

 Tanks

Reference Details:

Owner YEMEN LNG Company, Yemen +++ **Sub-Contractor for LNG tanks** Consortium consisting of Toyo Kanetsu K.K. (Japan), DYWIDAG International GmbH (Germany) and DAEWOO Engineering & Construction Co., Ltd. (South Korea)

DSI Unit DSI Group Headquarter Operations, Munich, Germany
DSI Scope Supply of about 49,000 m DYWIDAG Multistrand Tendons including anchorages and accessories, 17 t cryogenic GEWI[®] Threadbars & OSlash; 28 mm grade 500/550, 31 t GEWI[®] Threadbars Ø28 mm grade 500/550, 118 t GEWI[®] Threadbars Ø32 mm grade 500/550



Use of DYWIDAG Multistrand Tendons for the construction of the first LNG Tanks in Yemen

LNG export terminal, Bal Haf, Yemen

Yemen not only has an interesting, partly legendary history, but also large natural gas reservoirs. First plans to exploit the gas fields already existed in the late 1990s. The participation of Korean companies in the investors' group, now trading under the name of YEMEN LNG Company, as well as the worldwide increasing demand for gas led to the realization of these plans in 2005. With USD 3.7 billion, it is the country's largest investment project.

An export terminal for shipping liquefied natural gas particularly to Europe and South Korea is being built in Bal Haf on the busy shipping routes of the Arabian sea. The natural gas is to be transported to the terminal via pipelines from the Marib Block gas fields about 320 km away and liquefied there. Two tanks are being built for the interim storage of this liquefied natural gas (LNG). The consortium

consisting of TKK, DYWIDAG and DAEWOO began construction of the first two LNG tanks in Yemen in early 2006. Both tanks will have a capacity of 140,000 m³ each, with completion scheduled for late 2008.

Since natural gas only liquefies at temperatures below -161°C, low temperature stability of all materials used in the construction of LNG tanks is extremely important. DSI has already successfully demonstrated the cryogenic suitability of its post-tensioning systems in numerous tests in the past.

DSI's services for the construction of the first two LNG tanks in Yemen included the supply of more than 49,000 m DYWIDAG Multistrand Tendons including anchorages, types MA 6809 and 6819, as well as accessories. In addition, DSI successfully provided evidence for the cryogenic fitness of the GEWI[®] Threadbars and DYWIDAG Multistrand Anchors in a total of six tests conducted in its Munich testing laboratory.

Floor slabs of LNG tanks require extreme reinforcement. Additional strengthening of the ultimate load of floor slabs is achieved by post-tensioning the reinforcement. Therefore, the strands and reinforcing bars in the floor slabs of the two LNG tanks in Yemen were post-tensioned with 380 high-quality cryogenic DYWIDAG Multistrand Anchors each. For this purpose, DSI additionally supplied specific connection pieces for connecting the anchors to the strands and reinforcing bars.

Furthermore, DSI supplied GEWI[®] Threadbars including accessories for splices in construction joints. In addition, cryogenic GEWI[®] Threadbars are also used in access openings. GEWI[®] Threadbars are predestined for such use, since they can be extended to the length of the opening in the subsequent concreting of access openings, and thus the stability of the wall is ensured.