



Conversion of Three Crude Oil Tanks into Liquid Bitumen Storage Tanks at Auhafen, Basel, Switzerland

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Abstract

Due to a change in requirements, environmental protection awareness and therefore reduced use of petrochemical raw materials, the owner of the crude oil tank farm at Auhafen, Muttensz Baselland investigates the conversion of three from eight tanks with liquid holding capacities of 7500m³, 6800m³ and 3700m³ into bitumen storage tanks. The permanent heating of the bitumen to 170° C requires thermal insulation and also drainage of condensed water at the outer surface of the tank. Thorough inspection and supervision of the tanks are recommended. Measurements are proposed when tanks are initially filled and temperature of the steel shells are increased from the environmental temperature to the working temperature of the tanks.

The report will focus on the structural modelling, the model assumptions of the foundation of the tanks and the capability of thermal expansion of the base and walls of the tanks. The tanks, built in 1967, will be topics for discussion due to its buckling resisting capabilities under various filling stages.

The conclusion of the report will show strengthening solutions as well as possible reduction of holding capacities or achievements for better expansion potential of the tanks on the ground.

Keywords: Steel Tanks, Liquid Storage Tanks, Crude Oil Tanks, Bitumen Storage Tanks
High Temperature Storage of Liquids, Conversion of Steel Tanks, Thermal Insulation of Steel Tanks
Structural Design of Steel Tanks under Severe Conditions