

TICO Structural Bearings - CV/M

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TICO CV/M - Medium Stress Bearing

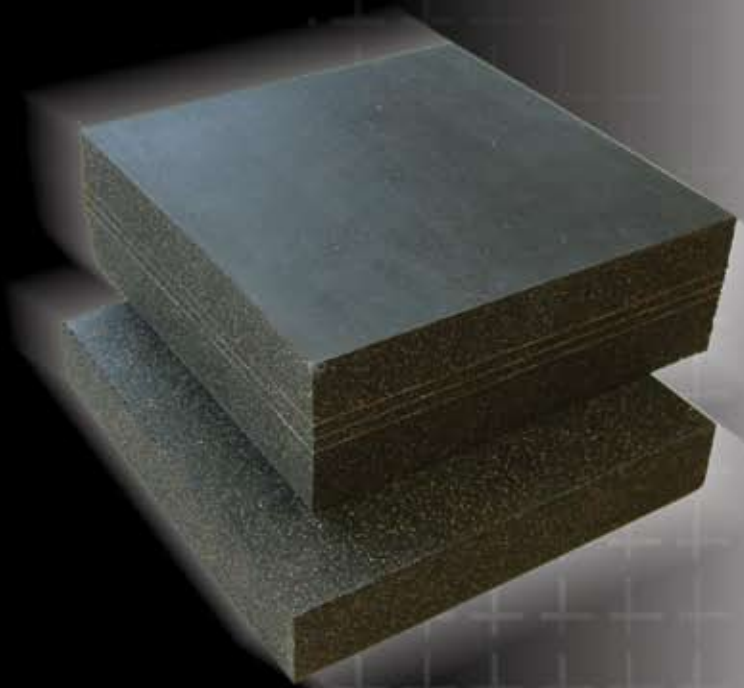
TICO CV/M is a medium load structural bearing material, engineered to reduce the transmission of ground borne and structure borne noise and vibration, for example vibrations transmitted into and through buildings from nearby public transport systems or road networks. TICO CV/M has a maximum recommended working stress of 1400 kN/m² making it suitable for a wide variety of applications.

To achieve a major reduction in structural noise transmission it is necessary to separate one structure from another, or to isolate the complete structure itself from its foundation, depending on the source of vibration and amount of reduction required. Typical examples of TICO CV/M applications include isolation of cinemas, lightweight oil-rig modules, control rooms and floating floors.

TICO CV/M structural bearings can be used in a number of different configurations from modular pad arrangements on pile caps to continuous strip footings. In suitable configurations, isolation systems based around TICO CV/M structural bearings can achieve natural frequencies of less than 10 Hz.

TICO CV/M bearings are dimensionally stable under widely varying atmospheric conditions and should provide acceptable vibration attenuation properties for 50 years or more - the high quality constituents used in manufacture will render them durable and age resistant over many decades with a total load bearing life expectancy well in excess of the normal working life of the building.

TICO CV/M bearings have been designed and tested to meet and exceed the requirements of BS6177:1982 'Guide to selection and use of elastomeric bearings for vibration isolation of buildings'.



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CV/M
CVM-250406

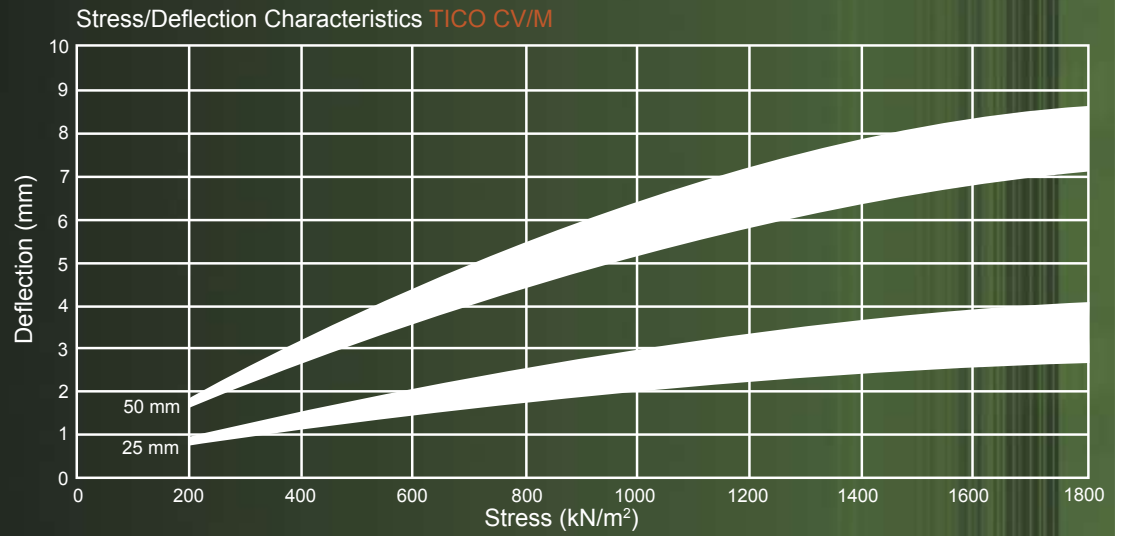
Physical Properties

TICO CV/M is formulated from the highest quality neoprene which has been modified by the inclusion of cellular cork particles. Thicker pads may be reinforced with a central layer, or layers, of high tensile fabric.

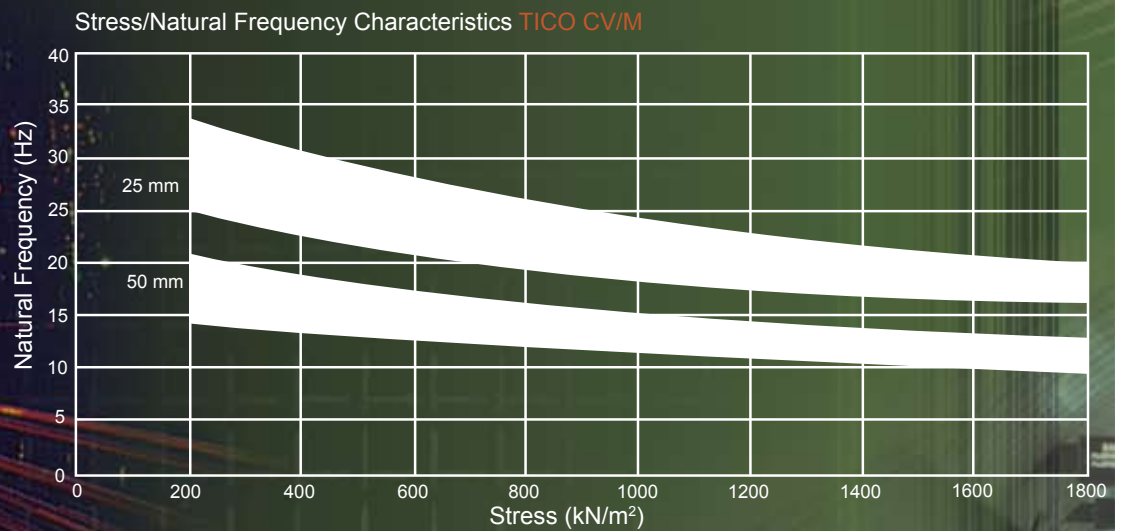
Maximum Recommended Working Stress	1400 kN/m ²
Working Stress Range	1000-1400 kN/m ²
Breakdown	In excess of 3 times the maximum recommended working stress (in accordance with BS6177)
Hardness (IRHD)	50 ± 5
Density (Typical)	1100 kg/m ³
Temperature Range	-30 to +70°C Performance of bearing may be impaired at extremes of durable temperature range.
Typical Damping Ratio	0.065 to 0.085
Thermal Conductivity	0.251 W/m.K



Bearing Stress vs Static Deflection



Bearing Stress vs Natural Frequency

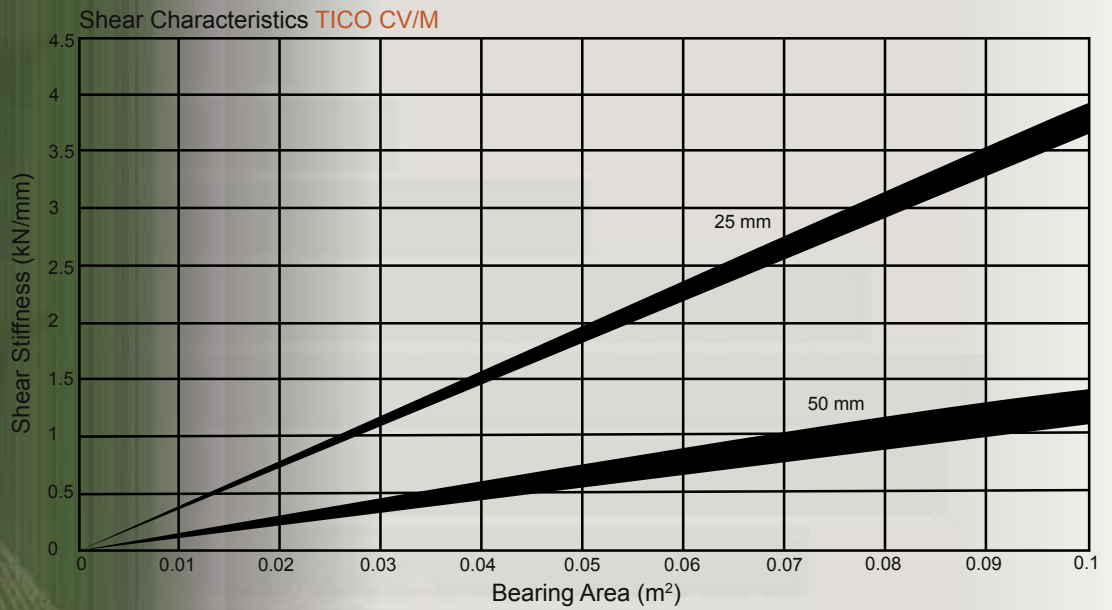


These graphs have been prepared from the results of extensive testing over many years. Where appropriate, data has been presented in the form of a shadow graph to illustrate the effect of shape factor on performance of the pads. All data is presented for guidance only.

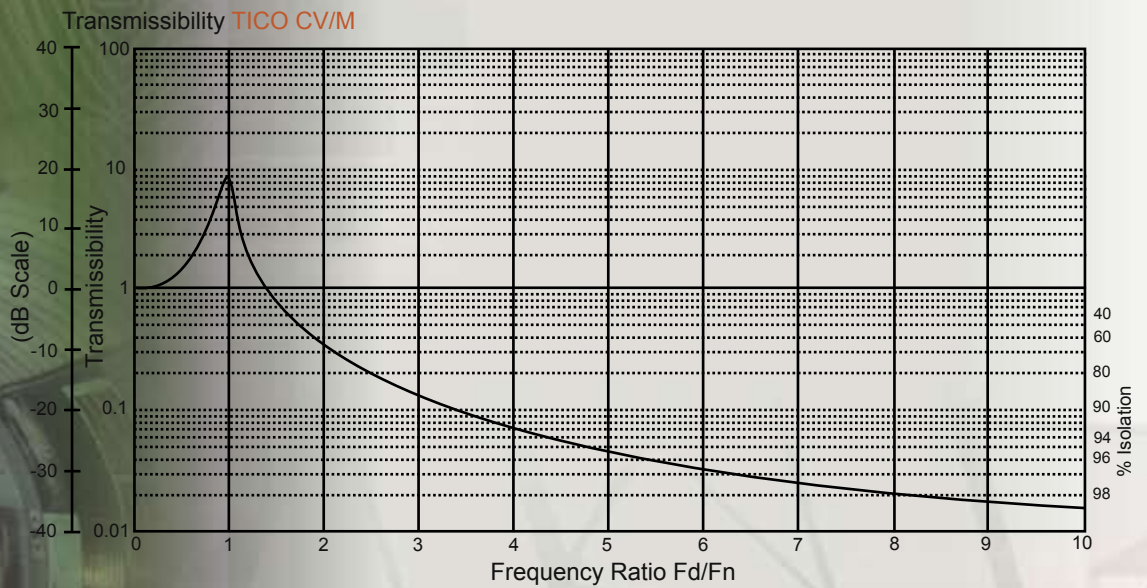
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Shear Stiffness



Transmissibility



Design Considerations

Because of the wide range of applications for which TICO CV/M is suitable, and the variation of material properties under different operating conditions it is difficult to provide a simple design guide.

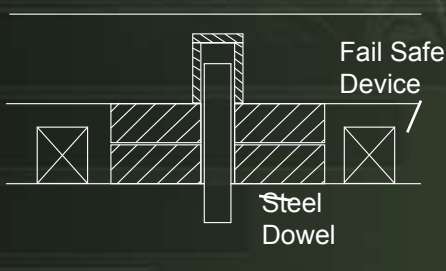
Key parameters in the specification of TICO CV/M bearing are:

- Operating loads (dead and live loads)
- Available space to incorporate bearings
- Required natural frequency of isolating system (bearings)
- Disturbing frequency of vibration to be isolated (if known)

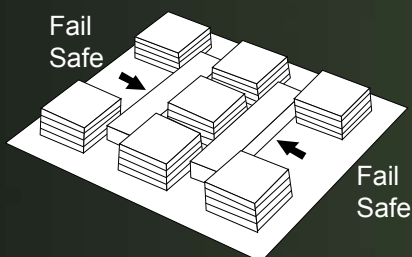
The load and available area will largely determine the plan dimensions and configuration of bearings, whereas the required natural frequency or disturbing frequency will strongly influence the bearing thickness. The interdependence of these parameters is indicated in the graphs in the previous section.

It is recommended that bearings are employed in modules of the order of 200 - 300 mm square to offset the reduced deflection and increased natural frequency which occurs due to shape factor when employing larger bearing sizes.

TICO CV/M bearings can be employed in thicknesses in multiples of 25 mm to provide the required natural frequency for a specific project. When a low natural frequency dictates that a very thick bearing is required, it may be necessary to provide some form of horizontal restraint, e.g. dowels or side restraint bearings.



It is also advisable to include some form of fail safe such as a steel or concrete upstand in the foundation design to support the structure should failure of the bearings occur through a major fire or other exceptional circumstance. Any block fail safe system needs to be carefully designed to take into account the natural deflection (creep) of the bearings over long periods of time.



The incorporation of resilient structural bearings into a structure has to be considered at an early design stage to enable a safe, effective and economical system to be engineered. Detailing such systems late in the construction process can cause major complications and in some instances may simply not be feasible. It is Tiflex' custom to work closely with consultants, engineers and other authorised bodies throughout the design and build process to ensure that we provide a bearing solution best suited to each individual application.

When incorporating bearings into a building, where possible and relevant, the guidance and recommendations of BS6177:1982 'Guide to selection and use of elastomeric bearings for vibration isolation of buildings' should be observed.

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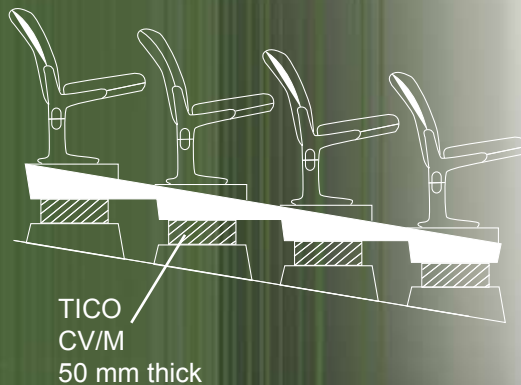
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Installation

Installation of TICO CV/M structural bearings will vary from application to application and also depend on the design and arrangement of the bearings.

For plain bearings, pads or strips should be securely fixed in position with Tiflex Marine Epoxy Adhesive. The instructions for use of this adhesive should be followed carefully. Pre-cast units can be placed directly on the top of the bearing without any further bonding.

If the bearing surface is sloping or very irregular, a small level plinth can sometimes be cast to support the bearing as in the following diagram.



Good surface preparation is essential for a strong and durable bond. Surfaces onto which the bearing is to be placed, and surfaces mating with the upper surface of the pad, should be clean and as level as possible. Although TICO CV/M bearings are designed to take up some surface irregularity, out of plane mating surfaces can produce excessive stresses on the pads and impair their performance. Where possible the guidance of BS6177:1982 should be followed, in particular section 4.6 regarding bearing support surfaces.

Storage and Handling

On arrival on site, TICO Structural Bearings should be stored away from direct sunlight, excessive heat, chemicals or any liquid media. They should be kept in a safe, secure location where they are unlikely to be damaged or tampered with, become immersed in water, or have other building materials stacked on top of them.

Bearings should be handled with care during installation to ensure that they are not dropped or in any other way damaged. Damaged bearings should never be incorporated in the works and should be brought to the attention of an engineer or consultant.

On no account should welding be carried out on, or next to, a bearing either during or after manufacture.

Safe Handling data sheets are available for TICO CV/M bearings on request.



Supply Details

TICO CV/M is manufactured in sheet form up to a maximum sheet size of 1200 x 1000 mm. However, it is more common and advisable to employ this material in modular or strip form for the best performance.

Typically supplied bearing sizes and load bearing capacities are given in the following table.

Length (mm)	Width (mm)	Maximum Recommended Load (kN)
125	125	21
150	150	31
175	175	42
200	200	56
225	225	70
250	250	87
275	275	105
300	300	126

Tiflex recognises that in civil applications bearings often have to be custom sized to meet the project requirements and thus we are happy to supply custom sizes up to the maximum sheet size available.

Standard thicknesses of TICO CV/M bearing material are 25, 50 and 75 mm, although other thicknesses are available on request.

For severe environments, bearing edges can be protected with a hypalon based coating applied during manufacture.

In major installations where fire protection is required, Tiflex are able to supply a protective ceramic fibre blanket and environmental shrouding.

Tiflex also offer a post installation bearing inspection service where required, to ensure that the bearings perform adequately over long periods of time.

Please contact our customer services department with full details of your requirements for a free written quotation. Our Technical Department will also be pleased to assist you in determining your exact bearing requirements.

All TICO materials are manufactured in accordance with BS EN ISO 9001: 2000



Uniclass L31:N14	EPIC C215
CI/SfB (29) X	

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