

Non-ASME vs. ASME-Coded Condensers

What's the Worst that Can Happen?

As mandated, the Environmental Protection Agency (EPA), 40 CFR 63 Subpart HH^[5] and HHH establishes emission limits for BTEX from glycol dehydration units. Similarly, the Occupational Safety and Health Administration (OSHA) declares permissible exposure limits^[4] (PELs) for substances like benzene. In 2025 alone, corporations were fined as much as \$35 million in civil penalties and forced to replace units as part of settlements^[1]. Non-ASME-coded condensers of ambient BTEX systems can quickly become a placebo, rather than cure the problem of benzene exposure in natural gas dehydration facilities. They are commonly hazardous, leading to both financial losses and health risks. Therefore, it is financially beneficial in the long term to invest in ASME-coded vessels that are safe, compliant, and built for longevity.

Non-ASME-Coded Condensers

Sites often opt for Non-ASME-Coded Condensers because ASME only regulates vessels with an internal or external pressure above 15 psi (100 kPa). However, non-coded vessels are vulnerable to temperature gradients. Metals have a unique coefficient of expansion that measures how a material's dimensions change with temperature. Therefore, material welds pop if not built to withstand mechanical stress. Cracks and weld separations require periodic maintenance. Non-coded vessels are also more susceptible to damage during shipping. Although hot-work welders can periodically maintain damaged or faulty non-coded vessels, temporary mends do not fix the root of the problem. What's more, skilled welders are required to control the unique heat distortion and thickness at each joint, as well as adeptly handle rusty and thin steel rods. The short lifespan and reduced operational efficiency of non-coded condensers inevitably lead to replacements.



Figure 1: Ambient condenser tube bundles experiencing accelerated erosion from leaking BTEX containing the carcinogen, benzene.

The corrosion of metals, cracks, and leaks of dangerous BTEX and carcinogens create hazardous conditions. Long-term exposure increases the risk of various cancers, with the worst-case being death.

Natural gas dehydration (dehy) facilities lose millions of dollars per day in profit during unplanned shutdowns and lawsuits. Criminal charges can be placed on employers for negligence or reckless disregard for human safety. In addition, serious fines for failure to correct unsafe work practices and

environments can be initiated by federal agencies such as the EPA and OSHA. Moreover, shutdowns and restarts create significant temperature and pressure variations, increasing the risk of leaks and equipment ruptures. As a result, unexpected maintenance and replacements of faulty condensers reduce net profits.

ASME-Coded Condensers

ASME-coded ambient units require hydrotesting at 1.3 times the pressure for which they are coded to ensure there are no carcinogen leaks. Furthermore, coded condensers are built with a heat trace number to confirm they meet ASME Sections VII^[2] and IX^[3], the boiler and pressure vessel codes guarantee quality manufactured welds, joints, and functionality. Code condensers are built to withstand extreme temperature swings, corrosive environments, and long-term field abuse. ASME-trained code welders, tight tolerances, and pressure ratings ensure longevity in variable weather conditions. As a result, there are far fewer financial risks: maintenance, replacements, profit loss from shutdowns, and fines.

ASME requirements keep employees safe from site accidents and carcinogen leaks. Leaks can result in environmental destruction, a failure to protect employees, and require workers' compensation. Safety and quality assurance ensure a site's compliance with both internal and external regulations. Coded vessels keep companies up to date with EPA, OSHA, and NESHAP laws to protect corporations from financial liabilities.

Lessons Learned

Non-ASME-coded condensers are not worth the financial, safety, and environmental risk. They use any welder, with no design restrictions. ASME-coded vessels are safe, compliant, and built for longevity. The financial payback of ASME-coded vessels far surpasses the cost of repairs and replacements of non-ASME-coded condensers.

Non-ASME vs. ASME-Coded Condensers (Cont'd)

References

- [1] (2025). *2025 HF Sinclair Navajo Clean Air Act Settlement Agreement Summary*. United States Environmental Protection Agency.
<https://www.epa.gov/enforcement/2025-hf-sinclair-navajo-clean-air-act-settlement-agreement-summary>
- [2] *BPVC.VIII.1 - BPVC Section VIII-Rules for Construction of Pressure Vessels Division 1*, BPVC.VIII.1 (2025). The American Society of Mechanical Engineers.
<https://www.asme.org/codes-standards/find-codes-standards/bpvc-viii-1-bpvc-section-viii-rules-construction-pressure-vessels-division-1/2025/print-book>
- [3] *BPVC.IX - BPVC Section IX-Welding, Brazing, and Fusing Qualifications*, BPVC.IX (2025). The American Society of Mechanical Engineers.
- [4] *Permissible Exposure Limits – Annotated Tables* (2021). Occupational Safety and Health Administration.
<https://www.osha.gov/annotated-pels/table-z-1>
- [5] *Subpart HH—National Emission Standards for Hazardous Air Pollutants from Oil and Natural Gas Production Facilities*, 40 C.F.R. § 63.760 (1999). Code of Federal Regulations.
<https://www.ecfr.gov/current/title-40/chapter-I/subchapter-C/part-63/subpart-HH>



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