



Thermal Insulation Products - Banding & Seals

Stainless Steel Expand-R-Strap

Introduction

The Thermal Insulation Contractor and Industry in general have long sought an answer to the strapping problem - how to hold insulation and aluminium sheeting snugly around tanks, vessels and other equipment which expands and contracts in circumference due to variations in temperature. The answer to this problem is Expand-R-Strap.



General Description

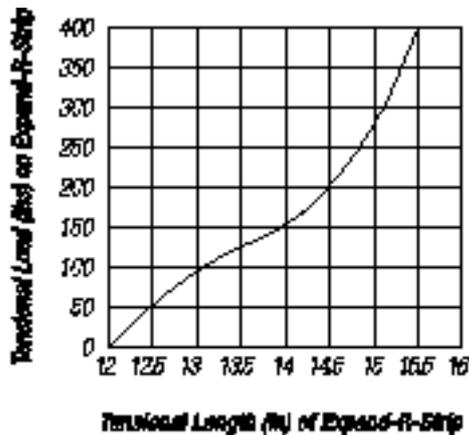
Expand-R-Strap stretches and snaps back like a spring, maintaining a constant tension over an expansion/contraction range of several feet. Because it is made of tempered stainless steel it is resistant to corrosion, including attack from most chemical fumes and mild acids. Field tests under a variety of atmospheric conditions have proved that it can be expected to last as long as the insulation itself. 1.5m (5') of corrugated and 1.5m (5') of plain strapping alternate (graph 1) along the entire length, which is usually, 97.5m (320').

Expand-R-Strap then stretches as the vessel expands, neither cutting into the insulation nor bursting the seals, contracting again with cooling thus maintaining a firm grip throughout the whole expansion/contraction cycle. In determining the amount of Expand-R-Strap required, engineers should consider the exact thermal expansion of the vessel to be bound, and the tensional load on the retaining straps required for the type of insulation used.

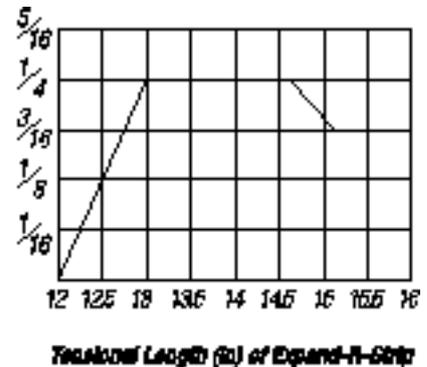
EXPAND-R-STRAP SHOULD NOT BE LEFT LOOSE TO ALLOW FOR EXPANSION OF THE VESSEL AS IT WARMS UP.

It should be stretched to give a tensional load suitable for the type of insulation used. Graph 1 shows the relationship between tensional load and the extended length. You will see, for example, that a tensional load of 38.5kg (85lb) (which is usual) will be obtained by an initial extended length of 25.4mm (1") for every 305mm. Graph 2 shows that under a 38.5kg (85lb) tensional load (ie. 25.4mm (1") expansion per 305mm, there will be 6.4mm (0.25") per ft thermal expansion/contraction range. Higher loads may be required but should be limited to 68kg (150lb) (ie. an initial stretch of 51mm (2") per ft. Graph 2 also shows that an initial stretch of more than 63.5mm (2.5")

Graph 1



Graph 2



will result in a drastic reduction of the thermal expansion/con-

Expand-R-Strap must be tensioned to a point depending on the density of insulation and/or type of metal cladding, where firm support is given, when the tank is at ambient temperature.

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DISCLAIMER

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Stainless Steel Expand-R-Strap Continued

Physical Properties Expand-R-Strap

Material	Type 304 0.25 hard Stainless Steel
Width	19.2mm (0.75")
Thickness	0.5mm (0.022")
Wt./foot (0.3m) of non corrugated part	0.026kg (0.59lb)
Wt./foot (0.3m) of corrugated part	0.034kg (0.78lb)
Length of non corrugated	11.1m per kg (16.9ft per lb)

Fixing Instructions

No tools, other than those normally used for strapping are

1. Determine circumference of vessel outside metal cladding, or over insulation, while the vessel is at ambient temperature.
2. Cut Expand-R-Strap slightly larger than the circumference dimension, ensuring that a plain section of the strapping is left at each end.
3. The strapping must be tightened to a point, where, depending on the type of metal cladding and/or density of insulation, firm support is given. If the tensioned load of 38.5kg (85lbs), as is normal, is required, deduct 25.4mm (1") per ft of Expand-R-Strap length and mark position for seal. For example, mark it at 8.3m (27'6") on a 9.1m (30') length. If a higher tension load is required then deduct the extended length reading against the tensional load on Graph 1.
4. On vessels 3m - 6m (10' - 20') in diameter we recommend that the strapping is applied in two pieces and tensioned with two steelbinders so that all corrugated sections of the strapping are of even tension so that there is no loss of expansion/contraction over the temperature cycle.
5. On vessels above 6m (20') in diameter additional seals should be used as required.

Die Cut Strapping

Die cut strapping should be used in conjunction with Expand-R-Strap. This is important when using Expand-R-Strap to secure aluminium sheeting to large diameter tanks. The use of die cut strapping is not so urgent when Expand-R-Strap is used to secure insulation underneath metal cladding because Expand-R-Strap will embed itself on the insulant when taking up the primary stretch. Made of 0.75" width stainless steel, Expand-R-Strap is applied to a ring at the base of the tank and stretched taut to the corresponding ring at the top of the tank. It is then draped around the tank so that the die cut fingers at 228mm (9") centres (sketches 2 & 3) hold them in exact alignment.

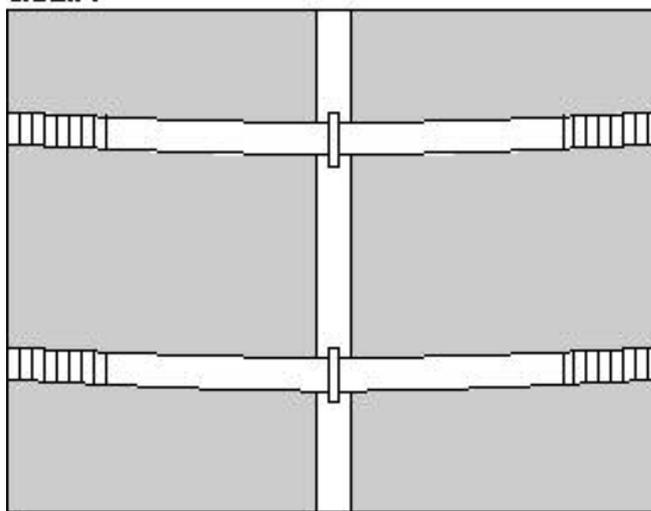
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Sketch 1



Sketch 2

