

*Development of industry, Improvement of quality, accuracy, work efficiency*

# 5S in measuring equipment Ver.5.1

Measurement is very important to develop plants. I will show you examples of 5S which fit the field conditions. These make your measurement effective.



The Toyota Commemorative Museum of Industry and Technology 2005/2



Ford Rouge Plant 2005/9



Guangzhou Toyota Motor Co., Ltd. (GTMC)  
Engine Plant 2007/3

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# Preface

□ What is 5S in measuring equipment ?

■ **Seiri**

To get rid of unneeded and broken items.

■ **Seiton**

To organize the workplace.

■ **Seisou**

To clean carefully

■ **Seiketsu**

To keep clean

■ **Shitsuke**

To keep a custom of using carefully



This net protects measuring equipment from fall when earthquakes happen.

A cabinet of measuring equipment taken measures against earthquakes.

- Measuring equipment are indispensable to making products.
- 5S in measuring equipment has a great effect.

## The points of 5S in measuring equipment

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To keep accuracy

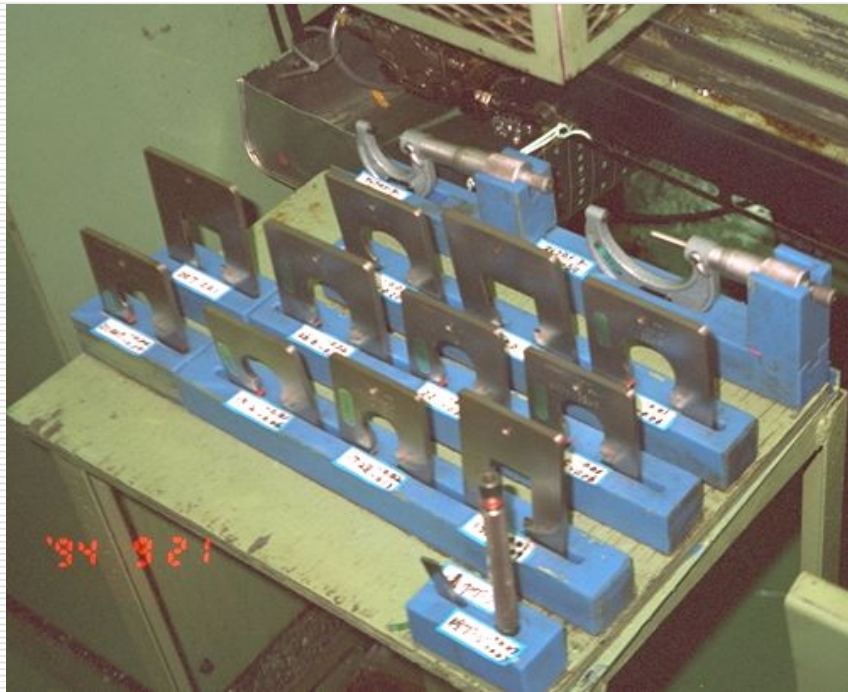
To work easily

The good look

These are the starting points for  
making products and  
ISO9000/TS16949.

# 1. Improvement of 5S in measuring equipment

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- 1.1 Organized 5S
- 1.2 Ideas of arrangement
- 1.3 Considering

All workers should put organized 5S technique to make and keep the 5S like this photo.

The Deming Prize –winning plant.

Place for measuring equipment

## *1. Characteristics of 5S in measuring equipment*

### 1.1 Necessity of organized 5S

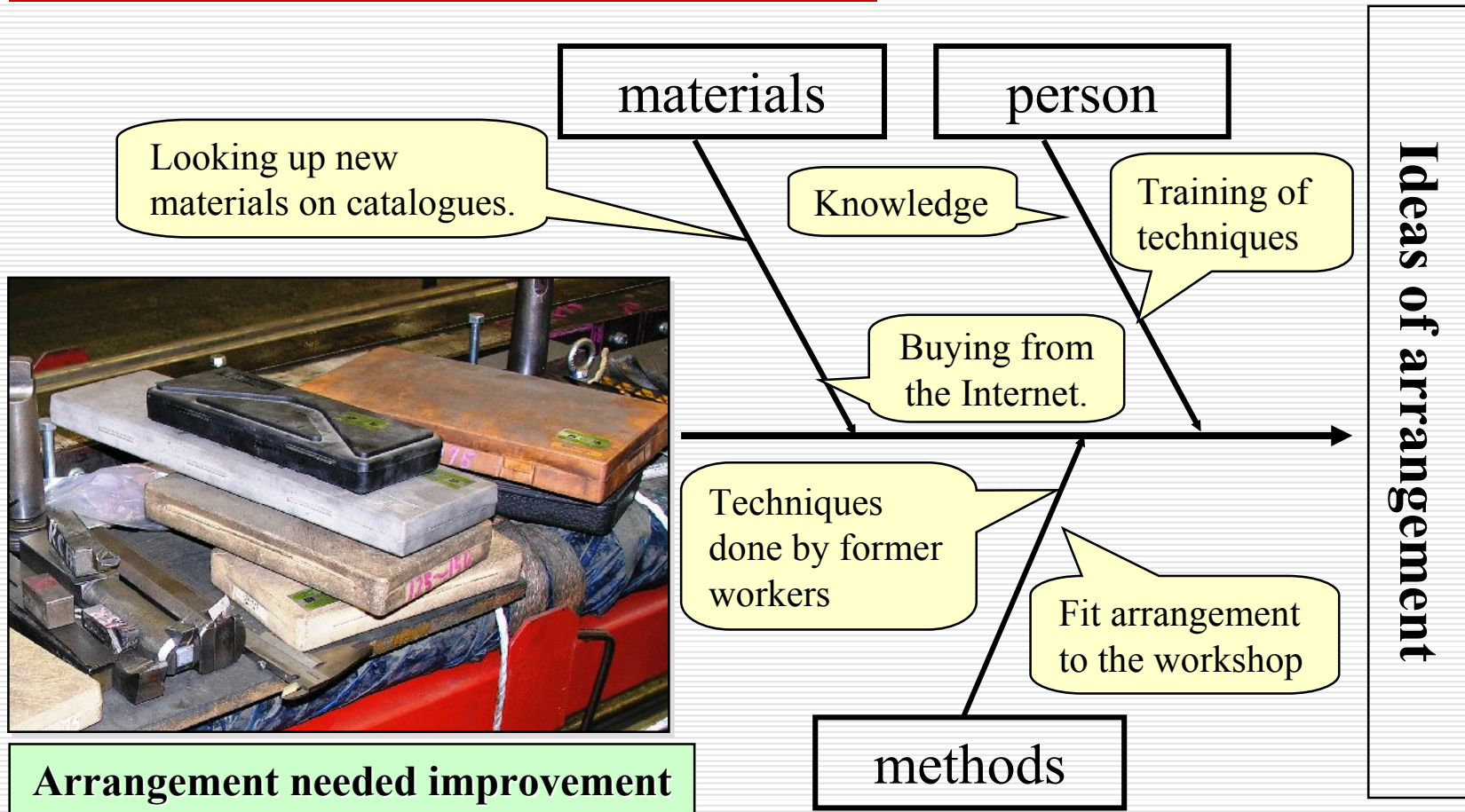
#### **Wrong 5S example.**



1. Measuring equipment are arranged neatly on white clothes while guests come.
2. The 5S has not been maintained.
3. These are wrong 5S. 5S needs techniques and organized practices.

# 1. Characteristics of 5S in measuring equipment

## 1.2 Ideas of arrangement



## 1. Characteristics of 5S in measuring equipment

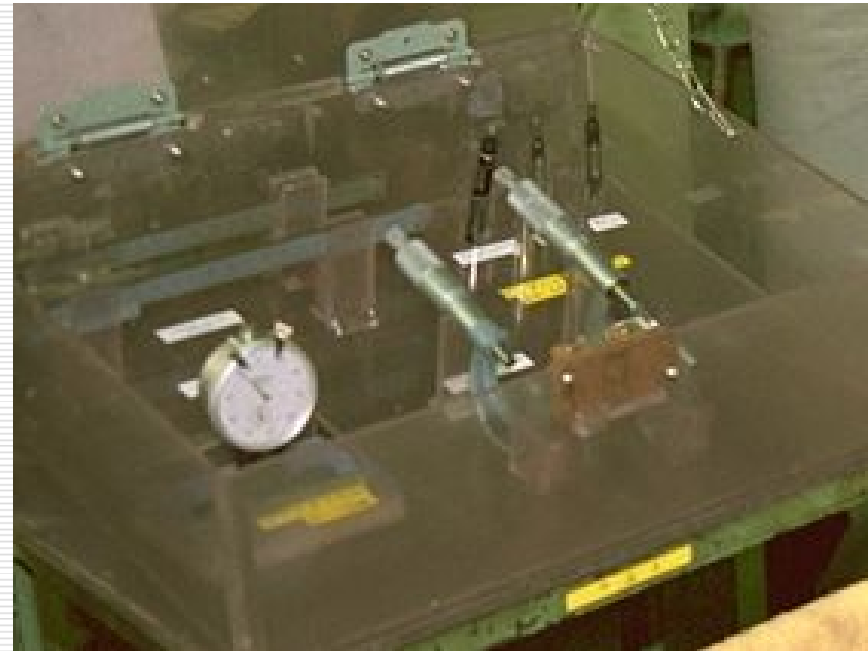
### 1.3 Considering

Not considered



1. Doing without thinking
2. Not noticing waste
3. Nobody teaches.

Considered

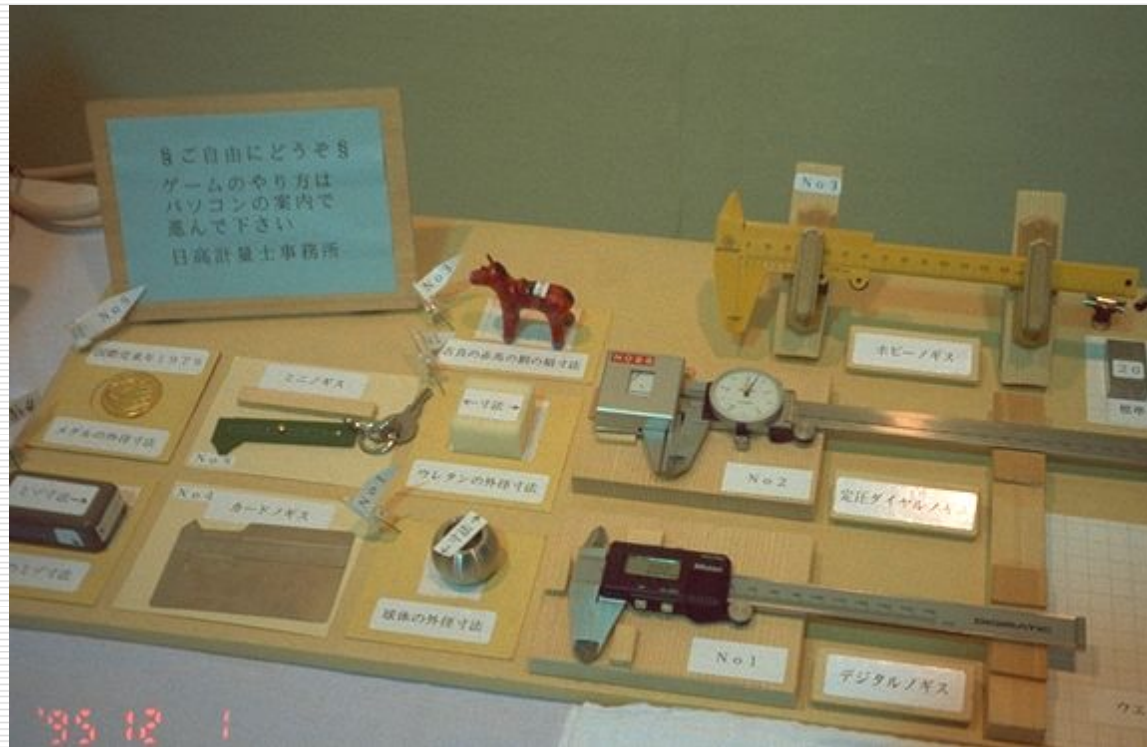


Improving when they got ISO9001

## 2. How to place measuring equipment.

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I will show you examples of arrangement of measuring equipment.



The 4th Aichi metrology and measurement exhibition in 1995.

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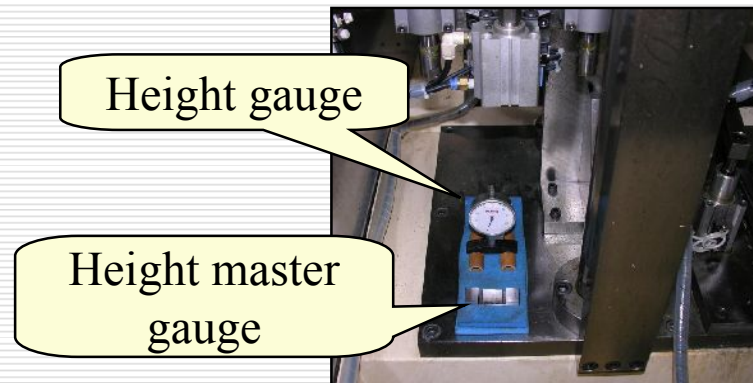
## 2. How to place measuring equipment.

### 2.1 placing single measuring equipment

	Placing a micrometer	Placing a micrometer on a manufacturing line.
Characteristics	Stable measurement	A short space of measurement time
Cleaning way	Clean the measurement part and the moving part with cloth.	
Notice	Do not clamp a micrometer too tight.	



An example of placing a micrometer.



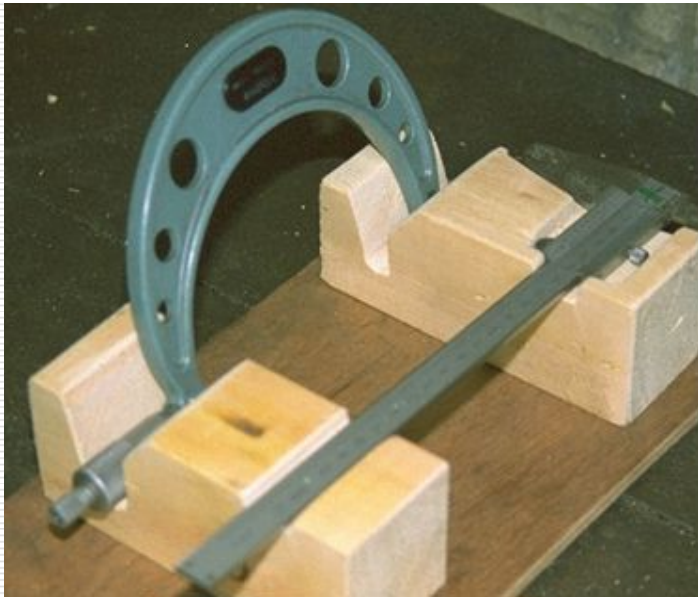
An example of placing a micrometer on a manufacturing line.

## *2.How to place measuring equipment.*

### 2.2 A few pieces of measuring equipment

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An example of placing a few pieces of measuring equipment on the line. Up to 5 pieces.



The stand is made by a skilled worker before painted.

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Characteristics  
It is easy to pick up  
equipment and measure.

The cleaning way  
Clean measuring parts,  
calibrations and the moving  
parts with cloth.

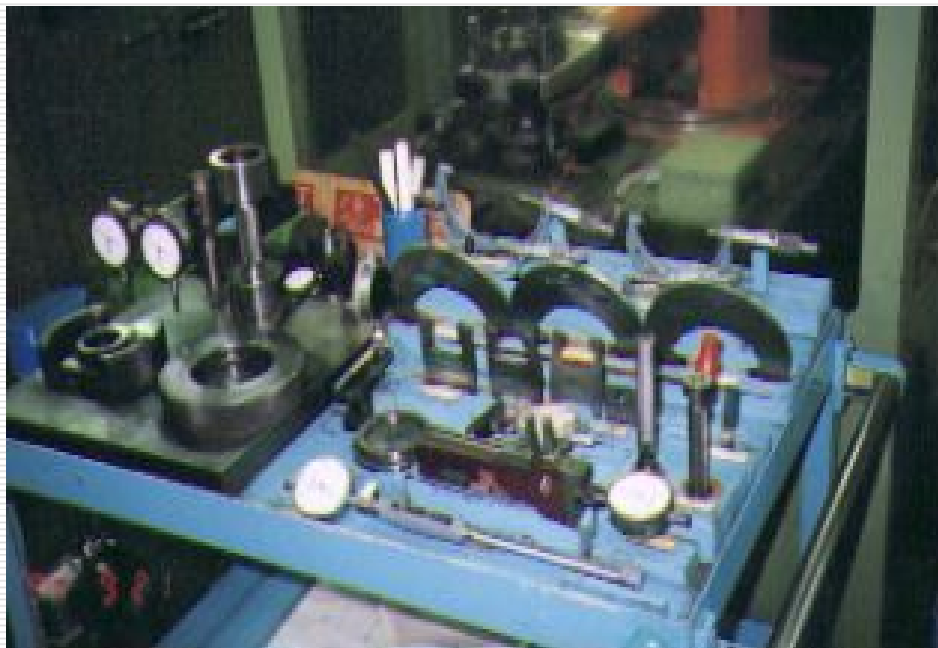
Notice  
Be sure to clean the  
measurement table.

## *2.How to place measuring equipment.*

### 2.3 Many pieces of measuring equipment

---

An example of measurement in the final process.



#### Characteristics

Measuring equipment is set in order. You can easily find the equipment you need.

#### The cleaning way

Sweep out the whole place to put on measuring equipment.  
Clean the whole gauges.

#### Notice

Be sure to put the measuring equipment on the appointed place.

## *2.How to place measuring equipment.*

### 2.4 Tow-stage type

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An example of tow-stage type

#### Characteristics

The fourth leg of this table is dislocated. It is useful to measure with many pieces of measuring equipment when you calibrate measuring equipment.

#### The cleaning way

Clean the frame, the revolving part of the equipment, calibrations with cloth.

#### Notice

When you put the measuring equipment on the stand, the handles face the users.

## *2.How to place measuring equipment.*

### 2.5 Placing in shelves

---

An example of keeping many pieces of measuring equipment such as a test workshop.



#### ❑ Characteristics

It costs so much to make a cabinet like this photo, but it is reasonable in all.

#### ❑ The cleaning way

Clean the equipment case and the shelves with broom and cloth.

Do not use an air blow.

#### ❑ Notice

Label the identifying numbers on the cabinet and measuring equipment and these cases.

## *2.How to place measuring equipment.*

### 2.6 Piling

An example of separation with wooden boards.



Not separated

Separated with  
wooden boards

#### ❑ Characteristics

It is stable and easy to take it out.

#### ❑ The cleaning way

Clean the shelves with broom and cloth.  
Do not use an air blow.

#### ❑ Notice

Label identifying numbers on both shelves and measuring equipment.

## *2.How to place measuring equipment.*

### 2.7 Electric measuring equipment

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An example of cabinet in a lab.



Characteristics  
Leads made into small loops are stable.

The cleaning way  
Clean with cloth.  
Do not use an air blow.

Notice  
Do not bend leads at right angles.

## *2.How to place measuring equipment.*

### 2.8 All kinds of measuring equipment

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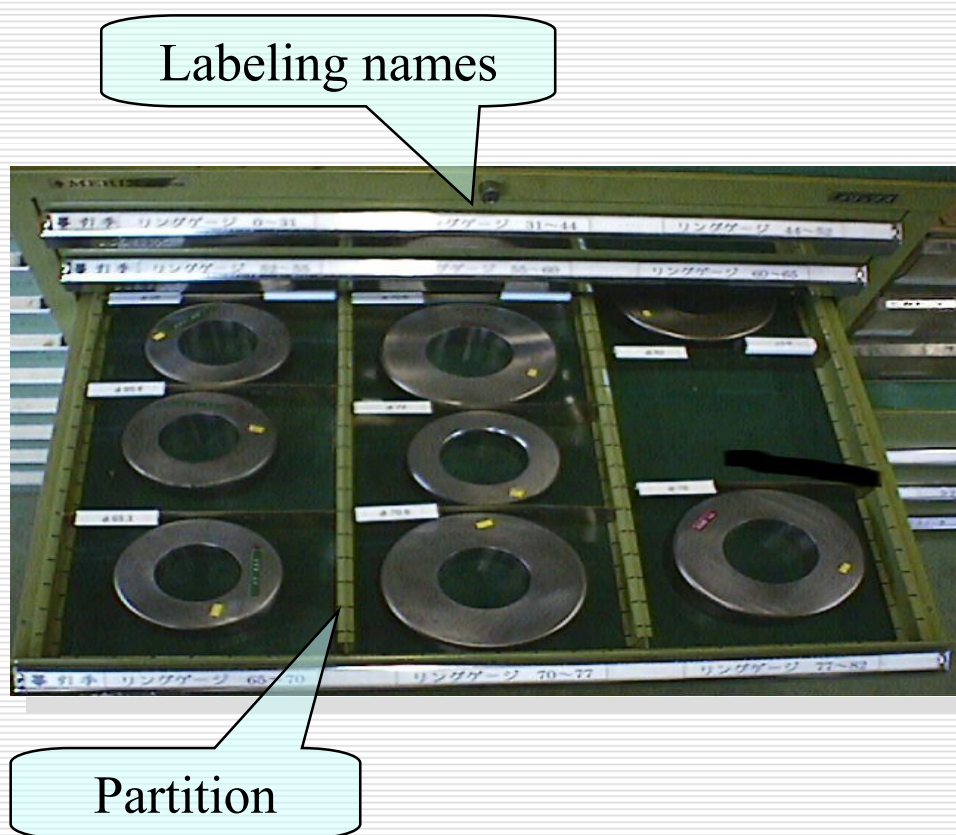
- Characteristics  
Clear arrangement.

- The cleaning way  
Clean the shelves, the equipment, the moving part of the equipment with cloth.  
Do not use an air blow.

- Notice  
Decide appropriate arrangement of measuring equipment with thinking over kinds, characteristics, frequency in use, and accuracy of measuring equipment.

## 2. How to place measuring equipment.

### 2.9 Using Vidoma (trade name?)



□ Characteristics  
Placing clearly, taking out easily, and putting easily.

□ The cleaning way  
Clean the inside of gauges and the surfaces to read the sizes with cloth.

□ Notice  
Use hard boards as partitions.

## 2. How to place measuring equipment.

### 2.10 Protecting from dust

An example of spreading the cutting powder, and the cutting oil over the measuring equipment.



Labeling  
the sizes.

A transparent acrylic case

Characteristics  
It can be kept accuracy.

The cleaning way  
Clean the cases and the  
measurement face with  
cloth.

Notice  
Do not forget to take  
the occurrence source  
measure.

## *2.How to place measuring equipment.*

### 2.11 Improving a magnet stand

---

Remove the part of magnet and fix measuring equipment on the surface plate.

Clamp



Characteristics  
It is effective to measure the same sizes.

The cleaning way  
Clean the part of the measurement point and the glass face with cloth.

Notice  
Fasten a clamp, firmly.  
If you do not do so, the data is error.

## *2.How to place measuring equipment.*

### 2.12 Tool type

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Drop easily !  
And break down.

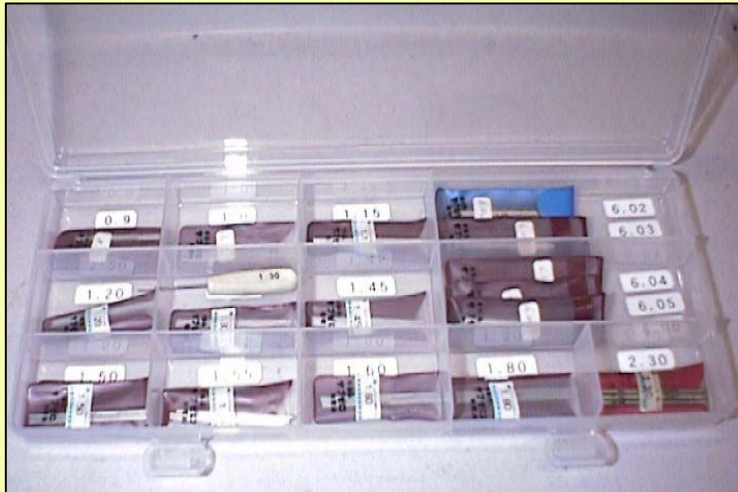
❑ Characteristics  
Small space for  
putting.

❑ The cleaning way  
Clean the frame, the  
measurement face, the  
revolving part with cloth.

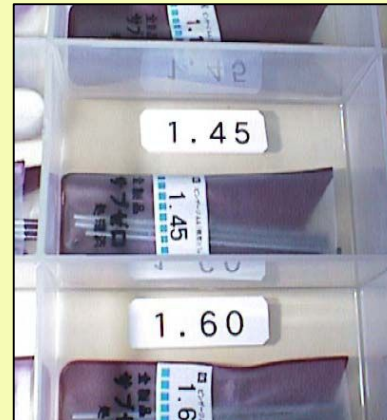
❑ Notice  
Measuring equipment  
is broken easily.

## 2. How to place measuring equipment.

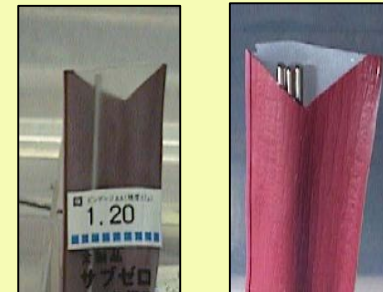
### 2.13 Pin gauge (single)



Using small boxes



Labeling sizes



Cutting the top of the case

❑ Characteristics  
Easily making  
space to put.

❑ The cleaning way  
Clean the oil dirty  
on cases with cloth.

❑ Notice  
Place pin gauges at  
the appointed places.

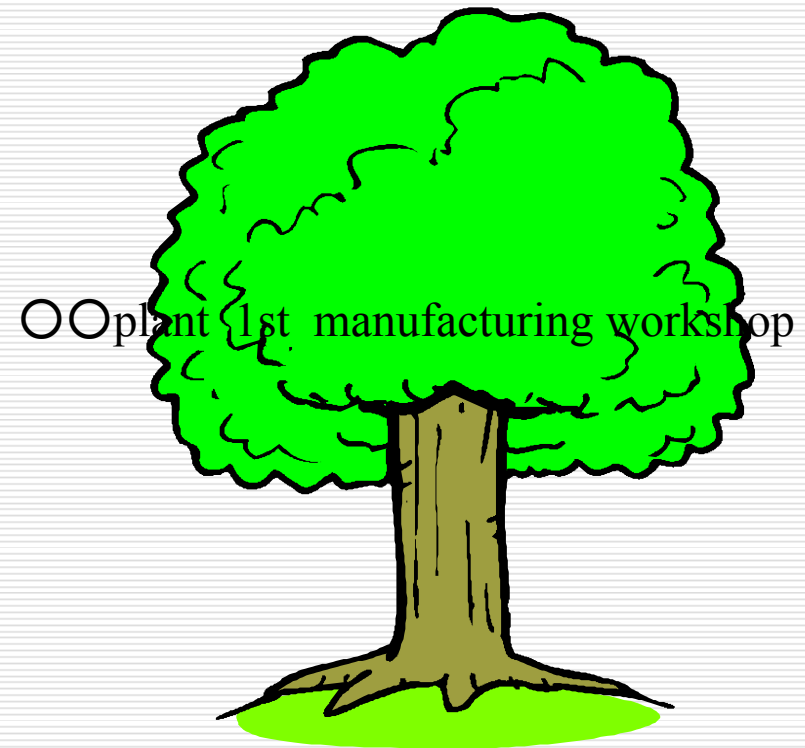
### 3. Steps of 5S in measuring equipment

## 3. Steps of 5S in measuring equipment

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3.1 Just 5S in measuring equipment, but...

3.2 Steps



Notice

Please change these steps to be suitable to your workshop when you use.

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### 3. Steps of 5S in measuring equipment

#### 3.1 It is just 5S in measuring equipment ,but....

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Well, your products are defective. They are too small.

Are your measuring equipment dirty, aren't they?

○○plant 1st manufacturing workshop



**,but it is important to do 5S.**

## 3. Steps of 5S in measuring equipment

### 3.2 1<sup>st</sup> step

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- Making an announcement about management policy and goal.
  - At Executive meeting, morning meeting, and by notices etc.
  - Implementing 5S fully
  - Reducing complaints and increasing work efficiency.
  
- Making a plan
  - cost            material、tools、personnel costs, training costs
  - member        group: 8~12 workers
  - term            4~12months
  - instructing    training individually
  - workshop      ○○plant 1<sup>st</sup> manufacturing workshop



## 3. Steps of 5S in measuring equipment

### 3.2 2<sup>nd</sup> step

- Bench mark (for every manufacturing line, every machine, every person)

- Records of the present 5S

- Fixed point photography

- Taking photos at the same point before and after the improvement.

- Making a list of unneeded items

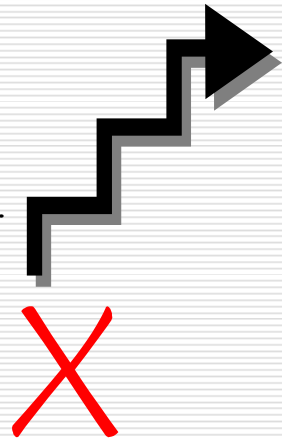
- Identifying unneeded items and defective products

- Making a total list of unneeded items and defective products

- Getting rid of unneeded items

- Eliminating defective products

- Removing unneeded items to a store house



Eliminate unnecessary items.

## 3. Steps of 5S in measuring equipment

### 3.2 3<sup>rd</sup> step

#### □ Check the process

- Role of measurement
- Effective arrangement to put and take out measuring equipment
- The Look good

#### □ Clean the process easily

- Specifying locations for cleaning tools near the work places.
- Easily taking waste out
- No care of getting accuracy of measuring equipment lower

#### □ Recording and using the records

- Quality check
- A history of trouble with the measuring equipment , etc.

Does it go well ?



- Quiet colors
- Stable placement
- Eliminating unneeded items

## 3. Steps of 5S in measuring equipment

### 3.2 4<sup>th</sup> step

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- Do cleaning

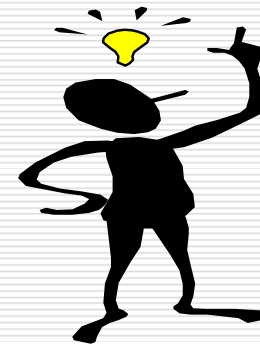
Cleaning changes processes.

- Decide the procedure by person

Decide to clean what part of the measuring equipment, when, how, and make papers with photos.

- Have cleaning tools

Dust cloth, cloth box, brooms, dust box



### 3. Steps of 5S in measuring equipment

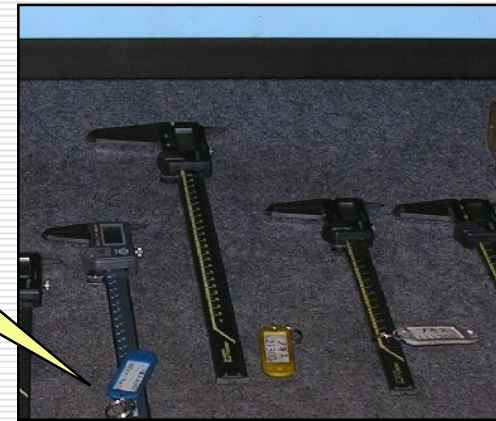
## 3.2 5<sup>th</sup> step

- ❑ Management of lending measuring equipment out.
- ❑ Putting measuring equipment name tags on each measuring equipment.

ex.: digital vernier caliper 200mm

- ❑ Making a board for putting measuring equipment name tags.
- ❑ A measuring equipment user put the equipment name tags on the board.

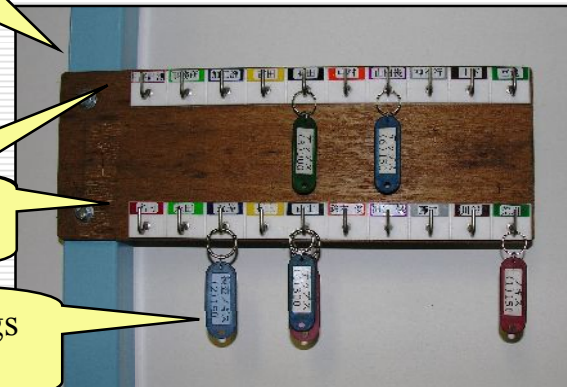
Measuring equipment name tag



Board putting name tags

User name

Measuring equipment name tags which are out on loan.



## 3. Steps of 5S in measuring equipment

### 3.2 6<sup>th</sup> step

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#### Patrolling on 5S for improvement

(There is an example which has been continuing 5S for 15 years.)

##### ■ goal

- Implementing 5S continually and fully

##### ■ member

- About 5 workers under manager, including office member (1)

##### ■ methods

- Frequency : three or four times /year
- Use of check lists, example 3KA
- Examining implemented 5S at a committee or personal instructive meeting after patrol

## 3. Steps of 5S in measuring equipment

### 3.2 7<sup>th</sup> step

- Examples of 5S competence in measuring equipment for each line , each machine , each person.

Measuring competence	5S competence	Total competence
<p>You are able to measure with the following measuring equipment which are in the process you are charged with and fill in check sheet.</p> <ul style="list-style-type: none"><li>• Vernier caliper</li><li>• Micrometer</li><li>• Dial gauge</li><li>• Plug gauge</li><li>• Caliper gauge, etc.</li></ul>	<p>You are able to do the following.</p> <ul style="list-style-type: none"><li>• cleaning of the measuring equipment.</li><li>• cleaning of the keeping places.</li><li>• check the condition of the measuring equipment.</li><li>• check the regular calibration label.</li></ul>	<ul style="list-style-type: none"><li>• You can teach how to use measuring equipment.</li><li>• You can teach 5S to other workers.</li><li>• You can instruct workers with data.</li><li>• You can report, tell, and talk to related workers.</li></ul>

# Postscript

## Just 5S of measuring equipment, but

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I found a thing when I studied measuring error (SN fraction). The dirt on measuring equipment has great influence on error. 5S of measuring equipment is one of the biggest factors in measurement techniques.

A manager who charges in quality guarantee passed without noticing dirty measuring equipment through the plant. Then I found that it is difficult for managers, even they are at high position, to notice something out of their special fields. We assume that we have known the roles and how to implement 5S of measuring equipment, but in fact many workers do not understand them.

I think that 5S is very important because 5S has an influence on quality and work efficiency. I have seen a lot of plants where workers have measured with dirty and damaged measuring equipment. Then they have produced defectives and work efficiency has been down. I think workers should put the techniques of 5S.

I show you typical 5S examples. I wrote this manual for improving 5S techniques in measuring equipment suited to every company. I would appreciate it if you would refer to this.

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## **5S in measuring equipment**

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## Achievements

Instructing appropriate measure control places (4)

Consulting of acquisition of ISO 9001 accreditation (10)

ISO9001 audit (52)

Consulting of acquisition of ISO 14001 accreditation (3)

QS-9000 audit (25)

ISO/IEC17025 Technical audit(12)

Coaching in business improvements (4)

Coaching for passing tests (Energy manager, Engineer)