Visual Inspection

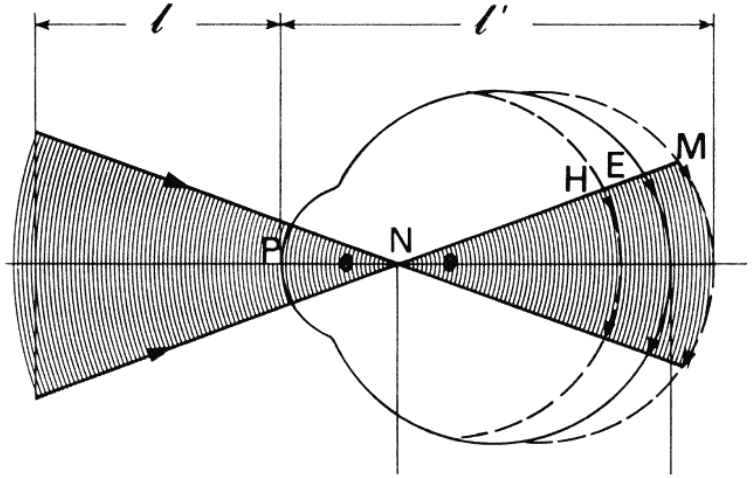
(NDT)

Visual Inspection (VT)

- Visual is the most common inspection method
  - Basic principle: – illuminate the test specimen with light – examine the specimen with the eye.
- VT reveals spatter, excessive buildup, incomplete slag removal, cracks, heat distortion, undercutting, & poor penetration
- Simple, easy to apply, quickly carried out and usually low in cost.

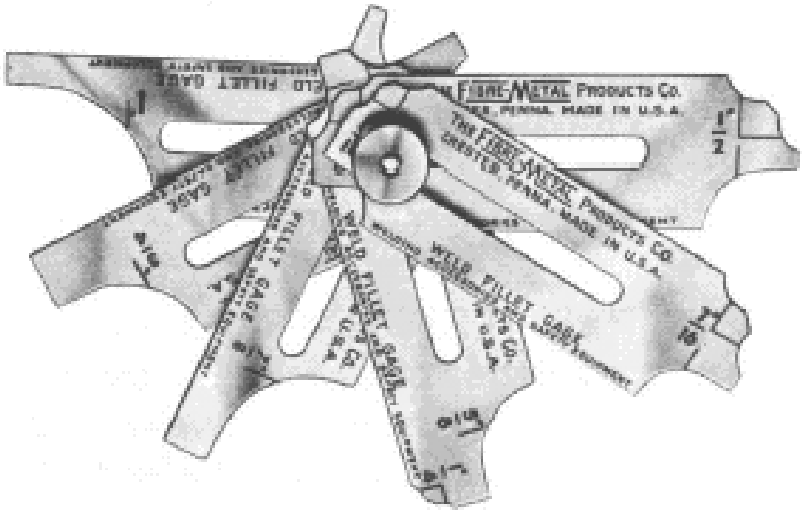
Visual Inspection Equipment

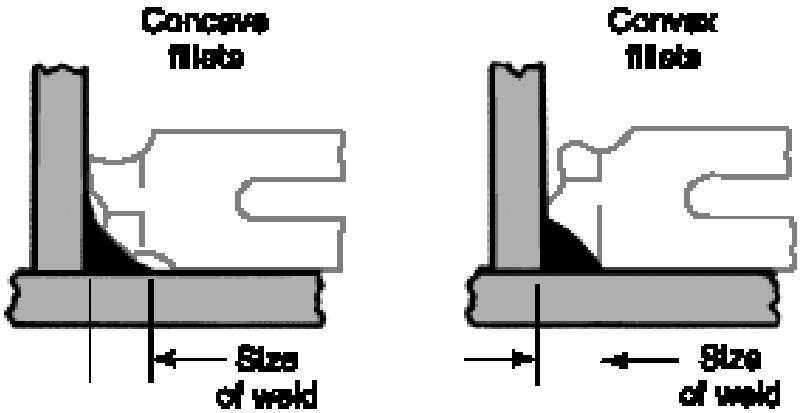
- Magnifying Glass
- The eye can not focus sharply on objects closer than approximately 250 mm.



Visual Inspection Equipment

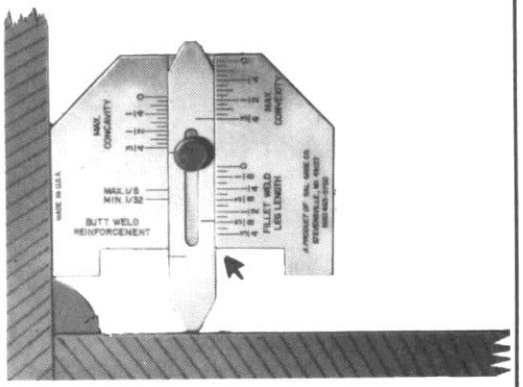
- Magnifying Mirror
- Fillet gauges / Weld gauge
- Fillet gauges measure
  - The "Legs" of the weld
  - Convexity
    - (weld rounded outward)
  - Concavity
    - (weld rounded inward)
  - Flatness





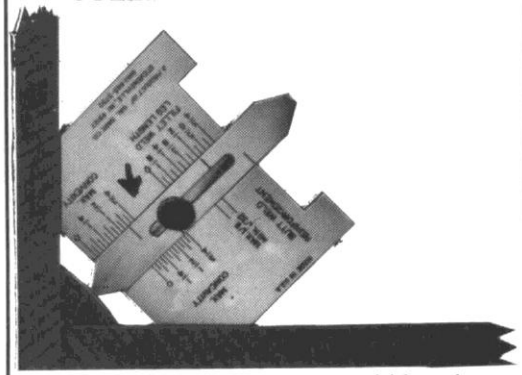
VT:
Uses of Weld Gauge

1. TO DETERMINE THE SIZE OF A FILLET WELD



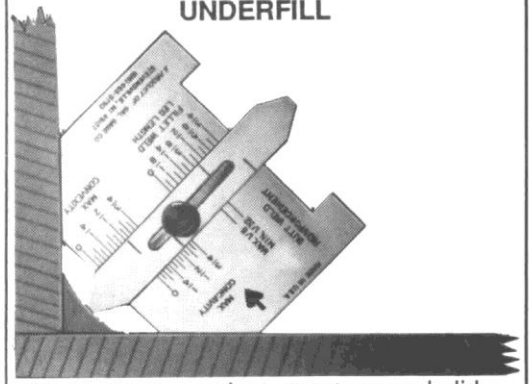
Place the gauge against the toe of the fillet weld and slide pointer out until it touches structure as shown. Read "Size of the Fillet Weld" on face of gauge as indicated by arrow.

2. TO CHECK THE PERMISSIBLE TOLERANCE OF CONVEXITY



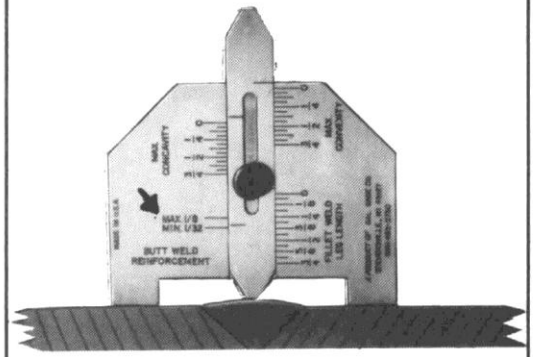
After the size of a convex weld has been determined, place the gauge against the structure and slide pointer until it touches face of fillet weld as shown. The maximum convexity should not be greater than indicated by "Maximum Convexity Scale" as indicated by arrow for the size of fillet being checked.

3. TO CHECK THE PERMISSIBLE TOLERANCE OF CONCAVITY AND UNDERFILL



Place gauge against structure and slide pointer out until it touches the face of the fillet weld as shown. If the pointer does not touch as shown, the fillet requires additional weld metal.

4. TO CHECK THE PERMISSIBLE TOLERANCE OF REINFORCEMENT



Place gauge so that reinforcement will come between legs of gauge and slide pointer out until it touches the face of weld as shown.

Visual Inspection Equipment

- Microscope
- Bore-scope – endoscopes or endoprobes
  - Endoscope:

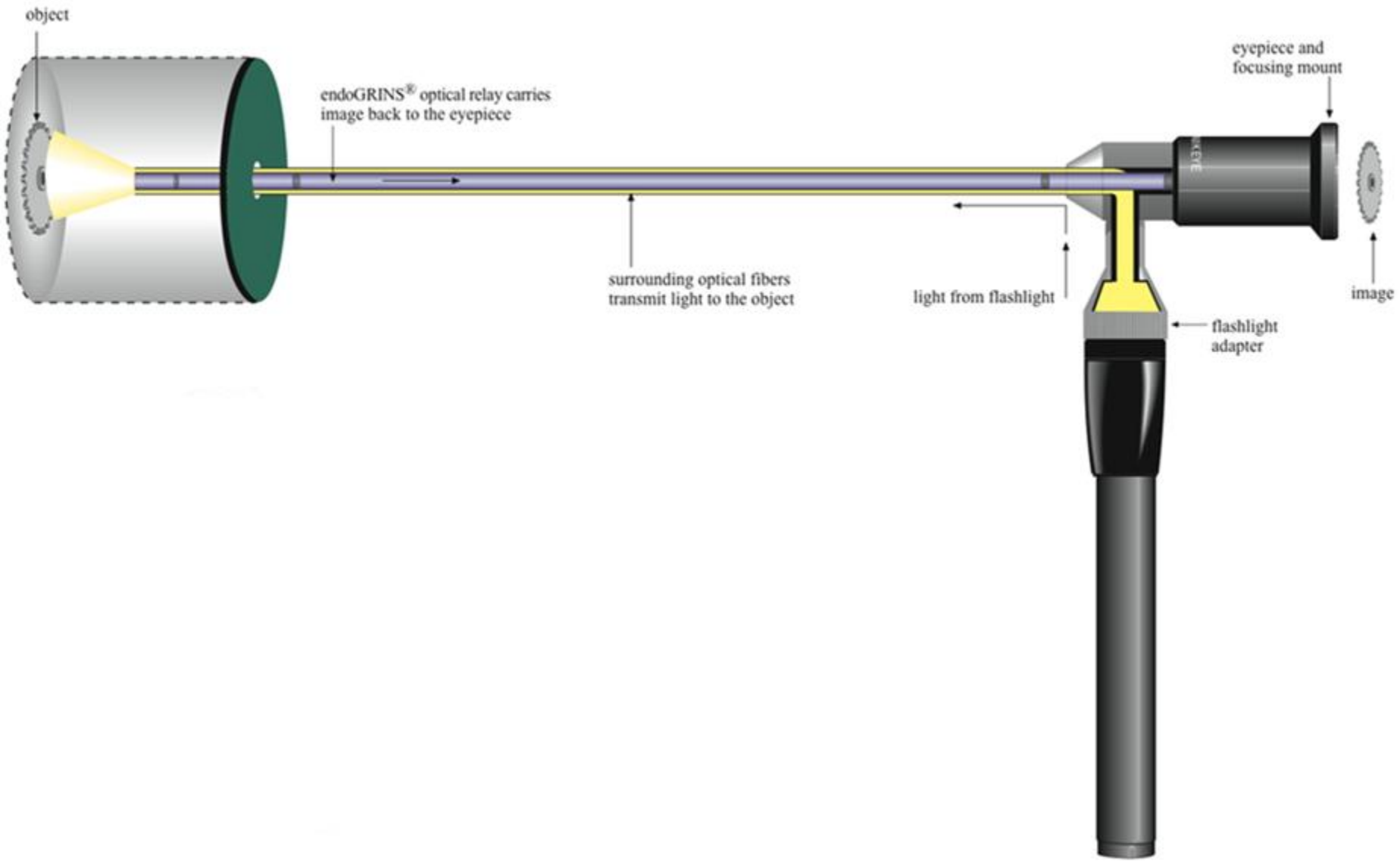
https://www.youtube.com/watch?v=9pv5Eg1PwLE

  - End probe:

https://www.youtube.com/watch?v=4OVWq6wG3Ic

- Flexible Fiber Optic Borescope – working lengths are normally 60 to 365 cm with diameters from 3 to 12.5 mm
- Video Image-scope

Borescope


object
endoGRINS® optical relay carries image back to the eyepiece
eyepiece and focusing mount
surrounding optical fibers transmit light to the object
light from flashlight
image
flashlight adapter

Endoscope

- An endoscope can consist of:
- a rigid or flexible tube.
- a light delivery system to illuminate the object under inspection. The light source is normally outside the object and the light is typically directed via an optical fiber system.
- a lens system transmitting the image from the objective lens to the viewer.
- an eyepiece. Modern instruments may be videoscopes, with no eyepiece, a camera transmits image to a screen for image capture.