

# MSA (Measurement System Analysis) Checklist

## Planning & Preparation

Ensuring the MSA is properly planned and the necessary resources and data are available.

### MSA Objective/Purpose

Write something...

### Process Description - What is being measured and why?

Write something...

### Number of Parts to be Measured (Sample Size)

Enter a number...

### Measurement Type (e.g., Continuous, Attribute)

Continuous

Attribute

### Measurement System Requirements (e.g., Precision, Stability)

- Precision
- Stability
- Linearity
- Resolution

### MSA Start Date

Enter date...

### MSA Completion Target Date

Enter date...

### Who is the MSA lead?

- Name 1
- Name 1
- Name 1

### Process Flow Diagram (if applicable)

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## Gauge Repeatability (GR&R) - Part 1

Focuses on the variation in measurements taken by a single operator using the gauge multiple times on the same part.

### Number of Operators Involved

Enter a number...

### Number of Parts Measured per Operator

Enter a number...

### Measurement Method Used (e.g., Direct, Vernier, Micrometer)

- Direct Measurement
- Vernier Scale
- Micrometer
- Caliper
- Other (Specify)

### Describe the part being measured (material, dimensions, specification)

Write something...

### Operator ID(s) involved in the GR&R study

Write something...

### Date of GR&R Study Execution

Enter date...

### Number of Readings Per Part, Per Operator

Enter a number...

### Was the Gauge Properly Calibrated Before the Study?

- Yes
- No
- N/A

## Gauge Repeatability (GR&R) - Part 2

Calculations and Analysis of the Gauge Repeatability component.

### Number of Repeats per Part

Enter a number...

### Number of Parts Measured

Enter a number...

### Average of All Readings (Operator 1)

Enter a number...

### Standard Deviation of Readings (Operator 1)

Enter a number...

### Mean Deviation for Operator 1

Enter a number...

### Operator 1 Data Complete?

Yes

No

### Notes on Operator 1 Readings (if applicable)

Write something...

### GRR Mean Deviation (Operator 1)

Enter a number...

## Gauge Reproducibility (RR) - Part 1

Focuses on the variation in measurements taken by different operators using the same gauge on the same part.

### Number of Operators Involved in RR Study

Enter a number...

### Operator Selection Method

- Random Selection
- Qualified Personnel
- Rotation Schedule
- Other (Specify in LONG\_TEXT)

### If 'Other' selected for Operator Selection, please explain:

Write something...

### Number of Trials per Operator per Part

Enter a number...

### Date of RR Study Start

Enter date...

### Approximate Time Allowed per Operator per Part Measurement

### Was the order of parts presented to operators randomized?

- Yes
- No

**If order was not randomized, please explain why and describe the order:**

Write something...

## **Gauge Reproducibility (RR) - Part 1**

Calculations and Analysis of the Gauge Reproducibility component.

**Number of Operators Participating**

Enter a number...

**Operator Selection Method**

- Random Selection
- Experienced Operators
- Designated Operators

**Brief description of operator experience and training related to the measurement process**

Write something...

**Number of Trials per Operator per Part**

Enter a number...

**Any observations during operator measurement (e.g., unusual issues, difficulty understanding instructions)**

Write something...

**Were standardized measurement procedures available to all operators?**

Yes

No

**Date of Reproducibility Study**

Enter date...

## Part Variation

Assessing the inherent variability of the parts being measured.

**Number of Parts Selected for Variation Study**

Enter a number...

**Justification for Part Selection (Why these specific parts?)**

Write something...

**Number of Measurements Per Part**

Enter a number...

### Description of Part Variation Assessment Method (e.g., Range, Standard Deviation)

Write something...

### Calculated Part Variation (e.g., Standard Deviation)

Enter a number...

### Notes on Observed Part Variation Characteristics (e.g., Are there known sources of variation?)

Write something...

### Part Variation Acceptable?

- Yes
- No
- Needs Further Investigation

### If 'No' or 'Needs Further Investigation', Describe Actions Taken/Planned Regarding Part Variation

Write something...

## System Variation

Calculating the total variation within the measurement system, accounting for gauge repeatability, gauge reproducibility, and part variation.

### Estimated Part Variation (EV)

Enter a number...

### Estimated Gauge Repeatability (GR)

Enter a number...

### Estimated Gauge Reproducibility (RR)

Enter a number...

### Total System Variation (SV)

Enter a number...

### Specification Limit

- Upper Specification Limit
- Lower Specification Limit

### Ratio of System Variation to Specification Width

Enter a number...


### Justification for acceptable/unacceptable System Variation

Write something...

### System Variation Acceptable?

- Yes
- No

### Supporting Data (System Variation Calculation)

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## MSA Performance Evaluation

Determining if the measurement system is adequate for its intended use based on established criteria.

### Overall GR&R Value

Enter a number...

### % of Total Variation (OCR)

Enter a number...

### Acceptance Criteria Met?

- Yes
- No
- Not Applicable

### Justification for Acceptance/Rejection

Write something...

### Is the Measurement System Adequate for its Intended Use?

- Yes
- No
- Needs Further Evaluation

### Summary of MSA Results & Conclusion

Write something...

### Date of MSA Performance Evaluation

Enter date...

### Evaluator Signature

## Corrective Actions & Improvements

Identifying and implementing changes to improve measurement system performance.

**Describe the specific issue(s) contributing to measurement system non-conformance.**

Write something...

**Select potential root causes contributing to measurement system variation.  
(Select all that apply)**

- Operator Training Deficiencies
- Gauge Calibration Issues
- Environmental Factors (Temperature, Humidity)
- Gauge Maintenance Issues
- Measurement Procedure Ambiguity
- Part Design Issues
- Gauge Design Issues

**Detail proposed corrective actions to address the identified root causes.**

Write something...

**Estimated cost of implementing corrective actions (in USD).**

Enter a number...

**Target completion date for implementing corrective actions.**

Enter date...

**Method of verification for the corrective actions.**

- Repeat MSA
- Process Monitoring
- Statistical Process Control (SPC)
- Other (Specify)

**If 'Other' was selected for verification, specify the method.**

Write something...

**Responsible party for implementing corrective action.**

- Engineering
- Manufacturing
- Quality
- Maintenance

**Signature of person responsible for implementing corrective action.**

## Documentation & Training

Ensuring proper documentation of the MSA process and adequate training for operators.

**Describe the documented MSA Procedure followed.**

Write something...

**Date of Last MSA Review**

Enter date...

### Number of Personnel Trained on MSA Procedure

Enter a number...

### Which MSA training modules were completed by operators?

- Gauge Calibration
- Operator Technique
- Data Interpretation
- Measurement System Improvement

### Upload copies of training records for operators involved in MSA.

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### Document any deviations from standard MSA procedure and rationale.

Write something...

### Is the MSA procedure readily accessible to all relevant personnel?

- Yes
- No
- Partially

### Signature of Person Responsible for MSA Documentation

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