

# **HIGHLAND EQUIPMENT LIMITED**

## **JACKETED TANKS**

Built to the latest ASME Code and Boilers and Pressure Vessels Act requirements, Highland Equipment Limited dimpled jacketed tanks offer these features:

Design pressure: 55 PSIG up to 100 PSIG

Design temperature: 400 degrees F.

Shop hydro-test pressure test as per ASME Code.

1. All heat is transferred through #12 gauge minimum and #7 gauge and up, in T304 Stainless Steel or T316 Stainless Steel inner shell.
2. Side and bottom jackets are separate or inter-connected to complete a single jacket. Each is supplied with inlet and outlet connections.
3. Used for heating and cooling applications.
4. Highland's dimpled jacket has been designed with a capacity of more than 1.5 cu.ft.
5. T.S.S.A. registration Number (CRN) can be provided for vessels with a design pressure of over 15 PSIG , after passing inspections and final testing by a qualified T.S.S.A inspector, prior to shipment.

## **ADVANTAGES OF DIMPLED JACKET OVER PLAIN JACKET:**

- 1) Greater efficiency of heat transfer – heat flows rapidly from the outer jacket wall through the weld (contact area of Dimpled Jacket with Tank wall).
- 2) Overall heat transfer coefficient “U” is significantly higher.

Highland Equipment Limited Tank wall thickness = #12 gauge (0.109”) = (2.77mm) is very small in comparison with those of the tanks provided with plain jacket. Therefore, a lower wall resistance will lead to a higher “U”. A higher “U” will lead to a lower area of heat transfer.

Substantial reduction in the thickness of Tank/Vessel wall is desirable, both for heat transfer and weight reduction, which will lead to significant dollar savings.

When a conventional jacket vessel is designed, the required shell thicknesses are the function of the diameter, design pressures, and the unsupported length of the inner shell. Any increase of these values necessarily leads to an increase in material thickness. The dimpled jacket makes a thinner wall possible, because it is based on using a relatively short distance between the dimples. Through the use of the large number of reinforcing dimples, the thickness of both the inner and outer walls can be considerably reduced.

From a process point of view, the use of a thinner shell and the turbulence created in the jacket side is greatly affected by the following design parameters.

Dimple size and shape.

Diameter of weld (i.e., contact area)

Jacket space or jacket volume.

Dimple arrangement (i.e. pitch)

Dimple density.

Highland Equipment Limited Dimpled Jacket, which is a 2.83" rotated square type, has one of the highest area efficiencies. It is next to a 4" square only, but the latter one, having a lesser dimple density (number of dimples per unit area) weakens the structure of the tank, and consequently, a thicker material of construction must be used.





**NOTE:** The area of efficiency is the ratio of heat transfer of a dimpled jacket to the heat transfer of a plain jacket. Highland Equipment Limited's Dimpled Jacket space = 0.24", giving one of the highest jacket heat transfer coefficients.

The fact that dimpled jacket exhibit a slightly higher pressure drop than that of plain jackets, makes the dimpled jacket superior in liquid distribution. Dimpled jacket appears the most favourable in many areas, when the performance of the jacket and the wall thickness are important.

Highland Equipment Limited's unique design will provide:

Reduced cost and weight;

Improved heat transfer ability;

The best design for liquid services, where process side cleanliness or scale prevention is judged to be essential for agitated vessels.

**NOTE:** The clamp type plate or thermal coils have lower efficiency and should only be used when time requirement is not critical.