

Identifying Particles in an Epoxy Adhesive Using Hegman Gauge (Grind Gauge) Analysis

WHAT

Hegman gauge helps to identify different potential types of particles within an epoxy

WHY

To identify particle characteristics when subjected to Hegman Gauge analysis

For wet particle analysis, a Hegman Gauge (sometimes referred to as a grind gauge) is frequently used to determine the fineness of the grind and to analyze different types of particles within an epoxy matrix. The test involves a flat, stainless steel block with two top channels, decreasing slightly in depth from one end to the other. The channel depth begins at 100µm and decreases to zero, with a corresponding scale on either side.

A typical Hegman Gauge measures approximately 170mm long by 65mm wide, with a height of 15mm. A small amount of the adhesive (Part A, Part B or Part A + B) is placed at the end of the steel block containing the deepest channel or groove. Using a stainless steel scraper, the material is slowly drawn down while maintaining uniform pressure along the entire length of the block.



The resultant thin coating or film on the block is then visually inspected for any lumps or non-uniformities on the surface of the coating. Any visual observations can also be read using the scale along either side of the block. This scale can be read in Hegman units (dimensionless), micrometers or mils.

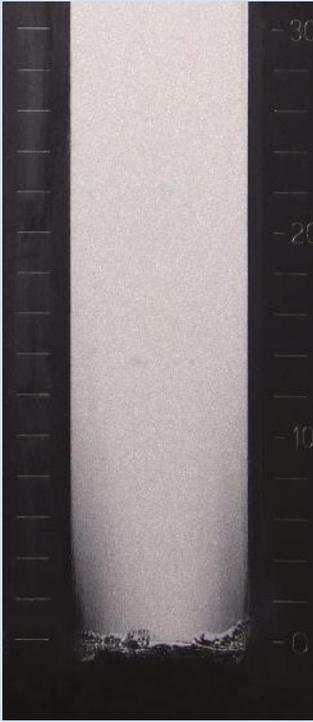
During a Hegman Gauge analysis, there are four main categories of particles that can be displayed:

- Uniform Fine Dispersion
- Particle Size Determination
- Crystallization
- Agglomeration

Examples of Hegman Gauge Results

The below figures display actual draw downs using Hegman Gauge analysis.

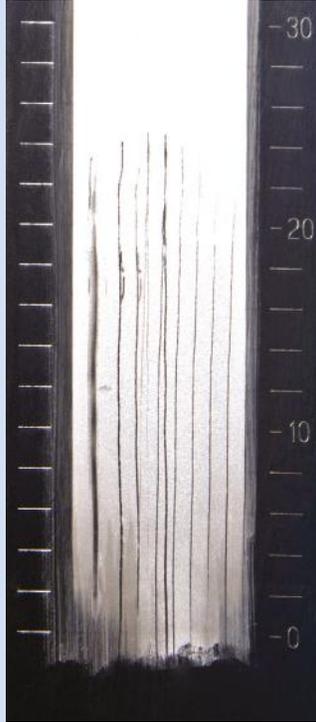
UNIFORM FINE DISPERSION



All particles show a flawless appearance throughout the draw down with proper dispersion.

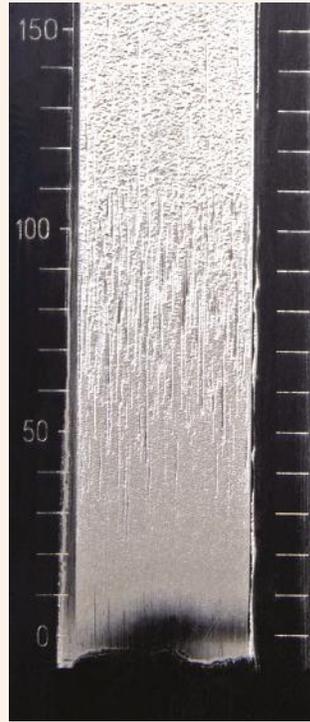
✓ **Good Results**

PARTICLE SIZE DETERMINATION



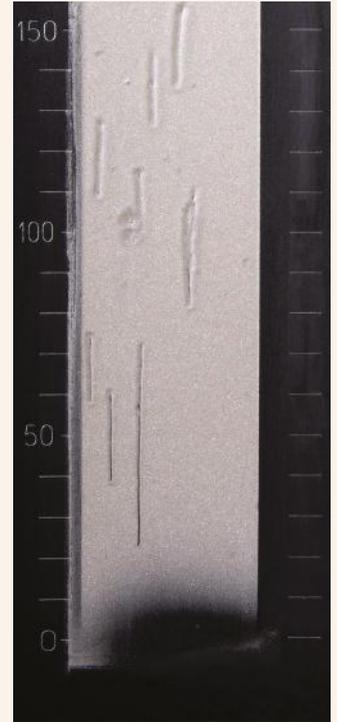
Forms uniform, unbroken lines from the initial draw to the corresponding particle size determination, continuing throughout entire draw down.

CRYSTALLIZATION



Appears as a lumpy texture throughout the entire draw down.

AGGLOMERATION



Has the appearance of intermittent breaks within the draw down; not corresponding to any size scale.

! **Bad/Problematic Results**

CONCLUSION

A Hegman Gauge is an excellent quality assurance tool to quickly evaluate and identify particles within an epoxy. It allows for differentiating any potential problems such as: crystallization, agglomeration, as well as determining varying particle sizes.