



Instruction Manual Fuel Storage Tank Hydro Test Procedure

Client: Peyvand Golestan Cement Co.

Consultant: IID Co.

Department: Heavy Fuel Oil Storage Tank



۱- GENERAL

After erection is completed and stress relieving, radiographic examinations, or other similar operations, as may be required, are performed, each tank shall satisfactorily pass a series of hydrostatic as prescribed in ۲ through ۶. In freezing weather, linseed oil or a similarly suitable material shall be used. Reference standards for this procedure are API ۶۵۰, API ۶۵۲, IPS-C-ME-۱۰۰.

۲- TEST PRELIMINARIES

۲-۱ The attachment welding around all opening and their reinforcements in the walls of the tank shall be inspected by the PT method both inside and outside the tank. When the underside of a tank bottom rests directly on the tank grade (and is not accessible after erection), such inspection of welding on the underside of the bottom and subsequent air testing may be omitted. However, such inspection and testing of any opening in the bottom plates shall be done before these plates are placed in position on the tank grade.

۳- RATE OF WATER FILLING AND WATER TEMPERATURE

The rate which water is introduced into a tank for a hydrostatic test shall not exceed values showed in table ۱.

TABLE ۱

BOTTOM COURSE THK. (mm)	TANK PORTION	FILLING RATE m ³ /hr
<۲۲	Top course	۳۰۰
	Bellow top course	۴۵۰
≥۲۲	Top third	۲۲۵
	Middle third	۳۰۰
	Bottom third	۴۵۰

The foundation, venting equipment, or other conditions may limit the water filling to a lower rate. Pressure shall not be applied above the surface of the water before the tank and its contents are at about the same temperature of the water used in the tests should be not less than ۲۰° C. using a pressure gauge on one of the blinded nozzles pressure and height of liquid may be controlled.

۴- CHANGES IN TANK SHAPE

If in any of the foregoing tests there is an excessive rise of the bottom of the tank around the boundary of contact with grade, or off its foundations, or if any of the specified conditions of test loading cause other appreciable changes in the shape of the tank, the design shall be reviewed and

means shall be provided in the tank for holding the shape within permissible limits under all conditions of loading.

Δ- SHELL TESTING

Δ-۱ Continuous inspection shall be maintained for the whole filling period. All leaks found shall be repaired with the water level at least ۳۰۰ mm below the point being repaired.

Δ-۲ Any tank showing evidence of leakage from the bottom during water test should be emptied immediately. The source of such leaks should be determined and rectified. Where there is risk that leakage may have caused washout of the foundation material. The foundation is to be inspected. The repair of the foundation should be subjected to special consideration and approval by company.

ϭ- SHELL SETTLEMENT

ϭ-۱ A minimum of four points on tanks up to ۲۵ m diameter and eight points on tanks over ۲۵m diameter should be marked around the base of the tank for subsequent leveling reference. a great number of points may be required for large tank. Circular distance of points shall not exceed ۳۰ ft, before water is added to the tank, the levels at each reference point should be recorded permanent reference levels have to be established in locations unaffected tank loading.

ϭ-۲ Typically, where settlements of over ۳۰۰ mm may be expected, water should be added to the tank at about ۰.۷m per day unit about ۳ m of water is stored such a head, filling should cease and levels at the reference points should be recorded daily. Daily reference point levels should be plotted on a timescale to follow the pattern of settlement.

ϭ-۳ when the daily rate of settlement beings to decrease, water should be added to the tank in decreasing increment of head when the settlement graph that the rate of settlement under each new increment of load is reducing.

ϭ-۴ As the water load nears the full capacity of the tank, water should perfectly beaded after an early morning check of reference levels so that further reading can be taken during the day and the day tank offloaded should the rate of settlement increase unduly.

ϭ-۵ uneven settlement of the tank on its foundation shall be reported immediately to the owner's representative, and filling shall be stopped at any signs of excessive settlement pending a decision by the owner's representative on the action to be taken.

Hydro test schedule is as bellow. Delay times shall be mentioned CAREFULLY to PREVENT foundation deformations.

