Anti-Vibration & Installation Products

Product Manual

Contents

Introduction

Objectives of this training manual

- **Introduce the TICO range of products.**
- **Provide examples of how and where TICO products can be successfully employed.**
- **Provide technical details to enable correct**
- **product selection**
- **Provide details of how TICO products can be customised for specific projects and applications.**
- **Provide guidance on how TICO products can be specified for particular projects.**

What is TICO?

TICO is a generic brand name for a range of products, that are used for a variety of purposes including: Machinery Mounting, Vibration Attenuation, Plant Levelling, Pipe Supports, Movement Joints, Low Friction Supports and Impact Absorption.

Main Features & Benefits

TICO is a rubber bonded cork compound that is vulcanised to create three-dimensional bonds, this gives greater strength and toughness when compared with glued rubber crumb products or air filled elastomers, it additionally gives a higher resistance to break down during the life of the products.

We only use pure elastomers in our rubber bonded cork compounds, this gives the compound a high compression set within its own volume. This means that when under compression, the product maintains its footprint and has a low creep rate and limited bulge outside its load area. The rubber bonded cork compound has a key benefit, our pure elastomers having a high compression set that occurs within its own volume. This means the product under compression maintains its foot print and does not creep or bulge outside of the load area.

TICO is only manufactured in the UK at the Tiflex facility, where it has a quality controlled production process and end of production line testing. This testing verifies performance against product data sheets, giving confidence of product reliability and consistency. Over 60 years of reliability in many diverse applications, validates the TICO brand name heritage and recognition all over the world.

TICO products are designed to operate in harsh environments with its closed cell structure, providing resistance to absorption of oils & water. The product maintains its original performance structure through a wide temperature range, beyond that of many competitor materials.

Background

Since December 1949, TICO has been the registered trademark for James Walker rubber bonded cork anti-vibration materials.

For many years cork had been used for the mounting of machinery in the printing industry. It provided an excellent resilient seating, but had the disadvantage that it quickly took on a high level of compression set (i.e, it had a low level of recovery). The addition of elastomer products to cork provided a material with similar damping properties but a higher level of resilience and recovery. It was recognised that the rubber bonded cork being manufactured for footwear and other applications had a use in the machinery mounting field and TICO S was born.

It became clear during the 1950's and 1960's that a resilient pad could be used for a large number of heavy duty applications in the steel and forging industries. TICO S however, did not have a high enough load bearing capacity and other ways had to be explored to produce a pad of great strength and toughness. Experiments with fabric plies within the materials proved very successful and this, together with the adoption of high performance elastomers, led to the development of the Hi-Duty range.

Once TICO Hi-Duty and TICO S were fully developed the only obvious gap in the range was a pad which would compete with certain types of spring mounts, that would have the ability to isolate low frequencies. Extensive research and testing led to the development of the TICO LF range with its unique waffle format core and TICO S bonding faces.

TICO S was the original grade of anti-vibration material and over the years other more specialised grades have been developed. All these grades are sold under the 'TICO' product family heading.

Basic required information for recommendations using TICO products

Pads for vibration isolation of 'simple' machines:

The basic principal of vibration isolation is that the machine is entirely isolated/separated from the floor by a resilient material that is 'tuned' in such a way that the main disturbing frequencies of vibration are not transmitted through it (or are greatly reduced).

The resilient isolation layer may be in the form of a continuous mat, strips or discrete pads depending on the machine, mounting configuration and performance requirements.

The main design considerations when choosing a pad are:

- **That under normal conditions of load that the material is not stressed beyond its recommended maximum load bearing capacity.**
- **That under normal working conditions the natural frequency of the pad is half or less of the disturbing frequency (or where this is not possible that the natural frequency of the pad is not close to the disturbing frequency to avoid a resonance condition).**

Other considerations include the intended mounting arrangement (bonded/bolted), machine type and location and environmental conditions.

The following information is generally required to enable a full recommendation to be made:

- **The type of machine.**
- **The weight of the machine (dead load).**
- **Indication of any additional loads or dynamic service loads (live load).**
- **The area available to place the pads, e.g. Dimensions of mounting feet, size of skids etc. Plus any restrictions on mounting locations.**
- **An indication of the principal disturbing frequencies of vibration (see notes below).**
- **Is the machine bolted down. If the machine is to be bolted, how many bolts and what size they are.**
- **Will the pads be in contact with oils or any other fluids in service?**
- **Are there any environmental conditions that might affect the pad e.g. Extremes of temperature, radiation etc.**
- **Any limitations on bearing dimensions (size and height) or bearing deflection under load.**

In most cases it is not possible to obtain information directly on the disturbing frequencies of vibration without physically measuring them. In such cases an estimate is usually made based on the machine type, operating conditions and general experience. In particular the following information should be sought:

- **The speed of any rotating parts (or speeds if there are more than one, e.g. If a machine operates over a range) e.g. Fan speed in r.p.m.**
- **The type of machine.**
- **Any observations of particular problems in service (e.g. Is the main problem at a particular speed or point in the machine operating cycle).**

Pit and Plinth Installations

In these applications the machine is normally mounted on a concrete block. In the case of plinth installations the block is above the floor level, and in the case of pit installations the block is sited below ground level in a suitably sized void.

When making recommendations for these applications the additional mass and size of the concrete block needs to be taken in to account (as the pads are normally mounted beneath it). The following information should generally be requested in addition to that listed for simple machines:

- **Dimensions of the concrete block (length, width and height).**
- **A drawing or sketch of the installation if possible.**
- **Whether installation is a pit or plinth.**
- **Is the block precast or to be cast in-situ.**

How to make a basic recommendation for TICO products

In the following pages the process has been broken down into a series of steps which can be used as a model for most situations. Where stress is greater than 0.5 MN/m² consult with Tiflex Technical Team. This example is based around TICO S/PA, if the applied stress is greater than 0.5 MN/m², alternate TICO products would be required.

1. Static Deflection

The deflection of the pad under static load is measured in mm. This is important, as the extent of the pad compression changes its ability to absorb/reduce the range of transmission frequencies and their amplitude (fd. Disturbing frequencies).

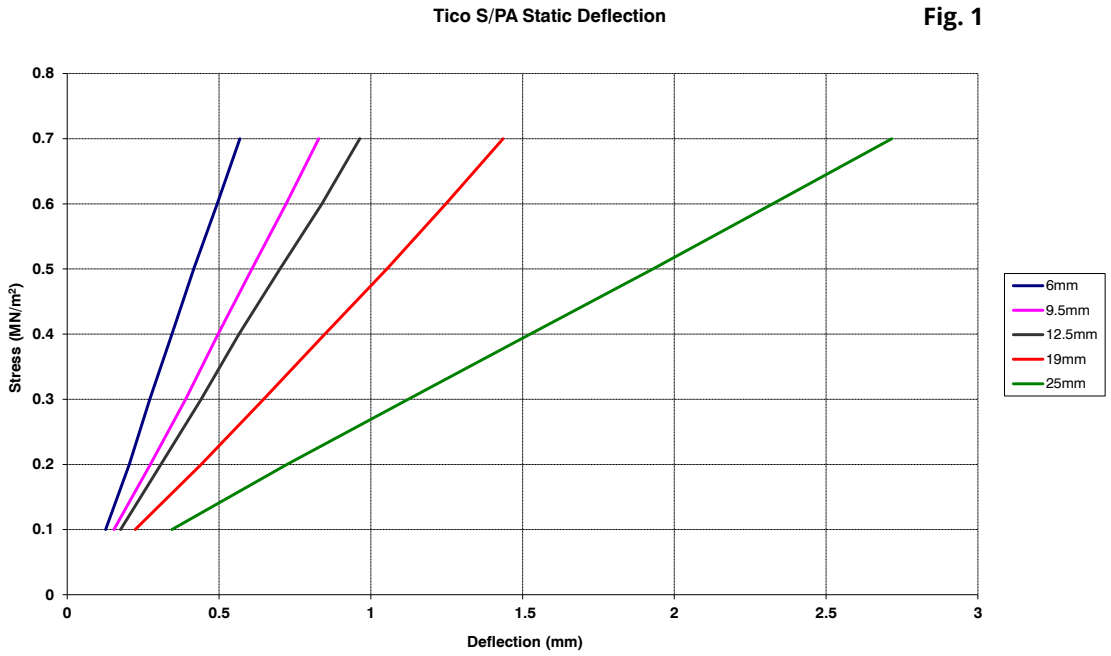
To use graph:

1.1 Calculate Stress on pads in MN/m² using formula:

$$\text{Stress in MN/m}^2 = \frac{(\text{Weight of machine in kg} \times 9.81) \div 1{,}000{,}000}{\text{Area of pad in m}^2}$$

1.2 Project horizontal line from calculated stress to intercept desired thickness. Read deflection off horizontal axis.

Fig. 1

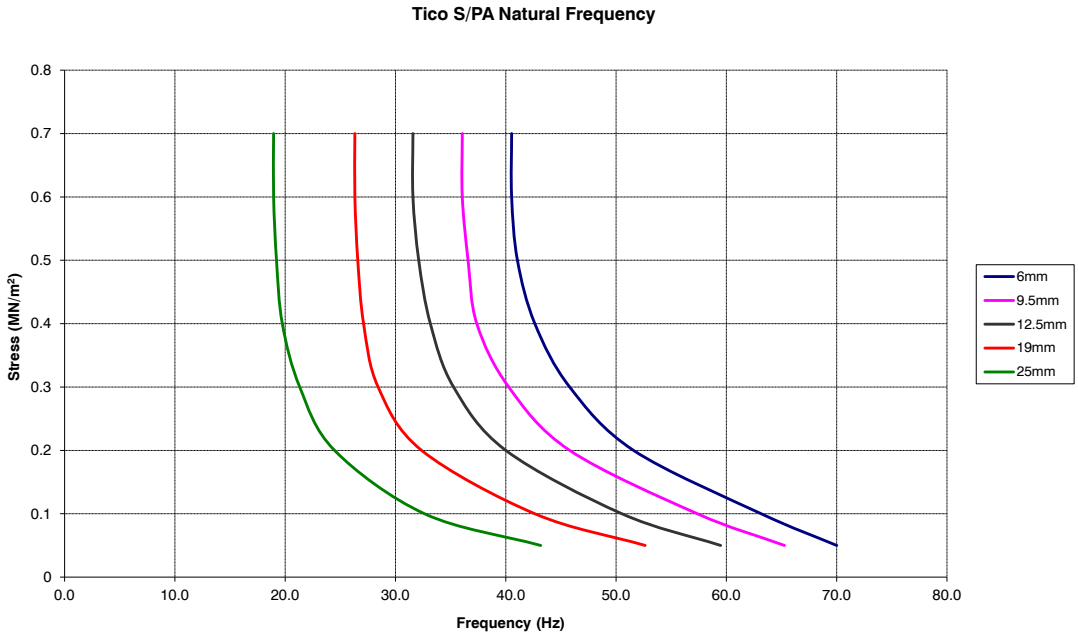


2. Natural Frequency of Pad

Any pad under load will have its own natural frequency, this figure will vary depending upon the load applied. It is important to avoid the system natural frequency and the pad natural frequency being similar, to avoid resonance. If these figures are too close, the vibrations will be amplified rather than reduced.

2.1 Calculate Stress on pad in MN/m² (see 1.1).
2.2 Project horizontal line from calculated stress to intercept desired thickness.
2.3 Read natural frequency (fn) off horizontal axis.

Fig. 2

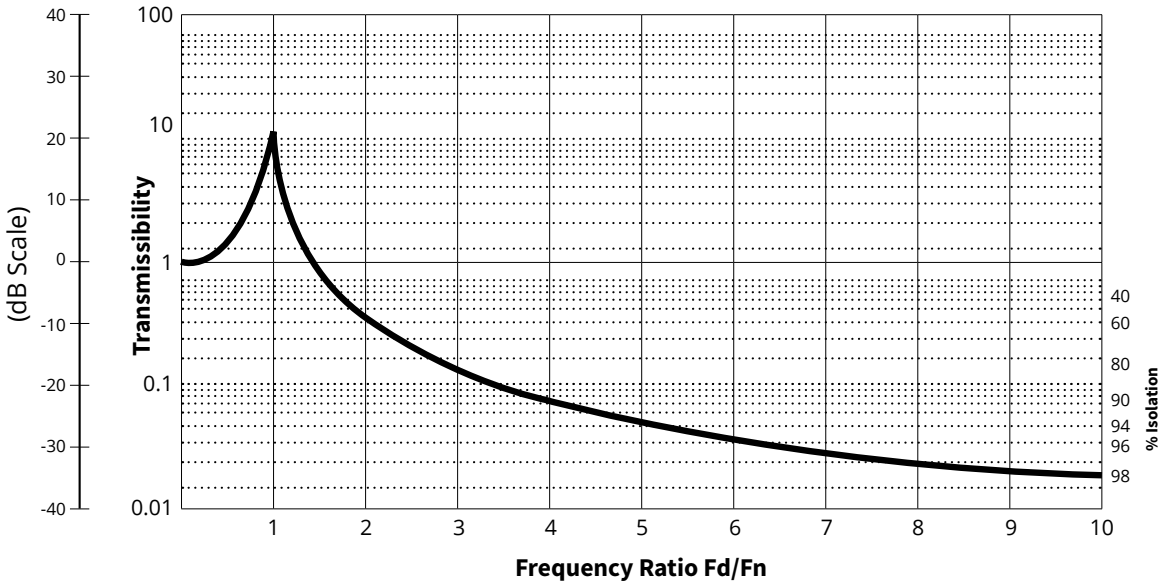


3. Isolation Efficiency

This is obtained by working out the ratio of the systems disturbing frequency (fd) to the pads natural frequency (fn). The higher the ratio fd/fn, the greater the isolation efficiency. Each TICO grade will have its own transmissibility graph to show this.

3.1 Ascertain disturbing frequency of plant to be isolated (fd)
3.2 Calculate frequency ratio fd ÷ fn
3.3 From horizontal axis project a line up to curve of graph and read off isolation efficiency from right-hand side vertical axis.

Fig. 3



Note: Recommendation should be arranged so that frequency ratio does not fall between 0.5 and 2.

At this point you can link the information given in the literature with the actual installation under review to check that the pad is not overloaded. Drawing together steps 1-3 it can be seen that a basic loading recommendation can be arrived at using the formula.

Load (or static stress) N/m^2 = weight of machine (kg) x 9.81 pad area m^2

Divide result by 1,000,000 to arrive at a result in MN/m^2

Note: It is important to understand that for the vast majority of applications this is as far as you need to go. Do not go any further unless you have to. For TICO 'S' in particular it can be sold as a fit for purpose machinery mounting material without any further technical justification.

Making a recommendation summary

Example: TICO pad loading calculations
You visit a customer's premises and he shows you a machine which he wishes to mount on TICO pads. You examine the machine base and find that it has four feet each of which measures 200mm x 200mm. The customer tells you that the machine weighs 2500kg.

Calculate:

- **The total area of the four feet in m^2.**
- **The static stress seen by the pads if an all over coverage of the four feet is used. (Express in MN/m^2.)**

To make a pad recommendation to a customer you will need to have several pieces of information. (This is the same whether you intend to make the recommendation yourself or to pass on to TICO Technical department.)

1. Weight of machine (kg)
2. Foot area or area available for pads (m^2)
3. Does machine need to be bolted?
4. Floor condition
5. Disturbing frequency (if applicable)
6. Any other relevant information, eg chemical contamination, high temperatures etc.

STEP ONE

Convert weight of machine into load in Newtons.
Example:

Machine Weight	=	2500kg
Load	=	2500 x 9.81
	=	24525 N

STEP TWO

Calculate total foot area in m^2.
Example
Machine has four feet, 200mm x 200mm

Total foot area	=	(0.2 x 0.2) x 4
	=	0.16 m^2

STEP THREE

Divide load (N) by area (m^2) to arrive at pad loading in N/m^2.
Using Both Examples

$$\text{Loading} = \frac{24525}{0.16}$$

$$= \frac{153281.25\ N/m^2}{1{,}000{,}000}$$

$$= 0.15\ MN/m^2$$

TICO INDUSTRIAL

MACHINERY MOUNTING							PIPE SUPPORTS			
STANDARD	LOW FREQUENCY	HI-DUTY	LEVELLING	BOLT ISOLATION	ACCESSORIES	SPECIALIST	ISOLATED U-BOLTS (PIPE GRIPS)	CLAMP LINERS (CLIP STRIPS)	CLAMP BLOCKS	LOW FRICTION SUPPORT (BONDSLIPS)
S/PA	LF/PA/10	RF/PA	S/SH	S/CO	VF/PA	Z/PA	FR/UB Grip (JW 152, JW 153)	S/NP/PA (Isolation wrap)	S/CB	S/PT/PA
	LF/PA/80	PF/PA	S/AD (Adjustamounts)	S/WA	Contact 'S'	HP/PA	FR/PT/UB Guide (JW 172, JW 173)	S/CL	S/NG/CB	RF/PT/PA
	CF/PA/10	FF/PA		MS/WA	Marine Epoxy	HT/PA	VHT/UB Grip (JW 352, JW 353)	S/PT/CL		PF/PT/PA
	CF/PA/80					CS/PA		HT/CL		Z/PT/PA
						FR/PA		HT/PT/CL		VR/PT/PA
						FR/PT/PA		VHT/CL		S/NG/PA
						TR/PA				PTFE (Virgin & filled)
						VR/PA				NG/PA
										B/PA
										B/PT/PA
										RF/NG/PA

Machinery Mounting

THE MOST COMMON REASON FOR EMPLOYING A TICO PAD
IN A MACHINERY MOUNTING APPLICATION IS FOR THE CONTROL OF VIBRATION.

The problem
An un-isolated machine may transmit vibrations into the surrounding structure and cause annoyance, other problems, or be susceptible to vibrations being transmitted to itself from its surroundings (e.g. In the case of sensitive test equipment).

Vibrations can cause:
- Damage to floors
- Damage to machine parts
- Transmitted Noise
- Problems with sensitive and accurate equipment

Solution
The basic principal of vibration control is to ensure there is no rigid connection between the machine and its support (e.g. The floor) – this is achieved by introducing a TICO pad between the two.

Benefits of using TICO Machinery Mounting Materials
- Wide range of TICO pads catering for a wide variety of applications
- Reduces installation time
- Improve plant and cost efficiency, by increasing time between maintenance
- Extend the working life of equipment
- Reduces troublesome vibrations and transmitted noise enhancing the working environment with reduced noise

TICO S/PA

THE MOST COMMONLY USED RESILIENT PAD FOR MOUNTING GENERAL PLANT AND MACHINERY.

PRODUCT DESCRIPTION

Suitable for the majority of applications where ease of installation and flexibility of plant layout are prime factors on installations. This pad is compatible with all types of machine base - individual feet (also see TICO Adjustamounts for precision mounting), cast skirts or flat base. Operational temperature range -40°C to +100°C (-40°F to +212°F) and a high load bearing capacity covers virtually all mounting applications.

MATERIAL DESCRIPTION

TICO S/PA is a tough and resilient bonded cellular material. TICO S is made from a blend of selected cork particles and polychloroprene/acrylonitrile elastomers. It is resistant to water, most oils, spirits and cutting fluids. The material has a high coefficient of friction and does not need a textured surface for efficient operation. TICO S/PA pads are identified by their reddish-brown appearance and printed TICO trademark.

GENERAL INSTALLATION

The material is usually fixed to the floor and the machine with TICO Contact Adhesive S, but machines with a high centre of gravity (for example) may be bolted using nuts and studs. In this instance TICO Washers and Collars must be employed to stop transfer of vibration through bolts. Also see page 12 for Plinth and Pit installations.

KEY FEATURES	TYPICAL APPLICATIONS
Technical	• Air Handling Units (AHU's)
1. Reduces noise and vibration	• Compressors
2. Maximum recommended load bearing capacity of 0.5 MN/m² (approx. 50 tonnes per square metre)	• Fans
3. Resistant to a wide range of fluid media	• Conveyors
4. Operating temperature range of -40°C to +100°C (-40°F to + 212°F)	• Forging machines
5. Can be adhered to floor – no bolting required	• Generators
	• Grinders
	• Milling machines
Installation Benefits	• Pumps
6. Easy to cut and simple to install	• Storage hoppers
7. TICO S material is manufactured to be maintenance free	• Wood working equipment
8. Well established product and recognised brand name	• Lathes
9. Compatible with all types of machine base	• Refrigeration plant
10. Contact 'S' can be used to eliminate the need for drilling, grouting, rawl bolts etc.	• Lifts
11. Easily lifted to allow for layout changes	• Vacuum Pumps
12. Increases working life of machinery and time between maintenance	• Saws
	• Power Presses
	• Slotting Machines
	• Crushers
	• Routing Machines
	• Mixers
	• Duct work

S/PA

SUPPLY DETAILS

- **Can confidently be offered to provide a good degree of vibration attenuation without resorting to a detailed technical assessment of the application.**
- **The largest available size of TICO S sheet is 1.2 m x 1.2 m. Standard thicknesses range from 6 mm to 25 mm.**
- **Thicker material can be produced to special order. A range of ready cut strips is available at 1.2 m length and a variety of widths.**

Part No.	Length	Width	Thickness
See S/SH for thickness under 6mm or for shimming to pack out standard products below			
TP-010002	1200	25	6.0
TP-010029	1200	50	6.0
TP-010045	1200	75	6.0
TP-010061	1200	100	6.0
TP-010088	1200	125	6.0
TP-01010X	1200	150	6.0
TP-010126	1200	300	6.0
TP-010169	1200	600	6.0
TP-010207	1200	900	6.0
TP-01024X	1200	1200	6.0
TP-020504	1200	25	9.5
TP-020520	1200	50	9.5
TP-020547	1200	75	9.5
TP-020563	1200	100	9.5
TP-02058X	1200	125	9.5
TP-020601	1200	150	9.5
TP-020628	1200	300	9.5
TP-020660	1200	600	9.5
TP-020709	1200	900	9.5
TP-020741	1200	1200	9.5
TP-03100X	1200	25	12.5
TP-031026	1200	50	12.5
TP-031042	1200	75	12.5
TP-031069	1200	100	12.5
TP-031085	1200	125	12.5

Part no.	Length	Width	Thickness
TP-031107	1200	150	12.5
TP-031123	1200	300	12.5
TP-031166	1200	600	12.5
TP-031182	1200	750	12.5
TP-031204	1200	900	12.5
TP-031247	1200	1200	12.5
TP-041501	1200	25	19.0
TP-041528	1200	50	19.0
TP-041544	1200	75	19.0
TP-041560	1200	100	19.0
TP-041587	1200	125	19.0
TP-041609	1200	150	19.0
TP-041625	1200	300	19.0
TP-041668	1200	600	19.0
TP-041706	1200	900	19.0
TP-041749	1200	1200	19.0
TP-052007	1200	25	25.0
TP-052023	1200	50	25.0
TP-05204X	1200	75	25.0
TP-052066	1200	100	25.0
TP-052082	1200	125	25.0
TP-052104	1200	150	25.0
TP-052120	1200	300	25.0
TP-052163	1200	600	25.0
TP-05218X	1200	750	25.0
TP-052201	1200	900	25.0
TP-052244	1200	1200	25.0

All table sizes are displayed in mm

Frequently asked questions

How can you cut it?
TICO S can be cut easily on site with a sharp knife up to 12.5mm thick, above this a saw would be required.

How much weight can it take or what is its maximum load?
The maximum working load of TICO S is 0.5 MN/m^2, this equates to approximately 50,000 Kg/m^2.

Does the thickness of the pad relate to its ability to carry load?
No. The maximum working load for TICO S is the same regardless of pad thickness. The major difference between pads of different thicknesses is their response to the vibration seen in service. (The thicker the pad, the lower the natural frequency for a given load.)

What is its compression under load?
At maximum loading (0.5 MN/m^2) compression is approximately 5% of original thickness.

How can it be fixed to the floor?
There are two methods by which TICO S/PA can be fixed to the floor:

(A) Bolted
TICO S can be easily drilled using wood working equipment, an auger bit being the most suitable. Helical flute drills should be avoided as the material has a tendency to run up the drill. If the machine manufacturer or customer wishes to bolt down their machine, then TICO Collars and Washers should be employed to isolate the stud.

(B) Bonding
TICO S can be bonded with two types of adhesive
1. TICO Contact 'S' - this is a contact adhesive suitable for the majority of applications including bonding to concrete, steel, etc.
2. Tiflex Marine 2 part epoxy system for very high duty or difficult applications.

TICO M/PA

SUPPLY DETAILS

- **Can confidently be offered to provide a good degree of vibration attenuation without resorting to a detailed technical assessment of the application.**
- **The largest available size of TICO M/PA sheet is 1.2 m x 1 m. Standard thickness' range from 6 mm to 25 mm.**
- **Thicker material can be produced to special order. A range of ready cut strips is available at 1.2 m length and a variety of widths.**

PRODUCT DESCRIPTION

Anti vibration pad TICO M is a low stress machinery mounting material made from cork enhanced polyisoprene rubber and is usually specified for low stress applications where situations benefit from its good damping properties. Operational temperature range -40°C to +70°C (-40°F to +158°F) with a miximum load bearing capacity of 0.3MN/m^2.

KEY FEATURES
1. Maximum load-bearing capacity is 0.3 MN/m^2 (approx. 30 tonnes per square metre)
2. Ultimate breakdown is in excess of 3 times the maximum recommended working stress
3. Density (kg/m^3) 600
4. Hardness 68 ± 5° IRHD
5. Durable temperature range -40°C to +70°C
6. Co-efficient of friction 0.65 TICO to concrete, 0.64 TICO to steel

Plinth Installations

Plinth installations are employed for a number of reasons.

1. When a stabilising inertia block will assist in the damping of troublesome vibrations, in situations where a pit installation may not be used e.g. On floors above ground level.
2. Where a large mass is essential to provide additional stability to the machine.
3. To avoid floor damage to expensive tiled or waterproof surfaces.
4. To provide level surfaces on drainage floors, irrespective of slope or camber.
5. Where additional height is required for a particular machine or structure.

All recommendations must be approved by a suitably qualified person. Please contact Tiflex Technical Team for assistance.

Plinth and Pit installations can also be used with other TICO pads eg. CF/PA and LF/PA.

Installation procedure - bond TICO S/PA material to the appropriate floor area, shutter to the required height, seal all joins with TICO A/ST sealing tape and cast the concrete directly on to the TICO Pads. Machinery may then be mounted on the plinth with additional TICO Pads or bolts, if necessary. This arrangement ensures that if the machine has to be moved, the plinth can easily be broken up without damaging the floor.

Pit Installations

Pit installations are used for two main reasons.

1. Where a large mass is essential, to provide additional rigidity to the machine.
2. When a stabilising inertia block will assist in the damping of troublesome vibrations.

In the past, pits have been employed for machinery mounting in conjunction with agglomerated cork, as an anti-vibration material. This is prone to compression set and will absorb any liquids falling into the pit. TICO S/PA combines high resilience with minimal creep and good resistance to oils and water.

Installation procedure - the usual method is to bond TICO S/PA in alternate strips with TICO VF/PA (Fig.2) to the pit floor. Seal all the joins with TICO A/ST sealing tape and cast the concrete directly on to the TICO Pads (Fig.3). It is preferred that there are air gaps at the side of the inertia block, although it may be necessary to fill the sides with TICO Pads for practical reasons such as to prevent ingress of oil, water or dirt into the pit. Shuttering will be required for pits with an air gap, but where no gap is employed the S/PA and VF/PA should be bonded to the pit wall as permanent shuttering.

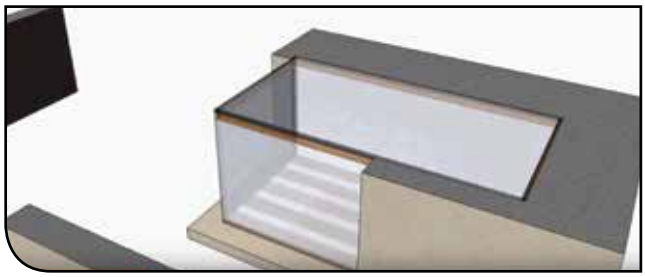


Fig 1.

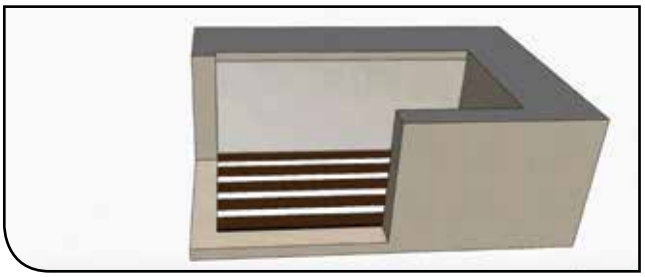


Fig 2.

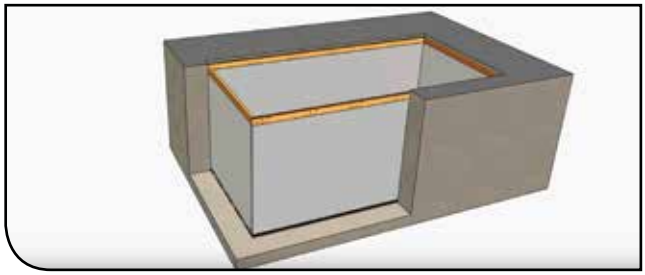


Fig 3.

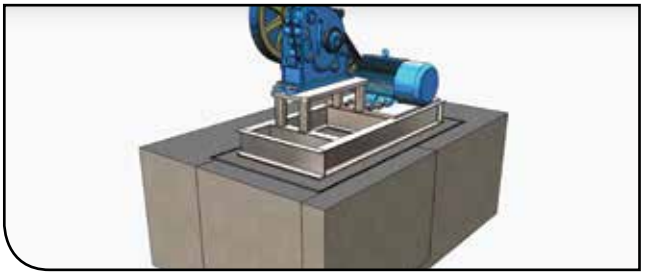


Fig 4.

Low Frequency Pads

TICO LF/PA AND CF/PA HAVE BEEN DESIGNED TO GIVE EXCELLENT LOW FREQUENCY VIBRATION ISOLATION

RANGE DESCRIPTION

Whilst TICO S/PA has excellent vibration attenuating properties, there are certain applications where a very high degree of isolation is required – in particular, applications where the frequency of the disturbing vibration is very low. In addition there are some vibration critical applications where the plant is lightweight and the required performance cannot be achieved with TICO S (which is most effective under higher loads). TICO LF/PA and TICO CF/PA have been specifically designed to give excellent low frequency vibration isolation.

In common with nearly all the TICO range, these materials are simple to install, maintenance free and usable to good effect in wide ranging environmental conditions.

KEY FEATURES	TYPICAL APPLICATIONS
Technical	• Air conditioning plant
1. Engineered low stiffness rubber core with flat bonding faces.	• Boiler plant
2. Capable of isolating very low frequencies.	• Fans
3. Can be fixed with TICO adhesives.	• Compressors
	• Test equipment
Installation Benefits	• Instrumentation situated near known sources of vibration
4. Cost effective alternative to spring mounts, - no bolting, no moving parts to fail	• Isolated inertia blocks
5. Long service life and maintenance free	• Small, lightweight units e.g. Pumps
6. Simple to install	• Heating and ventilation
7. Usable to good effect in wide ranging environmental conditions.	• Inspection equipment

Given the wide range of applications the Low Frequency materials are used in, they are usually specified by the Tiflex Technical Services team.

TICO LF/PA

PRODUCT DESCRIPTION

TICO LF/PA pads have a fluted rubber construction which gives the pads excellent low frequency properties. The core is sandwiched between layers of cork not only to facilitate bonding of the pads into position but also allowing, in certain applications, concrete to be poured directly on top of them. There are two versions of TICO LF/PA catering for different load ranges. These can be supplied as either a single or double layer:-

- **TICO LF/PA/10 - Load bearing capacity 0.07 MN/m² (~7 tons per square metre). Offset flutes on either side of the pad.**
- **TICO LF/PA/80 - Load bearing capacity 0.7 MN/m² (~70 tons per square metre). Aligned flutes on either side of pad.**

INSTALLATION

Take great care to select the correct TICO LF/PA grade, exact number of pads required, and optimum layout for a specific installation. To meet these criteria it is essential to know:

1. Static weight of equipment to be mounted
2. Load distribution between feet or across base area
3. Disturbing frequencies to be isolated
4. Condition of mounting surfaces.

SUPPLY DETAILS

Two standard sizes are held in stock. Other sizes are considered non-standard and may be subject to extended lead times.

TICO LF/PA/10

Part No.	Length	Width	Thickness
TP-009004	150	150	25
6 (L) x 6 (W) x 1 (D) Inches)			

TICO LF/PA/80

Part No.	Length	Width	Thickness
TP-009209	150	150	32
(6 (L) x 6 (W) x 1¼ (D) Inches)			

All table sizes are displayed in mm

TICO CF/PA

PRODUCT DESCRIPTION

TICO CF/PA pads are composed of a micro cellular rubber sponge with upper and lower surfaces of geotextile fabric which protect the rubber and facilitate bonding. There are two versions of TICO CF/PA catering for different load ranges. These can be supplied as either a single or double layer:-

- **TICO CF/PA/10 - Load bearing capacity 0.1 MN/m² (~10 tons per square metre)**
- **TICO CF/PA/80 - Load bearing capacity 0.25 MN/m² (~25 tons per square metre)**

Temperature range of -40°C to +70°C (-40°F to +158°F)

TICO CF/PA pads offer more flexibility of design than TICO LF/PA pads as they are manufactured as sheets and cut to virtually any size. TICO CF/PA pads should not be used in areas which are heavily contaminated with oil.

SUPPLY DETAILS

Largest available sheet size for both CF/PA/10 and CF/PA/80 is 1000 x 1000 mm. CF/PA/10 is 30mm thick, CF/PA/80 is 29mm thick. These materials are not held as finished stock and are custom cut to order.

TICO CF/PA and LF/PA can sometimes be used as alternatives for each other, depending on the nature of the application and performance requirements. Advice should always be sought from the Tiflex Technical Services team if this is being considered.

CF/PA/10

Part No.	Length	Width	Thickness
TP-202690	1000	1000	30

CF/PA/80

Part No.	Length	Width	Thickness
TP-202698	1000	1000	29

All table sizes are displayed in mm

TICO TR/PA

Designed specifically for use under transformers and coolers. These pads isolate low disturbing frequencies and remain naturally stable under compressive stress.

KEY FEATURES
1. Excellent isolation at low frequencies
2. Maximum static stress: 0.70 MN/m^2
3. Very good resistance to transformer oils
4. High Dielectric strength
5. Maximum pad size 600 x 150 x 26mm

Frequently asked questions

Can TICO LF/PA pads be supplied in sizes other than 150 x 150mm?

Yes, but because of the fluted nature of the product the scope of the alternative sizes is restricted. The maximum available size is 600 x 150mm. Pads with any dimension less than 75mm are not recommended for stability reasons and Tiflex Technical Services should be consulted when a non-standard size is being considered.

Can you bolt any equipment in place when using Low Frequency pads?

The range of TICO Low Frequency pads has been developed to provide a high degree of vibration isolation, and they are relatively soft compared to other grades. Where possible bolting should be avoided as this will lead to an impairment of isolation and may cause the pads to become over compressed. Pads and machine should ideally be secured using Contact 'S' adhesive.

Are Low Frequency pads oil resistant?

TICO LF/PA and TR/PA are oil resistant, however CF/PA is not and should not be used in environments which are heavily contaminated by oil.

Can Low Frequency pads be used outdoors?

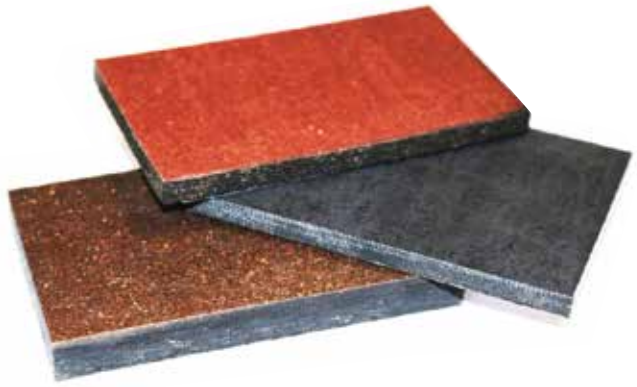
Yes, all grades are suitable for external use, however care should be taken using CF/PA materials as being based on a sponge they can potentially absorb water - advice should be sought from Tiflex Technical Services in those instances.

Hi-Duty

TICO HI-DUTY PADS AND BUFFERS TAKE ON THE TOUGHEST TASKS.

TICO HI-DUTY pads have been specifically formulated and designed to have the strength and resilience required to accommodate large impacts, absorb fierce shock loads and attenuate severe vibration from heavy plant.
There are three grades of TICO HI-DUTY pads:

- **TICO RF/PA (7 MN/m²)**
- **TICO PF/PA (15.50 MN/m²)**
- **TICO FF/PA (15.50 MN/m²)**



TICO Hi-Duty materials are designed to reduce shock, impact loads and vibration in a wide range of applications in heavy industries where arduous conditions prevail. They are manufactured from the highest quality constituents and fabricated to form anvil mats, mounting pads, buffers, washers and special moulded shapes to a users specification.

KEY FEATURES
Technical
1. Absorb highly-destructive shock loads without reducing efficiency
2. Range of three materials originally designed for very heavy duty hammer applications.
3. Very high impact absorption capabilities.
4. Can be made with different make ups for specific custom applications.
5. Can be moulded to form specific shapes.
Installation Benefits
6. Very tough and resilient material offering an alternative to spring mounts, with - no bolting, no moving parts to fail
7. Prolong the life of machinery
8. Retention of properties under extreme conditions with a long service life
9. Maintenance free and simple to install

TICO RF/PA

PRODUCT DESCRIPTION

Originally developed to absorb shock loads under drop hammer anvils (see Fig. 1), replacing timber packings which would break down unevenly over time and cause the anvil to take on an uneven set. It can also be used as a heavy-duty machinery mounting pad to reduce vibration from large plant, acting as a heavy duty buffer.

MATERIAL DESCRIPTION

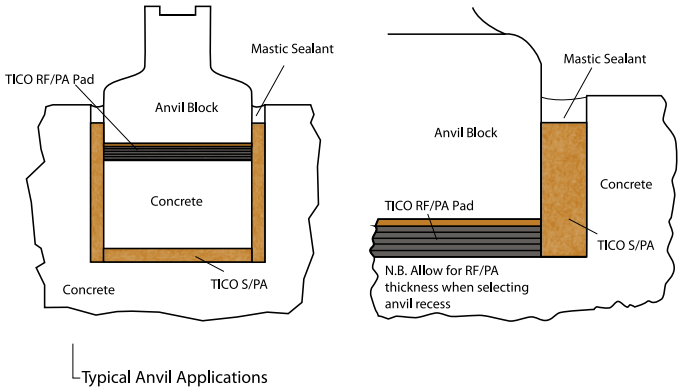
TICO RF/PA is a high load-bearing pad material. Plies of synthetic rubber proofed cotton with interplies of neoprene rubber, modified with cellular particles. One side is faced with a thin layer of rubber bonded cork material to absorb irregularities in the concrete surface. It is resistant to water, oil, cooling fluids and other media generally encountered in heavy industry. The tough yet resilient nature of TICO RF/PA ensures continuous heavy impact absorption, whilst the interply construction provides extended life under high stress conditions in both exterior and protected applications.

SUPPLY DETAILS

- **Maximum sheet size: 1200 mm x 1200 mm. Standard nominal thicknesses: 6 mm, 12.5 mm, 19mm and 25 mm.**
- **Non standard thicknesses in excess of 25 mm can be advised on by Tiflex Technical Team, depending on the area required.**

Fig. 1

TYPICAL APPLICATIONS
• Anvil pads on new and existing forging hammer installations
• Anti-vibration mounts on large plant
• Heavy duty buffers
• Pipe support and isolation (oil and gas industry)
• Elastomer component of TICO Sliding Bearings
• Maximum load bearing capacity: 7MN/m^2 (approx. 700 tonnes per square metre)



Typical Anvil Applications

TICO PF/PA

PRODUCT DESCRIPTION

For this material, plies of synthetic rubber and proofed cotton fabric are vulcanised together to form a smooth finish pad of great durability.

MATERIAL DESCRIPTION

TICO PF/PA should be used where the material's high stiffness is more important than a predictable response to impact. Typical applications are for impact absorption on piling hammers, sheet piling buffers and as resilient spigot packings - the absorbing layer between sections of hammer frames - frequently used in conjunction with TICO PF/WA washers which replace the springs or Belleville washers on the tie bolts. It is also ideal for preventing fretting corrosion and spalling of concrete seatings. A further application is its use on heavy industrial machinery, for mounting equipment on the main frame to reduce noise and vibration, and increase operator comfort.

SUPPLY DETAILS

Maximum sheet size: 1200 mm x 1200 mm. Typical thickness 6, 12 & 25mm. Can also be supplied as collars, washers, and special moulded shapes.

TYPICAL APPLICATIONS
• Power and drop hammer anvil supports
• Bumper pads for crane stops and conveyer end stops
• Load bearing pads for bearing brackets, crane cab mountings, transfer tables
• Mine shaft cages
• Crush machines
• Door stops / buffers
• General industrial mountings where there is a high load and a small support area.

INSTALLATION BENEFITS
1. Prevents fretting, corrosion and spalling of concrete seatings.
2. Impact absorption on piling hammers
3. Resilient spigot packing between section of hammer frames
4. Maximum load bearing capability: 15.5 MN/m^2 (approx. 1550 tonnes per square metre)

TICO FF/PA

PRODUCT DESCRIPTION

This composite material is intended for arduous shock absorbing applications, for example; buffers on counter blow hammers (See Fig. 2) and mine cages. The properties of TICO FF/PA can be varied to suit specific demands by altering the proportions of the individual layers in the material.

MATERIAL DESCRIPTION

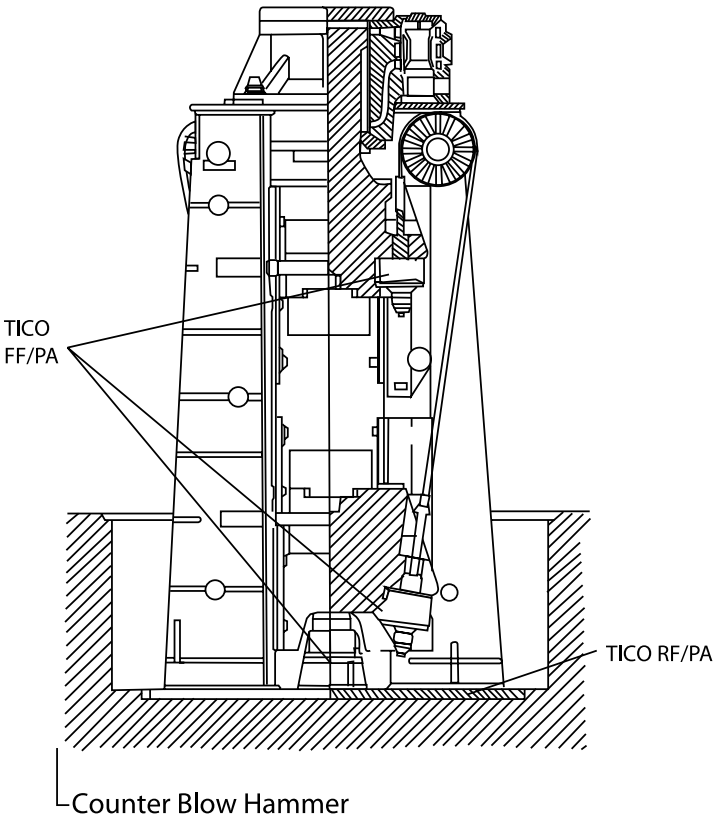
TICO FF/PA is a combination pad, it is normally based on TICO PF/PA material, coupled with an appropriate TICO product selected to meet design criteria, typically TICO B/PA.

SUPPLY DETAILS

- **Maximum sheet size: 1200 mm x 1200 mm.**
- **Standard nominal thickness 6, 12.5 and 25mm.**
- **This material is available with a standard TICO B/PA upper face.**
- **Alternative sheet constructions by consultation with Tiflex Technical Services.**

TYPICAL APPLICATIONS
• Forging hammer buffer pads
• End stop buffers
• Buffers for mine cages
• Mounting high-load machines on irregular surfaces

Fig. 2



Precision Levelling

WHERE ACCURACY OF PLANT HEIGHT, GRADIENT OR LEVEL IS IMPORTANT, TICO ADJUSTAMOUNTS AND TICO S/SH SHIMMING PROVIDE EFFICIENT PRECISION MOUNTING.

TICO Adjustamounts - are specially designed for mounting machines and structures where accurate levelling is of prime importance, and where slight additional height is required. They have been found especially suitable for certain tool room machinery such as long bed lathes, precision grinders as well as for conveyors and light structures mounted on varying floor levels. They provide a rapid and efficient method of machinery mounting, without recourse to other methods which can damage floors.

TICO S/SH Shimming is commonly used in conjunction with other TICO pads (e.g. TICO S/PA) to provide a quick and efficient way of levelling plant without compromising the vibration isolating properties of the main pads.

KEY FEATURES	INSTALLATION BENEFITS
1. Accurate, rapid height adjustment & levelling 2. TICO resilient insert virtually eliminates floor damage 3. Low profile for minimum additional height 4. Will also fit many existing levelling studs on plant 5. Wide range to suit many applications and loads.	• Plant or machinery needing a high degree of levelling for precision operation e.g precision lathes, precision grinders, transfer machinery. • Transfer systems and conveyors where accurate gradient is required. • Free-standing equipment needing a quick and economical mounting. • Test beds and instruments, marking-out tables, inspection benches etc. where a reliable horizontal reference is essential. • Any instance when time constraints prohibit installation by other means.

TICO S/SH SHIMMING

PRODUCT DESCRIPTION
TICO S/SH is normally used for relatively small variations in level, because of its thickness.

MATERIAL DESCRIPTION
TICO S/SH Shimming is a sheet formed from rubber bonded cork TICO S/SH can also be used to provide a conformable interface between two members with a minimal impact on height.

SUPPLY DETAILS
Standard stock sizes are:

- **1200 x 900 x 0.75 mm (47.24 x 35.43 x 0.029 Inches)**
- **1200 x 900 x 1.5 mm (47.24 x 35.43 x 0.059 Inches)**
- **1200 x 900 x 3 mm (47.24 x 35.43 x 0.118 Inches)**

Pads can be cut to size, but because of the relatively low cost, stock availability and ease of cutting the material, it is usually sold as full sheets.

TICO S/AD ADJUSTAMOUNTS

PRODUCT DESCRIPTION

Where accuracy of plant height, gradient or level is important, TICO Adjustamounts provide efficient precision mounting. Swift screw adjustment plus the advantages of TICO resilient inserts, make them popular for mounting any freestanding equipment. This full mounting kit comprises of a circular base plate with a resilient insert bonded in the recessed underside, complete with machine levelling stud and associated nuts and washers for immediate installation (see Fig. 1). TICO Adjustamounts can be fitted with other grades of TICO resilient inserts for special duties.

MATERIAL DESCRIPTION

- The base plate is a polished nickel coated mild steel with a TICO S/PA resilient insert bonded in the recessed underside.
- A tapped hole at centre of the top surface holds the levelling stud.
- This metric-threaded steel stud passes through a clearance hole in the equipment being mounted.
- Nuts and washers above and below the clearance hole allow height to be precision adjusted with ease.

The result is a secure and stable mounting - with a high coefficient of friction which usually needs no other fixing to prevent lateral movement on horizontal surfaces.

TICO S/CB/AD Adjustamount is a modified base plate for use with existing levelling studs on plant. It has the circular base described above, but with a plastic-coated steel adaptor screwed into its stud hole. A dimple recess in the adaptor accepts a levelling stud of M16 or less.

SUPPLY DETAILS

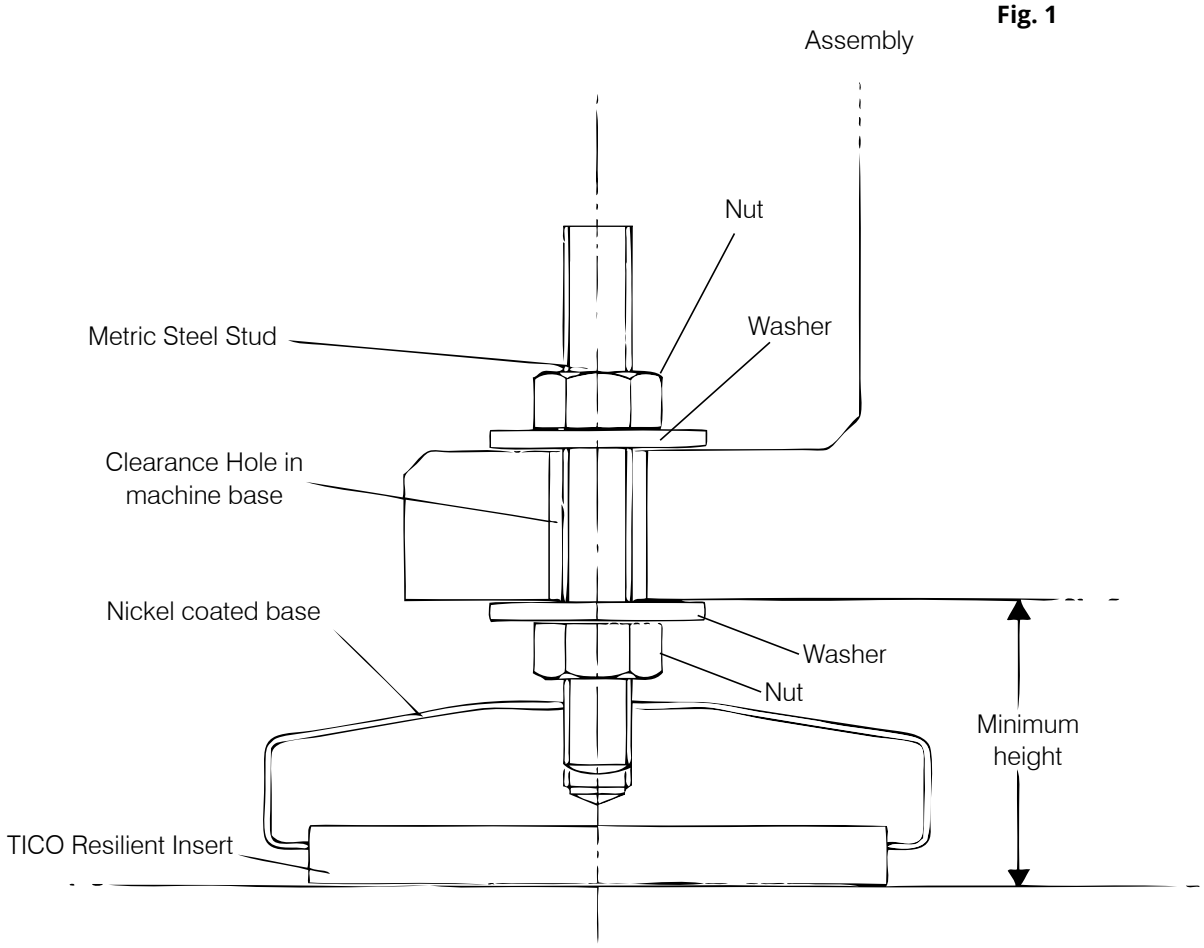
TICO S/AD ADJUSTAMOUNTS

Part no.	Drawing Code	Base Nominal Diameter (mm)	Resilient Insert Thickness (mm)
TF-040111	JW61-2-2	65	12.5 (½")
TF-040227	JW61-4-2	110	12.5 (½")
TF-040243	JW61-4-4	110	12.5 (½")
TF-040510	JW61-7-2	180	12.5 (½")
TF-040537	JW61-7-4	180	12.5 (½")

Stud size and length (mm)	Minimum Height: Machine base to Floor (mm)	Quantity (per box)	Max. Load per adjustamount (kg)
M10 X 90	35.0	4	135
M12 X 140	44.5	4	450
M16 X 180	47.5	4	450
M16 X 180	54.0	2	1350
M20 X 190	57.0	2	1350

TICO S/AD ADJUSTAMOUNTS

Fig. 1



TYPICAL APPLICATIONS

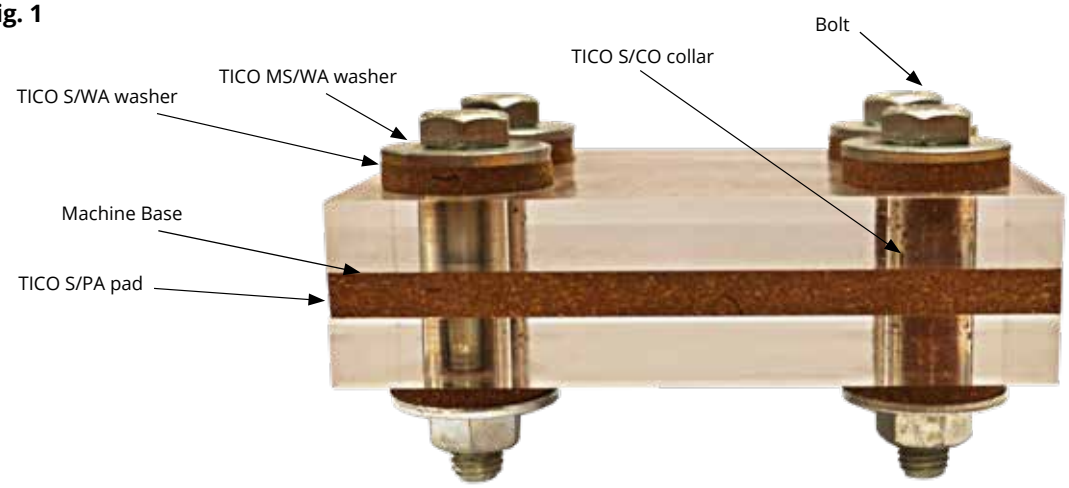
- Plant or machinery needing a high degree of levelling for precision operation
- Transfer systems and conveyors where accurate gradient is required
- Free-standing equipment needing a quick and economical mounting
- Test beds and instruments, marking out tables, inspection benches etc. Where a reliable horizontal reference is essential
- Any instance when time constraints prohibit installation by other means

Installation Methods

Bolt Isolation

A bolt provides a direct transmission path for vibration from the machine to the floor, effectively short-circuiting the TICO pad. To prevent this, it is essential that the bolts are isolated from the machine base. This is achieved using TICO Collars and Washers (see Fig. 1).

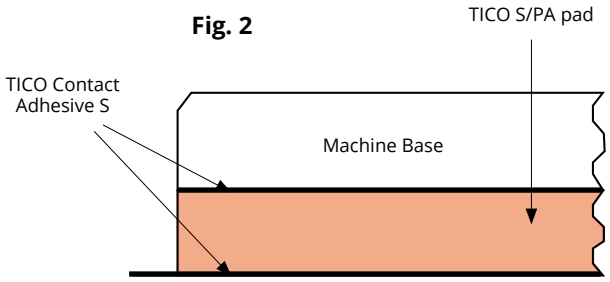
Fig. 1



Adhesive Secured

Pads are bonded to the substrate, and the machine bonded to the pads, using Contact 'S' Adhesive. Bonding the pads to the floor (or other substrate) prevents them from moving out of position when the plant is mounted on top (see Fig. 2).

Fig. 2



Collars & Washers

Although the vast majority of machinery plant can be secured by TICO Pads and Adhesive, cases where bolts might be employed are where the centre of gravity falls outside the machine base as with an inclinable power press, radial drill, or where the centre of gravity is high.

In these applications, TICO S/CO Collars and S/WA Washers should also be used to prevent transmission of machine noise and vibration through the bolt to the surrounding area.
It is recommended that the nuts not be over tightened so as to firmly locate the machine without applying further compression to the TICO Pads.

TICO S/CO Collars have a recommended minimum wall thickness of 3mm, a 6mm wall is available on request.
TICO S/WA Washers- 6mm thick with an outside diameter of three times the bolt diameter.
TICO MS/WA steel washers - the outside diameter must be equal to that of the TICO S/WA washer.

TICO S/CO COLLARS

Part No.	Wall Section	i.d. (mm)	o.d (mm)	Length (mm)	No. per pack
TL-000967	3	M10	16	50	6
TL-001017	3	M12	18	50	6
TL-001068	3	M14	20	50	6
TL-001092	3	M16	22	50	6
TL-001114	3	M18	24	50	6
TL-001211	3	M20	26	50	6
TL-001262	3	M24	30	50	6
TL-001319	3	M26	32	50	6
TL-00203X	6	M12	24	50	6
TL-002080	6	M14	26	50	6
TL-002129	6	M18	30	50	6
TL-00217X	6	M20	32	50	6
TL-002218	6	M24	36	50	6
TL-002269	6	M26	38	50	6

TICO S/WA WASHERS

Part No.	i.d.	o.d	Thickness
TR-005073	M10	30	6
TR-00512X	M12	36	6
TR-005170	M14	42	6
TR-005197	M16	48	6
TR-005227	M18	54	6
TR-005278	M20	60	6
TR-005324	M24	72	6
TR-005359	M26	78	6

TICO MS/WA WASHERS

Part No.	i.d. (mm)	o.d (mm)	Thickness (mm)
TR-000950	M10	30	3
TR-001000	M12	36	3
TR-001051	M14	42	3
TR-001078	M16	48	3
TR-001108	M18	54	3
TR-001159	M20	60	3
TR-001205	M24	72	3
TR-001256	M26	78	3

Adhesive and Fillers

These products have been specifically formulated for TICO pads and are the only adhesives which we have tested, and recommend. We cannot guarantee that any other bonding products will not degrade the TICO pads.

TICO Contact Adhesive 'S'

A special polychloroprene based adhesive for bonding TICO products to concrete, brick or ceramic surfaces.

- **Also suitable for use with TICO VF/PA.**

Marine 2 Part Epoxy

TREADMASTER MARINE 2 Part Epoxy Adhesive 600g. This two pack epoxy adhesive is designed to provide excellent bonding properties, particularly in applications with large lateral movements such as TICO Bondslip Pipe Supports.

TICO VF/PA Void Filler

This fills air gaps between TICO S/PA mounting pads. It has no inherent resilience and is used to reduce the area of load bearing pad material. Made from closed-cell expanded polyurethane. The void filler deforms slightly under initial compression and vibration, so that, any additional loads applied can be supported by the mounting pads.

ADHESIVES

Part No.	Description	Container size
AA-000100	Marine 2 Part Epoxy	600g
AA-002009	TICO Contact S Adhesive	1 litre
AA-001053	TICO Contact S Adhesive	5 litres

Contact Adhesive S

Description
Contact Adhesive S is a cream coloured, brushable, general-purpose contact adhesive. It exhibits excellent adhesion to most surfaces and has good heat resistance. Bonds may be made over a wide range of open times because of its fast flash off and long open time.

Preparation
Stir adhesive thoroughly before use. Ensure the surfaces to be bonded are clean, dry and free from dirt, grease and other contamination. Lightly abrade metal surfaces. Wipe clean with a suitable solvent such as methylated spirit.

Application
Apply a thin, even coat of adhesive to both surfaces. Allow to become touch-dry (approx.10 - 30 minutes). On very absorbent surfaces a second coat may be required. Align carefully and bring the two surfaces together. Apply firm pressure over the whole surface, ideally using a roller or press to consolidate the bond. The adhesive forms an immediate, strong bond, but will achieve maximum strength after a few days.

Coverage
3 to 4 m^2 per litre, depending on surface (apply to both surfaces).
The newly bonded material should not be subjected to extreme temperature changes for 3 to 4 days after bonding and avoid further fabrication until the adhesive has fully cured.

Health and Safety
Read the product label before use. Further details can be obtained from the Health and Safety Data Sheet.

Specialist Pads

TICO Z/PA

A medium stress resilient bearing, manufactured from a particle loaded polychloroprene rubber.

KEY FEATURES
1. Suitable for a wide range of medium stress bearing applications
2. Applications include isolating steel connections, resilient seatings & buffers
3. Maximum recommended load bearing capacity of 1.4 MNm^2 (approx. 140 tonnes per square metre)

TICO HP/PA

A rubber/cork composite particularly suitable for providing anti vibration in transformer core applications, where its oil resistance and acoustic properties are beneficial.

KEY FEATURES
1. Quick and easy installation.
2. Maximum recommended load bearing capacity of 1.0MN/m^2 (approx. 100 tonnes per square metre)

TICO HT/PA

A synthetic rubber product designed to provide vibration isolation at elevated temperatures. This product is commonly used in high temperature pipe work applications.

KEY FEATURES
1. Quick, easy installation
2. Temperature range : -40°C to + 150°C
3. Maximum recommended load bearing capacity of 0.5MN/m^2 (approx. 50 tonnes per square metre)

TICO CS/PA

An oil resistant sponge product made from Polychloroprene rubber and cork, designed for low stress applications.

KEY FEATURES
1. Quick and easy installation
2. Operating Temperature -30°C to +70°C
3. Maximum recommended load bearing capacity of 0.7MN/m^2 (approx. 70 tonnes per square metre)

TICO FR/PA

TICO FR material consists of a blend of polymers and specialised compounding ingredients developed to operate in the aggressive environments in the offshore and petrochemical industries. In the event of fire, the material, has a low surface spread of flame, low smoke & low toxicity. It also self extinguishes when the source of the flame is removed.

KEY FEATURES
1. Temp Range -50°C to 120°C with intermittent use up to 150°C
2. It offers good resistance to a wide range of fluids as well as ozone and UV.

TICO VR/PA

TICO VR/PA is a laminated elastomeric pad comprising of synthetic rubber, modified by the inclusion of cork, reinforced with piles of high tensile fabric. The upper and lower surfaces of the material are a rubber bonded cork which serves as a bonding surface and provides a conformable interface between the pad and its seating surfaces.

TICO VR/PA has a maximum recommended loading capacity of 7MN/m^2 (approx. 700 tonnes per square metre) - the same as TICO RF/PA - but its construction allows it to provide a higher degree of vibration isolation than its Hi-Duty counterpart.

TICO VR/PA is typically used in high load applications where vibration is an issue and lower stress grades (eg. S/PA and Z/PA) are unsuitable. It also finds use as a resilient buffer material, for example in lifts or pneumatic hammers.

Largest available sheet size is 1200 x 1000 mm in standard thicknesses 6, 12.5 and 25 mm. This product is not as easy to cut as other TICO materials and is typically supplied cut to size. Applications requiring (or possibly requiring) TICO VR/PA should be referred to Tiflex Technical Team for approval.

TICO B/PA

TICO B/PA is a rubber bonded cork material which was specially developed for the use in buffer applications. It has a maximum recommended loading capacity of 1.5 MN/m^2 which is three times that of TICO S/PA and slightly higher than Z/PA, so B/PA can be used in high load situations as a good general anti-vibration material.

TICO B/PA is commonly used in conjunction with the Hi-Duty material PF/PA to form TICO FF/PA composite pads where it's dynamic features significantly enhance the buffer characteristics of the material. As a twin layer on the surface of VR/PA and FF/PA, it also provides a conformable interface layer with the equipment mounted up on it.

TICO B/PA can be combined with low friction materials such as PTFE as a component in a TICO Bondslip unit for uses in offshore & multiple applications. TICO B/PA can be manufactured in sheet form up to 1200 x 1000 mm but is more typically sold as pre-cut strips. Typical thicknesses are 6, 12.5 and 25 mm although other thicknesses can be manufactured upon request.

Pipe Supports

THE TICO INDUSTRIAL PIPE SUPPORT FAMILY OF PRODUCTS CONSISTS OF PIPE GRIPS, CLIP STRIPS, CLAMP BLOCKS AND BONDSLIPS.

TICO Pipe Support products perform a number of varied functions, which include:

- **Supporting and positively locating pipework over long spans.**
- **Isolating the pipe from the mounting bolts and clamps to prevent fretting and corrosion**
- **Isolating dissimilar metals (e.g. Between a pipe and a clamp) to prevent electrolytic corrosion**
- **Cater for movements in the pipe due to e.g. Thermal expansion and contraction which might otherwise result in a build-up of stress in the pipe and potential rupture**
- **Maintaining pipe spacing of multiple pipe runs over long spans**

KEY FEATURES
• Designed so that the pipe is fully isolated from its support to prevent electrolytic corrosion
• Lining prevents clamping damage to the pipes during installation and wear due to fretting
• Reduction in the transmission of noise and vibration

Pipe Grips (Isolated U-Bolts)

PRODUCT DESCRIPTION

TICO Pipe Grips have been specifically designed to minimise vibration transmission between pipework and hanger, and also preventing corrosion between dissimilar metals.

There are two designs of Pipe supports:

- **Guide Type with PTFE lining, inside surface to allow movement of the pipework**
- **Grip Type which securely holds the pipe in place to restrict movement**

Standard steel grades available: Stainless Steel Grade 316, Carbon Steel with either a Galvanised or Bright Zinc Plated finish. Alternate steel grades/finishes on request.

Guide Type

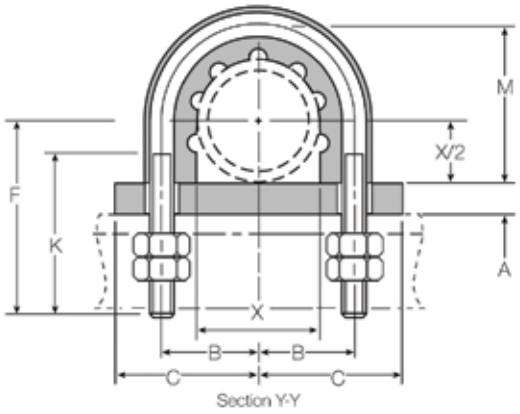
Grip Type

High Temperature VHT

Pipe Supports - Grip Type

GRIP TYPE

Configuration enables the pipe to be gripped and supported while accommodating small axial and torsional movements of the pipe. Two size ranges based on different types of thin walled pipe:



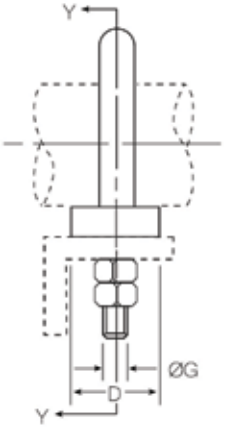
JW 152 Series

- Sizes based on stainless steel pipe outer diameters to BS3974 ..Part 1 1974
- Rubber sleeve and pad colour coded Black

JW 153 Series

- Sizes based on Cu-Ni pipe outer diameters to BS2871 Part 2
- Rubber sleeve and pad colour coded Red

The JW reference number uniquely identifies each size of bolt. The suffix on the JW number is equal to the X dimension of the Pipe Grip (Pipe OD)



SUPPLY DETAILS

FOR STAINLESS PIPES AND CARBON STEEL
O/Ds of pipes are based on BS 3974 Part 1 1974 Table 10. Also suitable for O/D stainless steel tubing.

Nominal Pipe Size		JW Part Number	Dimensions (mm)								
mm	Inch		A	B	C	D	F	G	K	M	X
12.70	1/2"	JW 152 - 21	10	18.5	30	25	60	6	57	29	21
19.00	3/4"	JW 152 - 27	10	21.5	34	25	65	6	60	35	27
25.40	1"	JW 152 - 34	10	25	36	25	65	6	60	42	34
31.75	1 1/4"	JW 152 - 43	10	34.5	45	25	70	10	60	56	43
38.10	1 1/2"	JW 152 - 49	10	37.5	49	25	80	10	70	62	49
50.80	2"	JW 152 - 61	10	43.5	55	25	90	10	75	74	61
76.20	3"	JW 152 - 89	10	57.5	70	25	100	12	75	102	89
101.60	4"	JW 152 - 115	10	70.5	83	25	110	12	75	128	115
152.40	6"	JW 152 - 168	15	105	123	50	180	16	120	189	168
203.20	8"	JW 152 - 219	15	131	150	50	199	16	120	240	219

FOR CU/NI PIPES (BASED ON SEAMLESS 'KUNIFER 10' SIZES)
O/D of pipes conform to BS 2871 Part 2 Table 3. BS MA 18 Table 2 BS MA60.

Nominal Pipe Size		JW Part Number	Dimensions (mm)								
mm	Inch		A	B	C	D	F	G	K	M	X
12.70	1/2"	JW 153 - 16	10	16	30	25	60	6	54	24	16
19.00	3/4"	JW 153 - 25	10	20.5	34	25	65	6	58	33	25
25.40	1"	JW 153 - 30	10	23	36	25	65	6	61	38	30
31.75	1 1/4"	JW 153 - 38	10	32	45	25	70	10	62	51	38
38.10	1 1/2"	JW 153 - 45	10	35	49	25	80	10	70	57	44.5
50.80	2"	JW 153 - 57	10	41.5	55	25	90	10	75	70	57
63.50	2 1/2"	JW 153 - 76	10	51	67	25	100	12	75	89	76
76.20	3"	JW 153 - 89	10	57.5	70	25	100	12	75	102	89
101.60	4"	JW 153 - 108	10	67	83	25	110	12	75	121	108
152.40	6"	JW 153 - 159	15	100.5	119	50	180	16	120	180	159
203.20	8"	JW 153 - 219	15	131	150	50	199	16	120	240	219

Dimensions in mm unless otherwise stated. Non-standard sizes are available on request.

Pipe Supports - Guide Type

GUIDE TYPE

The configuration of PTFE lined rubber components enables the accommodation of larger axial and torsional pipe movements. Two size ranges, based on different types of thin walled pipe:

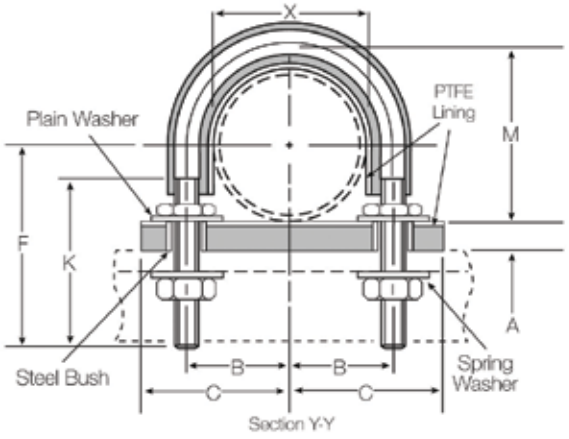
JW 172 Series

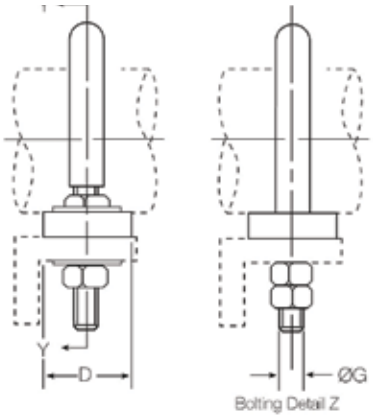
- Sizes based on stainless steel pipe outer diameters to BS3974 ..Part 1 1974
- Rubber sleeve and pad colour coded Black

JW 173 Series

- Sizes based on Cu-Ni pipe outer diameters to BS2871 Part 2
- Rubber sleeve and pad colour coded Red

The JW reference number uniquely identifies each size of bolt. The suffix on the JW number is equal to the X dimension of the Pipe Grip (Pipe OD)





SUPPLY DETAILS

FOR STAINLESS PIPES AND CARBON STEEL
O/Ds of pipes are based on BS 3974 Part 1 1974 Table 10.

Nominal Pipe Size		JW Part Number	Dimensions (mm)								
mm	Inch		A	B	C	D	F	G	K	M	X
*12.70	1/2"	JW 172 - 21	10	18.5	30	25	60	6	57	29	21
*19.00	3/4"	JW 172 - 27	10	21.5	34	25	65	6	60	35	27
*25.40	1"	JW 172 - 34	10	25	36	25	65	6	60	42	34
*** See bolt detail Z. These items are without steel bushes and washers.**											
31.75	1 1/4"	JW 172 - 43	10	34.5	49	30	70	10	60	56	43
38.10	1 1/2"	JW 172 - 49	10	37.5	53	30	80	10	70	62	49
50.80	2"	JW 172 - 61	10	43.5	59	30	90	10	75	74	61
76.20	3"	JW 172 - 89	10	57.5	77	40	100	12	75	102	89
101.60	4"	JW 172 - 115	10	70.5	90	40	110	12	75	128	115
152.40	6"	JW 172 - 168	15	105	129	50	180	16	120	189	168
203.20	8"	JW 172 - 219	15	131	156	50	199	16	120	240	219

FOR CU/NI PIPES (BASED ON SEAMLESS 'KUNIFER 10' SIZES)
O/Ds of pipes conform to BS2871 Part 2 Table 3. BS MA 18 Table 2 BS MA60.

Nominal Pipe Size		JW Part Number	Dimensions (mm)								
mm	Inch		A	B	C	D	F	G	K	M	X
*12.70	1/2"	JW 173 - 16	10	16	30	25	60	6	54	24	16
*19.00	3/4"	JW 173 - 25	10	20.5	34	25	65	6	58	33	25
*25.40	1"	JW 173 - 30	10	23	36	25	65	6	61	38	30
*** See bolt detail Z. These items are without steel bushes and washers.**											
31.75	1 1/4"	JW 173 - 38	10	32	49	30	70	10	62	51	38
38.10	1 1/2"	JW 173 - 45	10	35	53	30	80	10	70	57	44.5
50.80	2"	JW 173 - 57	10	41.5	59	30	90	10	75	70	57
63.50	2 1/2"	JW 173 - 76	10	51	74	40	100	12	75	89	76
76.20	3"	JW 173 - 89	10	57.5	77	40	100	12	75	102	89
101.60	4"	JW 173 - 108	10	67	90	40	110	12	75	121	108
152.40	6"	JW 173 - 159	15	100.5	129	50	180	16	120	180	159
203.20	8"	JW 173 - 219	15	131	156	50	199	16	120	240	219

Dimensions in mm unless otherwise stated. Non-standard sizes are available on request.

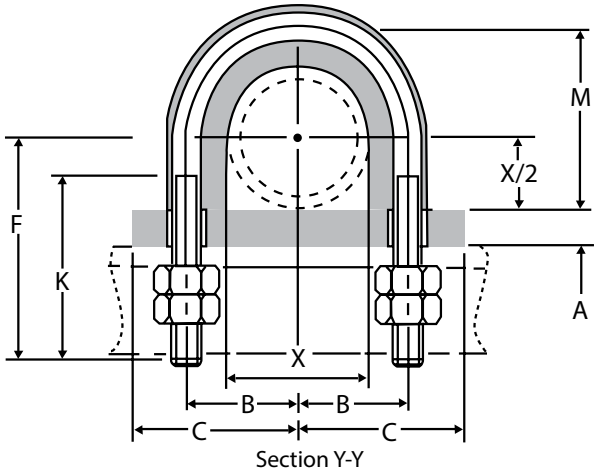
High Temperature Pipe Supports (VHT)

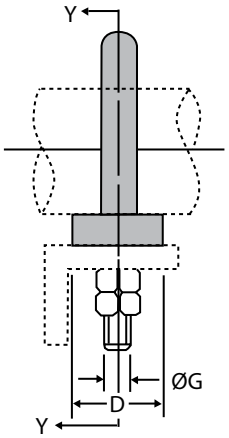
TICO VHT Pipe Support is based on Silicone rubber. Specialised compounding has allowed this product to maintain high levels of flexibility, after severe heat ageing tests.

TICO VHT Pipe Support is ideally suited for applications where temperatures may be expected to range from –60°C to +300°C continuous, +350°C intermittent.

The Pipe Support is also resistant to a wide range of oils and environmental conditions. TICO VHT has been independently tested for UV protection (ASTM G154) and water uptake (ASTM D471).

The material prevents electrolytic action between dissimilar metals, which can lead to corrosion.





SUPPLY DETAILS

FOR STAINLESS PIPES AND CARBON STEEL
O/Ds of pipes are based on BS 3974 Part 1 1974 Table 10. Also suitable for O/D stainless steel tubing.

Nominal Pipe Size		JW Number	Dimensions (mm)								
mm	Inch		A	B	C	D	F	G	K	M	X
12.70	1/2"	JW 352 - 21	10	18.5	30	25	60	6	57	29	21
19.00	3/4"	JW 352 - 27	10	21.5	34	25	65	6	60	35	27
25.40	1"	JW 352 - 34	10	25	36	25	65	6	60	42	34
31.75	1 1/4"	JW 352 - 43	10	34.5	45	25	70	10	60	56	43
38.10	1 1/2"	JW 352 - 49	10	37.5	49	25	80	10	70	62	49
50.80	2"	JW 352 - 61	10	43.5	55	25	90	10	75	74	61
76.20	3"	JW 352 - 89	10	57.5	70	25	100	12	75	102	89
101.60	4"	JW 352 - 115	10	70.5	83	25	110	12	75	128	115
152.40	6"	JW 352 - 168	10	105	123	50	180	16	120	189	168
203.20	8"	JW 352 - 219	10	131	150	50	199	16	120	240	219

FOR CU/NI PIPES (BASED ON SEAMLESS 'KUNIFER 10' SIZES)
O/D of pipes conform to BS 2871 Part 2 Table 3. BS MA 18 Table 2 BS MA60.

Nominal Pipe Size		JW Number	Dimensions (mm)								
mm	Inch		A	B	C	D	F	G	K	M	X
12.70	1/2"	JW 353 - 16	10	16	30	25	60	6	54	24	16
19.00	3/4"	JW 353 - 25	10	20.5	34	25	65	6	58	33	25
25.40	1"	JW 353 - 30	10	23	36	25	65	6	61	38	30
31.75	1 1/4"	JW 353 - 38	10	32	45	25	70	10	62	51	38
38.10	1 1/2"	JW 353 - 45	10	35	49	25	80	10	70	57	44.5
50.80	2"	JW 353 - 57	10	41.5	55	25	90	10	75	70	57
63.50	2 1/2"	JW 353 - 76	10	51	67	25	100	12	75	89	76
76.20	3"	JW 353 - 89	10	57.5	70	25	100	12	75	102	89
101.60	4"	JW 353 - 108	10	67	83	25	110	12	75	121	108
152.40	6"	JW 353 - 159	10	100.5	119	50	180	16	120	180	159
203.20	8"	JW 353 - 219	10	131	150	50	199	16	120	240	219

Dimensions in mm unless otherwise stated. Non-standard sizes are available on request.

Clip Strips

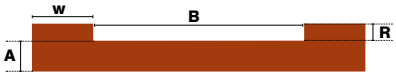
Utilising our TICO materials and drawing on many years of experience in the design of load bearing elastomeric components, we have designed this range of products to provide the highest level of shock and vibration isolation between pipe-work and hanger. Available in a comprehensive range of sizes, TICO Clip Strips provide an effective and economical answer to the problem of pipe isolation.

KEY FEATURES
1. Raised shoulder design for positive location.
2. Sizes to suit most common strap widths. Non-standard sizes can be supplied upon request.
3. Quick, easy installation.
4. Reduction and absorption of shock, noise and vibration.
5. Pliable and easy to cut.
6. Prevents electrolytic action between dissimilar metals.
7. Grades available to suit temperatures up to +300°C.

S/CL

TICO S/CL is manufactured from our well known TICO S rubber bonded cork material and is red/ brown in colour.

S/CL CLIP STRIP



Colour: Red

Operating Temp: -40°C to +100°C (-40°F to +212°F)

JW Ref. No.	Part No.	Base (A)Thickness	Clip Width (B)	Recess Depth (R)	Wall Width (W)
55-50	TK-070120	3 mm (0.12")	12.5 mm (0.49")	1.5 mm (0.06")	3 mm (0.12")
55-75	TK-070198	3 mm (0.12")	19 mm (0.75")	1.5 mm (0.06")	3 mm (0.12")
55-100	TK-070252	5 mm (0.20")	25 mm (0.98")	2.5 mm (0.10")	6 mm (0.24")
55-125	TK-070325	5 mm (0.20")	32 mm (1.26")	2.5 mm (0.10")	6 mm (0.24")
55-175	TK-070406	6 mm (0.24")	40 mm (1.57")	2.5 mm (0.10")	6 mm (0.24")
55-200	TK-070503	6 mm (0.24")	50 mm (1.97")	2.5 mm (0.10")	6 mm (0.24")
55-250	TK-070635	6 mm (0.24")	64 mm (2.52")	2.5 mm (0.10")	6 mm (0.24")
55-300	TK-070759	9.5 mm (0.37")	75 mm (2.95")	5 mm (0.20")	12.5 mm (0.49")
55-400	TK-071003	9.5 mm (0.37")	100 mm (3.94")	5 mm (0.20")	12.5 mm (0.49")
55-500	TK-071259	9.5 mm (0.37")	125 mm (4.92")	5 mm (0.20")	12.5 mm (0.49")
55-600	TK-07150X	12.5 mm (0.49")	150 mm (5.91")	6 mm (0.24")	19 mm (0.75")

Note: standard length is 1200mm and cut pieces can be supplied on request.

HT/CL

TICO HT/CL is a rubber bonded cork material which has been engineered to accommodate higher operating temperatures and is green in colour.

HT/CL CLIP STRIP

Colour: Green
Operating Temp: -40°C to +150°C (-40°F to +302°F)

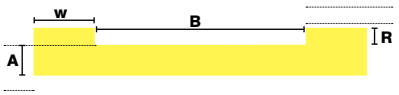
JW Ref. No.	Part No.	Base (A)Thickness	Clip Width (B)	Recess Depth (R)	Wall Width (W)
55-50	TK-030129	3 mm (0.12")	12.5 mm (0.49")	1.5 mm (0.06")	3 mm (0.12")
55-75	TK-030196	3 mm (0.12")	19 mm (0.75")	1.5 mm (0.06")	3 mm (0.12")
55-100	TK-030250	5 mm (0.20")	25 mm (0.98")	2.5 mm (0.10")	6 mm (0.24")
55-125	TK-030323	5 mm (0.20")	32 mm (1.26")	2.5 mm (0.10")	6 mm (0.24")
55-175	TK-102928	6 mm (0.24")	40 mm (1.57")	2.5 mm (0.10")	6 mm (0.24")
55-200	TK-030501	6 mm (0.24")	50 mm (1.97")	2.5 mm (0.10")	6 mm (0.24")
55-250	TK-030633	6 mm (0.24")	64 mm (2.52")	2.5 mm (0.10")	6 mm (0.24")
55-300	TK-030757	9.5 mm (0.37")	75 mm (2.95")	5 mm (0.20")	12.5 mm (0.49")
55-400	TK-031001	9.5 mm (0.37")	100 mm (3.94")	5 mm (0.20")	12.5 mm (0.49")
55-500	TK-031257	9.5 mm (0.37")	125 mm (4.92")	5 mm (0.20")	12.5 mm (0.49")
55-600	TK-031508	12.5 mm (0.49")	150 mm (5.91")	6 mm (0.24")	19 mm (0.75")

Note: standard length is 1200mm and cut pieces can be supplied on request.

VHT/CL

TICO VHT/CL is an extruded polymer with a wide operating temperature range -60°C to +300°C (-76°F to +572°F).

VHT/CL CLIP STRIP



Colour: Yellow
Operating Temp: -60°C to +300°C (-76°F to 572°F)
Flexibility: Retained after 1 month at +300°C (572°F)

Part No.	Base (A)Thickness	Clip Width (B)	Recess Depth (R)	Wall Width (W)
TK-000300	2mm (0.08")	35mm (1.38")	2mm (0.08")	5mm (0.20")
TK-000408	2mm (0.08")	45mm (1.77")	2mm (0.08")	5mm (0.20")
TK-000505	2mm (0.08")	55mm (2.17")	2mm (0.08")	5mm (0.20")
TK-000602	2mm (0.08")	65mm (2.56")	2mm (0.08")	5mm (0.20")
TK-00070X	2mm (0.08")	75mm (2.95")	2mm (0.08")	5mm (0.20")
TK-000807	2mm (0.08")	85mm (3.35")	2mm (0.08")	5mm (0.20")
TK-000904	2mm (0.08")	95mm (3.74")	2mm (0.08")	5mm (0.20")
TK-001005	2mm (0.08")	105mm (4.13")	2mm (0.08")	5mm (0.20")
TK-001102	2mm (0.08")	115mm (4.53")	2mm (0.08")	5mm (0.20")

Note: standard length is 1000mm and cut pieces can be supplied on request.

HT/CL Clip Strip

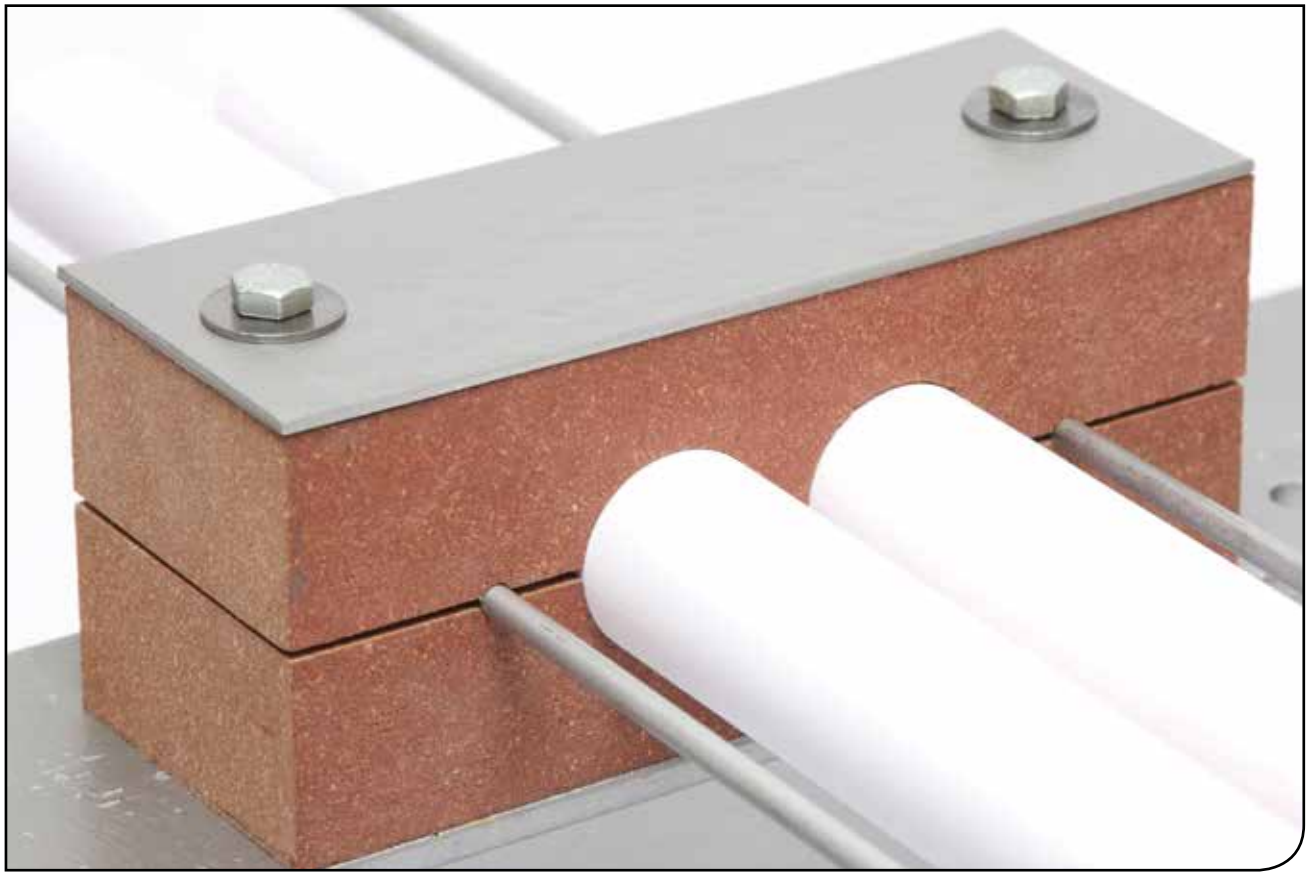
VHT/CL Clip Strip

TICO Clamp Blocks

A TICO CLAMP BLOCK IS USUALLY MADE FROM OUR STANDARD TICO S RUBBER BONDED CORK MATERIAL AND CAN BE SUPPLIED IN MANY DIFFERENT CONFIGURATIONS.

Due to the custom nature of this product there are many different types.

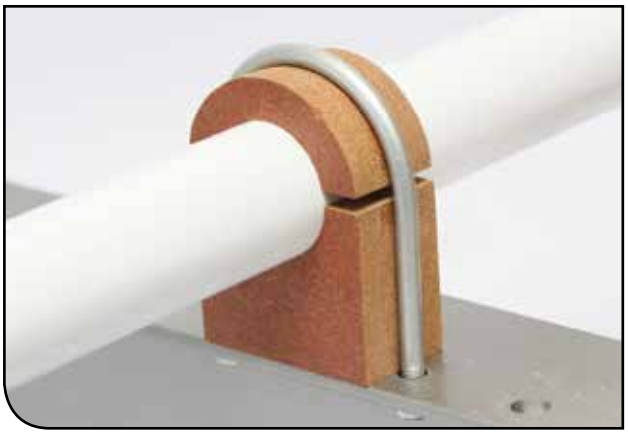
KEY FEATURES
1. Offer an effective method of clamping where it is necessary to anchor pipes firmly whilst at the same time allowing expansion and contraction due to temperature and pressure fluctuations
2. Provide protection and uniform spacing of pipelines
3. Absorb shock and vibration caused by fluid velocity and turbulence in pipes etc. which would otherwise be transmitted through the clamp to the surrounding structure or building.
4. Highly customisable
5. Maximum operating temperature 100°C (212°F), can be extended by using alternative TICO grades

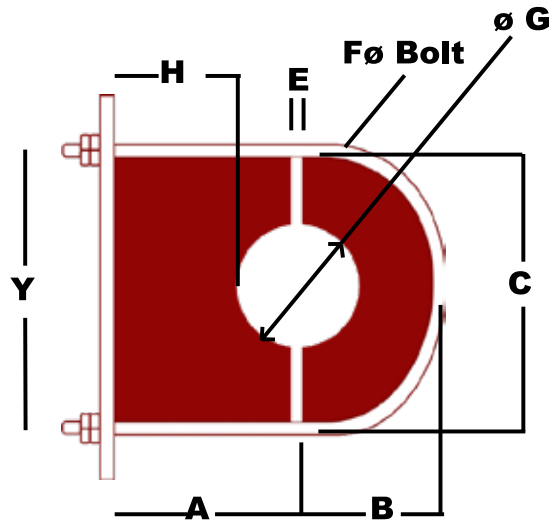


TICO S/CB - Single Bore

- Designed for use with a U-Bolt
- Standard dimensions available (see size guide) but can be custom sized for specific applications
- Can be supplied with a low friction bore (TICO S/NG/CB Clamp Block)
- Not held in stock but manufactured to order

JW Part Number	G	A	B	C	Depth	E	H	Y	'U' Bolt Ø F
M 92 - 16	16	33	21	42	25	3	25	52	10
M 92 - 25	25	38	30	60	25	3	25	70	10
M 92 - 30	30	40	30	60	25	6	25	70	10
M 92 - 38	38	44	38	76	25	6	25	86	10
M 92 - 45	45	61	38	76	50	6	38	86	10
M 92 - 57	57	67	45	90	50	9.5	38	102	12
M 92 - 76	76	76	57	114	50	9.5	38	126	12
M 92 - 89	89	83	70	140	50	9.5	38	152	12
M 92 - 108	108	104	85	170	75	9.5	50	182	12
M 92 - 159	159	130	110	220	75	12.5	50	236	16
M 92 - 219	219	160	162	324	75	12.5	50	344	20

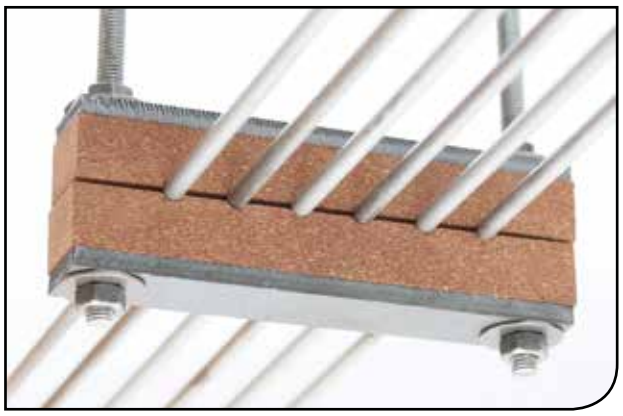




TICO S/CB - Multiple Pipe

- **Ideally suited for maintaining a regular spacing of pipes with the additional benefits of vibration attenuation.**
- **No standard types, always custom designed and manufactured to order.**

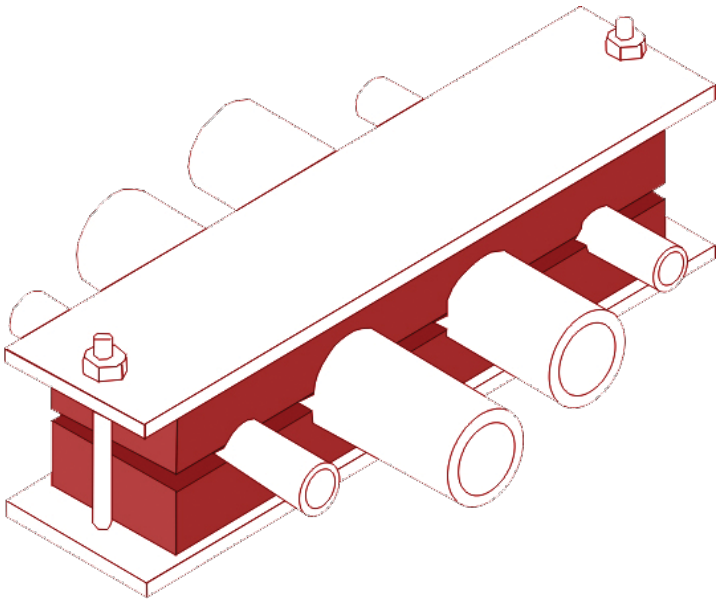
Please contact Tiflex Technical Team with project requirements.



TICO S/NG/CB

S/NG/CB clamp blocks are identical to S/CB clamp blocks but with the added benefit of a molybdenum disulphide impregnated nylon bush to provide a low friction bore for the accommodation of additional longitudinal movement.

Please contact Tiflex Technical Team if a size not specified in the standard range is required.
We can manufacture bespoke clamps to suit specific applications.



TICO Bondslips

TICO BOND SLIP UNITS ACCOMMODATE LARGE MOVEMENTS IN PIPEWORK INSTALLATIONS AS WELL AS MANY OTHER TYPES OF STRUCTURE.

They are usually comprised of two separate components that act together to provide a sliding surface with a low coefficient of friction.

A typical application for a TICO Bond Slip is as a pipe support where its low friction characteristics cater for pipe movements, e.g. Due to thermal expansion and contraction, without a build up of stress

TICO Bond Slip units can also be used as guide stops to restrain movement in one or more directions.

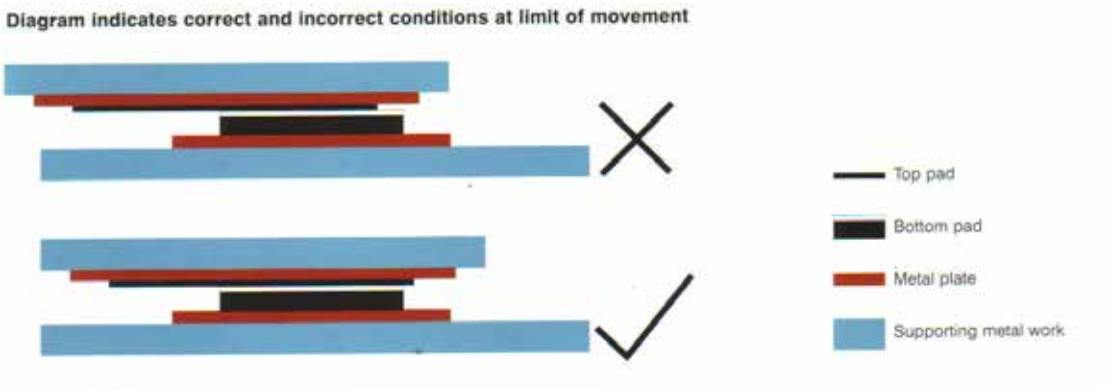
KEY FEATURES
• Maintenance free
• Very low coefficients of friction, typically less than 0.1
• Smooth movement without slip/stick effects
• Accommodate both planar and rotational movements
• Provide noise and vibration attenuation with the correct specification of materials
• Highly customisable for different applications
• Simple to install
• Working temperature range -40°C to +100°C (-40°F to +212°F)

A TICO Bond Slip typically consists of an upper and lower member. Each member has a low friction surface. One member is attached to the fixed part of the structure (e.g. The pipe support) and the other is attached to the part of the structure that will move (e.g. The underside of a pipe shoe). When movement occurs, the upper member slides over the lower member. Each member has a low friction surface with a resilient TICO backing.

The TICO backing material provides:

- **A bondable substrate that can accommodate surface irregularities in the structure**
- **Allowance of rotational movement in the structure**
- **Vibration attenuation**

The TICO materials can be pre-bonded to steel backing plates which can then be welded or bolted into position on site.



Types of TICO Bondslip Materials

S/NG/PA

Molybdenum disulphide loaded nylon with rubber bonded cork backing. Usually 2.5 mm thick (0.098 Inches).

S/PT/PA

Virgin PTFE with a rubber bonded cork backing. Usually 3 mm (0.118 Inches) thick. Maximum working stress 0.5 MN/m^2 (approx. 50 tonnes per square meter).

Typical lower member materials (chosen based on load).

B/PT/PA*

Rubber bonded cork with PTFE surface. Maximum working stress 1 MN/m^2 (approx. 100 tonnes per square metre).

RF/PT/PA*

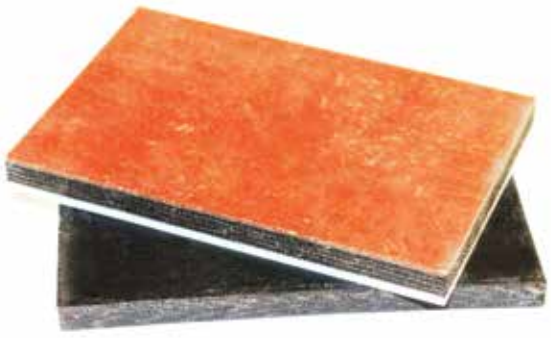
Fabric reinforced rubber pad with PTFE surface. Maximum working stress 7 MN/m^2 (approx. 700 tonnes per square metre).

PF/PT/PA*

Fabric reinforced rubber pad with PTFE surface. Maximum working stress 15.5 MN/m^2 (approx. 1550 tonnes per square metre).

***Typical lower member thicknesses are 8, 14.5 and 27 mm, (0.31, 0.55 and 1.06 Inches).**

TICO materials can be supplied cut to size ready for bonding on site



Recommended adhesive for use with TICO materials is Tiflex Marine two-part epoxy

- **Standard 600g pack**
- **Coverage approximately 2 square metres (6 1/2 Sq ft) per pack**
- **Available from stock**

Upper and lower members can be bonded to steel backing plates by Tiflex

- **We can carry out the bonding under controlled conditions of temperature and pressure**
- **Units can be tack welded to the structure on site**
- **Plates can be pre-drilled to accept countersunk fixings**

TICO Bond Slip units are usually specified by Tiflex Technical Team. Due to the highly custom nature of this product materials are not held as finished stock and are cut to size to order.

LOADTECH

The name TICO Loadtech is used to cover a range of capabilities which Tiflex Ltd. have in-house to produce products to fulfil specific bearing needs in the market place. Tiflex have many years of specialist knowledge of the formulation of elastomers to provide specific mechanical properties, mould design and tooling, testing elastomers for a wide range of performance criteria and the design and supply of associated metal components.

TICO Loadtech is simply the name which encompasses all of these capabilities.

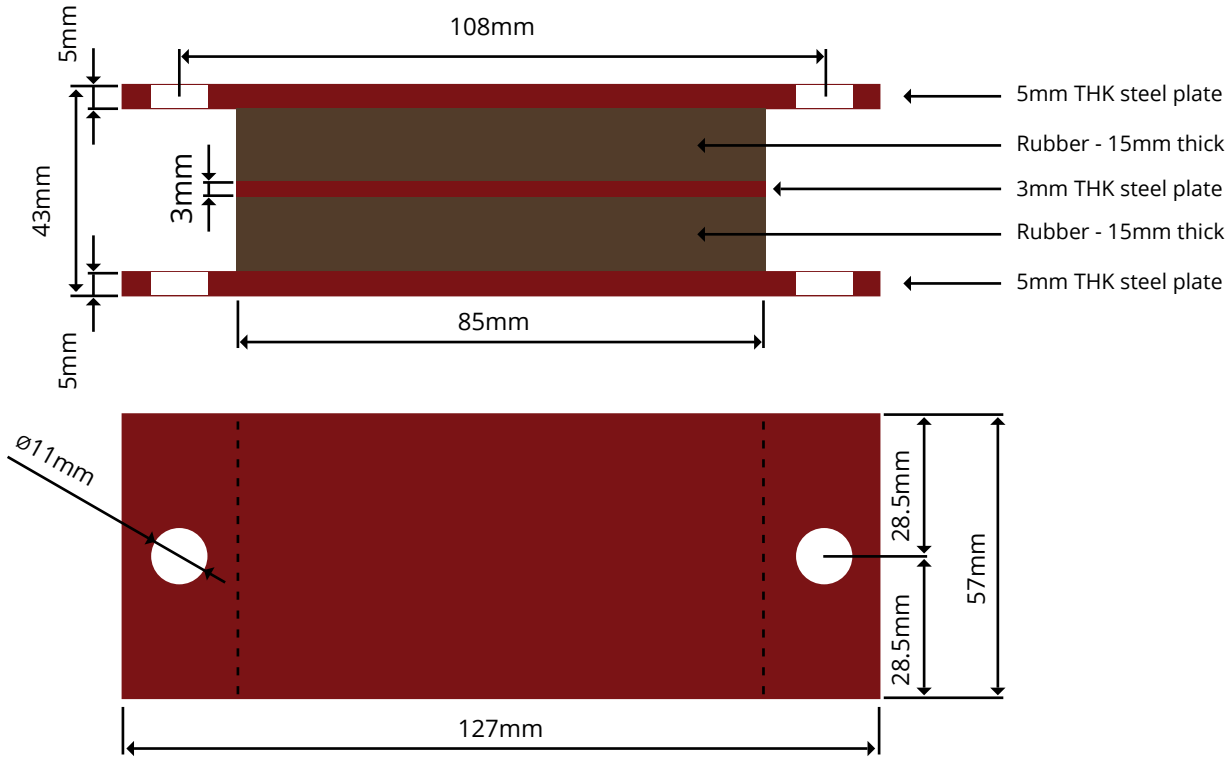
TICO Loadtech bearings are not sold into one specific industry, or application. In our experience they have been used in a wide range of applications and industries, such as the isolation of a railway bridge from a road bridge, the award winning Tsing Ma Bridge, isolating a floating slab track in the Jubilee Line Extension, load bearing Straddle Carrier Suspension Rings, the bearing of Train Engine Mounts, Hammer Buffers for a steel plant manufacturer, Resilient Mounts for Quarry Hoppers amongst others. The possibilities are endless.

CAPABILITIES
• A testing facility
• A design capability
• A capability to manufacture low quantity, high value products
• Designed to meet the requirements of the customer
• Capable of being used in any number of different industries, and applications
• A service to design within tight tolerances

LBM2 Sandwich Mount

TICO LBM2 Sandwich Mount comprises two high quality rubber bonded cork elastomeric pads bonded between two outer fixing plates, with a central reinforcing plate. The mounts have been designed to have a high compressive strength, coupled with a good resilience and a low shear stiffness.

KEY FEATURES
• Maximum load-bearing capacity 20KN (2000kg approx.)
• Typical Damping Ratio 0.15



Projects

Many years of involvement with the onshore/offshore, petrochemical, marine engineering and production industries have led to the development of a large range of elastomer based components that provide unique solutions for machinery mounting, vibration reduction, pipe management and noise reduction.

In these most demanding of environments, Tiflex continues to provide an extensive design and problem solving solutions.

Some of the projects we have worked on:

- **Gorgon**
- **Sakhalin (Arkuntun Dagi)**
- **Sakhalin II**
- **Skene**
- **Terra Nova FPSO**
- **AKPO**
- **North Rankin 2**
- **Saqqara**
- **Shah Deniz**
- **Pearl GTL**
- **RasGas LNG Trains**
- **Ichthys**
- **BP Clair Ridge**
- **Quad 204**
- **Hebron**
- **Barzan**
- **Arkutun Dagi**
- **Goliat**
- **Sable**
- **Pearl GTL**
- **Bonga Deepwater**
- **Buzzard Field Development**

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