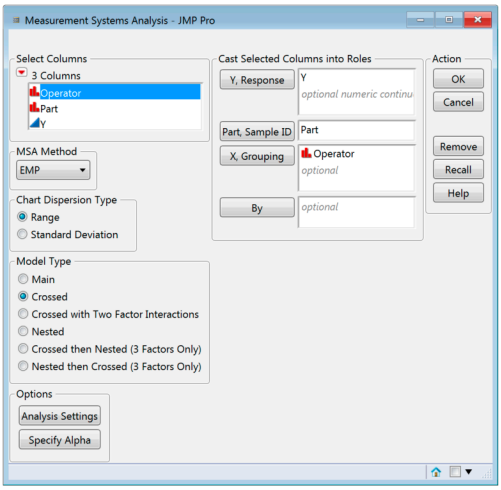
MSA Continuous Data – EMP Method

This page provides information on the EMP (Evaluating the Measurement Process) MSA method, which is largely based on the methods presented in Donald J. Wheeler's book, *EMP III Using Imperfect Data* (2006). The results are visual and easily interpretable, offering an alternative to the traditional Gauge R&R approach.

Measurement Systems Analysis: EMP Method

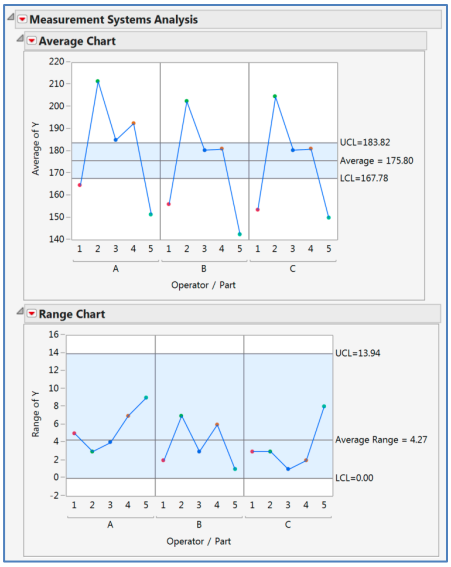
Gasket.jmp (Help > Sample Data Library > Variability Data)



1. Select **Analyze > Quality and Process > Measurement Systems Analysis**.
2. Click on a continuous variable from **Select Columns**, and click **Y, Response** (continuous variables have blue triangles).
3. Select a part or sample variable and click **Part, Sample ID**.
4. Select one or more grouping variables and click **X, Grouping**.
5. Ensure that **EMP** is the **MSA Method**, and click **OK.**

   (Notes: If desired, change the **Chart Dispersion Type** to **Standard Deviation** to base analyses on variances instead of ranges, and change **Model Type** if required.)

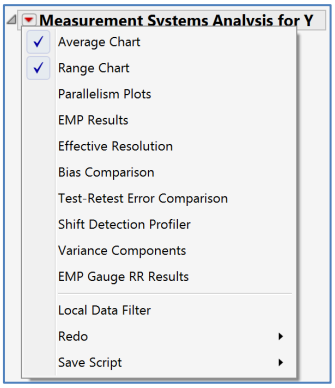
By default, JMP displays an **Average Chart** and a **Range Chart**:



- The **Average Chart** shows the average measurement for each combination of the part and the grouping variables. Out-of-control points are desirable, as they indicate the ability to detect part-to-part variation.
- The **Range Chart** shows the range for each combination of the part and the grouping variables. Having all points within the control limits is desirable, as this indicates similar measurement error across groups.

  (Note: A **Standard Deviation Chart** displays if the **Chart Dispersion Type** has been changed to **Standard Deviation**.)

Many additional options are available under the **top red triangle**:



- **Parallelism Plots**, for assessing interactions between the parts and the grouping variables.
- **EMP Results**, for evaluating and classifying the measurement system.
- **Effective Resolution**, for determining the resolution of the measurement system.
- **Bias Comparison** and **Test-Retest Error Comparison** plots, for assessing differences in grouping variable means and errors, respectively.
- **Shift Detection Profiler**, for dynamically exploring the probability of a warning.
- **Variance Components** and **EMP Gauge RR Results**, for quantifying sources of measurement system variation.

Notes: For more details, search for "EMP" in the JMP Help, or refer to the "Assess Measurement Systems" chapter of the ***Quality and Process Methods*** book (under **Help > Books**).