



American Welding Society®
LEARNING

WELD PROFILE GAUGE

New tool developed for Welding Inspectors

CWI Seminar

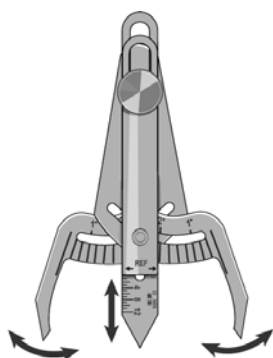
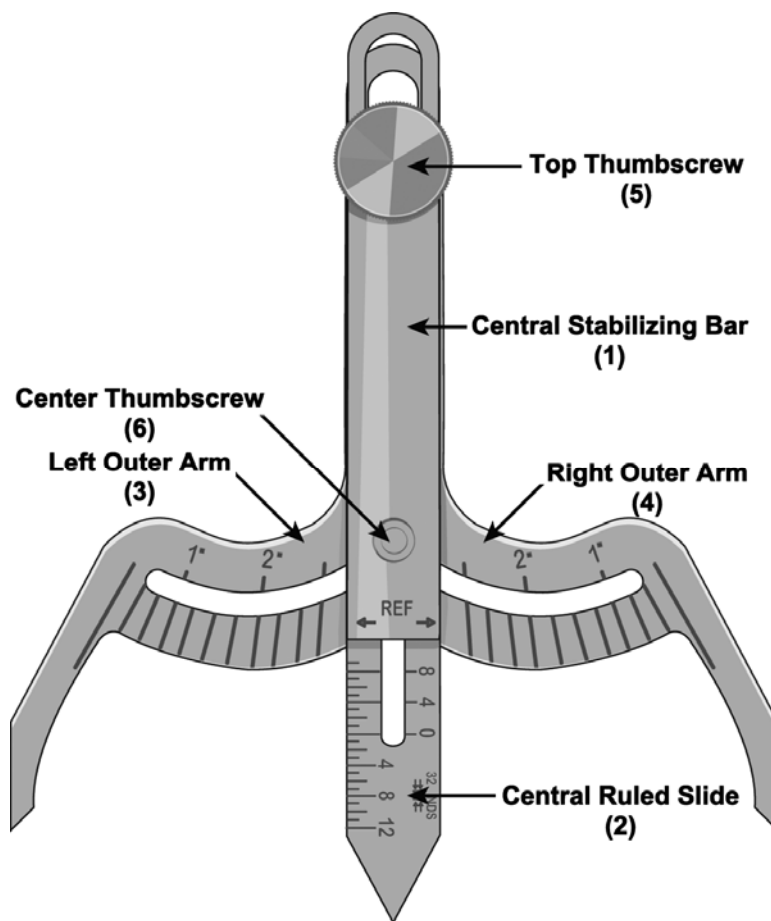
Overview: The weld profile gauge was developed by engineers and welding inspectors primarily to measure convexity on fillet welds. Up until now, there has not been a commercially available tool able to do that, and measuring convexity on fillet welds required access to an edge.

Purpose: The weld profile gauge can perform several functions:

- Fillet weld convexity (single bead or individual beads in split bead layer)
- Fillet weld concavity
- Weld reinforcement
- Weld underfill
- Weld bead width
- Depth of weld deposit
- Depth of repair excavation

Design: Structurally, the fillet weld profile gauge has essentially six components.

1. A central stabilizing bar or spine (in this example, this part contains the GAL logo).
2. A central ruled slide with 1/32 inch markings along one edge.
3. A left outer arm (or leg, or rib).
4. A right outer arm (or leg, or rib).
5. A top thumbscrew at the vertex.
6. A central thumbscrew at the center of the gauge.



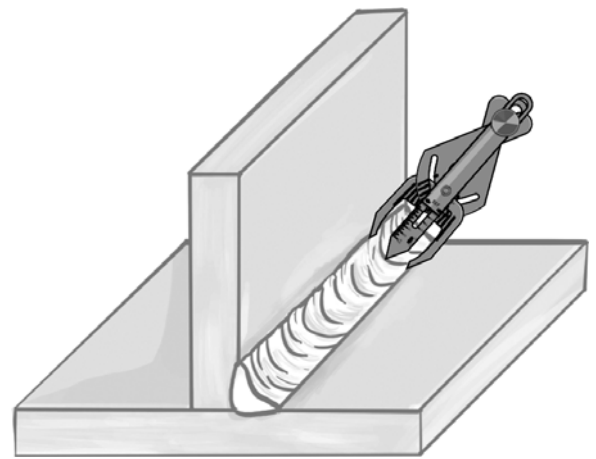
Movement: There are two basic movements of the gauge when the thumbscrews have been loosened. One movement is the simultaneous and opposite movement of the two outer arms: they can be moved together so that the tips are touching, or they can be spread apart to a maximum width of about 2 1/2 inches. The other movement is that of the central slide, which moves up and down about a total movement of 3/4 inches.

G.A.L. Gage Company

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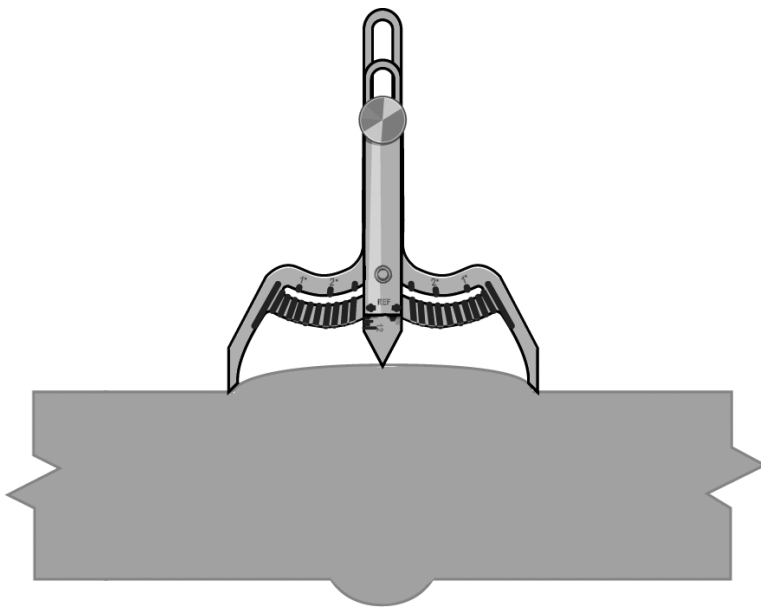
Use: To use the gauge, the two outer arms are extended to the width of a weld such that the ends of the outer arms are touching the toes of the weld. Then the central slide can be raised or lowered to measure either the concavity or convexity of the weld to +3/8 or -3/8 inch. When the central ruled slide reads 0, the weld face is neither convex nor concave at that point. What makes this gauge unique is that whether the weld bead is narrow or wide, the central ruled slide will read 0 when the weld face is flat and neither convexity nor concavity are present.



To measure the convexity of fillet welds, place the points of the outer arms at the toes of the weld and pull the slide down into the face of the weld, then tighten the thumbscrews.

To measure the concavity (suckback) of fillet welds, place the points of the outer arms at the toes of the weld and pull the slide down onto to the face of the weld.

To measure the convexity of a single bead in a multi-bead weld, put the two points of the outer arms against the toes of the individual bead to be measured, then move the slide down to the face of the weld and tighten the central thumbscrew to read the measurement on the central ruled slide.



To measure reinforcement on a groove weld, place the outer arms of the gauge on the weld toes on opposite sides of the weld face. The central ruled slide will need to rise to measure the reinforcement. The measurement is taken at the point where the central ruled slide disappears behind the central stabilizing bar.

To measure underfill in a groove weld, place the outer arms of the gauge on the weld toes on opposite sides of the weld face. The central ruled slide will need to be lowered to measure the depth of underfill. The gauge can be read where the central ruled slide disappears behind the central stabilizing bar.

To get an approximate measure of a weld bead: The gauge also has markings on the outer arms which can be used to approximate the width of a weld face, up to 2 1/2 inches. The reason this is particularly useful is that requirements for concavity and convexity typically vary with the width of a weld. Please note this important caveat: the primary function of this gauge is NOT to measure the width of a weld and the 1/4 inch markings on the outer arms of this tool do not reach the same level of precision as a standard steel rule. For increased accuracy and precision, the points of the outer arms could be placed at the toes of a weld, then the thumbscrew tightened to preserve that measurement, and then a standard steel rule could be used to measure the distance between the points of the outer arms.



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