

ACCESS AND INSPECTION STRUCTURE FOR TANKS IN THE PHARMACEUTICAL INDUSTRY

CLIENT	A MULTINATIONAL COMPANY, LEADER IN THE PHARMACEUTICAL FIELD AND IN THE PRODUCTION OF BASIC ELEMENTS FOR THE FOOD INDUSTRY
LOCATION	PIEMONTE - ITALY
USE	THE CONSTRUCTION OF WALKWAYS FOR THE INSPECTION AND CONNECTION OF TWO STORAGE TANKS AND THEIR ACCESS STRUCTURES INCLUDING VERTICAL LADDERS
PRODUCT	CONNECTING WALKWAY AND FLOORING IN SCH 52/30 IFR GRATING, VERTICAL LADDER TYPE 1 AND STANDARD HANDRAIL SYSTEM
SERVICE	SEISMIC STRUCTURAL PROJECT AND THE HANDLING OF THE DIFFERENTIAL THERMAL EXPANSION (DRILLED JOINTS) ASSEMBLING AND DETAILED DRAWINGS, CUSTOMIZED MATERIALS (TEFLON-COATED SCREWS)



OBJECTIVE

The client needed a structure that would allow the inspection of the valves on top of the storage tanks. The structure needed to include an inspection platform, a safety handrail system, vertical ladders with a rest platform, connection walkway between the two tanks with a distance of 5.5 meters and placed at over 10 m height from floor.

The main difficulties of this project and construction were three:

- 1. Vertical ladders:** fixed on the curved wall of the tanks in order to allow the movement of the tank due to thermal expansion and to filling and emptying procedures.
- 2. Valve inspection platform:** its fixing on the curved top of the tanks and the tailor-made shaping allowing the passage to the valves that need continuous inspections (fumes, functioning, reliefs)
- 3. Connecting walkway:** anti-seismic project that would allow the out of phase movements of the tanks that could be caused by earthquakes.

SOLUTIONS

The problems have been solved as follows:

- 1.** The fixing of the vertical ladders on the curved surface of the tanks has conveniently been made with steel plates fixed to corresponding thermoplastic material plates welded on the surface of the tanks at the minimum distance required by the applicable norms. The plates have been drilled with vertical holes in order to support eventual vertical movements caused by thermal expansion and/or filling/emptying of the tanks.
- 2.** In the above-ground platforms of the tanks, the walkway beams have been fixed to specifically dimensioned six steel plates which in turn have been fixed to the curved surface of the tanks. The position of the beams and the shaping of the grating have been tailor-made to permit the passage of the valves and their effortless inspection. The whole structure has then been completed by a safety handrail system.
- 3.** To avoid stress in case of earthquakes, the connection walkway must be able to freely move by means of a seismic joint. The walkway has been fixed to the tanks with steel plates and on one end we have made a seismic joint by keeping the walkway shorter and using slotted hole plates in order to allow a horizontal movement of the structure in case of out of phase movements of the tanks. For the continuity of the walkway, the safety gap has been covered by a laminated plate that would break in case of earthquake and allow to freely oscillate.