KANTA RUBBER PRIVATE LIMITED

Product Catalogue & Technical Data Sheets

Bridge Bearings

Manufactured & Tested as per Indian Standards

IRC:83 (Part I) | IRC:83 (Part II) | IRC:83 (Part III) | IRC:83 (Part IV) | MoRTH Specifications

for NHAI / National Highway, Road, Flyover & Bridge Applications

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1. Bridge Bearings

1.1 Elastomeric Bearing (All Types)





Manufactured and tested in accordance with IRC:83-2018 (Part II), these bearings comprise alternate layers of elastomer bonded to mild-steel reinforcing laminates, vulcanised into a single fully bonded block and supplied plain, fabric-reinforced or steel-laminated, with or without top and bottom mild-steel mounting plates.

Elastomeric bearings are supplied ex-works packed and identified by size and grid dimensions, ready for direct placement between superstructure and substructure.

Applicable Standard: IRC:83-2018 (Part II), IS:3400 (Methods of Test for Vulcanized Rubber), MORTH Specifications for Road and Bridge Works

Elastomeric bearings comprise alternate layers of elastomer bonded to mild steel reinforcing laminates, manufactured and tested as per IRC:83-2018 (Part II). The bearing transmits vertical and horizontal loads from superstructure to substructure while accommodating rotation and translational movement due to live load, temperature and shrinkage/creep effects, as specified in IRC:6 for loading and IRC:83 for bearing design. Supplied as plain pad, fabric-reinforced or steel-laminated type as per the classification given at the end of this data sheet (Table 3 of IRC:83-2018, Part-II).

Parameter	Specification / Typical Range
Elastomer	Natural Rubber (NR) or Chloroprene Rubber (CR) conforming to IS:3400, 50-60 IRHD Shore A hardness
Design Vertical Load	Up to 10,000 kN, as per structural design and IRC:6 loading (Class A / Class 70R)
Shear Modulus (G)	0.9 - 1.15 N/mm^2 as specified in IRC:83 (Part II)
Permissible Compressive Stress	As per IRC:83 (Part II), governed by bearing plan area and shape factor
Rotation Capacity	Up to 0.02 rad (typical, size dependent)
Horizontal Movement	± up to 100 mm (size dependent)
Steel Laminates	Mild steel plates conforming to IS:2062
Service Temperature	-25°C to +50°C
Ozone / Weathering Resistance	As per IS:3400 / ASTM D1149 test method
Bond Strength	Tested as per IRC:83 (Part II) type-test schedule

Key Features

- Manufactured and tested as per IRC:83-2018 (Part II)
- Fully bonded steel laminates with corrosion protection
- Type tested for compression, shear and bond as per IRC:83 test schedule
- Low maintenance, long service life under Indian climatic conditions

Typical Applications

- National Highway and State Highway bridges
- Railway bridges
- Flyovers and ROBs/RUBs
- Metro rail viaducts

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Table 3: Types of Elastomeric Bearings (IRC:83-2018, Part-II)

IRC:83-2018 (Part-II), Clause 5.1.1 classifies laminated elastomeric bearings into nine types, individually or in combination, as per Table 3 of the Code, summarized below.

1)	**Type A: Plain Pad / Strip Bearings**
2)	**Type B: Laminated Bearings**
3)	**Type C: Laminated Bearings with Thicker End Laminates** - Laminate may be provided on either side or on both sides - Ensures better load distribution - Ensures better rotation capability - Reduces risk of back-lifting of the bearing under shear
4)	**Type D: Laminated Bearings with Thicker End Laminates Exposed** - Corrosion protection is required on the exposed steel surface - May improve frictional resistance at the bearing-structure interface - Friction, where taken into account, should be based on a tested and certified value - Useful where the bearing is in contact with a steel structure
5)	**Type E: Bearings with Separate Steel Plate Directly Vulcanised with the Bearing** - Lifting / separation of the bearing elastomer at the edges from the exposed steel plate should be avoided under all loading conditions
6)	**Type F: Bearings with Positive Anchorage** - Separate plates provide ease of replacement and fool-proof positive anchorage - Plates may be connected to covered / exposed end laminates - Internal fastening and positive means of location shall be adequately designed
7)	**Type G: Bearings with PTFE Bonded to the Elastomer** - Bond of elastomer to PTFE is critical and vulnerable, and shall be designed accordingly
8)	**Type H: Bearings with Sliding Interface** - Design of the sliding interface shall be as per the relevant Part of IRC:83 covering sliding elements - The opposite face of the bearing may be detailed as any of the other types described above
9)	**Type I: Bearings with Restraint Against Translation to Simulate Support Condition** - (a) Typical detail of restraint in the form of a central pin - (b) Typical detail of side restraint - Restraints shall be designed based on the relevant Part or other relevant IRC code

1.2 Pot PTFE, Pin & Metallic Guided Bearing







Applicable Standard: *IRC:83-2018 (Part III), MORTH Specifications*

POT bearings transfer heavy vertical loads from superstructure to substructure through a confined elastomeric disc acting as a POT, while permitting rotation and, where required, controlled horizontal movement. The family is manufactured in five functional configurations selected to suit the fixity and movement condition at each support.

- Fixed Bearing — Restrains movement in both horizontal directions while permitting free rotation. Comprises base pot, piston and enclosed elastomeric rotation element.
- Free (POT-cum-PTFE) Bearing — Permits rotation together with longitudinal and transverse movement, using a PTFE-on-stainless sliding interface in addition to the fixed-bearing components.
- Guided Bearing — A sliding assembly that permits rotation and movement in one direction only, restraining the perpendicular direction — used where longitudinal or transverse movement alone is required at a support.
- Metallic Guided Bearing — A sliding steel assembly that restrains horizontal force along a chosen direction while allowing free movement perpendicular to it, independent of the POT/PTFE bearing element.
- Pin Fixed Bearing — A metal pin housed within a metal cylinder to transmit horizontal force in any direction in the horizontal plane while accommodating rotation about any axis.

Pot bearings, manufactured as per IRC:83-2018 (Part III), confine an elastomeric disc within a machined steel pot which acts as a near-incompressible medium to provide rotation, while a PTFE-stainless steel sliding interface accommodates translation. Pin bearings and metallic guided bearings are provided where movement is to be restrained in a chosen direction while permitting free rotation, as commonly adopted for major bridges on National Highways and railway girder bridges.

Parameter	Specification / Typical Range
Design Vertical Load	Upto 50,000 kN+, as per structural design
Rotation Capacity	+/- 0.03
Sliding Material	PTFE or UHMWPE. Low friction sliding material
Mating Sliding Surface	316, mirror polished
Base / Piston	Forged steel or cast steel or higher grade of mild steel
Coating system	Metallized with Epoxy top coat

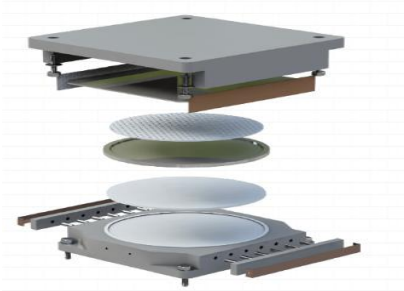
Key Features

- Manufactured as per IRC:83-2018 (Part III)
- High load capacity in compact footprint suitable for major bridges
- Low friction PTFE sliding surface
- Available in Fixed, Free and Guided configurations

Typical Applications

- Long-span Road & River Bridges
- High-load flyovers
- Railway girder bridges

1.3 Spherical and Cylindrical Bearing





Applicable Standard: *IRC:83-2014 (Part IV), MORTH Specifications*

Spherical bearings transfer heavy vertical loads from the superstructure to the substructure while accommodating rotation and, where required, controlled horizontal movement. The bearing operates through a precision-machined convex and concave spherical sliding interface, allowing rotation in multiple directions while maintaining stable load transfer.

- Fixed Spherical Bearing — Permits rotation about all horizontal axes while restraining horizontal movement in both directions.
- Free Sliding Spherical Bearing — Permits rotation together with horizontal movement in both longitudinal and transverse directions, using a PTFE / UHMWPE-on-stainless-steel sliding interface.
- Guided Spherical Bearing — Permits rotation and horizontal movement in one specified direction while restraining movement in the perpendicular direction.
- Spherical Sliding Assembly — Precision-machined spherical surfaces combined with a PTFE / UHMWPE-on-stainless-steel sliding interface to accommodate rotation and horizontal displacement.

Spherical bearings employ a curved PTFE-stainless steel interface machined to a spherical radius to accommodate rotation about any axis within a single component, along with a flat or curved sliding surface for translation, as covered under IRC:83-2014 (Part IV). Cylindrical bearings are provided where rotation is required about a single axis only, typically for long-span and major river bridges.

Parameter	Specification / Typical Range
Design Vertical Load	Up to 50,000 kN, as per structural design
Rotation Capacity	± 0.05
Sliding Material	PTFE or UHMWPE. Low friction sliding material
Mating Sliding Surface	316, mirror polished
Base / Piston	Forged steel or cast steel or higher grade of mild steel
Coating System	Metallized with Epoxy top coat

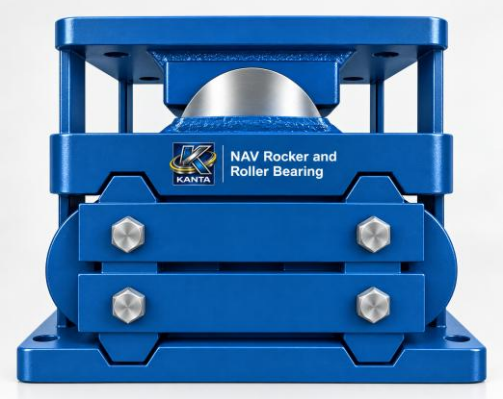
Key Features

- Accommodates large rotations in a compact unit
- Suited to high load, long-span major bridges
- Manufactured as per IRC:83-2014 (Part IV)

Typical Applications

- Long-span Road & River Bridges
- Cable-stayed / extra dosed bridges
- Structures with high rotation demand

1.4 Rocker and Roller Bearing



Applicable Standard: *IRC:83 (Part I) - legacy codal provisions*

Used chiefly on railway bridges with open-web through girders of span in excess of about 30.5 m, where the vertical load and required movement are too large for sliding or elastomeric bearings. A rocker bearing is typically provided at the fixed end and a rocker-cum-roller bearing at the free end of each girder.

Rocker and roller bearings are traditional mechanical steel bearings that accommodate rotation and translation through rolling/rocking action, historically specified under IRC:83 (Part I) prior to the adoption of elastomeric and pot bearings. These continue to be specified for replacement and retrofit works on existing bridges built to the earlier code provisions.

Parameter	Specification / Typical Range
Material	Cast / forged steel conforming to IS:2062 Grade E250
Load Capacity	As per existing structure's original design basis
Movement Mechanism	Longitudinal translation via rollers; rotation via rocker curvature
Corrosion Protection	Hot-dip galvanizing as per IS:1477
Surface Hardness	As per applicable IS specification

Key Features

- Robust mechanical design
- Manufactured to match existing bridge bearing details for replacement works

Typical Applications

- Retrofit / replacement of bearings on existing bridges
- Heritage and legacy structures

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Seismic Arrestors



Designed to restrain excessive longitudinal and transverse movements during seismic events, Seismic Arrestors provide protection to bridge structures and other critical infrastructure. They allow controlled movement under normal service conditions while limiting sudden displacement caused by seismic forces.

- Designed to resist seismic and dynamic forces
- Allows controlled movement during normal operating conditions
- Restrains excessive displacement during seismic events
- Custom designed to meet specific project requirements

Custom-engineered to project-specific seismic design requirements; capacity and fixing details are confirmed with our design team at the time of ordering.