



# TENMAT

ADVANCED MATERIALS



***FEROFORM* F3637**

**HOT CARGO SUPPORT AND INSULATION PADS  
INSTALLATION MANUAL**



## **Introduction**

The *FEROFORM* hot Tank Support Pad system from **TENMAT** is a versatile and very simple support system for hot steel tanks (containing Sulphur/Bitumen/Asphalt/Coal tar). The system is very easy to adjust to ensure that sufficient surface contact is achieved between the base of the tank and the pad giving optimum support and insulation.

The following manual describes the general instructions for installation of *FEROFORM* F3637 in both:

### **A. Vertical load supports (Typically 3 different options)**

- i) Ships Rib
- ii) Support pillar
- iii) No penetration

### **B. Side load supports (anti-pitch and anti-roll)**

These instructions are based on installation procedures for the basic design of the supports (please refer to the typical drawings of vertical and anti-pitch/anti-roll supports).

For the vertical load supports the basic installation is common to all 3 designs. Any variations in the individual installation procedure is highlighted.

Because the **TENMAT** *FEROFORM* F3637 system is very versatile, on occasions shipyards and designers prefer a slightly different design for their supports, but in these cases the principle procedure remains the same for installation and we are on hand to guide you where necessary.

In general, we recommend positioning the support points where possible at the intersection between the longitudinal girders and the web frame ribs (Option Ai), in this way avoiding unnecessary extra structural support.

# A. Vertical Load Supports – Ships Rib and Support pillar option (i & ii)

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## Preparation

- 1) The base plate should be cut, drilled and the chocking dam welded in place prior to welding to the support structure. (Note that the jacking screw holes may be either tapped in the plate or use nuts welded to the underside of the plate and the dam plate needs only to be 3 mm steel as its only purpose is to retain the chocking compound until it is fully cured).
- 2) The support plate should have Ø6mm weld beads spaced 25 mm apart at right angles to the direction of expansion of the tank, this is required to maximize the chock bond and thus the shear strength between the chock and the steel plate. The exact pattern of the weld bead is unimportant. Lines, squares, zig-zag, spots etc are all acceptable.

## Assembly

- 1) Fit the leveling screws, *FEROFORM* pad and security bolts (do not tighten the security bolts at this stage). The optimum thickness of chock for the Tenmat system is 20mm thick between the *FEROFORM* plate and the base plate. To start at this optimum chock thickness the jacking screws should be fitted to protrude 20mm above the support plate.
- 2) Fit the anti-pitch and anti-roll pads before the tank is lowered (see section B)
- 3) The tank can now be lowered into its final position and it will need to be supported until the next stage is completed, (at this stage be careful not to damage the Anti Roll / Anti Pitch pads). Ideally hydraulic jacks are recommended as they allow easy adjustment of the tank. Note grease may be applied to the counter face if so desired as an anti-corrosion measure but this is not essential as *FEROFORM* pads are non-corrosive and also have a mild cleaning action that will help minimize counter face corrosion.
- 4) The depth of the counter bore in the pad is chosen to create a 5mm gap between the head of the security bolt and the base of the tank. If required, the bolt head thickness can be reduced to achieve this clearance.
- 5) A plug (PTFE is suggested) can be used to provide further insulation on top of the bolt if desired.

# Vertical Load Supports – Ships Rib and Support pillar option (i & ii)

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## Installation

- 1) The chock thickness is to be between 15mm and 25mm. Adjustment of the tank should be made if needed to achieve this. Extra counter face plates can be welded in place for those supports that exceed 25mm thickness of chock. It is not essential that all supports have identical chock thickness.
- 2) Level the pad to the bottom of the tank using the leveling screws to get a good contact surface area. This can be checked with a 0.25mm feeler gauge around all 4 sides of the pad. The pad only needs 35% contact to meet the required specifications however it is advisable to get as much contact area as possible. Normally 75% to 85% contact can be easily achieved. The adjusting screws do not need locking in place but may be tack welded if desired.
- 3) Then inject the chocking compound into the dam area according to the manufacturer's instructions and procedures until it overflows the dam plate. Once the chocking compound is fully cured the tank supports may be removed. At this stage the security bolts may be tightened. Finger tighten ONLY and tack weld the nuts to prevent loosening. If preferred locknuts can be used. It is important that the security bolts are not over tightened as this would lead to the FEROFORM pad being distorted thus compromising the effectiveness of the system.

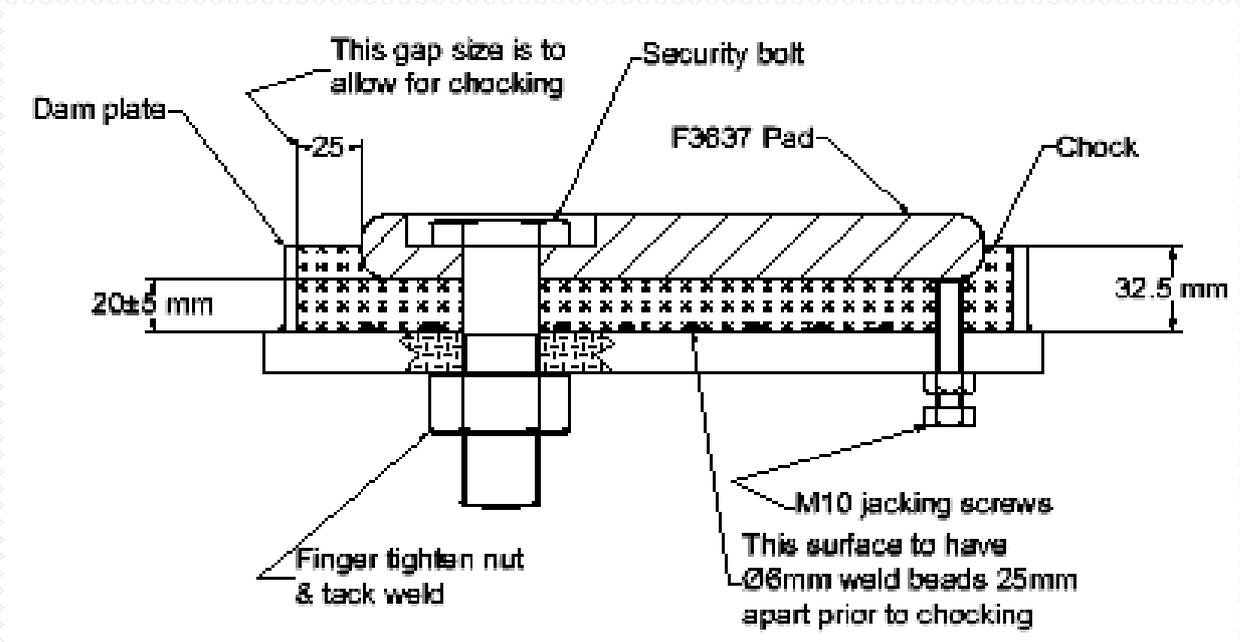
## Vertical Load Supports – No Penetration option (iii)

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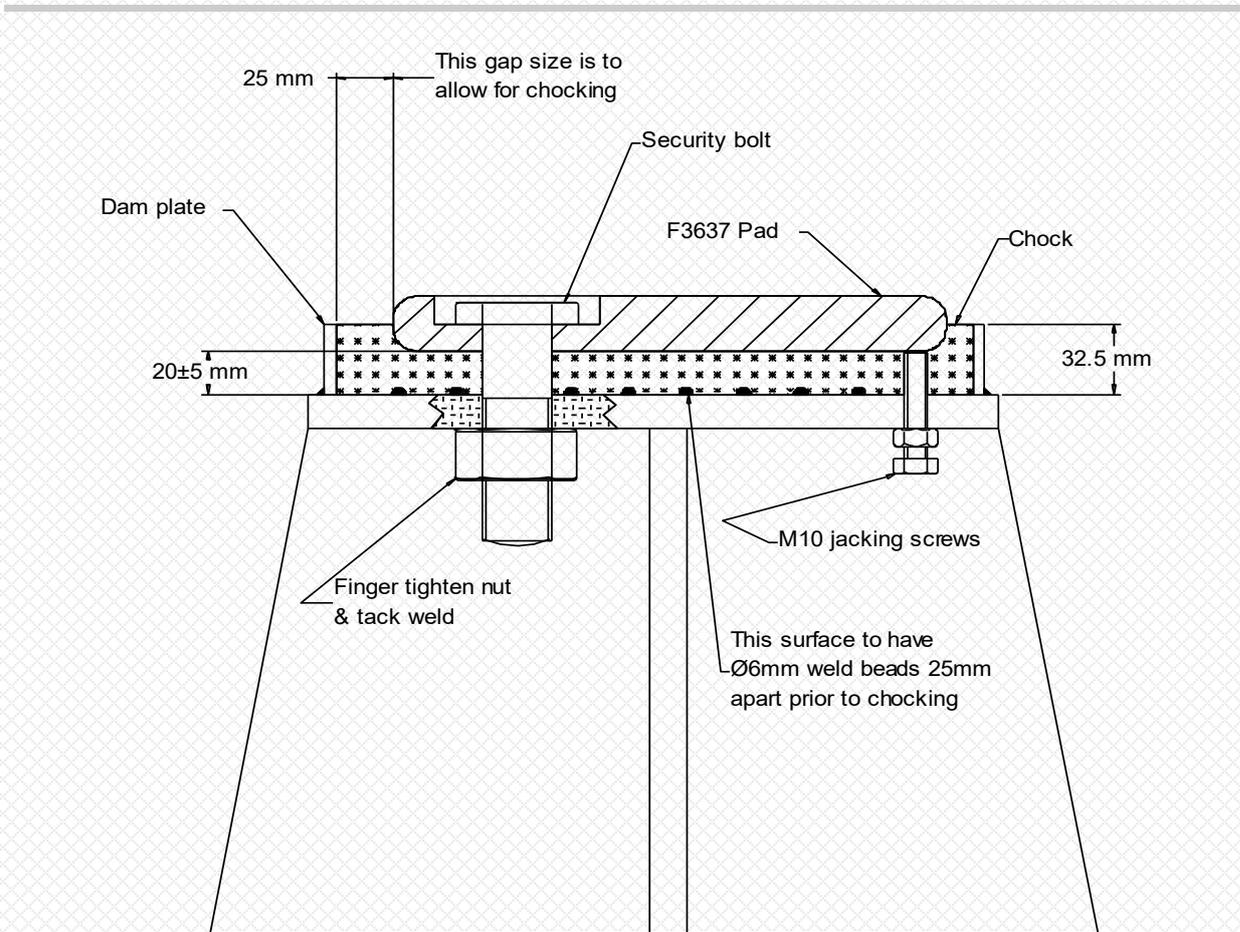
Where “no penetration” is possible i.e. double hull designs or where the advantage of the alignment feature of the FEROFORM F3637 tank support pad is not chosen, a simple flat system may be used to accommodate the use of FEROFORM F3637. In general, follow the installation procedure for (i and ii above) with the following modifications.

Due to the need to adjust the jacking screws the damplate should only be fitted after installation and levelling. The dam plate can be tack welded in place and sealed with silicone sealant prior to chocking. The tank should be raised prior to chocking to allow the security bolts to be finger tightened ONLY on to the F3637 pad.

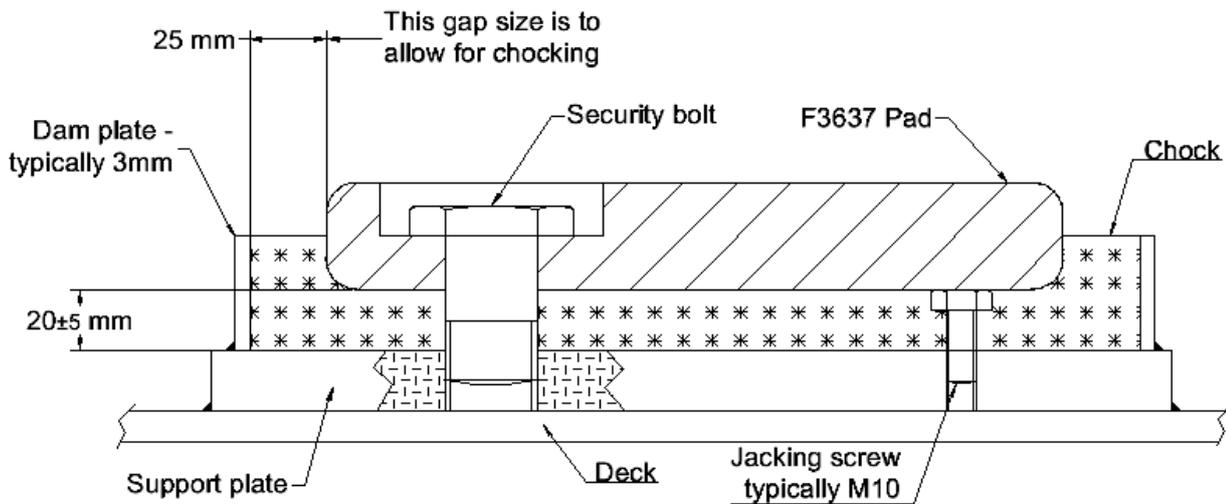
# i. Vertical supports – Ships Rib Arrangement



# ii. Vertical supports – Support Pillar Arrangement



### iii. Vertical Supports – No Penetration Arrangement



## B. Side Load Supports – Anti-pitch

### Introduction

Side support Anti Roll pads are normally mounted along the centerline of the tank and the Anti Pitch pads at the pump house end of the tank. The function of these pads is to absorb the pitch and roll forces and control the expansion / contraction of the tank. These pads are 5mm thicker than the vertical support pads to provide extra insulation. They are retained by bolts and the gap to the tank adjusted by the use of shims fitted between the pad and its support.

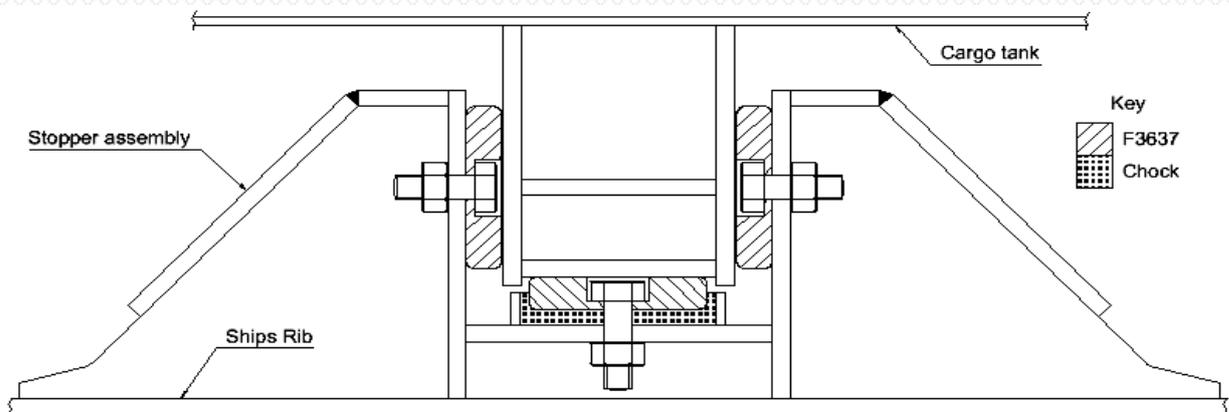
### Preparation

The anti pitch / anti roll structures should be completely fabricated including the appropriate holes. Since chock is not required for anti pitch / anti roll pads then dam plates are not used.

### Installation

- 1) Fit the anti pitch / anti roll pads in place with the appropriate bolts. At this stage the bolts should be only lightly tightened.
- 2) The tank should now be installed according to the instructions given in section A) for the vertical pads.
- 3) The anti pitch and anti roll gaps between the FEROFORM pads and the tanks should now be measured and suitable steel shims produced to reduce the gap to approx. 1-2mm. These shims are fitted by loosening the retaining bolts and sliding the shims between the support structure and the back face of the FEROFORM pads.
- 4) Once in place the retaining bolts can be tightened and the nuts must be tack welded to prevent loosening. If preferred locknuts can be used.

# Side load supports (Anti-pitch and Anti-roll) arrangement



## Statement of Understanding

Please complete and return this page to confirm your having read and understood and followed the installation instructions.

I confirm that I have read, understood and followed all of the fitting instructions and that **FEROFORM F3637 Load Bearing Insulation System** has been installed according to these instructions.

Project / Shipyard / Vessel Hull Number

Company

Print Name

Position

Signed

Dated

**TENMAT** and its agents cannot be held responsible for any damages, loss of earnings or additional costs incurred due to failure to comply with the installation instructions and in this case all warranties will be null and void.



*FEROFORM* **RAILKO** *FEROGLIDE* *FEROBIDE*

**REFRAVER** **REFEL** **ARCLEX**

***FIREFLY*** **NITRASIL** **SINDANYO**

**TENMAT** is committed to the highest standards in customer service and our international staff is looking forward to assist you.

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