

Practice: Analyzing the Melt Flow Index MSA

In this practice, you analyze the MFI (Melt Flow Index) MSA that was conducted in the White Polymer case study using the EMP method.

The data are in the file **MSA_MFI_Initial.jmp**. The specifications for **MFI** are 192 to 198.

1. Select the **Measurement Systems Analysis** platform from the **Analyze** menu under **Quality and Process**. Select **MFI** for **Y, Response**, **Batch** for **Part, Sample ID**, and both **Technician** and **Instrument** for **X, Grouping**, and click **OK**.
2. Select **Variance Components** from the top red triangle. Focus on the % of Total column.
 - a. What are the three largest components of variation in this study?
 - b. How much of the variation in the study is from differences between the batches?
 - a. **Instrument** (42%), **Within** (39.9%), and **Instrument*Batch** (9.3)
 - b. 4.2% of the variation is from **Batch**.
3. Select **EMP Gauge R&R Results** from the top red triangle.
 - a. How much of the variability is due to repeatability variation?
 - b. How much of the variability is due to reproducibility variation?
 - c. How much of the variability is due to the interactions?
 - d. What is the total variance from the measurement system (to three decimal places)?
 - e. What is the standard deviation for the measurement system (to three decimal places)? Interpret this value (relative to the specs).
 - a. 39.9%
 - b. 46.7%
 - c. 9.3%

- d. The total variance is **Gauge R&R + Interaction Variation** = $1.807 + 0.194 = 2.001$
- e. The square root of 2.001 is 1.415 cm. The measurement process width is $6 \times 1.415 = 8.474$. The tolerance width (the width of the specs) is 6. The variation from the measurement system is much wider than the width of the specs. This measurement system cannot distinguish between good and bad batches.

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