

SLITTING METHOD

Technical summary:

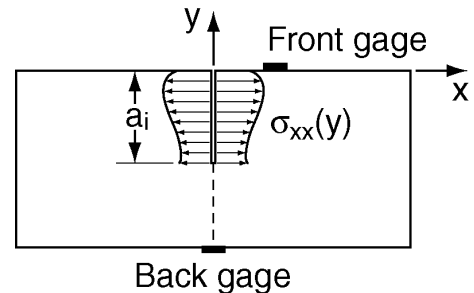
The slitting method determines the distribution of bulk residual stress as a function of depth from the surface of a part or coupon. Slitting is often used to determine residual stress in simple coupons (blocks, disks, and cylinders), but is also useful for parts that are more complex.

Slitting is based on the principle that residual stress causes a body to deform when it is cut, and cutting progressively through a body while measuring its deformation (strain gages) allows calculation of the pre-cut residual stress distribution.

Slitting is realized through careful cutting of a slit through the depth of a part while monitoring cut-induced deformation using metallic foil strain gages. The record of strain and cut depth are then used to compute the pre-cut residual stress distribution using the principles of elasticity.

Hill Engineering has a reputation for using the slitting method to provide accurate, repeatable results. Hill Engineering continues to develop new uses for the slitting method to address customer needs for complex component geometries and material configurations.

Measurement principle:



Slitting is useful for:

- Sub-surface residual stress determination (0.5 mm to 500 mm and beyond)
- Wide range of material types (e.g., metallics, plastics, FGMs, and single crystals)
- Parts with large or complex geometry
- Materials with variable microstructure or large grains
- Applications requiring excellent repeatability and/or rapid turn time

