

PENATRENT TESTING:

- Dye penetrant inspection (DP), also called liquid penetrate inspection (LPI) or penetrant testing (PT), is a widely applied and low-cost inspection method used to check surface-breaking defects in all non-porous materials (metals, plastics, or ceramics). The penetrant may be applied to all non-ferrous materials and ferrous materials, although for ferrous components magnetic-particle inspection is often used instead for its subsurface detection capability. LPI is used to detect casting, forging and welding surface defects such as hairline cracks, surface porosity, leaks in new products, and fatigue cracks on in-service components.
- The main advantages of DPI are the speed of the test and the low cost. Disadvantages include the detection of only surface flaws, skin irritation, and the inspection should be on a smooth clean surface where excessive penetrant can be removed prior to being developed. Conducting the test on rough surfaces, such as "as-welded" welds, will make it difficult to remove any excessive penetrant and could result in false indications. Water-washable penetrant should be considered here if no other option is available. Also, on certain surfaces a great enough colour contrast cannot be achieved or the dye will stain the workpiece.^[2]
- Limited training is required for the operator — although experience is quite valuable. Proper cleaning is necessary to assure that surface contaminants have been removed and any defects present are clean and dry. Some cleaning methods have been shown to be detrimental to test sensitivity, so acid etching to remove metal smearing and re-open the defect may be necessary