

# COLD WALL EQUIPMENT HAZARDS

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Cold walls refer to the external walls of hot process piping or vessels that have internal refractory linings. The purpose of the refractory lining is to ensure external wall temperature is within the design temperature limit. Examples of such cold walls are internal refractory-lined gasification reactors, heaters, or furnaces used in process industry that are not externally insulated.

Cold wall hazards exist when external insulation or a physical barrier is inadvertently added to the piping or vessel, for example to enhance personnel safety and comfort. In such cases, localized overheated surfaces on equipment may form as heat dissipation to the atmosphere is hindered. These localized areas, or 'hot spots', could present potential failure modes due to

refractory failure or hot corrosion. As the hot spots exceed design temperature limits, localized melting or corrosion of the metal could occur, resulting in rupture and loss of containment of very hot process gases, leading to blowouts and process safety incidents.

A good way to detect hot spots before they become an issue is with an effective thermography inspection program e.g. an on-line thermal IR scan or a scheduled inspection. In cases where this is not possible, temperature sensitive paints are a viable alternative as an effective warning system of localized overheating.



All of the recommendations are technical advisory in nature from a risk management perspective and may not apply to your specific operations. Please review recommendations carefully and determine how they can best apply to your specific needs prior to implementation. Any queries relating to insurance cover should be made with your local contact in underwriting, agent and/or broker.

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In addition to loss control engineering measures, the plant Operations management should communicate Cold Wall hazards effectively to relevant personnel, indicate potential hazard areas with signage (e.g. Do Not Insulate tags) and strictly apply a Management of Change process. The requirements of **NFPA 86 Standard for Ovens and Furnaces** and **API 571 Damage Mechanism Affecting Fixed Equipment** in the Refining Industry should be consulted in the development or improvement of safe operation & inspection procedures.

Design: [Graphic Design Centre](#)

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