

Project name:	Structural integrity assessment of heterogeneous welded joints of pressure equipment system elements
Description:	Pressurized pipelines and vessels are used in many important installations such as oil pipelines, gas pipelines, marine structures, etc. The most important method of joining the elements of pressurized equipment, apart from detachable joints, is the welding process. As the elements are joined with additional material during welding, the resulting welded joints may have different mechanical properties than the base materials. The influence of different mechanical properties in welded joints of pressure equipment has not yet been sufficiently investigated. Since damage can occur in the environment or in the weld itself during the welding process and during use, this project is aimed precisely at researching the influence of different mechanical properties of the joints of pressure equipment with regard to the integrity assessment in the presence of damage in welded joints.
Webpage:	
Source of finances:	University of Slavonski Brod
Project coordinator:::	Prof. Pejo Konjatić
Project budget:	2.650,00 EUR
Duration:	October 2023. – September 2024.
Location:	Slavonski Brod
Target groups:	The University of Slavonski Brod, the Faculty of Mechanical Engineering in Slavonski Brod, the wider scientific community, companies and employees involved in the design, production, inspection and maintenance of pressure equipment
Objectives:	<p>Pressurized piping and vessels are part of any pressure equipment system, and the most common connections in such systems are vessel-to-piping and pipe-to-piping connections. The most common method of joining pressurized equipment is welding with filler material, creating joints with different mechanical properties than those of the base material. Since defects and damage can occur during the welding process itself or later during use, usually in the form of cracks, it is necessary to investigate the effects of cracks using the principles of fracture mechanics to estimate the service life of such a welded joint. The existing methods for evaluating the integrity and determining the service life of pressure equipment are mainly focused on the evaluation of pressure equipment joints, where the difference between the mechanical properties of the weld and the base material is not taken into account, and to a much lesser extent and with significant limitations, the heterogeneity of the welded joint is taken into account in the presence of damage in welded joints. Therefore, this project foresees:</p> <p>A) Establish a systematized research plan that includes several different joints of pipeline elements, pipeline connections and pressure vessels with respect to different geometries, different materials and therefore mechanical properties.</p> <p>B) By varying the basic geometric parameters in their application range, by changing the magnitude of the potential damage caused by the exploitation, a complete insight would be obtained as to how in different joints of pressure</p>

	equipment elements performed by the welding process, certain geometric parameters and mechanical properties of the base and filler material with certain have the greatest damage, and whether it has a favorable or unfavorable influence on the fracture behavior of pressure equipment joints.
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