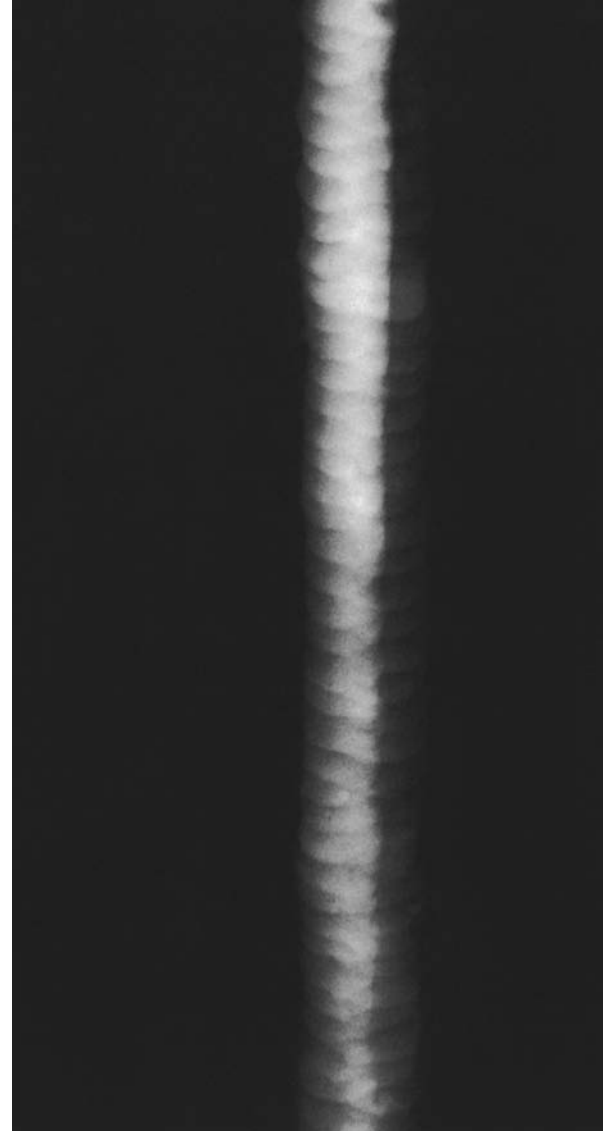
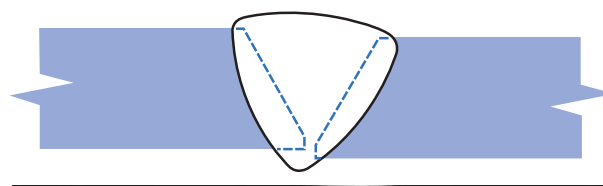


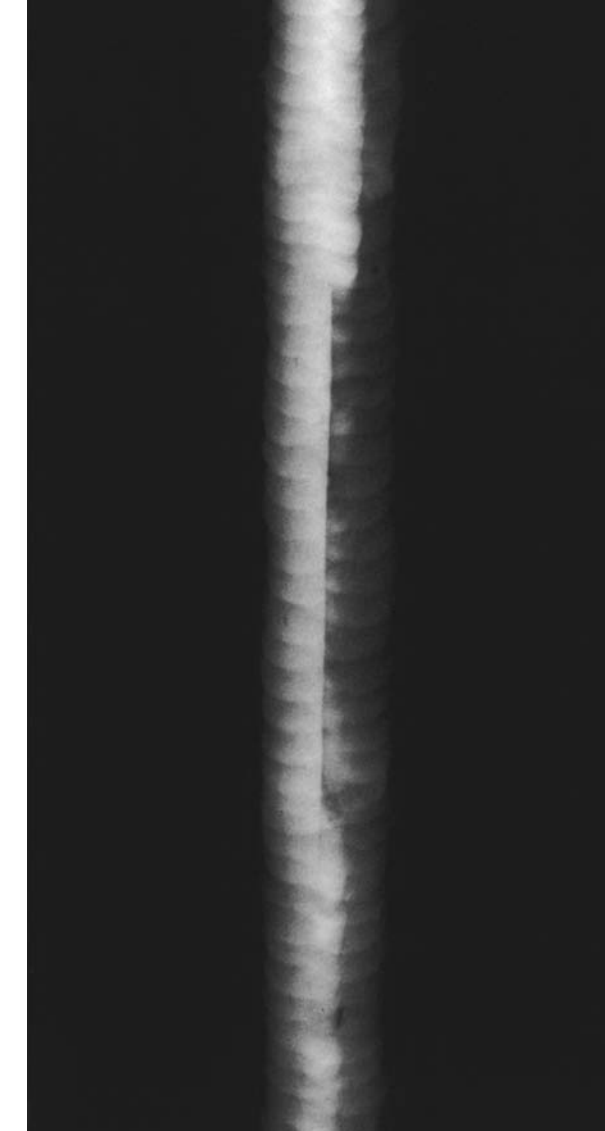
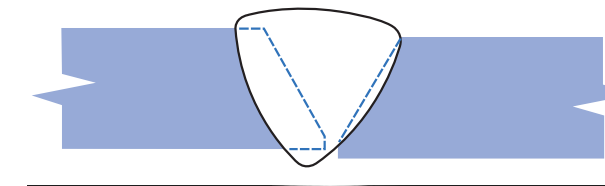
Radiographer's Weld Interpretation Reference

Offset or Mismatch (Hi-Lo):
A misalignment of the pieces to be welded.



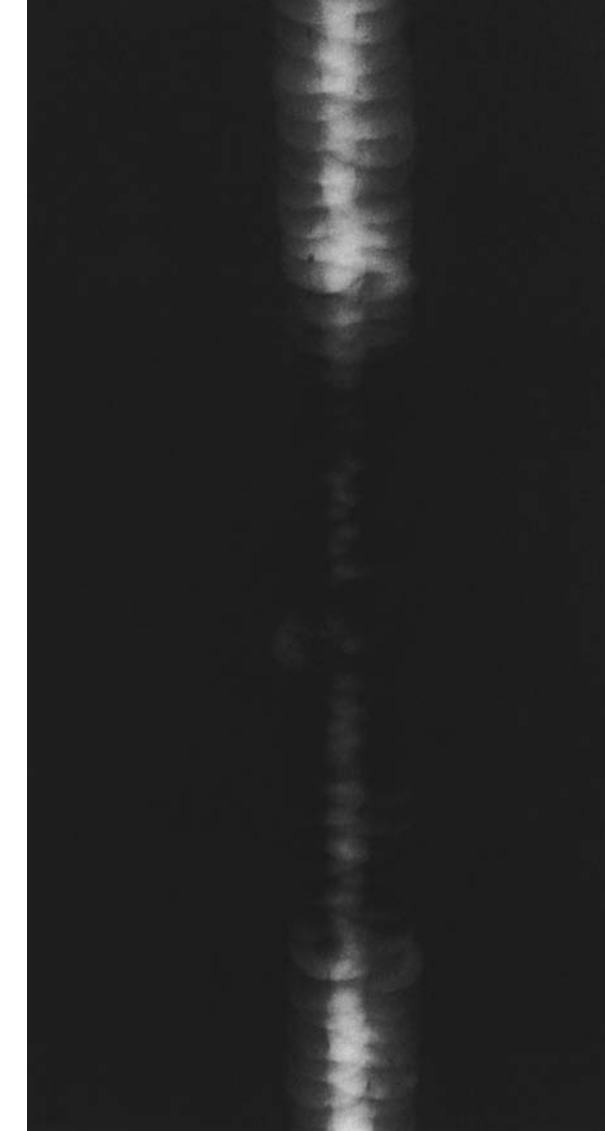
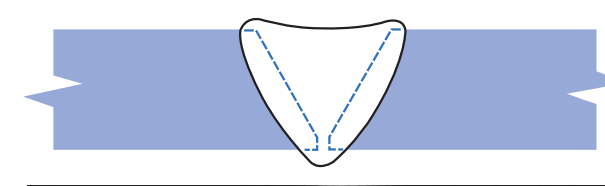
Radiographic Image:
An abrupt change in film density across the width of the weld image

Offset or Mismatch with lack of Penetration (LOP):
A misalignment of the pieces to be welded and insufficient filling of the bottom of the weld or "root area".



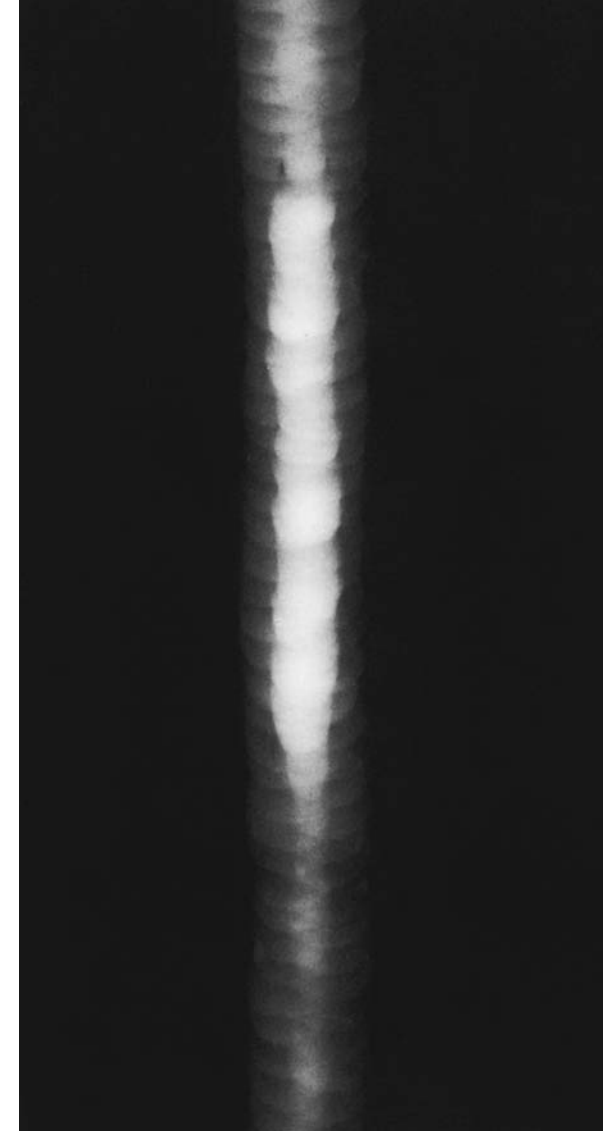
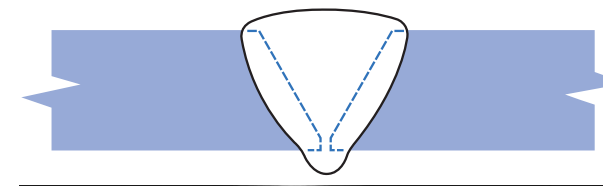
Radiographic Image:
An abrupt density change across the width of the weld image with a straight longitudinal darker density line at the center of the width of the weld image along the edge of the density change.

External Concavity or insufficient Fill:
A depression in the top of the weld, or cover pass, indicating a thinner than normal section thickness.



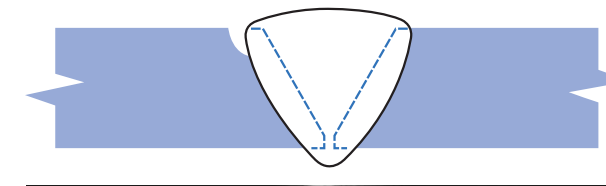
Radiographic Image:
A weld density darker than the density of the pieces being welded and extending across the full width of the weld image.

Excessive Penetration (Circles, Drop-thru):
Extra metal at the bottom (root) of the weld.



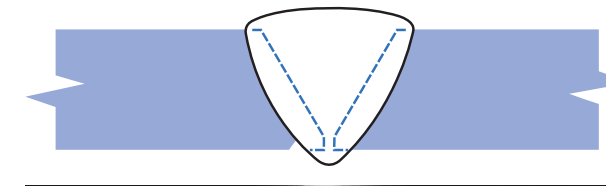
Radiographic Image:
A lighter density in the center of the width of the weld image, either extended along the weld or in isolated circular "drops".

External Undercut:
A gouging out of the piece to be welded, alongside the edge of the top or "external" surface of the weld.



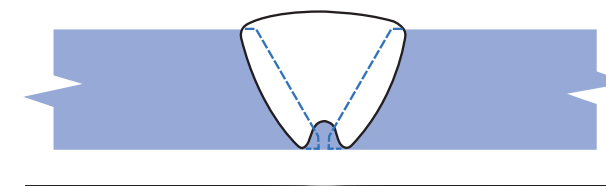
Radiographic Image:
An irregular darker density along the edge of the weld image. The density will always be darker than the density of the pieces being welded.

Internal (Root) Undercut:
A gouging out of the parent metal, alongside the edge of the bottom or "internal" surface of the weld.



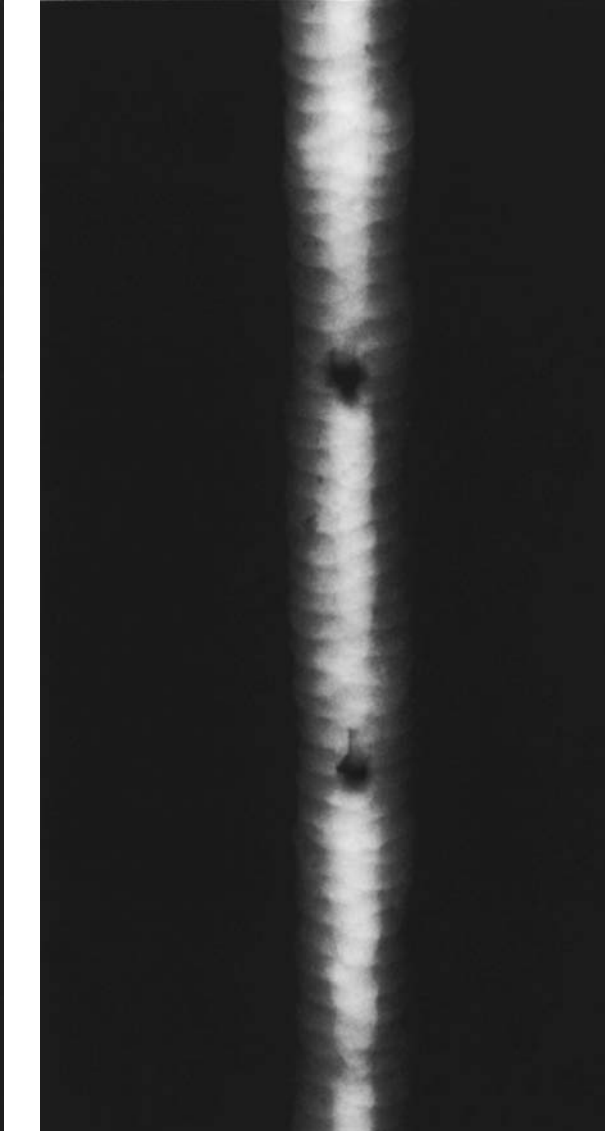
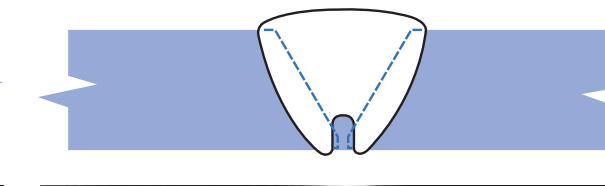
Radiographic Image:
An irregular darker density near the center of the width of the weld image and along the edge of the root pass image.

Internal Concavity (Suck Back):
A depression in the center of the surface of the root pass.



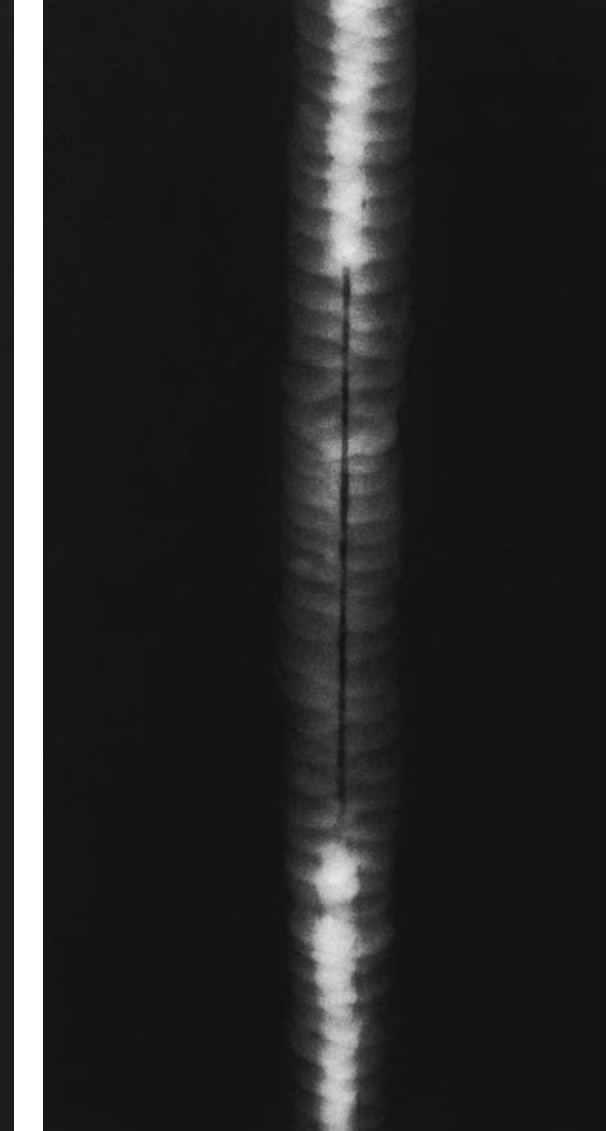
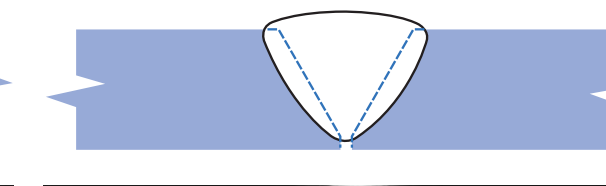
Radiographic Image:
An elongated irregular darker density with fuzzy edges, in the center of the width of the weld image.

Burn Through:
A severe depression or a crater-type hole at the bottom of the weld but usually not elongated.



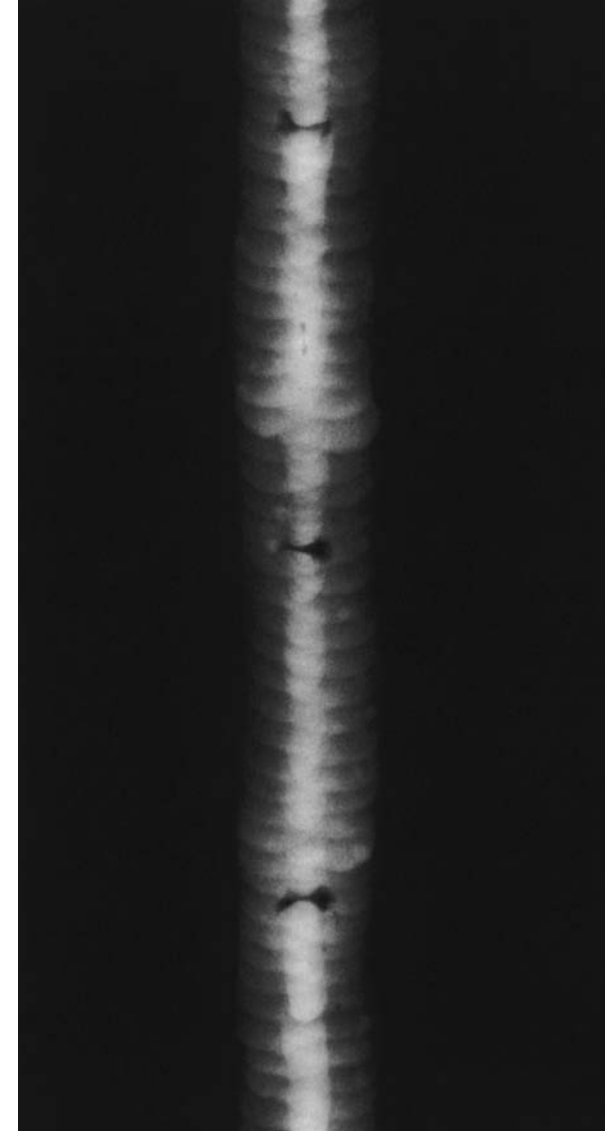
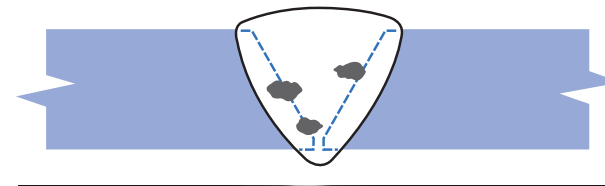
Radiographic Image:
A localized darker density with fuzzy edges in the center of the width of the weld image. It may be wider than the width of the root pass image.

Incomplete or Lack of Penetration (LOP):
The edges of the pieces have not been welded together, usually at the bottom of single V-groove welds.



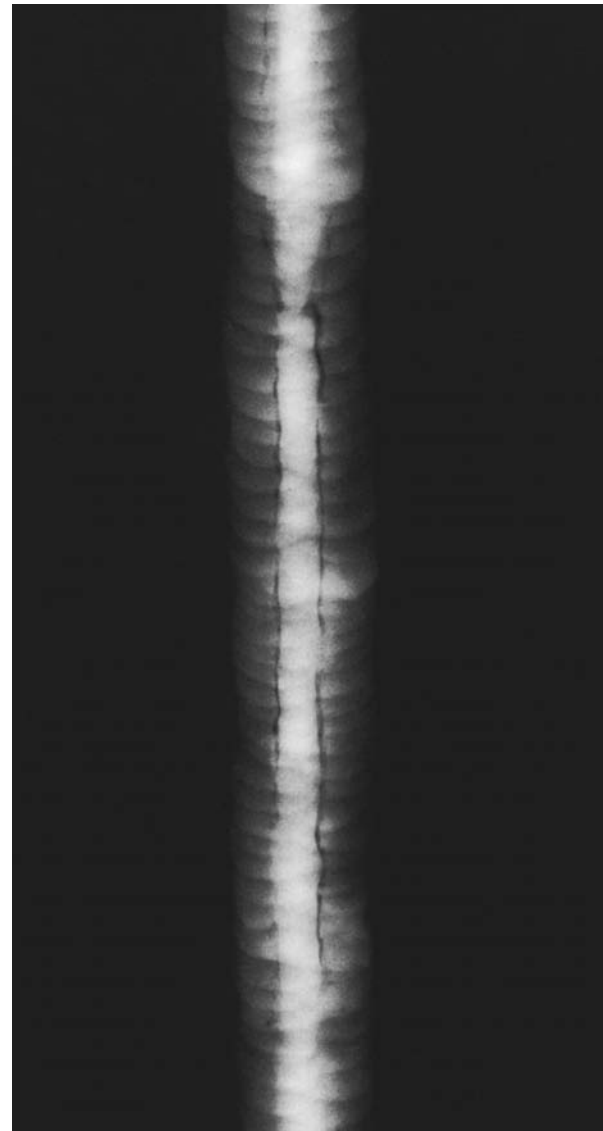
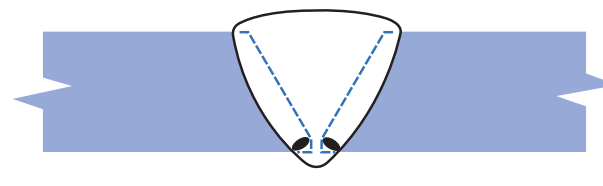
Radiographic Image:
A darker density band, with very straight parallel edges, in the center of the width of the weld image.

Interpass Slag Inclusions:
Usually non-metallic impurities that solidified on the weld surface and were not removed between weld passes.



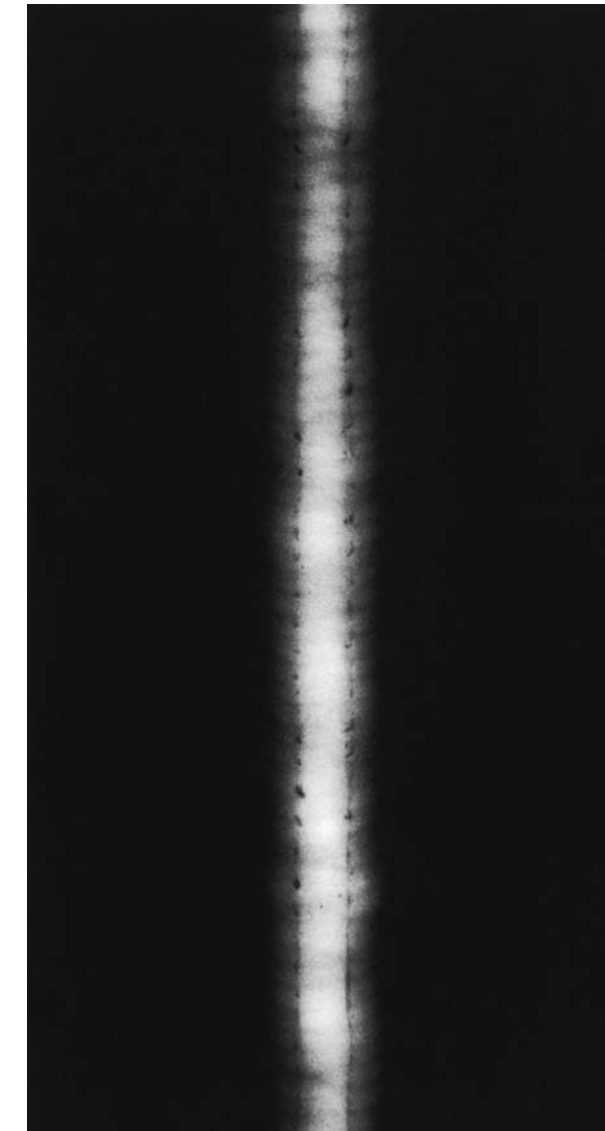
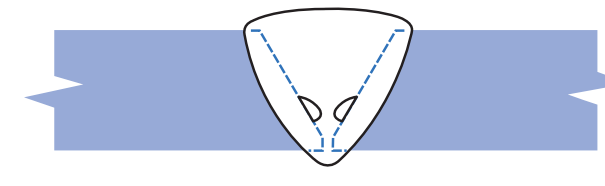
Radiographic Image:
An irregularly-shaped darker density spot, usually slightly elongated and randomly spaced.

Elongated Slag Lines (Wagon Traks):
Impurities that solidify on the surface after welding and were not removed between passes



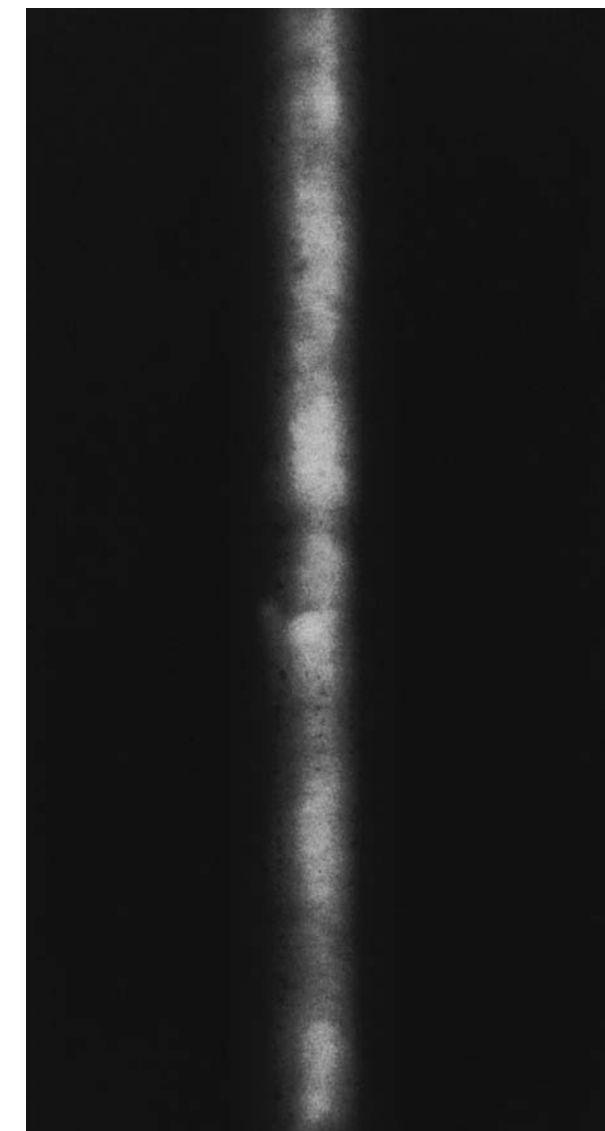
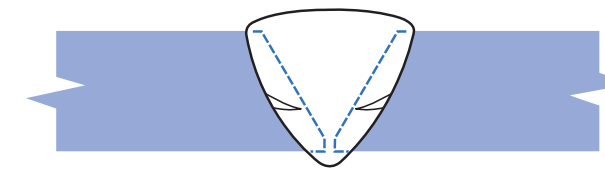
Radiographic Image:
Elongated, parallel or single darker density lines, irregular in width and slightly winding in the lengthwise direction.

Lack of Side Wall Fusion (LOF):
Elongated voids between the weld beads and the joint surfaces.



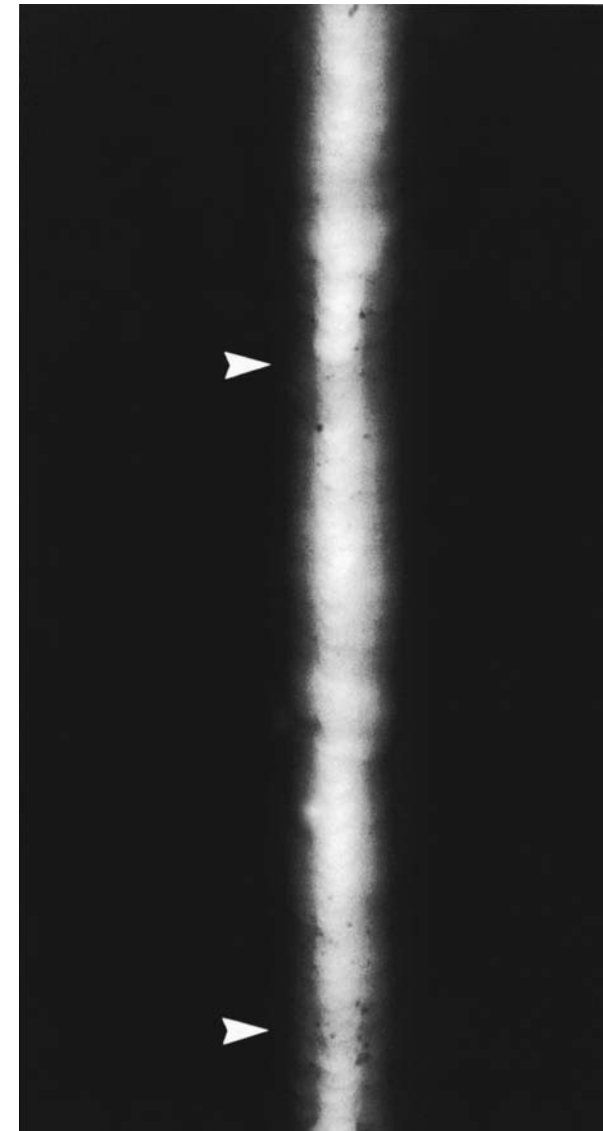
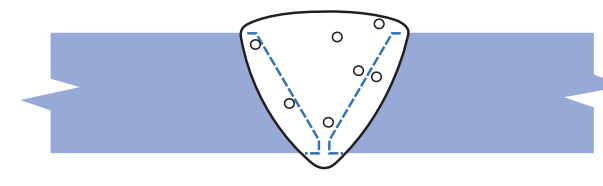
Radiographic Image:
Elongated parallel, or single, darker density lines sometimes with darker density spots dispersed along the LOF lines which are very straight in the lengthwise direction and not winding like elongated slag lines.

Interpass Cold Lap:
Lack of fusion areas along the top surface and edge of lower passes.



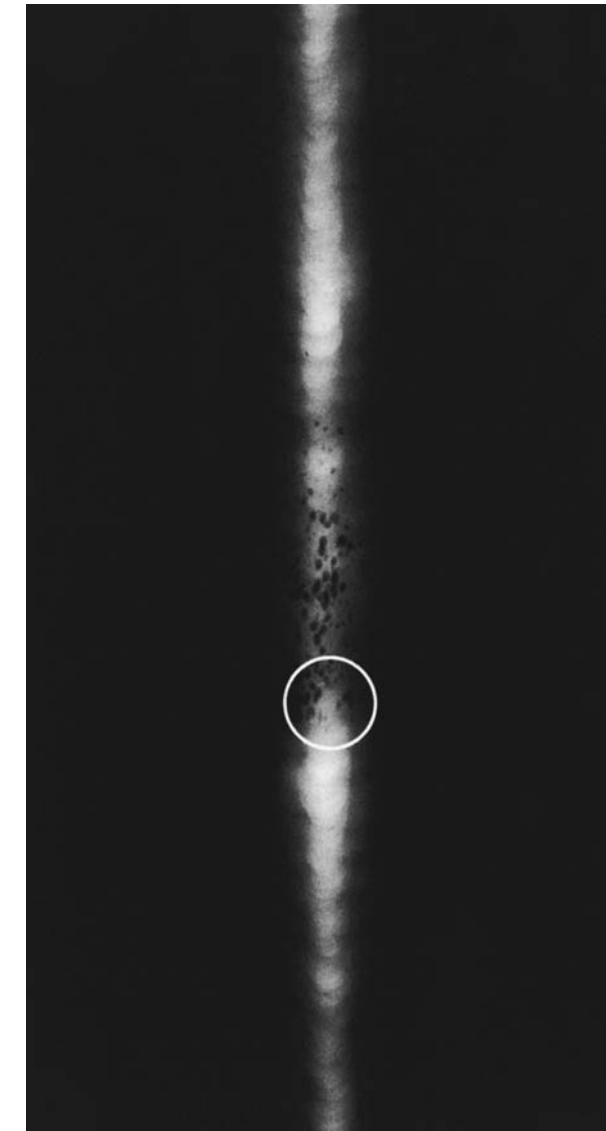
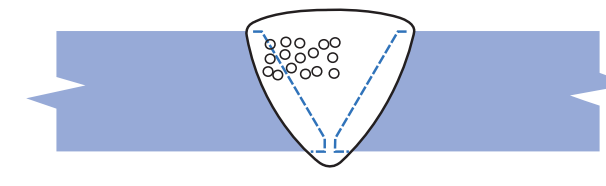
Radiographic Image:
Small spots of darker densities, some with slightly elongated tails, aligned in the welding direction and not in the center of the width of the weld image.

Scattered Porosity:
Rounded voids random in size and location.



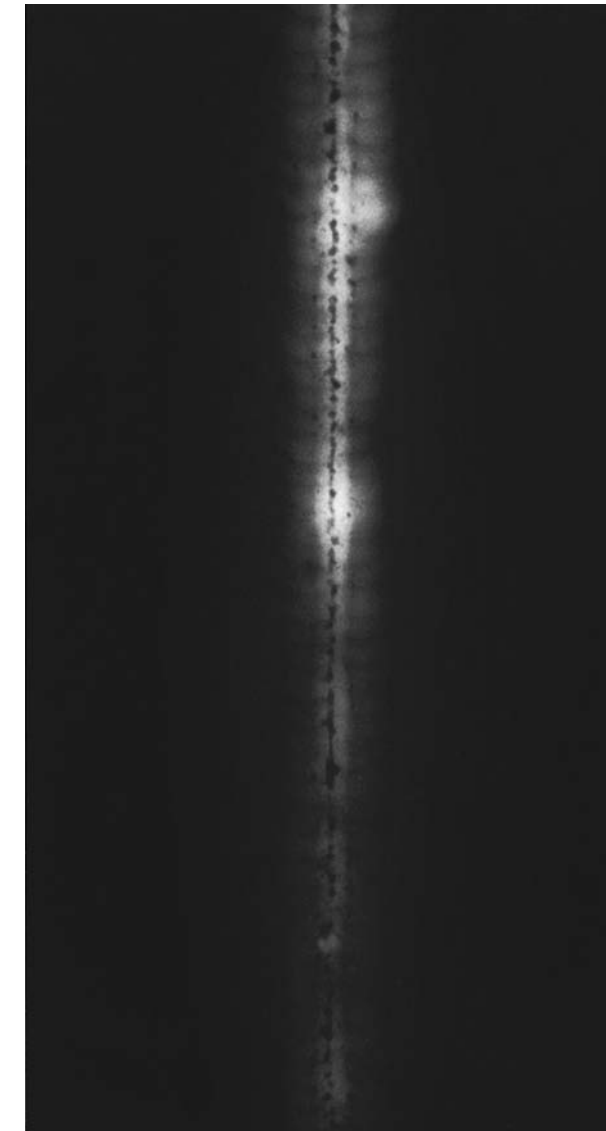
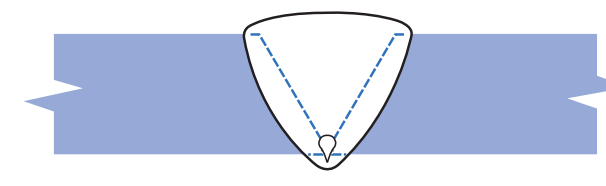
Radiographic Image:
Rounded spots of darker densities random in size and location.

Cluster Porosity:
Rounded or slightly elongated voids grouped together.



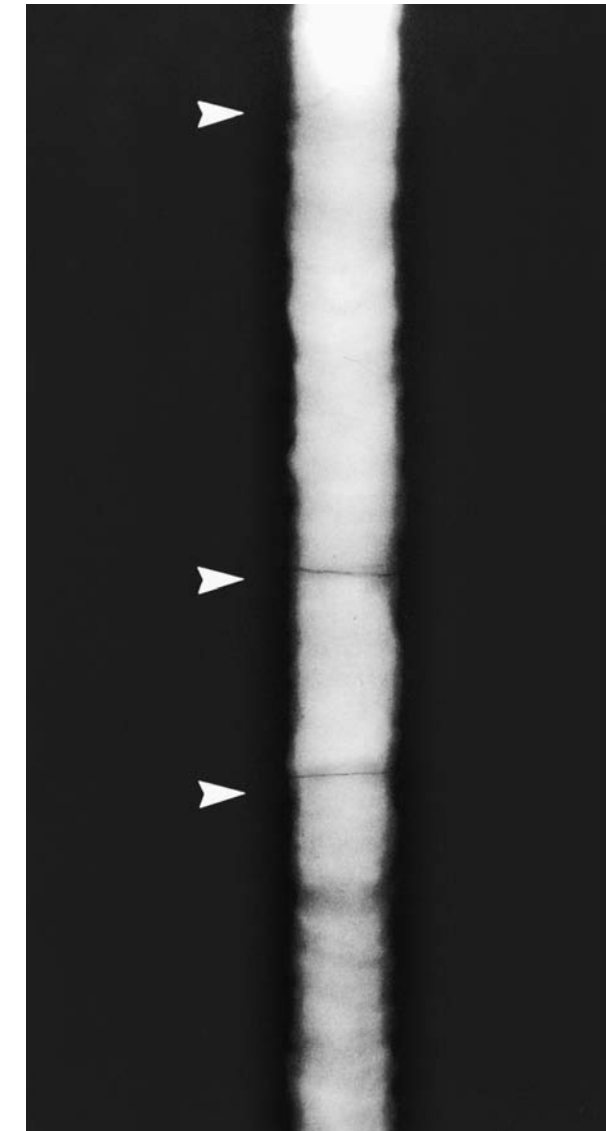
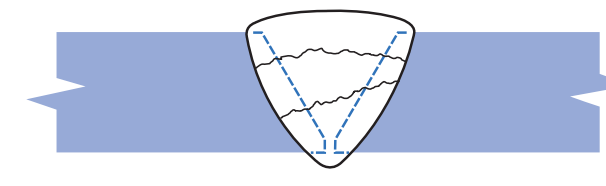
Radiographic Image:
Rounded or elongated darker density spots, that may be connected, in a straight line in the center of the width of the weld image.

Root Pass Aligned Porosity:
Rounded and elongated voids in the bottom of the weld aligned along the weld centerline.



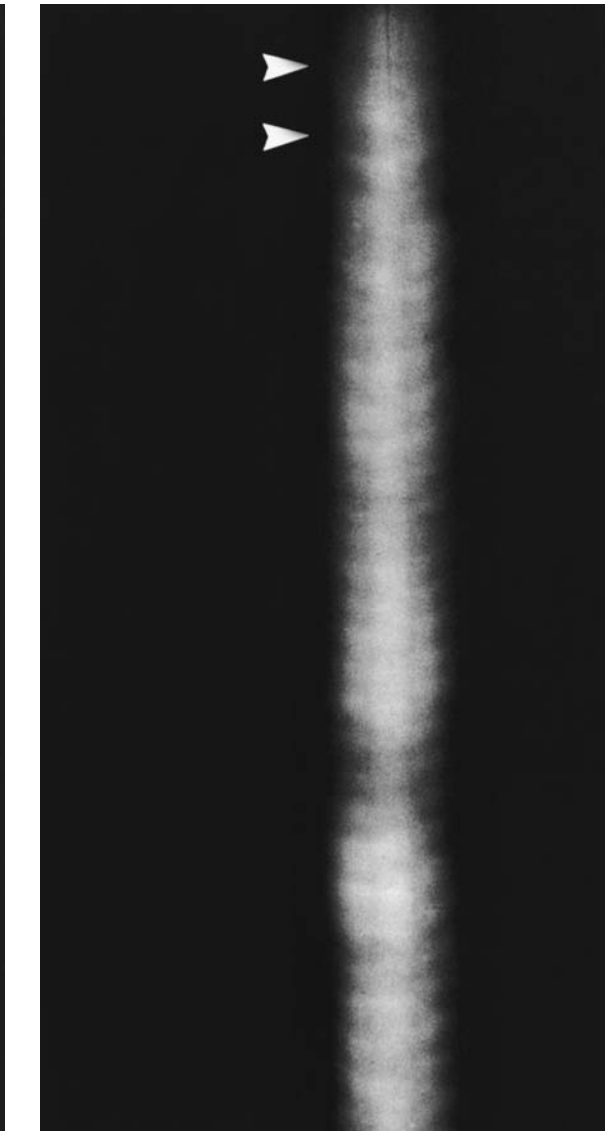
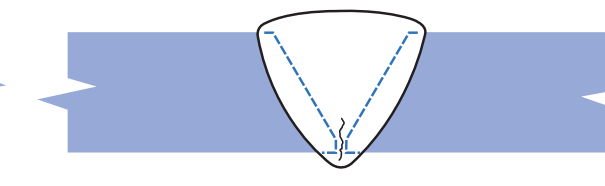
Radiographic Image:
Rounded and elongated darker density spots, that may be connected, in a straight line in the center of the width of the weld image.

Transverse Crack:
A fracture in the weld metal running across the width of the weld.



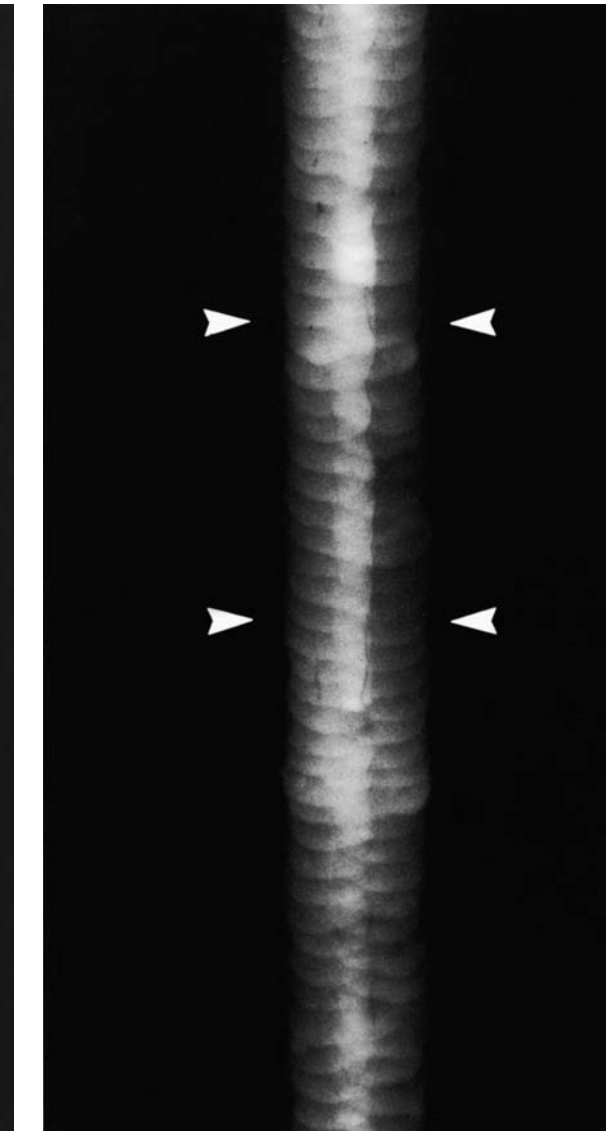
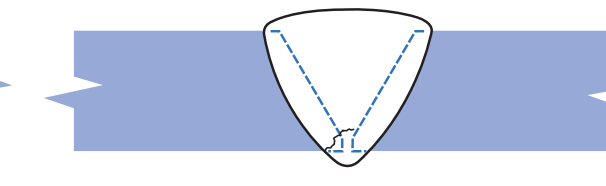
Radiographic Image:
Feathery, twisting line of darker density running across the width of the weld image.

Longitudinal Crack:
A fracture in the weld metal running lengthwise in the welding direction.



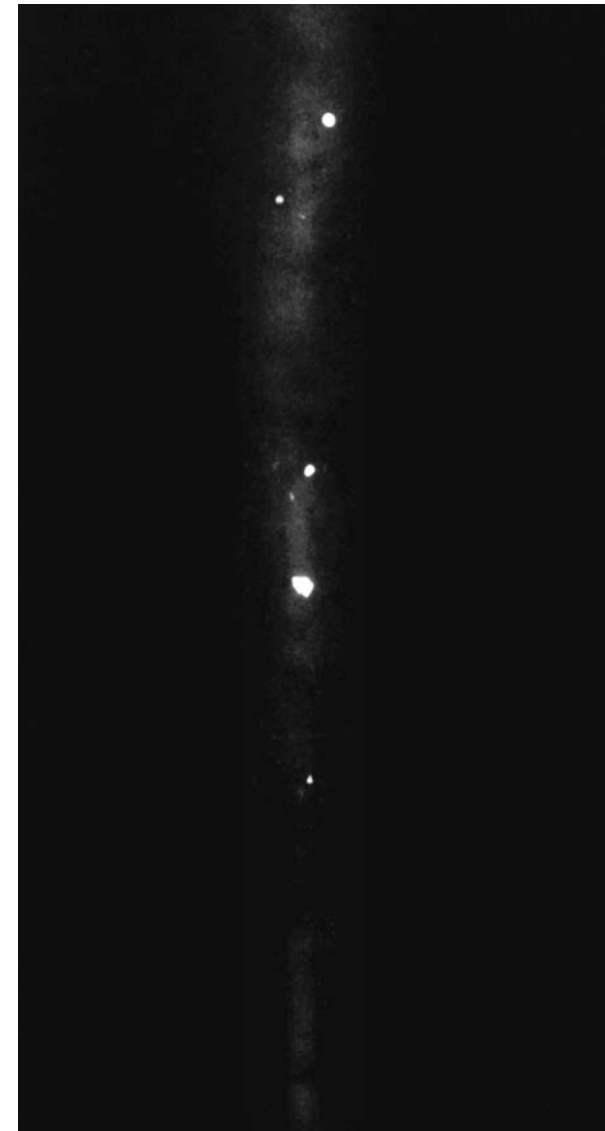
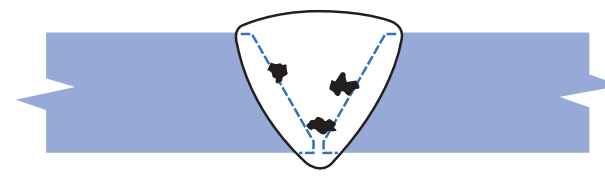
Radiographic Image:
Feathery, twisting lines of darker density running lengthwise along the weld at any location in the width of the weld image.

Longitudinal Root Crack:
A fracture in the weld metal at the edge of the root pass.



Radiographic Image:
Feathery, twisting lines of darker density along the edge of the image of the root pass. The "twisting" feature helps to distinguish the root crack from incomplete root penetration.

Tungsten Inclusions:
Random bits of tungsten fused into but not melted into the weld metal.



Radiographic Image:
Irregularly shaped lower density spots randomly located in the weld image.