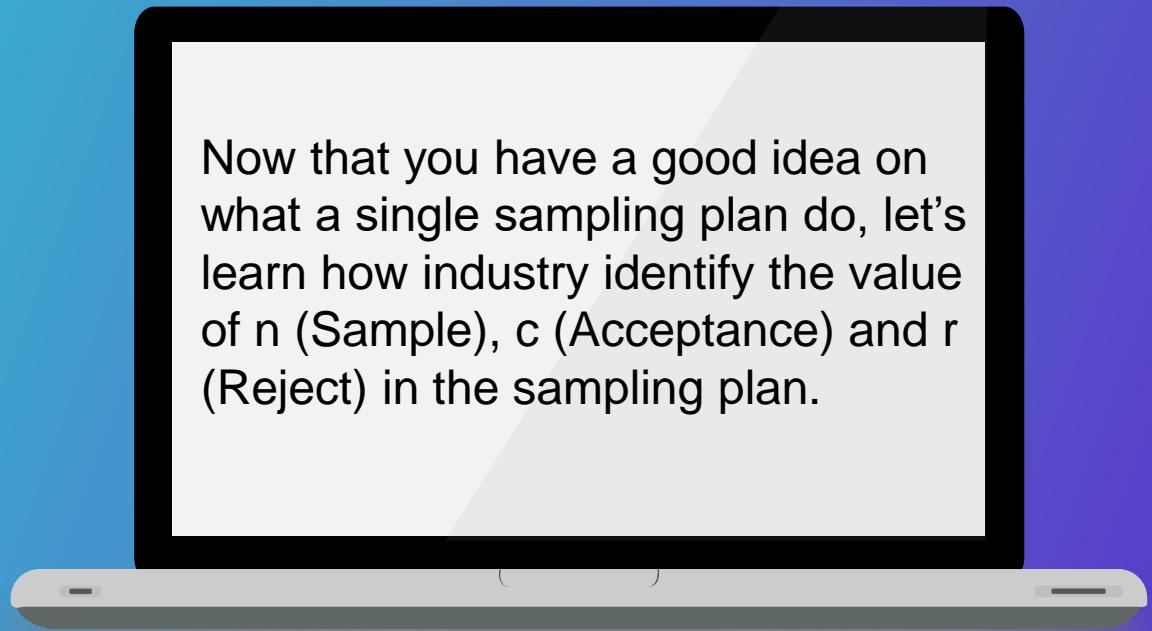
**Exercise 1** A manufacturer of portable storage drive produces lots of 1000 Portable Drive for January. A buyer uses a single sampling plan with  $n = 50$  and  $c = 2$  to test for bad outgoing lots. Explain the procedure for implementing it under acceptance sampling plan.



**Solution:** For implementing the single sampling plan,

- the buyer randomly draws a sample of 50 portable drive
- At the end of the inspection, the number of defective drive ( $d$ ) found in the sample are counted and compares it with the acceptance value ( $c$ ).
- If  $d \leq c$  ( $= 2$ ), the lot is accepted and if  $d > c$  ( $= 2$ ), the lot is rejected.

# Well done



Now that you have a good idea on what a single sampling plan do, let's learn how industry identify the value of  $n$  (Sample),  $c$  (Acceptance) and  $r$  (Reject) in the sampling plan.