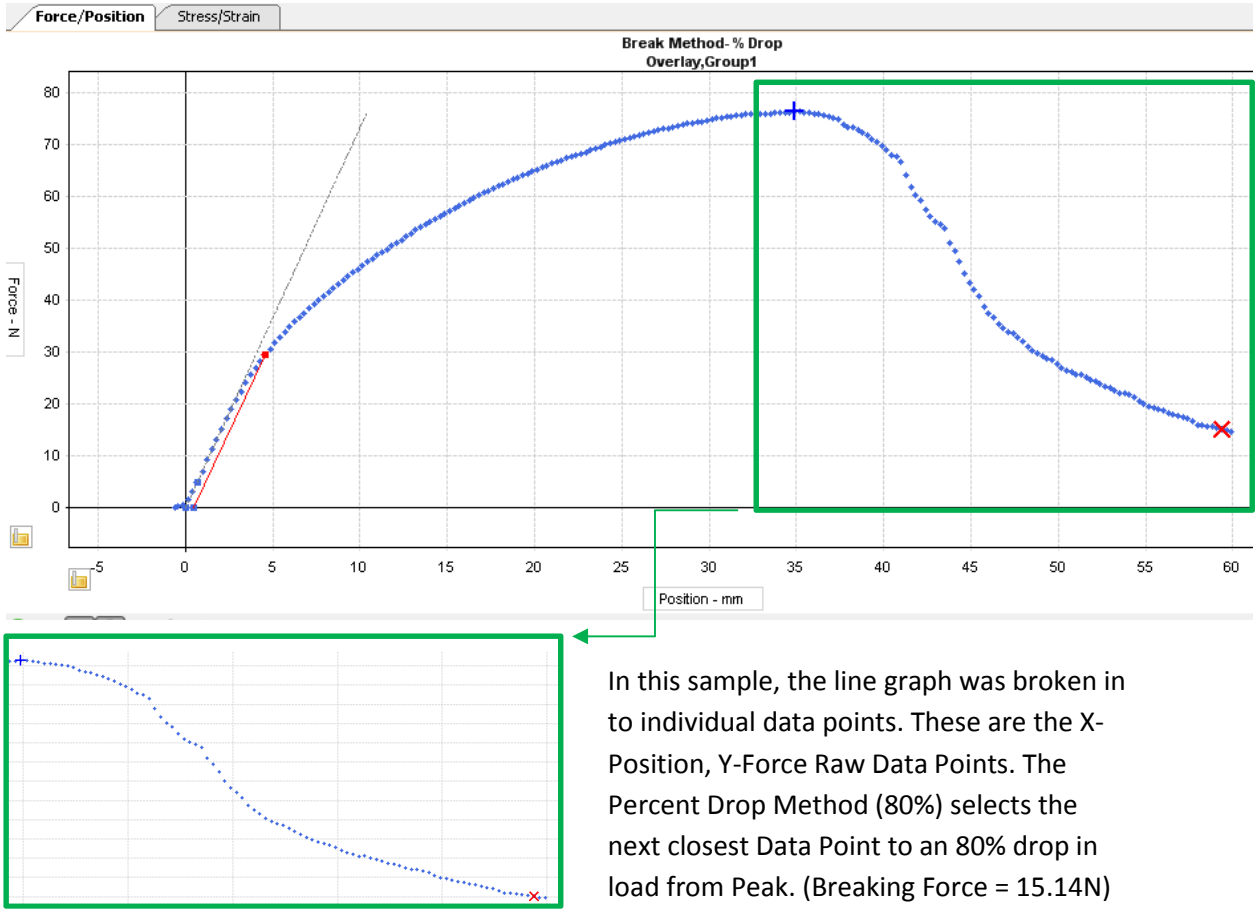
Break Methods: Percent Drop & Slope

How does MAP4 know when to stop a test or determine a break point during a test? Some materials have a clearly defined break or failure accompanied by a sharp drop in force. Other materials may have a more gradual failure accompanied by slower drop in force. MAP4 has two options to choose from in Break Point Method. These can be changed in the Setup Icon . Other factors can also effect the break point method. The following will show each option.

Percent Drop Method:

When selected in MAP4, the Percent Drop Method of determining Break Point searches the data along the curve of a test for the Peak Point or Maximum Load. Once a peak is established and the load begins to drop, the test will end when the Percent Drop value (Break Sensitivity) from Peak Load condition is met. The Percent Drop Value (Break Sensitivity) can directly affect the Break Point Elongation.

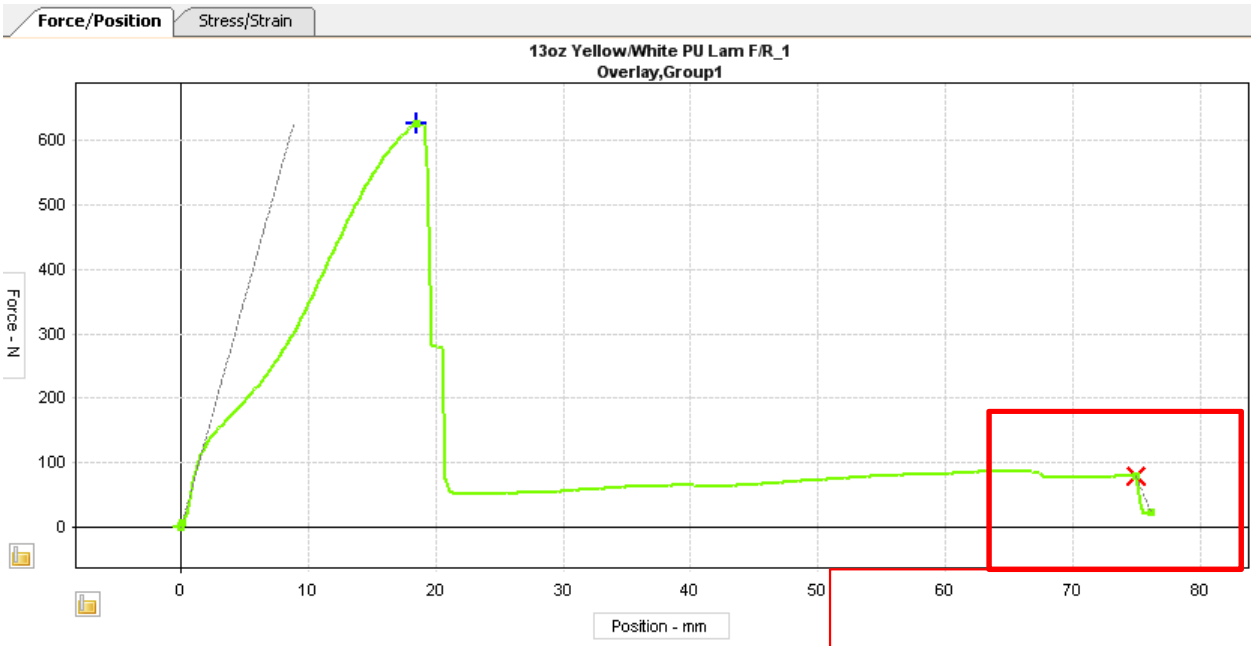
In the example below, a Percent Drop value of 80% was selected. Max Force can be seen at 76.39N(17.17lb-force). This means the test will stop once the force drops by at least 80% or about 61N(13.7lbf)

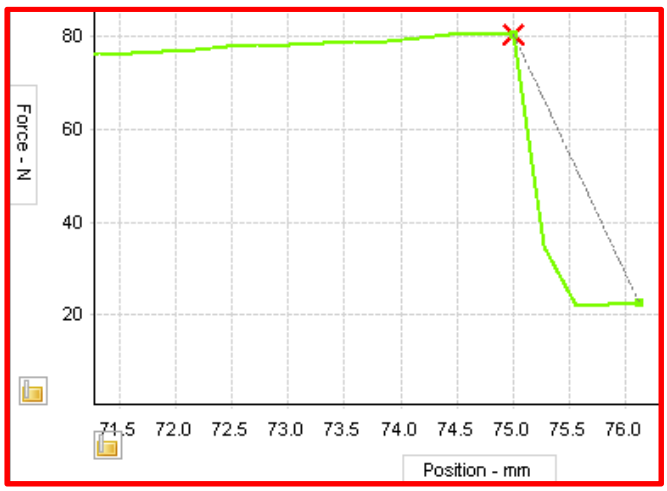


In this sample, the line graph was broken in to individual data points. These are the X-Position, Y-Force Raw Data Points. The Percent Drop Method (80%) selects the next closest Data Point to an 80% drop in load from Peak. (Breaking Force = 15.14N)

Slope Method:

In most instances, The Percent Drop Break Method will be sufficient since it allows for more consistency on ending the test after Peak Load is recorded with respect to force. Some materials exhibit a Force vs Position curve that has an early Peak followed by a sharp drop. The material does not actually fail after that initial drop, but continues to elongate until it finally breaks. If Percent Drop was used with a Break Sensitivity of 80%, the test would end prematurely. The Break Sensitivity could either be increased or the Slope Method can be used. The Slope Method will only look at a certain portion of the data and find a Slope less than one.





The Break Point using the Slope Method