



Radiographic Testing (RT) of Deaerator Vessels

The purpose of radiography of pressure vessels is to insure the structural integrity of welded joints on the vessel. The amount of radiography used affects the head and shell thickness and the vessel cost. Generally, if more radiographs are taken, thinner materials can be used.

This technical paper is meant to be used for informational purposes only. The ASME Code should be referred to for specific questions and applications.

There are several levels of radiography that should be considered by engineers who write specifications for deaerators. ASME Section VIII, Div.1, Par. UG-116 defines the following:

1. RT1 – This designation indicates that 100 % of all longitudinal and circumferential seams have been radiographed. It also indicates that 100 % of nozzle welds over 10” diameter and of weld neck design have been radiographed. This level yields a 1.0 joint efficiency on all welds. RT1 is mandatory for head/shell thickness greater than 1.25” (ASME SA-516-70).
2. RT2 – This designation indicates that 100 % of longitudinal weld seams have been radiographed and that spot RT has been done on circumferential seams. This level yields a 1.0 joint efficiency for thickness calculations. No radiographic testing is done on nozzle welds for this level. This is defined in Par. UW-11(a)5 and UW-11(a)(5)(b).
3. RT3 – This level requires spot RT on all longitudinal and circumferential seams and yields a 0.85 joint efficiency. No nozzle connection welds have RT performed on them. This is defined in UW-11(b) and UW-52.
4. RT4 – This is defined as any level of RT performed, but not defined by RT1, RT2, or RT3.
5. Vessels designed to ASME code, Section I require 100% RT on circumferential and longitudinal seams and certain nozzles as defined by the ASME Code.

Each specifying engineer should consider safety, cost and quality assurance before deciding which level of RT to include on a given deaerator.