

TICO PRODUCTS PRESENTATION



Presented by Patrick Ang

Introduction: Who Are We – Structure of Company



a member of the
James Walker
Group

Tiflex

INDUSTRIAL



RAIL



FLOORING



TICO



TRACKELAST



TREADMASTER



NEBAR



TREADMASTER
MARINE



TREADMASTER

The logo for Tiflex, featuring the word "Tiflex" in a bold, yellow, sans-serif font. The text is contained within a dark grey, rounded rectangular shape that has a slight 3D effect with a lighter grey highlight on the top edge.

Tiflex

Manufacturers of
Rubber & Cork bonded products

https://www.youtube.com/watch?v=_A4dWol7r2Y

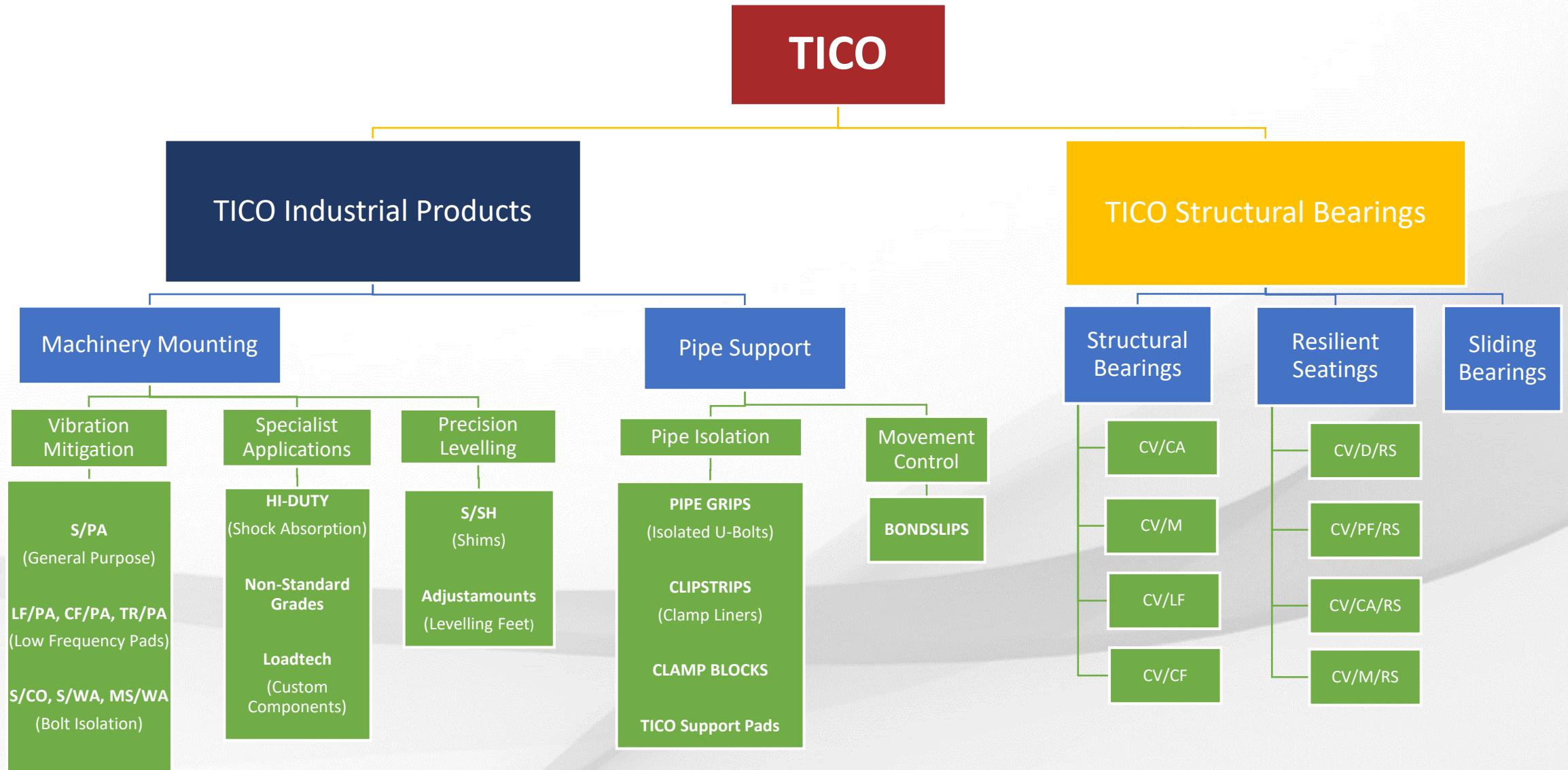
Customers



We are proud to support our customers around the world with Anti-vibration and Noise Isolation technical expertise and solutions.



Product Overview – Tree Diagram





Anti-Vibration & Installation Products

Manufactured and developed by



Introduction – What is TICO?



TICO is a brand name for a range of products that are used for a variety of purposes including:

- Machinery Mounting
- Plant Levelling
- Vibration Attenuation
- Pipe Supports
- Structural Bearings
- Resilient Seatings
- Movement Joints
- Low Friction Supports
- Impact Absorption



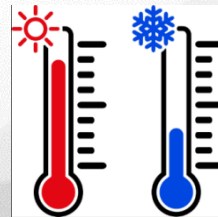
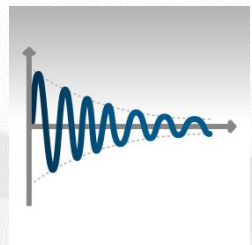
Introduction – Main Features & Benefits



TICO materials in general are rubber bonded cork compounds that are vulcanised under controlled conditions, and which may additionally be reinforced with strengthening layers.

The special formulations and curing conditions give enhanced material properties including:

- Strength
- Toughness
- Fluid Resistance
- Temperature Resistance
- Dimensional Stability
- Vibration Damping and Attenuation



Another key benefit to using rubber bonded cork is that it can compress 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. This is otherwise known as Poisson's Ratio.

Lift & Escalator

Our products are designed to attenuate the transference of noise and vibration from the gearing and lift mechanism into adjacent rooms and buildings.



Lifts



Escalators



Maintenance

HVAC

Solutions that offer maintenance free, easy installation and effective Vibration control whilst combining with the longevity and service you would expect from Industry leading specialists.



Pumps



Air Conditioning



Refrigeration



Heat Exchangers



Ventilation

Power

TICO is supplied extensively into the power industry to reduce structural noise and vibration from transformers and generators.



Transformers



Switch Gear



Generators



Wind Turbines



Compressors



Offshore

OEM

We can undertake almost any specific requirement for TICO pads including rubber to metal bonding, CNC routing, water jet cutting and producing pads to specific load, shear and compressibility requirements.



Industrial



Construction



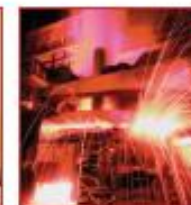
Production



Fabrication



Metrology



Forging

Oil & Gas Industry

TICO has served the Oil & Gas industry for over 60 years. This specific range of products are used upstream and downstream, and are commonly specified on a number of projects.



Onshore



Offshore



Ship Building



Heavy Industry



Bespoke

Engineering

Levelling mounts, anti-vibration washers, collars and pads, that can be used on an array of engineering equipment such as Lathes, CNC routers, compressors and more.



Machinery



Instruments



Mechanical



Power Systems



Electronics



Aerospace

Construction

Incorporated within new and existing building projects and includes Impact Attenuation Pads, Structural & Slide bearings and Resilient Seatings.



Pit Installation



Structural Bearings



Floating Floors



Resilient Seatings



Mining



Steel

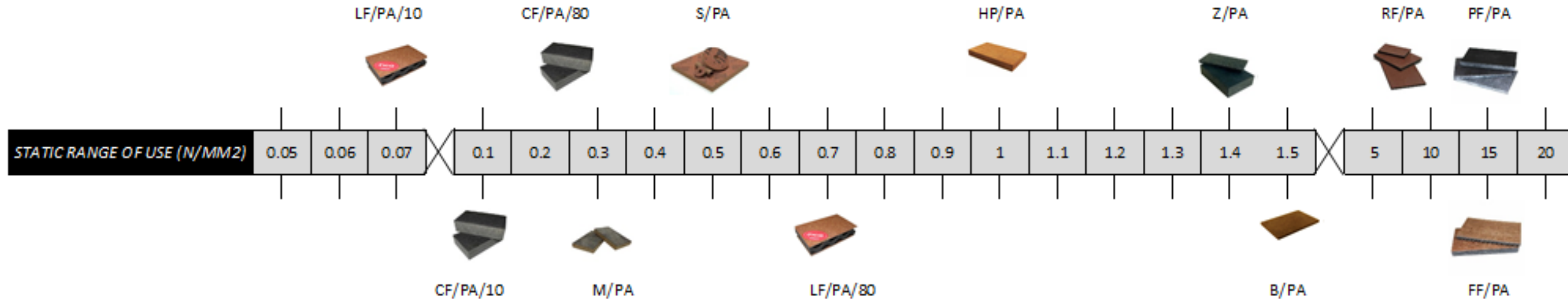


Anti-Vibration & Installation Products

Manufactured and developed by



A Range of Anti-vibration & Isolation Pad materials for different static ranges, loads and applications



Why use Anti-Vibration Isolation

The principal reason in most cases for employing a TICO pad in a mounting application is for the control of vibration

Problem

The main instance where vibration reduction is required:

- Preventing vibrations from machinery or equipment being transmitted to the surrounding structure

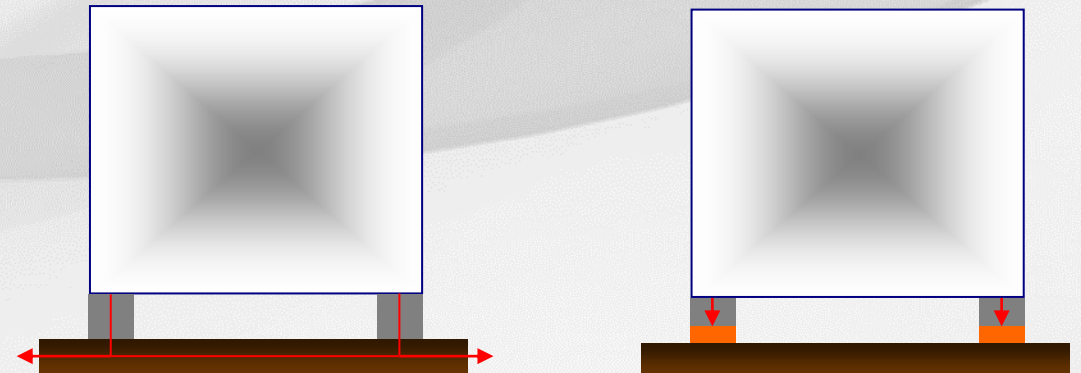
Examples: compressors & generators

Vibrations can cause:

- Damage to machine parts
- Damage to floors
- Transmitted Noise
- Problems with 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 can be achieved by introducing a TICO pad between the two.



Why use Anti-Vibration Isolation

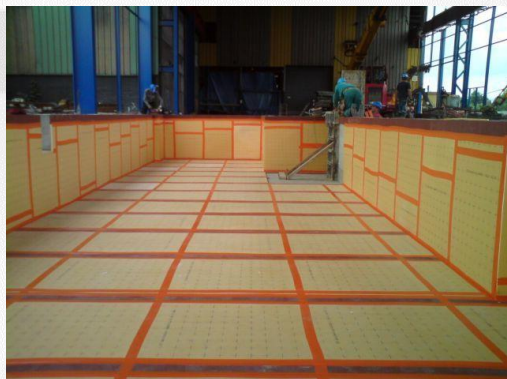


Principle :- *To entirely isolate/ separate the machine/structure from the foundation by a resilient material that is 'tuned' in such a way that the main disturbing frequencies of vibration are not transmitted through it (or are greatly reduced).*

TICO Materials can be employed in the manner above to control vibration. The choice of the correct material for a given application is dependent on a number of factors.

Design Considerations

- The material is not stressed beyond its recommended maximum load bearing capacity, under normal conditions of load.
- Under normal working conditions, the natural frequency of the pad is half or less of the disturbing frequency.
- How the pad/machine is mounted – free standing or fixed in place by an adhesive or bolts.



TICO S/PA IS THE MOST COMMONLY USED RESILIENT PAD FOR MOUNTING GENERAL PLANT AND MACHINERY

Key Features

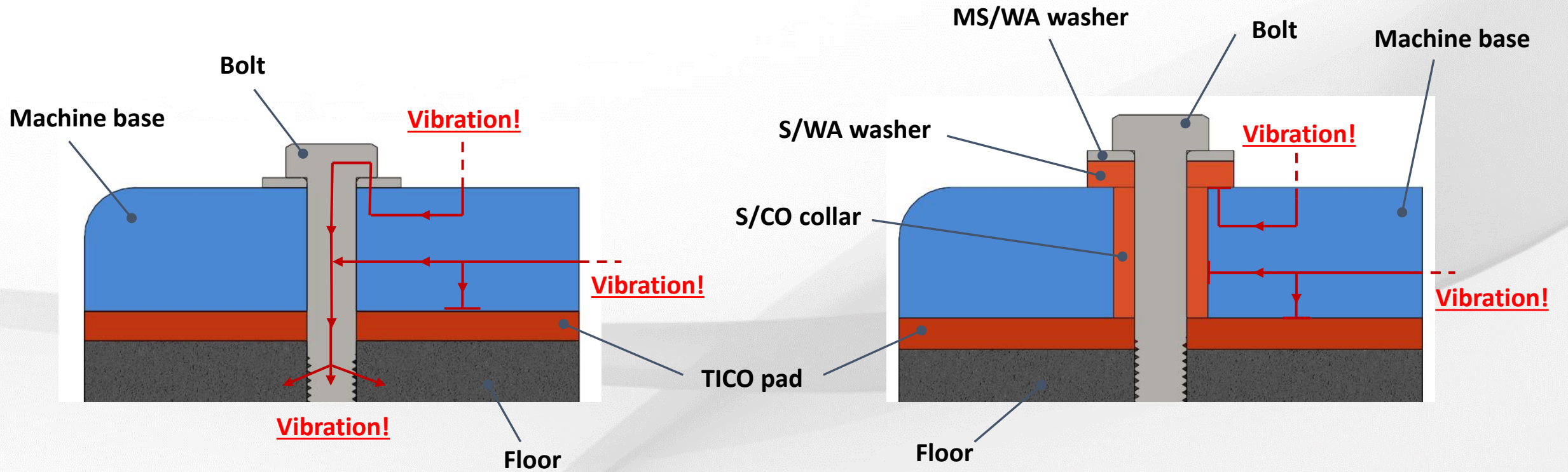
1. Reduces noise and vibration
2. Maximum load bearing capacity of 0.5MN/m² (50 tonnes per square meter)
3. Resistant to oils or other foreign fluids
4. Operating temperatures of -40°C to 100°C (212°F)
5. Easy to install
6. Maintenance free
7. Increases working life of machinery and time between maintenance



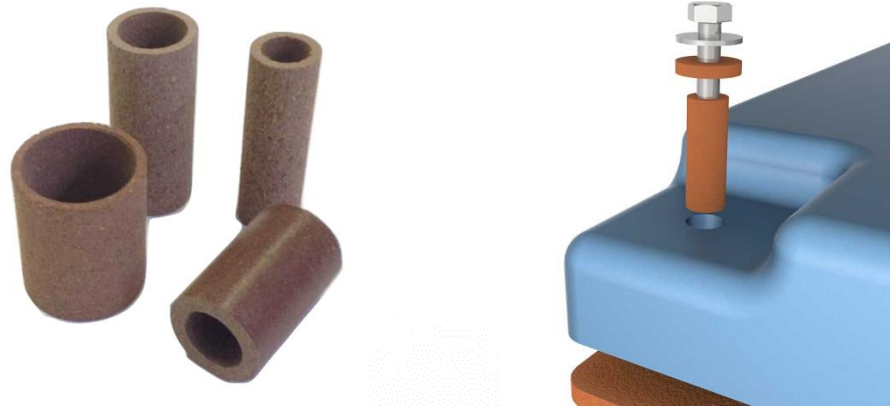
Bolt Isolation



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.



- TICO S/CO Collars have a recommended minimum wall thickness of 3mm. A 6mm wall is available but may be subject to extended lead times.



- TICO S/WA resilient washers and TICO MS/WA mild steel washers are available to suit nominal bolt sizes from M10 – M26.
- Non-standard size washers are available on request.



Part No.	Wall Section (mm)	I.D.	O.D.	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/SH Shimming is a sheet form rubber bonded cork. It's normally used for relatively small variations in level, because of its thickness.

- TICO S/SH can be used to provide a conformable interface between two members with a minimal impact on height.
- It's used in conjunction with other TICO pads to provide a quick and efficient way of levelling plant without compromising the vibration isolating properties of the main pads.

Supply Details

	Length (mm)	Width (mm)	Thickness (mm)
TICO S/SH	1200	900	0.75
	1200	900	1.5
	1200	900	3



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

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.

- A TICO Adjustamount comprises of a circular iron base plate, plastic coated, with a TICO S/PA insert bonded into its recessed underside, complete with a machine levelling stud and associated nuts and washers.
- The iron base can be modified to accept a TICO S/CB/AD adaptor. This an adaptor which screws into the stud hole and has a dimple recess that can accept levelling studs of size M16 or less

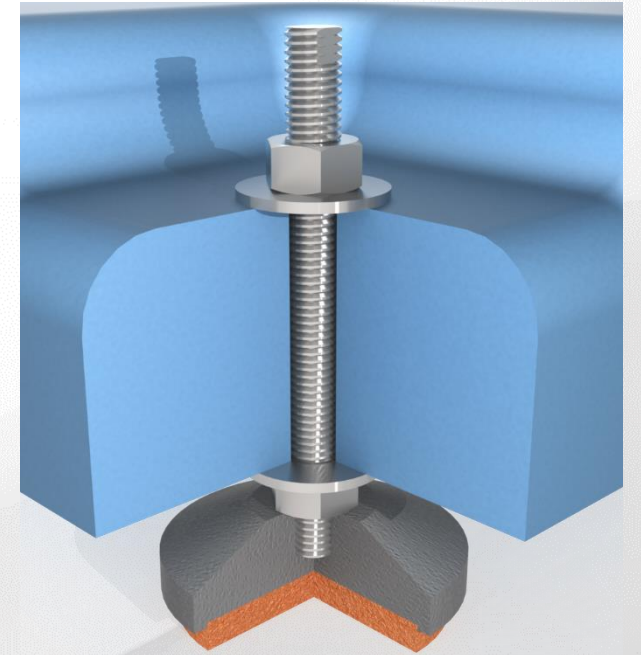


Typical Applications

- 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.

Supply Details

Part no.	Drawing Code	Base Nominal Diameter (mm)	Resilient Insert Thickness (mm)	Stud size and length (mm)	Minimum Height: Machine base to floor (mm)	Quantity (per box)	Max. load per adjustamount (kg)
TF-040111	JW61-2-2	65	12.5 (1/2")	M10 x 90	35.0	4	135
TF-040227	JW61-4-2	110	12.5 (1/2")	M12 x 140	44.5	4	450
TF-040243	JW61-4-4	110	12.5 (1/2")	M16 x 180	47.5	4	450
TF-040510	JW61-7-2	180	12.5 (1/2")	M16 x 180	54.0	2	1350
TF-040537	JW61-7-4	180	12.5 (1/2")	M20 x 190	57.0	2	1350



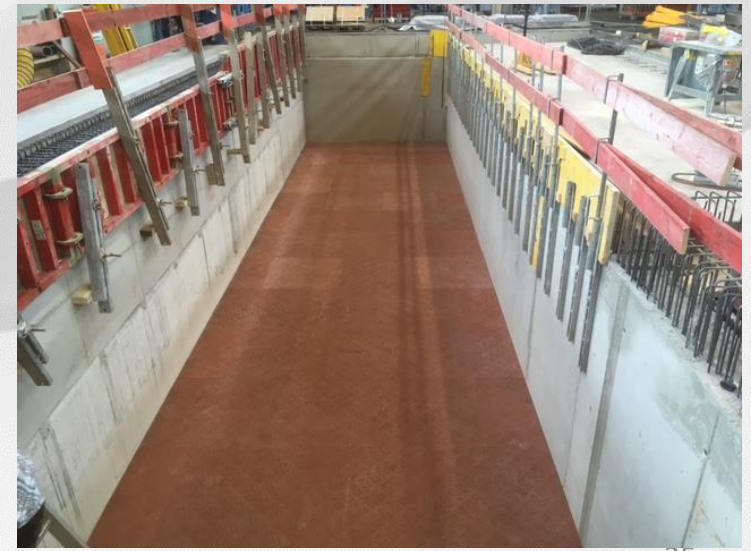
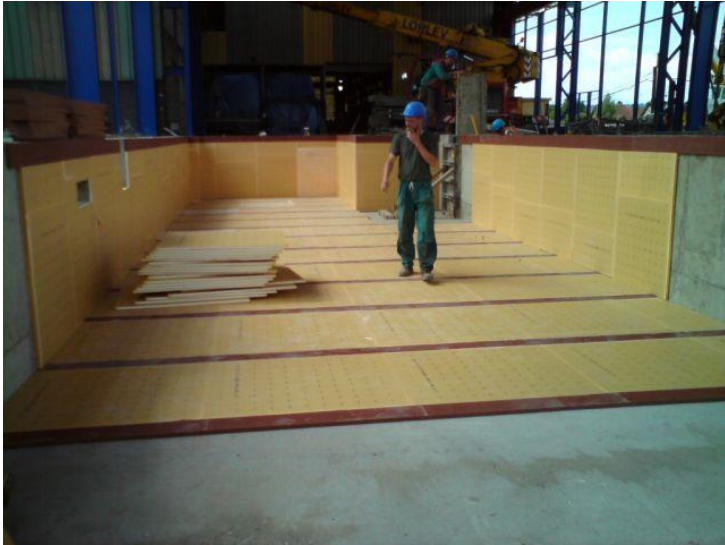
TICO S/PA - Applications

TYPICAL APPLICATIONS

- Air Handling Units (AHU's)
- Compressors
- Fans
- Conveyors
- Forging machines
- Generators
- Grinders
- Milling machines
- Pumps
- Storage hoppers
- Wood working equipment
- Lathes
- Refrigeration plant
- Lifts
- Vacuum Pumps
- Saws
- Power Presses
- Slotting Machines
- Crushers
- Routing Machines



TICO Pad - Examples



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

These pads are used in applications where the vibration is critical and where the plant is lightweight. They are generally an alternative to TICO S, which is most effective under higher loads.

Key Features

1. Engineered low stiffness rubber core with flat bonding faces
2. Capable of isolation very low frequencies
3. Cost effective alternative to spring mounts, no bolting, no moving parts to fail
4. Long service life and maintenance free
5. Usable to good effect in wide ranging environmental conditions



LF/PA/10



TICO LF/PA

Pads have a fluted rubber construction which gives the pad excellent low frequency properties.

The cork layers facilitate bonding of the pads into position and also allow, in certain applications, concrete to be poured directly on top of them.

There are two versions which can be supplied either a single or double layer:-

- TICO LF/PA/10 – Load bearing capacity 0.07 MN/m^2 (7 tonnes per square metre).
- TICO LF/PA/80 – Load bearing capacity 0.7 MN/m^2 (70 tonnes per square metre).
- Designed specifically for use under transformers and coolers. These pads has an High dielectric strength
- and remain naturally stable under compressive stress.

LF/PA/80



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.

These pads offer more flexibility of design than TICO LF/PA pads as they can be manufactured as sheets and cut to virtually any size.

Has an operating temperature range of -40°C to $+70^\circ\text{C}$ (158°F)

There are two versions which can be supplied either a single or double layer:-

- TICO CF/PA/10 – Load bearing capacity 0.1 MN/m^2 (10 tonnes per square metre).
- TICO CF/PA/80 – Load bearing capacity 0.25 MN/m^2 (25 tonnes per square metre).

Low Frequency Pads - Applications



Typical Applications:

- Air conditioning plant
- Boiler plant
- Fans
- Compressors
- Test equipment
- Instrumentation situated near known sources of vibration
- Isolated inertia blocks
- Small lightweight units e.g. pumps
- Heating and ventilation
- Inspection equipment

TICO

Anti-Vibration & Noise Isolation Mounting Solutions

Find out more: www.anti-vibration.solutions +44 (0) 1579 320808 Email: tico@tiflex.co.uk

 Centrifugal Compressors	 Centrifugal Pumps	 Reciprocating Compressors
 Rotary Screw Compressors	 Rotodynamic Pumps	 HVAC & Refrigeration

Specialist Applications – HI-DUTY



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

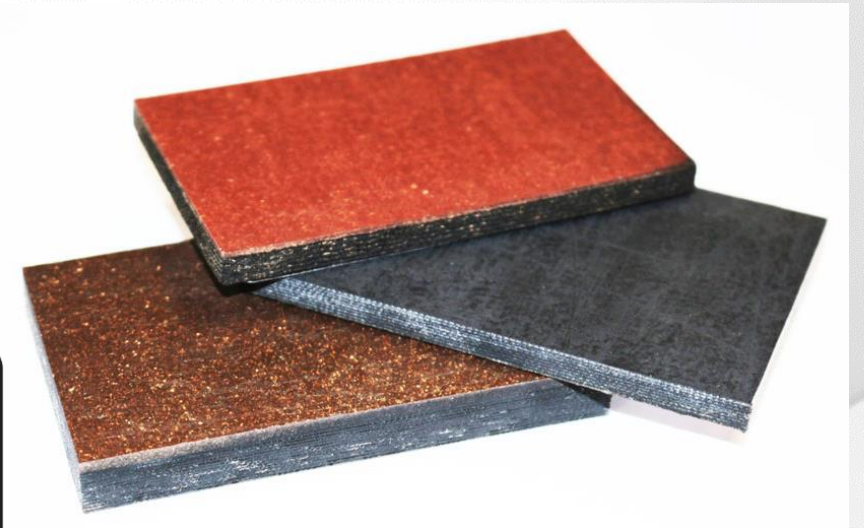
TICO HI-DUTY pads have been specifically formulated and designed to have the strength and resilience required to accommodate large impacts, absorb fierce shock loads and attenuate severe vibration from heavy plant.

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)

Key Features:

1. Very tough and resilient
2. Absorbs highly-destructive shock loads without reducing efficiency
3. Prolongs the life of machinery
4. Retention of properties under extreme conditions with a long service life
5. Maintenance free and simply to install





TICO RF/PA (Reinforced Fabric)

Was originally developed to absorb loads under drop hammer anvils, replacing timber packings which would break down unevenly over time and cause the anvil to take on an uneven set.

It is now used as a heavy-duty machinery mounting pad to reduce vibration from large plant, acting as a heavy duty buffer.

1. TICO RF/PA – Load bearing capacity 7MN/m^2 (70000 tonnes per square metre).

Typical Applications

- Anti-vibration mounts on large plant
- Heavy duty buffers
- Pipe support and isolation (oil and gas industry)
- Elastomer component of TICO Sliding Bearing



TICO PF/PA (Proofed Fabric)

Should be used where the material's high stiffness is more important than a predictable response to impact.

It is also ideal for preventing fretting corrosion and spalling of concrete seating's.

TICO PF/PA – Load bearing capacity 15.5MN/m^2 (150,500 tonnes per square metre).

Typical Applications

- Power and Machinery supports
- Bumper pads for crane stops and conveyer end stops
- Load bearing pads for bearing brackets, mountings, transfer tables
- Crush machines
- General industrial mountings where there is a high load and a small support area

Non-Standard Grades – TICO Specialist Pads



TICO Z/PA

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

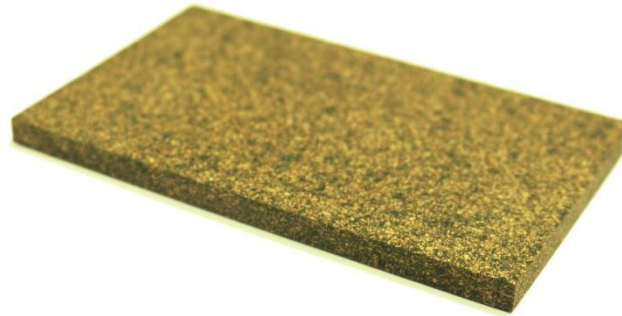
1. Applications include isolating steel/ steel connections, resilient seating's & buffers
2. Working stress = 1.4 MN/m²



TICO FR/PA (Fire Retardant)

Developed to operate in the aggressive environments in the offshore and petrochemical industries. In the event of a fire, the material has low surface spread of flame, low smoke & low toxicity. It also self extinguishes when the source of the flame is removed.

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 HT/PA

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

1. Quick and easy installation
2. Temperature range: -40°C to +150°C



TICO CS/PA

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

1. Quick and easy installation
2. Operating temperature -30°C to +70°C
3. Working stress up to 0.7 MN/m²



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.

1. Quick and easy installation
2. Working stress = 1.0 MN/m²

TICO VR/PA

Laminated elastomeric pad comprising of synthetic rubber, modified by the inclusion of cork, reinforced with piles of high tensile fabric.

1. Has a maximum recommended loading capacity of 7MN/m^2
2. Used in high loads applications where vibration is an issue
3. Used as a resilient buffer material, in lifts and pneumatic hammers



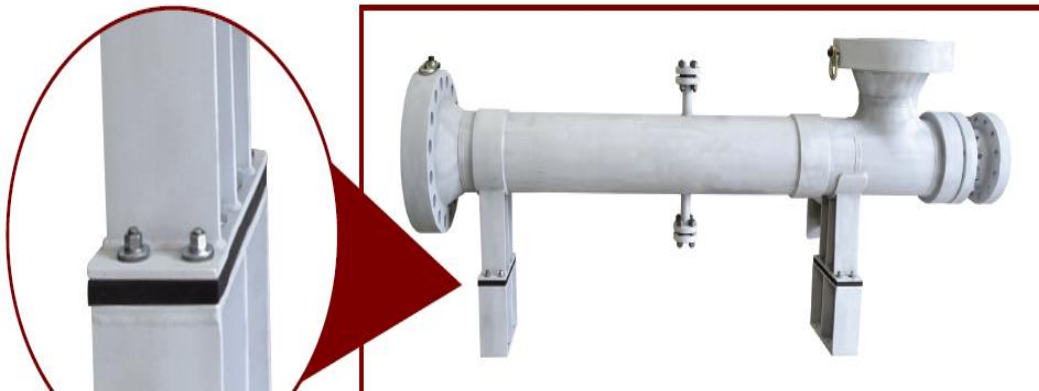
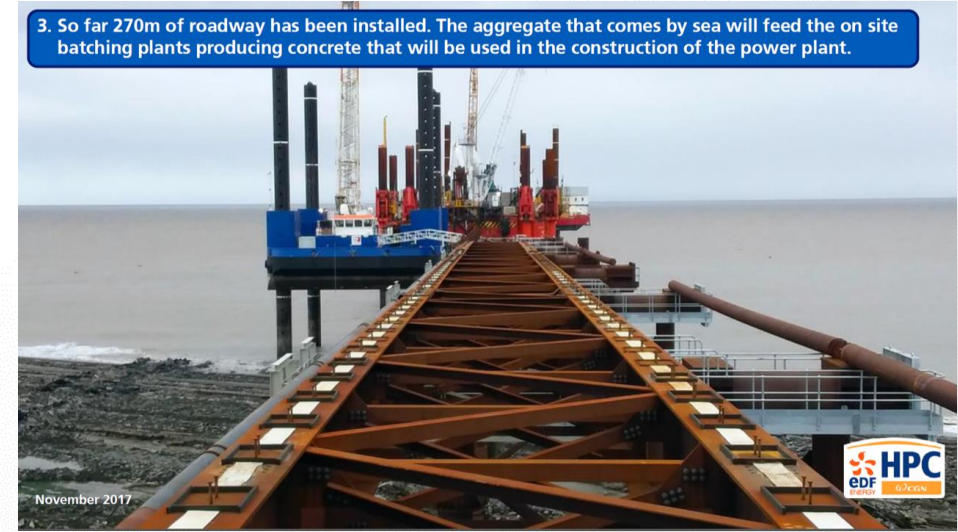
TICO B/PA

Rubber bonded cork material which was specially developed for the use in buffer applications.

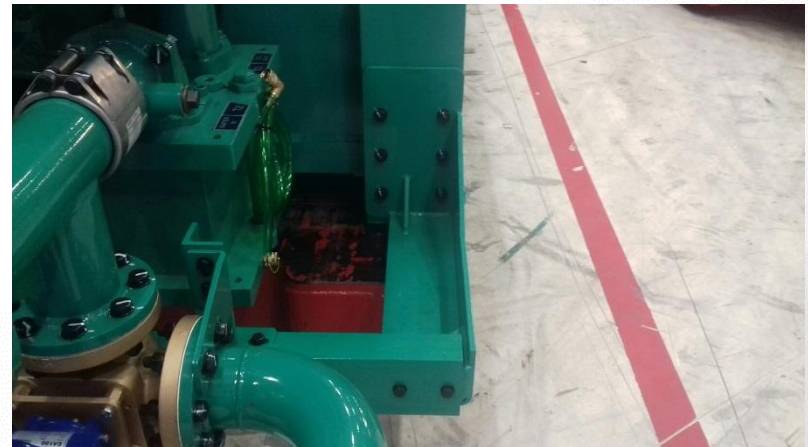
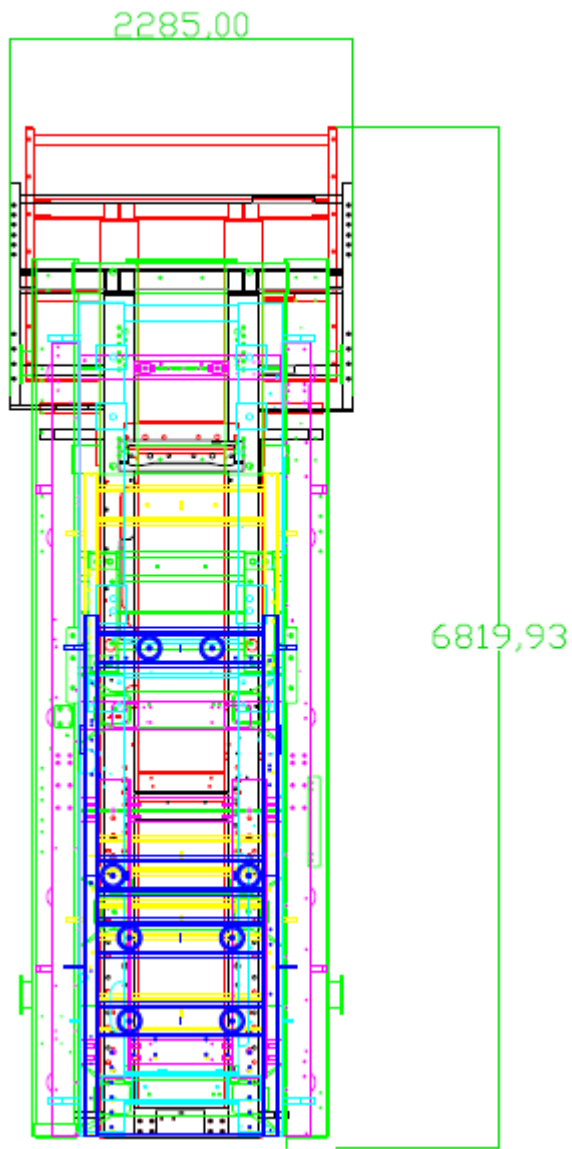
1. Has a maximum recommended loading capacity of 1.5MN/m^2
2. Used in high load situations as a good general anti-vibration material.



Application Examples



Application Example





PIPE SUPPORTS

Manufactured and developed by



Vibration and Resonance

- From a practical standpoint, the most important problem with forced vibration in a piping system is resonance. Resonance occurs when the vibration forcing frequency is at or very close to an acoustical or mechanical natural frequency of the system. Since most structures and piping systems have very little damping, the vibration amplitude becomes very high if resonance occurs.



Low & High-Temperature, Compound Corrosion

- Corrosion at pipe supports is one of the leading causes of process piping failures, which can have potentially catastrophic results. Many pipework failures have been caused by external corrosion.
- External corrosion may be present in many forms including simple environmental corrosion (e.g. coating breakdown and subsequent corrosion, corrosion under insulation etc.), crevice corrosion, and galvanic corrosion.



Thermal Expansion and Contraction Stress

- Thermal expansion of piping, due to high temperature, can result in pipe strain and high pipe support loads.
- Pipe supports are removed or modified to reduce pipe static stress and/or equipment loads, but are not always adequate for vibration design, resulting in high vibration.



Pipe Supports

- DEVELOPED OVER 70 YEARS
- MANUFACTURED IN THE U.K.
- BESPOKE SIZES AVAILABLE

TEMPERATURE RANGE

GRIP TYPE: -50°C to +120°C

GUIDE TYPE: -50°C to +120°C

VHT TYPE: -50°C to +300°C



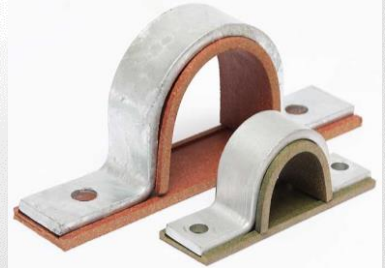
Pipe Support Products

TICO

The Tico Industrial Pipe Support family of products consists of Pipe Grips, Clip Strips, Clamp Blocks and Bondslips.

Pipe support functionality:

- Supporting and positively locating pipework over long spans.
- Isolating the pipe from its holding down bolts and clamps to prevent fretting and corrosion
- Isolating dissimilar metal (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
- Vibration and noise attenuation



TICO Pipe Grips (Isolated U-Bolts)



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

Key Features

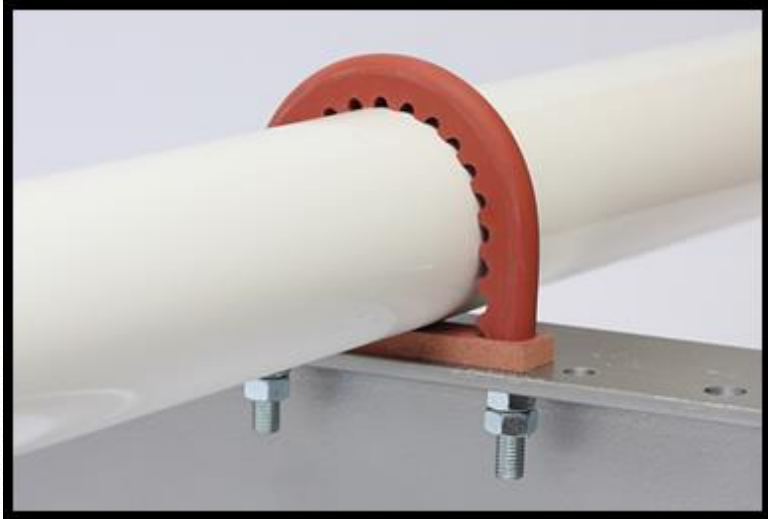
- Fire retardant and low evolution of toxic gases in fire
- Prevents electrolytic corrosion
- Prevents clamping damage and wear due to fretting
- Reduces transmission of noise and vibration
- Colour coded:
 - Black - Stainless steel pipe
 - Red - Cu-Ni pipe
 - Yellow - Very High Temperature Type



Pipe Grip Configurations



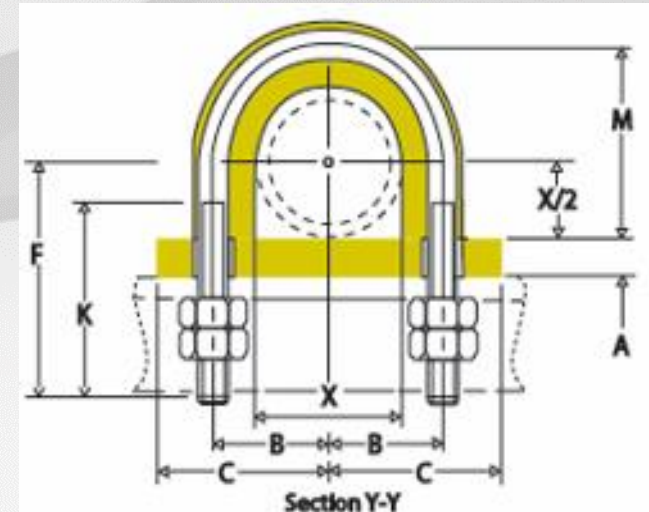
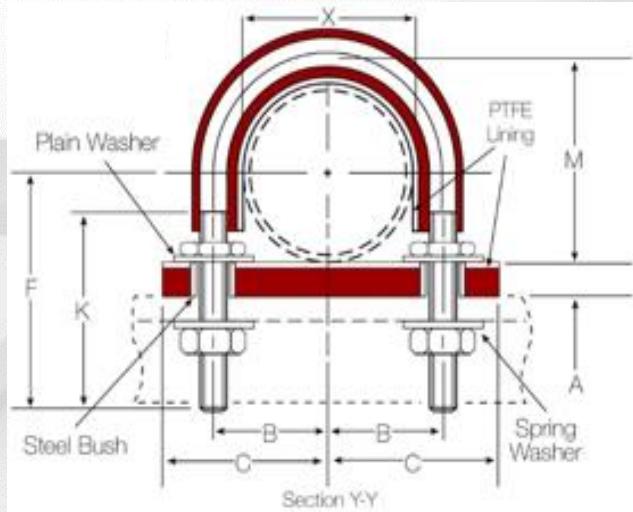
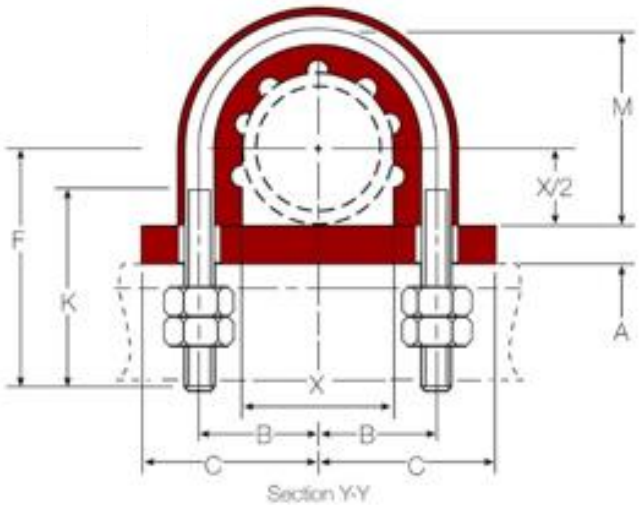
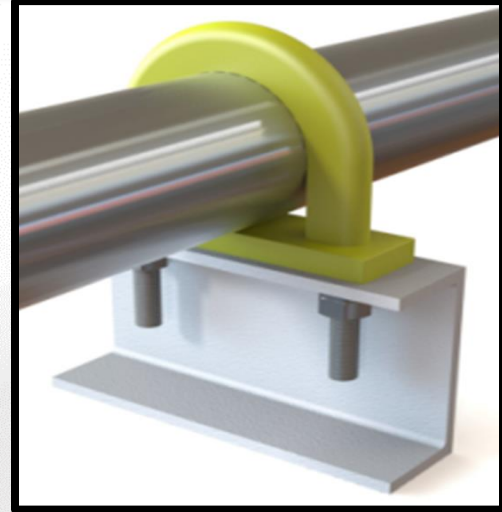
Grip Type



Guide Type



VHT Type - Grip



Three types:

Grip Type

Enables the pipe to be gripped & supported while accommodating small axial movements

- JW152 Series - have black sleeves & are used with stainless steel pipelines
- JW153 Series - have red sleeves & are used with Cupronickel pipelines

Guide Type

PTFE Lined - Accommodates greater axial movement and thermal expansion of the pipe

- JW172 Series - have black sleeves & are used with stainless steel pipelines
- JW173 Series - have red sleeves & are used with Cupronickel pipelines

VHT Type

Enables the pipe to be gripped & supported, accommodating high levels of heat (+300°C)

- JW352 Series - Used with stainless steel pipelines
- JW353 Series - Used with Cupronickel pipelines

The Color Codes:

- For ease of use and safety
- To enable recognition of pipe lines

Very High Temperature Type is constructed with Fire retardant synthetic silicone moulded components which do not support the surface spread of flame.

Key Features

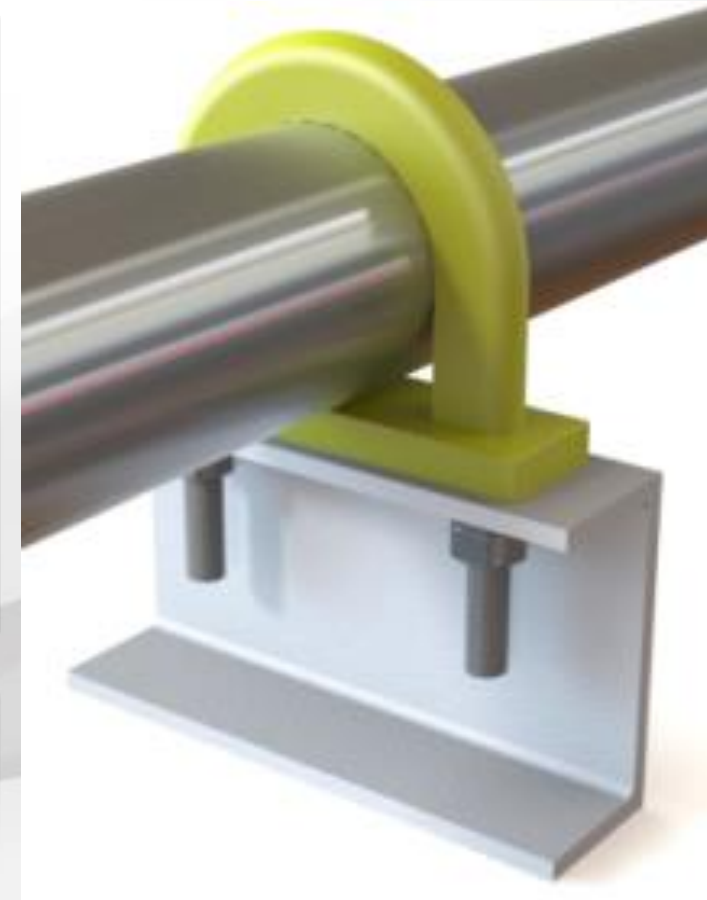
- Operational temperature range from -60°C to +300°C continuous, +350°C intermittent
- Easy identification: Yellow
- Fire retardant synthetic silicone moulded components which do not support the surface spread of flame
- Accurate threads mean easy fitting
- Provides an unrivalled level of cushioning and support

JW 352 Series

- Sizes based on stainless steel pipe outer diameters to BS3974 Part 1 1974
- operational temperature range of -60°C to +350°C

JW 353 Series

- Sizes based on Cu-Ni pipe outer diameters to BS2871 Part 2



TICO Pipe Support Installation



A **TICO Clip Strip** is a moulded elastomeric strip which is used principally with flat bar clamps as an isolating clamp liner.

Key Features

- Raised shoulder design for positive location
- Sizes to suit most common strap widths
- Quick, easy installation
- Reduction and absorption of shock, noise and vibration
- Pliable and easy to cut
- Prevents electrolytic action between dissimilar metals
- Grades available to suit temperatures up to 300°C

- Three types to suit different operation temperature conditions:
 - **TICO S/CL** (maximum working temperature 100°C continuous)
 - **TICO HT/CL** (maximum working temperature 150°C continuous)
 - **TICO VHT/CL** (maximum working temperature 300°C continuous)



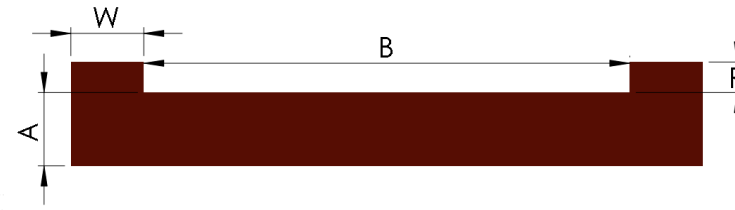
TICO Clip Strips – TICO S/CL



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

Colour: Red

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



JW Ref Number	Base (A) Thickness	Clip Width (B)	Recess Depth (R)	Wall Width (W)
55-50	3 mm (0.12")	12.5 mm (0.49")	1.5 mm (0.06")	3 mm (0.12")
55-75	3 mm (0.12")	19 mm (0.75")	1.5 mm (0.06")	3 mm (0.12")
55-100	5 mm (0.20")	25 mm (0.98")	2.5 mm (0.10")	5 mm (0.20")
55-125	5 mm (0.20")	32 mm (1.26")	2.5 mm (0.10")	5 mm (0.20")
55-175	6 mm (0.24")	40 mm (1.57")	2.5 mm (0.10")	6 mm (0.24")
55-200	6 mm (0.24")	50 mm (1.97")	2.5 mm (0.10")	6 mm (0.24")
55-250	6 mm (0.24")	64 mm (2.52")	2.5 mm (0.10")	6 mm (0.24")
55-300	9.5 mm (0.37")	75 mm (2.95")	5 mm (0.20")	12.5 mm (0.49")
55-400	9.5 mm (0.37")	100 mm (3.94")	5 mm (0.20")	12.5 mm (0.49")
55-500	9.5 mm (0.37")	125 mm (4.92")	5 mm (0.20")	12.5 mm (0.49")
55-600	12.5 mm (0.49")	150 mm (5.91")	6 mm (0.24")	19 mm (0.75")

Part No.	Drawing No.	Width (mm)	Length (mm)
TK-070120	JW55-50	12.5	1200
TK-070198	JW55-75	19	1200
TK-070252	JW55-100	25	1200
TK-070325	JW55-125	32	1200
TK-070406	JW55-175	40	1200
TK-070503	JW55-200	50	1200
TK-070635	JW55-250	64	1200
TK-070759	JW55-300	75	1200
TK-071003	JW55-400	100	1200
TK-071259	JW55-500	125	1200
TK-07150X	JW55-600	150	1200

****Note:** The base thickness ('A' dimension) is important as it dictates the size of clamp required for a particular pipe diameter.

TICO Clip Strips – TICO 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.

Colour: Green

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



JW Ref Number	Base (A) Thickness	Clip Width (B)	Recess Depth (R)	Wall Width (W)
55-50	3 mm (0.12")	12.5 mm (0.49")	1.5 mm (0.06")	3 mm (0.12")
55-75	3 mm (0.12")	19 mm (0.75")	1.5 mm (0.06")	3 mm (0.12")
55-100	5 mm (0.20")	25 mm (0.98")	2.5 mm (0.10")	5 mm (0.20")
55-125	5 mm (0.20")	32 mm (1.26")	2.5 mm (0.10")	5 mm (0.20")
55-175	6 mm (0.24")	40 mm (1.57")	2.5 mm (0.10")	6 mm (0.24")
55-200	6 mm (0.24")	50 mm (1.97")	2.5 mm (0.10")	6 mm (0.24")
55-250	6 mm (0.24")	64 mm (2.52")	2.5 mm (0.10")	6 mm (0.24")
55-300	9.5 mm (0.37")	75 mm (2.95")	5 mm (0.20")	12.5 mm (0.49")
55-400	9.5 mm (0.37")	100 mm (3.94")	5 mm (0.20")	12.5 mm (0.49")
55-500	9.5 mm (0.37")	125 mm (4.92")	5 mm (0.20")	12.5 mm (0.49")
55-600	12.5 mm (0.49")	150 mm (5.91")	6 mm (0.24")	19 mm (0.75")

Part No.	Drawing No.	Width (mm)	Length (mm)
TK-030129	JW55-50	12.5	1200
TK-030196	JW55-75	19	1200
TK-030250	JW55-100	25	1200
TK-030323	JW55-125	32	1200
TK-102928	JW55-175	40	1200
TK-030501	JW55-200	50	1200
TK-030633	JW55-250	64	1200
TK-030757	JW55-300	75	1200
TK-031001	JW55-400	100	1200
TK-031257	JW55-500	125	1200
TK-031508	JW55-600	150	1200

****Note:** The base thickness ('A' dimension) is important as it dictates the size of clamp required for a particular pipe diameter.

TICO Clip Strips – VHT/CL

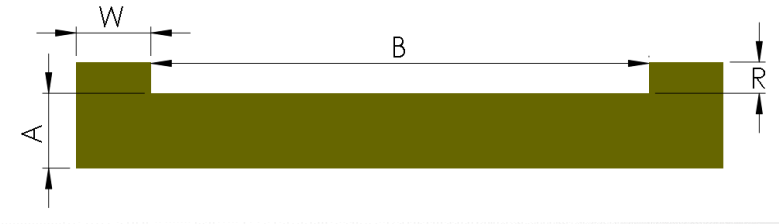


TICO VHT/CL is an extruded polymer with capabilities of supporting very high temperatures

Colour: Yellow

Operating Temp: -50°C to +300°C (-58°F to 572°F)

Flexibility: Retained after 1 month at +300°C (572°F)



Base (A) Thickness	Clip Width (B)	Recess Depth (R)	Wall Width (W)
2 mm (0.08")	35 mm (1.38")	2 mm (0.08")	5 mm (0.20")
2 mm (0.08")	45 mm (1.77")	2 mm (0.08")	5 mm (0.20")
2 mm (0.08")	55 mm (2.17")	2 mm (0.08")	5 mm (0.20")
2 mm (0.08")	65 mm (2.56")	2 mm (0.08")	5 mm (0.20")
2 mm (0.08")	75 mm (2.95")	2 mm (0.08")	5 mm (0.20")
2 mm (0.08")	85 mm (3.35")	2 mm (0.08")	5 mm (0.20")
2 mm (0.08")	95 mm (3.74")	2 mm (0.08")	5 mm (0.20")
2 mm (0.08")	105 mm (4.13")	2 mm (0.08")	5 mm (0.20")
2 mm (0.08")	115 mm (4.53")	2 mm (0.08")	5 mm (0.20")

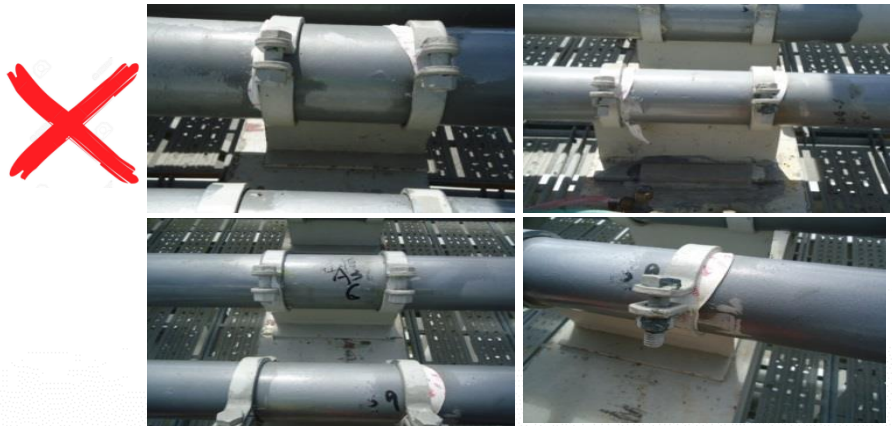
Part No.	Width (mm)	Length (Metre)
TK-000300	35	1
TK-000408	45	1
TK-000505	55	1
TK-000602	65	1
TK-00070X	75	1

**Note: The material is normally specified by grade and recess width ('B' dimension).

TICO Clip Strip – Case Study

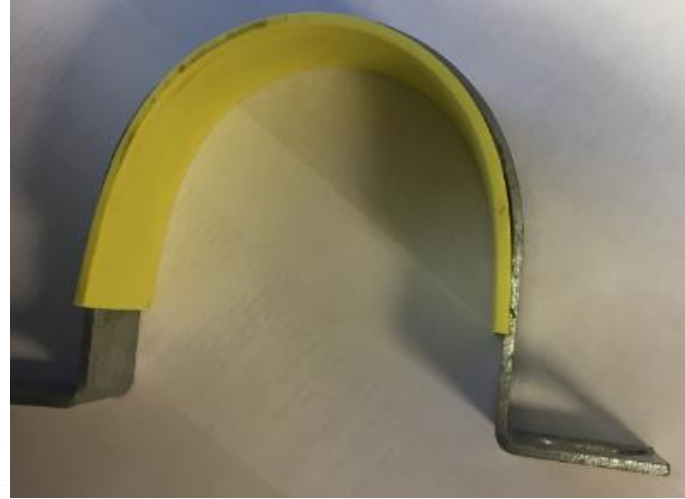
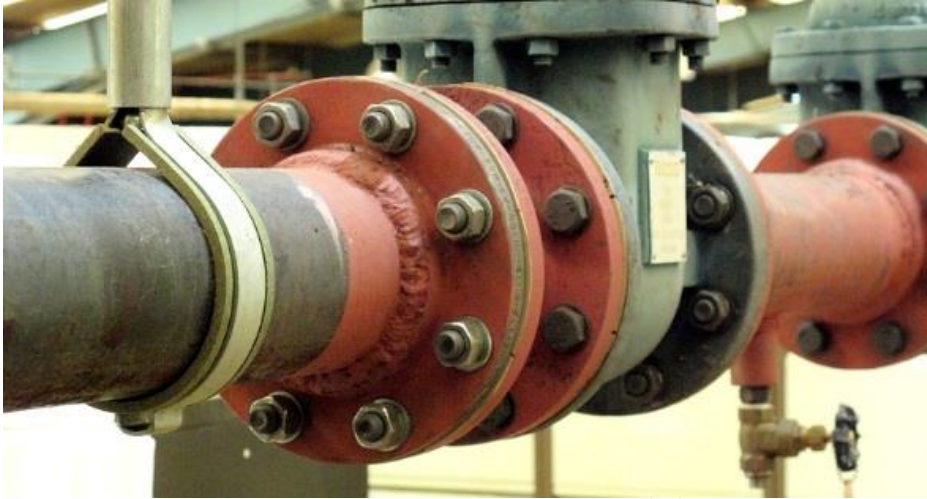


A petrochemical customer was having problems with pipe linings. To avoid electrolytic action between dissimilar metals, they were using PTFE as a high temperature liner between the pipe and the pipe clamp but thermal movement and expansion was resulting in the PTFE liners working free and requiring constant maintenance.



- TICO was asked to look into a solution and recommended our walled Clip Strips. The moulded configuration provided a positive location for the clamp ensuring the Strip couldn't work out during service and didn't need any adhesive. The rubber/silicone compound provided a more conformable interface between the pipe and clamp than the PTFE alone, which also helped to prevent fretting, pipe stress / fatigue and corrosion.
- During the testing phase it was found that the walled TICO Clip Strips stayed in place despite the expansion and contraction of the pipe due to temperature and pressure fluctuations. This saved substantial man hours in unnecessary maintenance. They also provided additional shock and vibration attenuation against fluid velocity and turbulence in the pipes against the PTFE strips which they replaced - this would otherwise have been transmitted through the clamp to the surrounding structure, building or pumping equipment.

TICO Clip Strip - Examples





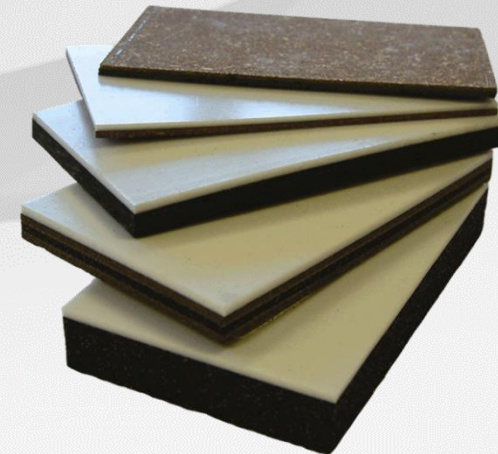
Bondslips

Manufactured and developed by



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

- Two separate plates act together to provide a plane 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 movement, e.g. due to thermal expansion and contraction, without a build up of stress.
- TICO Bond Slips units can also be used as a guide stop to restrain movement in one or more directions.
- Low friction sliding units providing an almost unlimited degree of movement
- Bearings can be installed for use on a permanent or temporary basis during a construction for example
- Reduce the horizontal stresses transmitted to structural supports



Key Features:

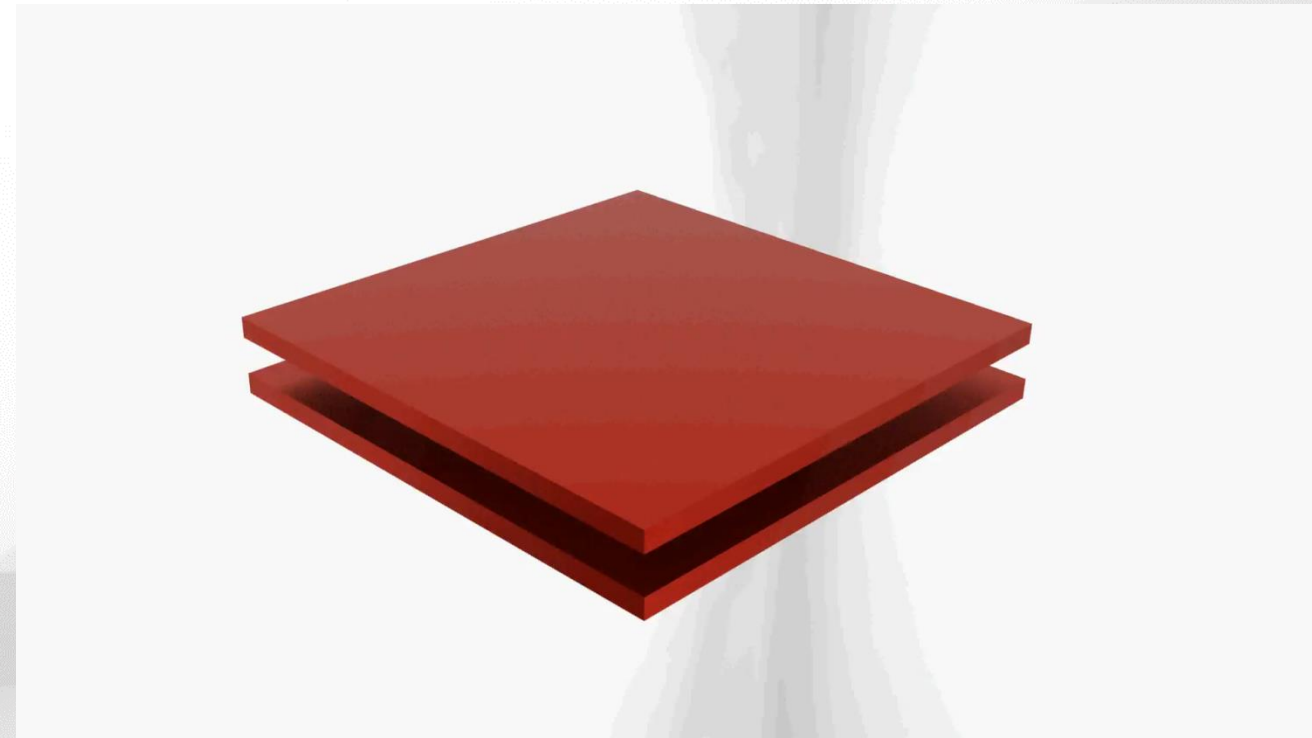
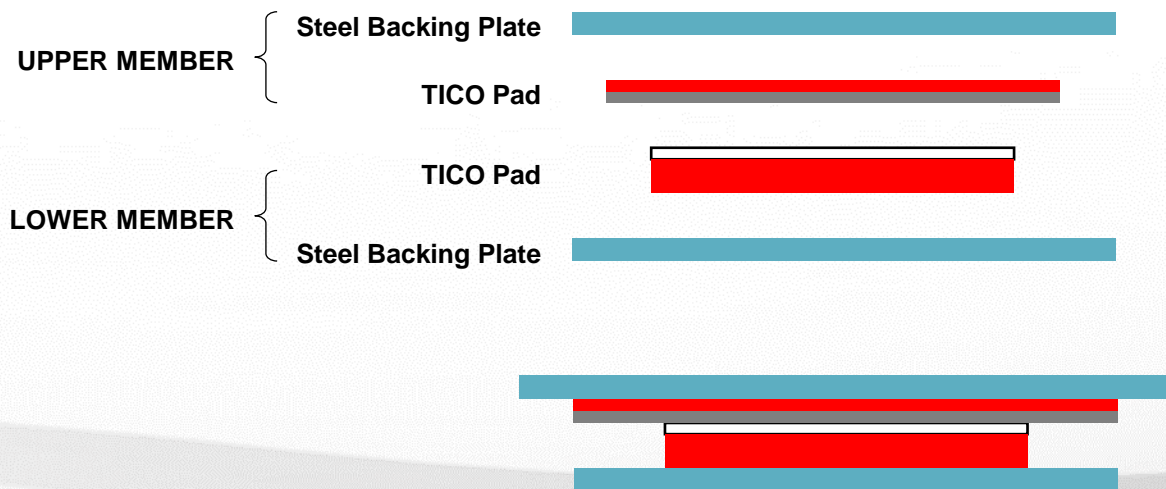
- Maintenance free
- Very low coefficients of friction, typically less than 0.1
- Smooth movement without slip/stick effects
- Accommodate both planar and rotational movements
- Provide noise and vibration attenuation with the correct specification of materials
- Highly customisable for different applications
- Simple to install
- Working temperature range -40 to 100°C (-40 to 212°F)
- TICO materials can be pre-bonded to steel backing plates which can then be welded or bolted into position on site.



A typical TICO Sliding Bearing has two components:

Upper Member: A TICO material with a low friction nylon surface which may or may not be bonded to a steel plate

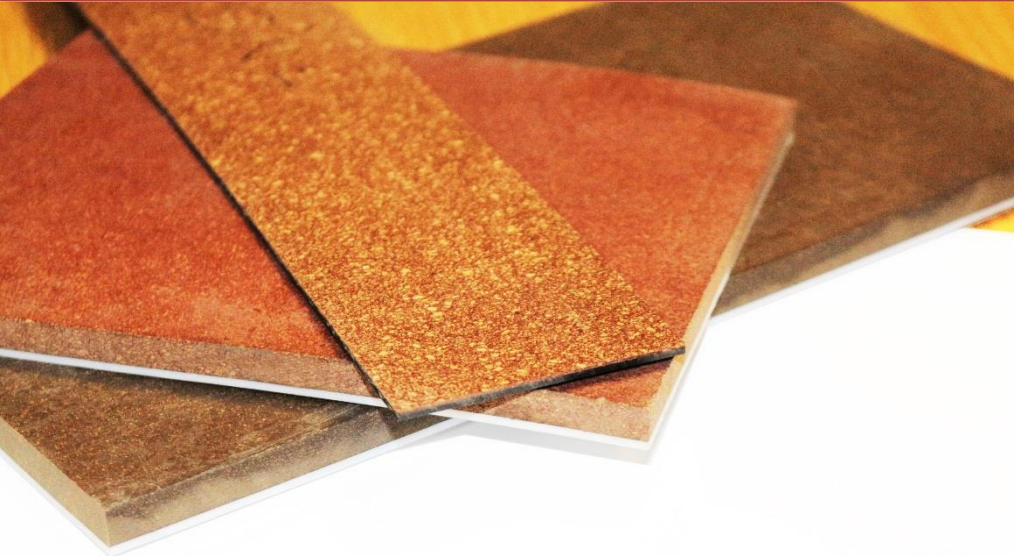
Lower Member: A TICO material with a low friction PTFE surface which may or may not be bonded to a steel plate



The top member movement must never exceed the edge of the bottom member as this will expose the low friction surface to contaminate and wear. It will also distort the load unevenly across the bearing.

TICO Bond Slip – Types of Materials

TICO



TICO S/NG/PA

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

TICO S/PT/PA

Virgin PTFE with a rubber bonded cork backing. Usually 3mm (0.118") thick. Typical lower materials (chosen based on load).

TICO B/PT/PA

Rubber bonded cork with PTFE surface. Maximum working stress 1.5 MN/m².

TICO RF/PT/PA

Fabric reinforced rubber pad with PTFE surface. Maximum working stress 7 MN/m².

TICO PF/PT/PA

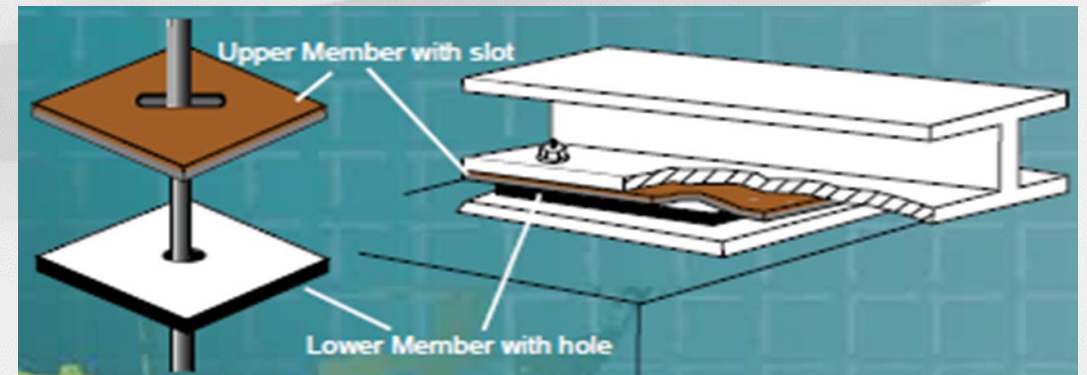
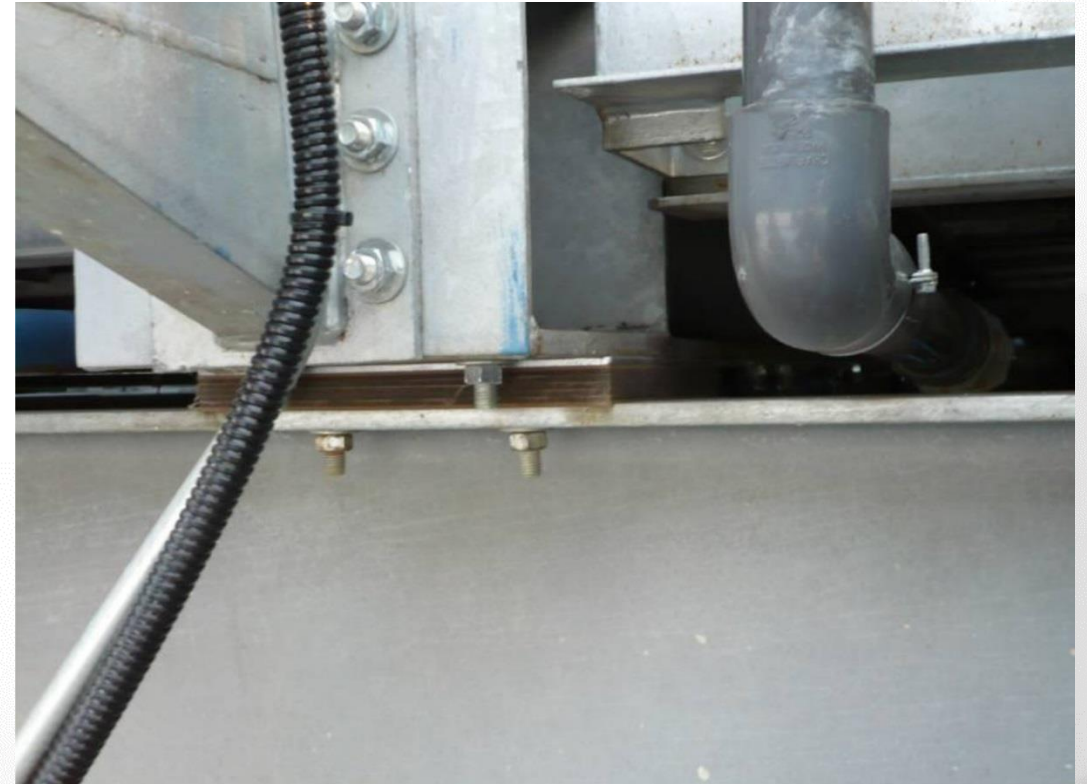
Fabric reinforced rubber pad with PTFE surface. Maximum working stress 15.5MN/m²

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



Sliding Bearings

TICO



Sliding Bearings

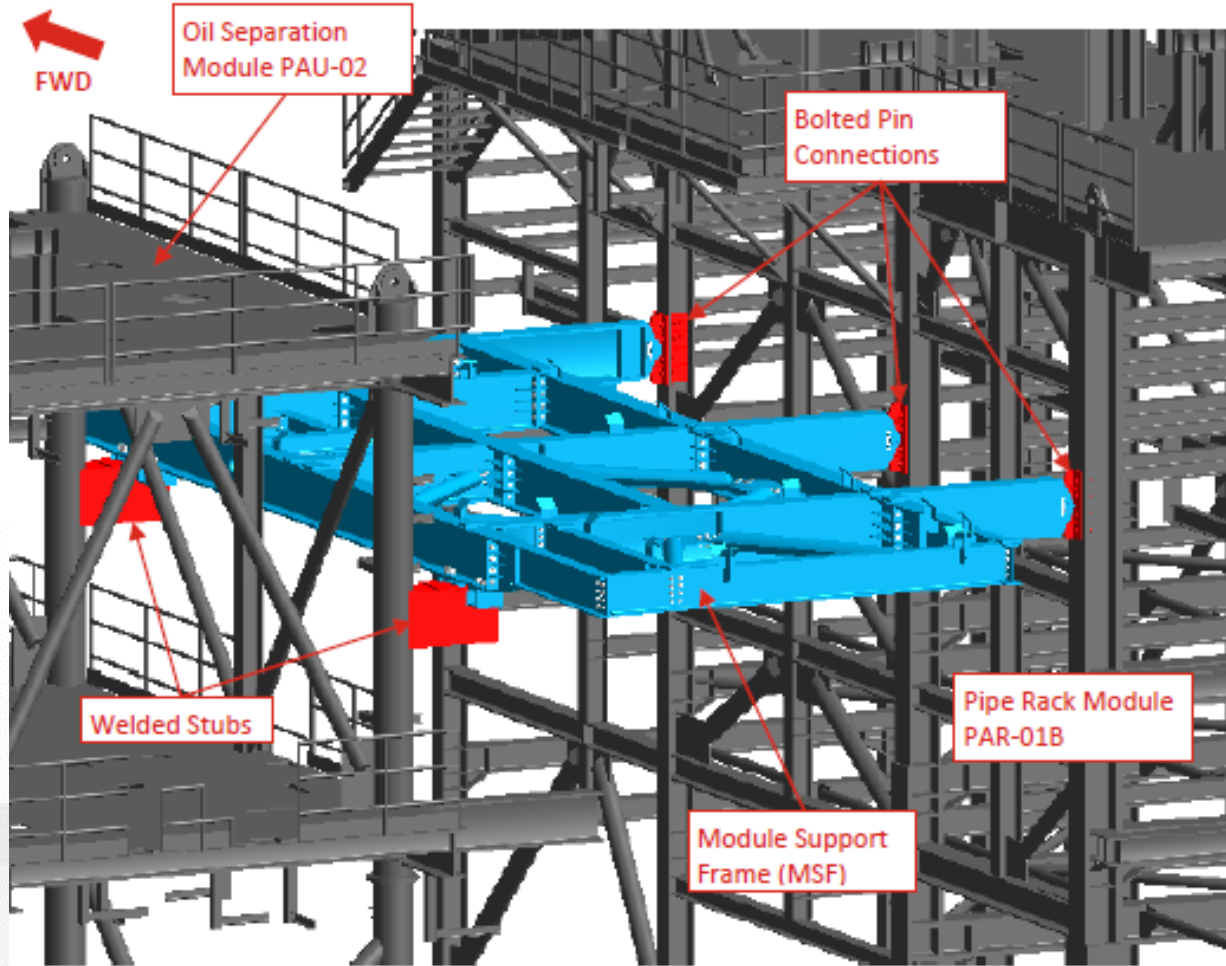


Figure 1.2: View Looking Forward-Starboard Showing Location of Module Support Frame

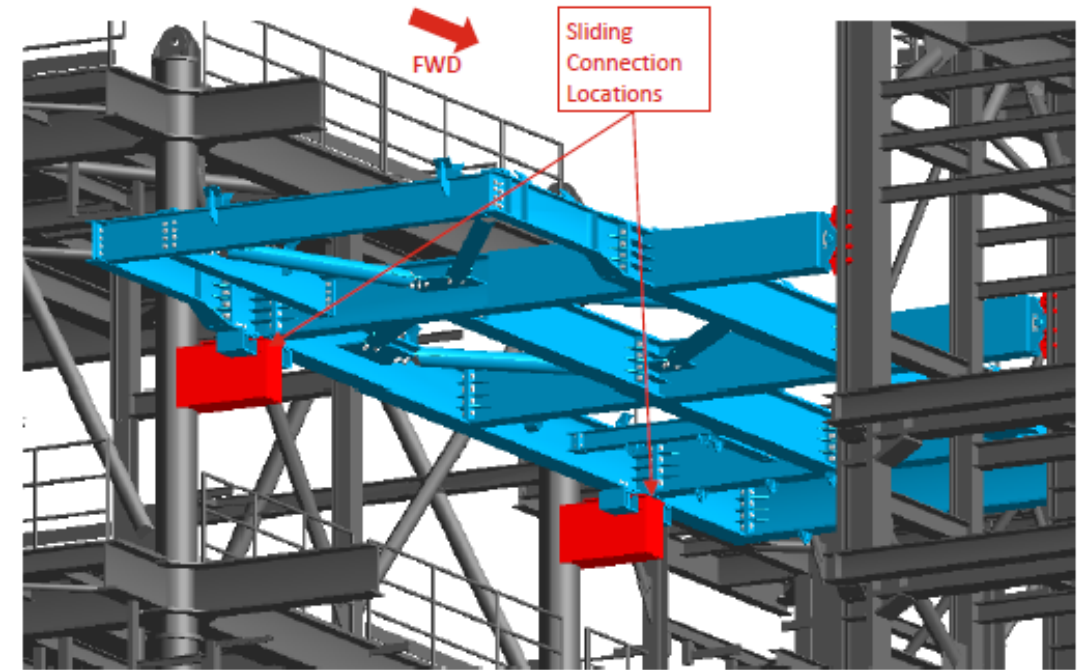


Figure 1.3: View Looking Forward-Port Showing Location of Sliding Connections

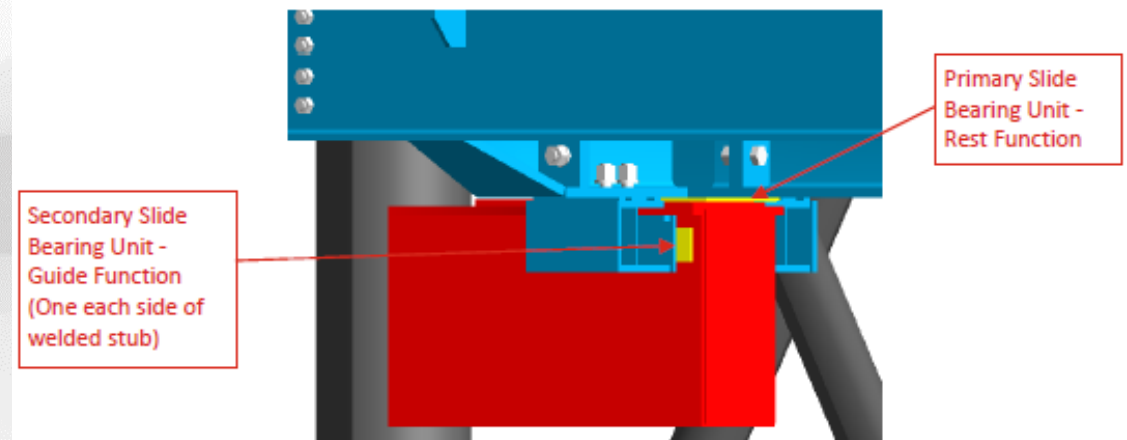
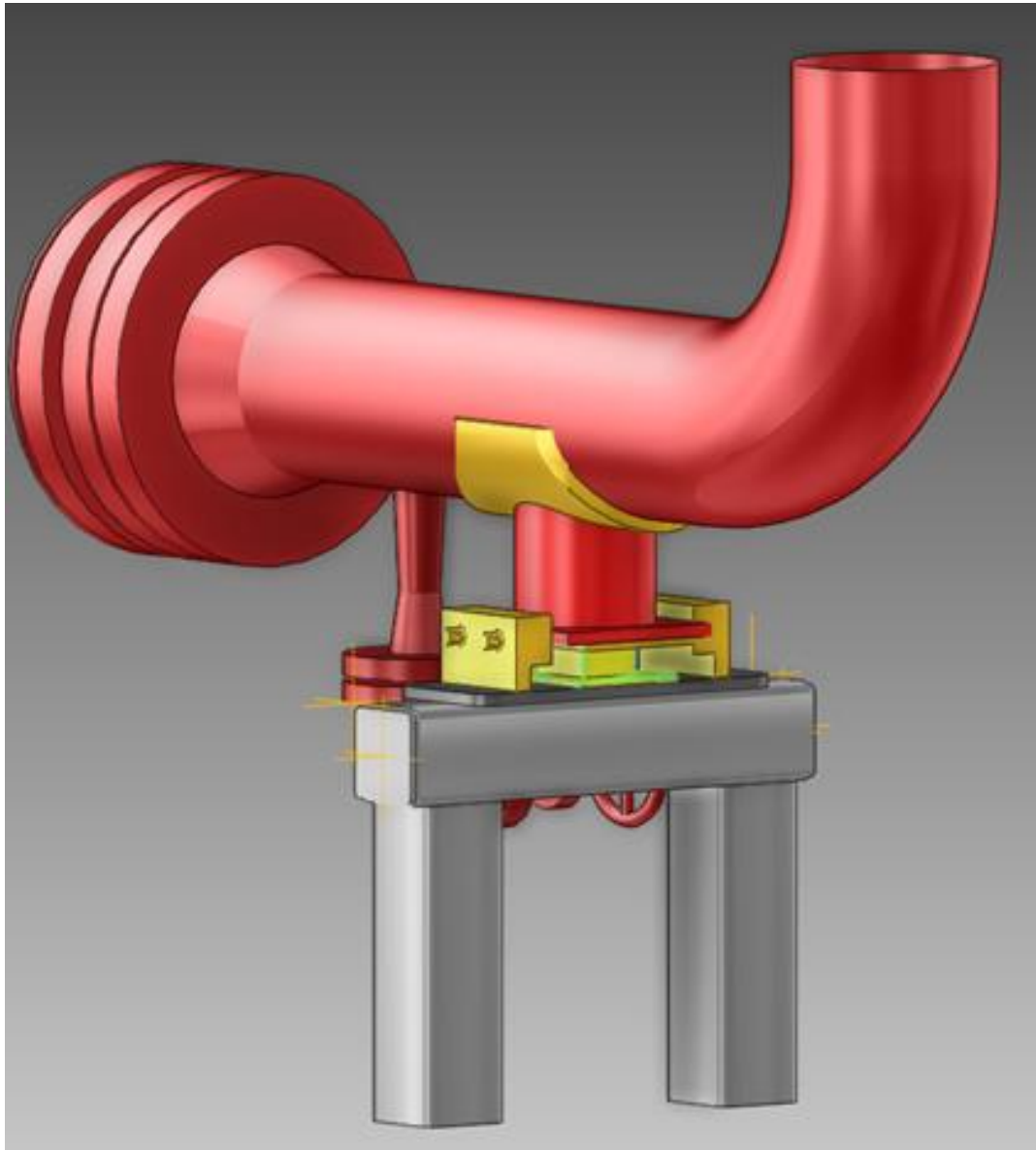


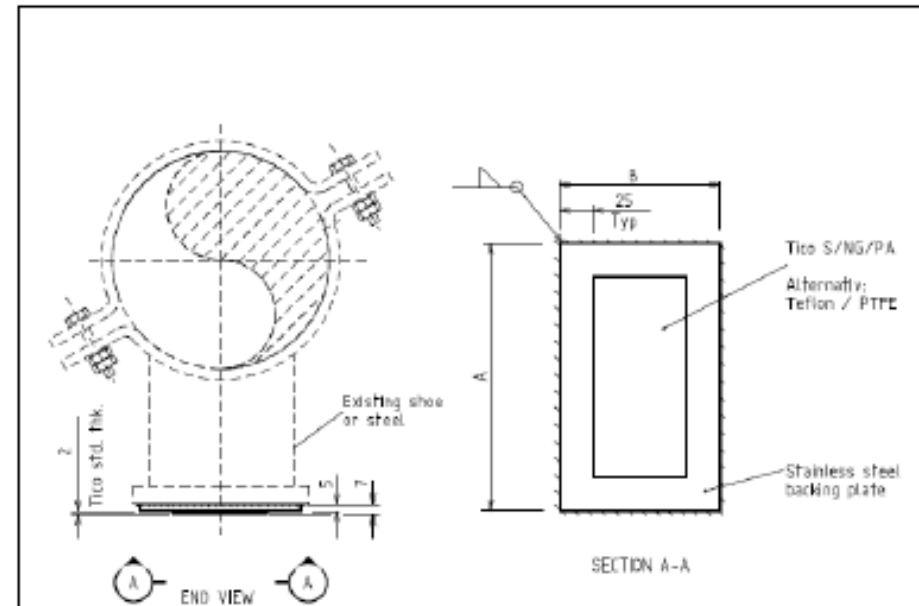
Figure 1.4: View Showing Arrangement of Slide Bearing Units

TICO Bondslips / Sliding Bearings





18.2 PD-02 - Top isolation pad. Low friction / Acoustic pad



Type A, B, C, D and E

Top pad of slide unit to be used with PD-03

Tico S/NG/PA is a hard self-lubrication Nylon sheet material.

Pad to be bonded to backing plate using Loctite 4090

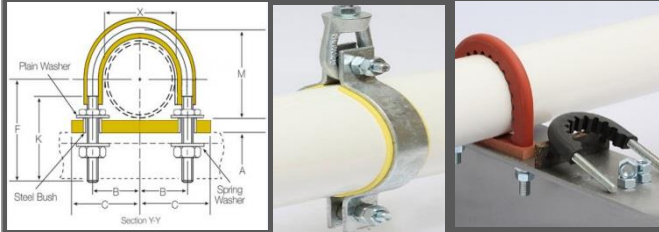
Notes: 1, 2, 3, 5, 7, 24, 26, 27, 35.

Type	A	B	Weight kg.	Allowable load if used with corresponding PD-03. (kN)		Load bearing capability used with PD-03 7 N/mm ²	Temperature range - 40°C to 100°C
PD-02A	160	120	0,2	21 kN	PD-03A		
PD-02B	200	120	0,2	35 kN	PD-03B		
PD-02C	210	140	0,2	54 kN	PD-03C		
PD-02D	250	140	0,3	74 kN	PD-03D		
PD-02E	250	180	0,4	116 kN	PD-03E		

PROJECT REFERENCE LIST

Project	Location	Materials Supplied	Client / Engineers
AKPO Project	Nigeria	Neoprene Clip Strip	Technip
Arkutun-Dagi (Sakhalin-1) Project	Russia	Pipegrips, Tico S	Exxon Neftegas
Barzan Project	Qatar	Pipegrips	Rasgas
Bayu Undan Gas Recycle Project	Offshore NW Australia	Bondslips, Pipegrips, Clip Strip, Misc Tico Pads, Steel Clamps	Phillips Petroleum/TIGA Joint Venture
Bonga Deepwater Project	Nigeria	Bondslip, Pipegrips, Clip Strip	Amec
Bongkot Project	Gulf of Thailand	Clip Strip	
BP Clair Ridge Project	North Sea	Pipegrips, Clip Strip, Tico Hi-Duty, Tico S	BP/Amec
BP Greater Plutonio	Angola	Bondslips, Pipegrips, Clip Strip	BP/KBR Halliburton
BP Shah Deniz	Azerbaijan	Bondslip, Pipegrips, Clip Strip	BP/CB&I
Buzzard Field Development	North Sea	Bondslip, Pipegrips, Clip Strip	Encana
Dumbarton Field Development Project	North Sea	Pipegrips, Clip Strip, Tico S	Aker Kvaerner
Gamba Oil Terminal	Gabon	Bondslips	Shell
Goliat Project	Barents Sea	Pipegrips	Statoil/ENI Norge
Gorgon Project	Offshore NW Australia	HT/CL	KBR
Goro Nickel Project	New Caledonia, S. Pacific	Bondslips	Inco
Hebron Project	Newfoundland, Canada	Pipegrips, Clip Strip, Bondslips, Tico S	Exxon Mobil / Worley Parsons
Hibernia Project	Newfoundland, Canada	Pipegrips	
Ichthys Project	Western Australia	Pipegrips	Inpex
Ikdam FPSO	Nigeria	Clip Strip	
In Salah Gas Project	Algeria	RF/PA Anti-vibration supports and guides	KBR
North Rankin 2 Project	Offshore NW Australia	Bondslip, Pipegrips, Clip Strip, Tico S	Woodside Energy
Pearl GTL	Qatar	Clip Strip	
Quad 204	North Sea	Pipegrips, Clips Strip	BP/KBR
RasGas LNG Trains	Qatar	Pipegrips	J Ray McDermott
Sable Project (Tier II)	Nova Scotia	Bondslip materials, Tico S	
Sakhalin Phase II	Eastern Russia	Bondslips, Pipegrips, Tico S, Clip Strip	SEIC
Saqqara Project	Egypt	Bondslips	BP/KBR
Skene Project	North Sea	Bondslip, Pipegrips, Clip Strip	Exxon Mobil / Amec
Sleipner Vast Project	North Sea	Pipegrips	Statoil/Kvaerner
Terra Nova FPSO	Newfoundland, Canada	Pipegrips	KBR
Upper Zakum Field Facilities	Abu Dhabi	Clamp Blocks	Zakum Devpt Co.
USAN Project	Nigeria	Pipegrips	
Wheatstone Project	Western Australia	Pipegrips	Chevron

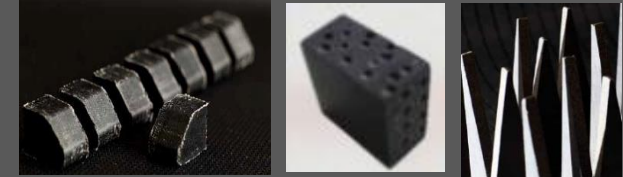
Isolation: TICO Pipe Support Isolation Support - Fire Retardant



Isolation: TICO Sliding bearings



Elastomer engineering Stealth / Acoustic Materials



Specialist Flooring Fire safety – Slip resistant spec



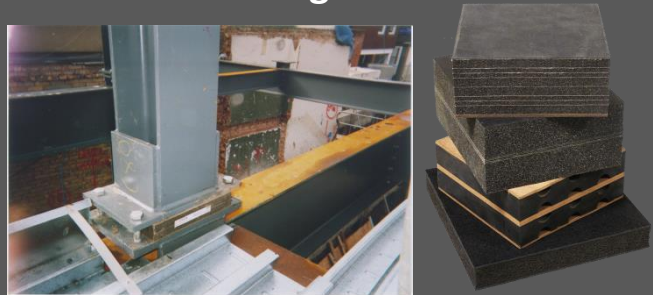
Damping: TICO S/PA / bespoke Vibration attenuation/noise isolation



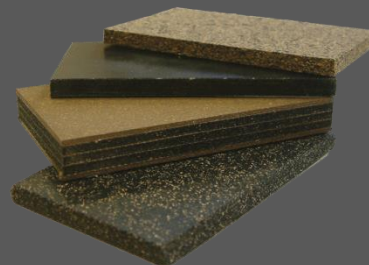
Bespoke Engineering Solutions



Structural Bearings



Resilient Seatings



Specialist



Our success is founded on the technical expertise and support we give to customers with expert advice, specialised materials and product designs.

Core Competencies

- ❖ Materials testing, development & research
- ❖ High performance elastomers
- ❖ Production development & testing
- ❖ Custom design & manufacture
- ❖ Cost effective, high-integrity elastomer engineering
- ❖ High performance vibration attenuation
- ❖ Standard and custom-designed products
- ❖ Researched, developed, tested and proven
- ❖ Backed by surety of global supply
- ❖ UK Manufactured



Thank you for your time