



MACKAY



**MACKAY HULL ISOLATION
MOUNTS**



INTRODUCTION

Mackay has been associated with wave-piercing high-speed vessels since the 1980's when Mackay developed the superstructure / hull isolators for Incat Tasmania's innovative Wave Piercing Catamarans for Commercial and Naval service.

Mackay continues as the partner of choice for Superstructure / Hull Isolators to Incat, providing proven isolator design and development for almost 40 years.



The concept of Superstructure / Hull isolators have been adopted by marine architects and shipbuilders globally with Mackay as the premium partner and supplier of marine industry expertise.

Mackay Superstructure / Hull Isolators are used in vessels built worldwide and certified by DNV-GL, Lloyds, American Bureau of Shipping, and others. Witnessed testing can be conducted at Mackay's manufacturing premises by certification authorities as required to meet any design specifications.

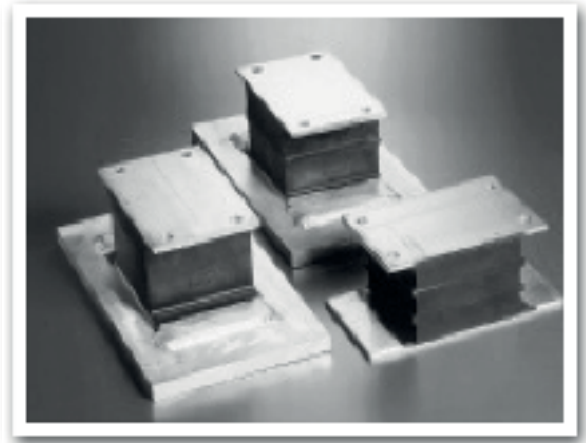
With almost 40 years of design and development experience, Mackay can provide custom solutions or offer a huge range of standard envelope designs which provide a wide range of mechanical properties allowing marine architects to customise isolator placement and system performance to meet vessel design requirements.

Superstructure / Hull Isolators can be made using marine grade aluminium, marine grade steels and stainless steels. The designs available allow for top & bottom plates to be bolted or welded to the hull and superstructure.

Mackay's expertise in CAE, rubber formulation development and rubber bonding technology ensure our isolator range meet all design requirements and application specifications.

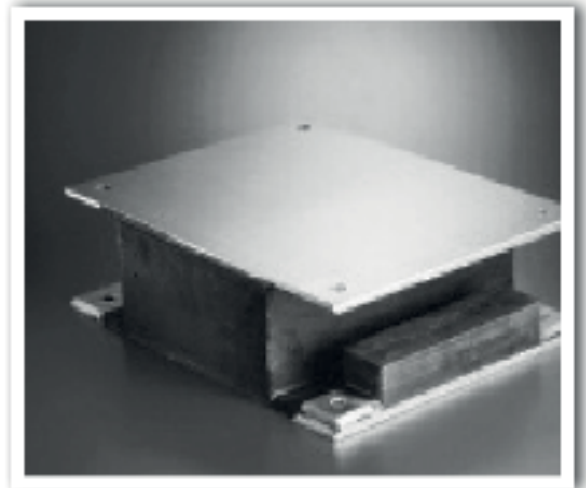
MACKAY HULL ISOLATION

Provide a bearing medium between vessels superstructure and the hull. Vessels utilizing Mackay Hull Isolators are operating worldwide in various conditions and applications including high-speed passenger ferries and pilot boats.



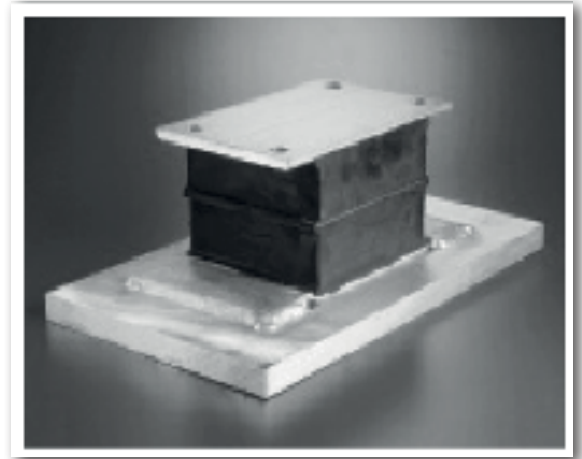
Features

Hull Isolators Mounts are designed to support and isolate the superstructure, or living area sections in the compression mode whilst allowing horizontal, lateral and rotational hull movements by virtue of the shear capacity of the mounts.

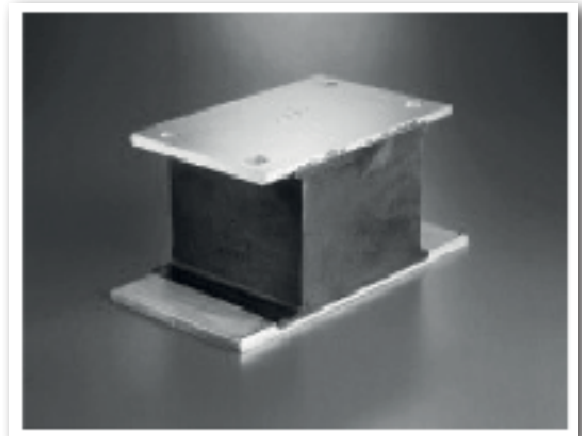




The design of the end-plates provides two options of mounting arrangements. The first option enables a complete bolted arrangement (HD Series) and the other option is bolted arrangement on one end plate and welding arrangement on the other end plate (HDA Series).



The aluminium plates are 5083/H321. Combinations of end plate materials are available if required. Mackay has manufactured combination aluminium / steel arrangements for aluminium superstructure / steel hull combinations.



A wide range of available rubber properties results in a wide range of vertical loads from the same space envelope.



Mackay Superstructure Isolators (Hull Isolators) are found on most of the world's resiliently mounted superstructure aluminium Fast Ferries.

Mackay has supplied Superstructure Isolators to many shipyards including:

- Incat Tasmania (Australia)
- Austal Australia
- Philippines
- Vietnam
- ASTILLEROS ARMON GIJON, S.A (Spain)
- Gladding Hearn (USA)
- Nichol Brothers (USA)
- Gladding Hearn (USA)
- Mavrik Marine In (USA)
- Lungteh Shipbuilding Co.LTD (Taiwan)
- Wight Shipyard Co (UK)
- WMO Shipping Company AS (Denmark)
- Vigor Industrial (USA)
- Marine Group Boat Works (USA)
- Bay Ship & Yacht Co (Australia)
- Golden Gate Bridge, Highway and Transport District (USA)

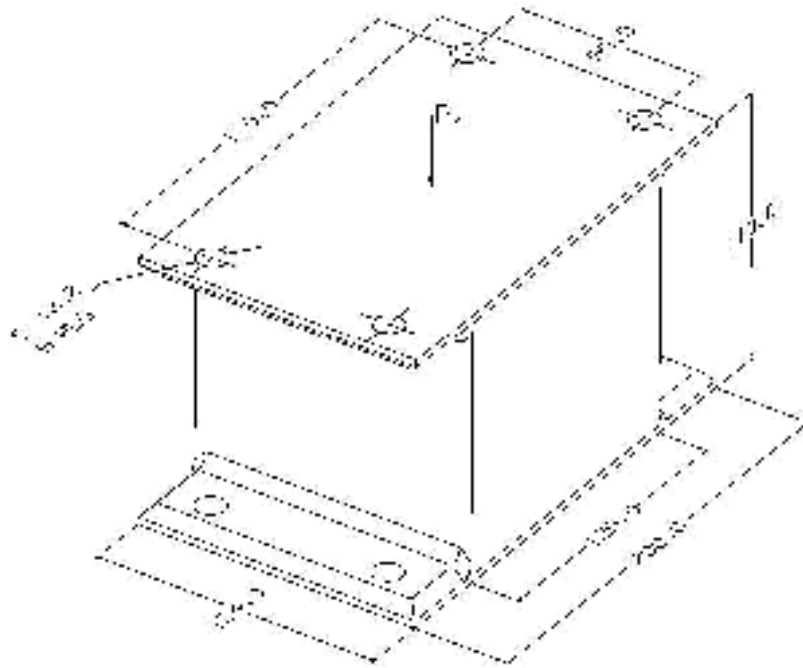


Superstructure isolators have also been used for workboats for isolation of wheel-houses and crew cabins to increase crew comfort.

Mackay also manufactures and supplies a range of stainless steel and marine grade aluminium flexible isolators for mounting ancillary equipment in wet areas.

HULL ISOLATION MOUNTS

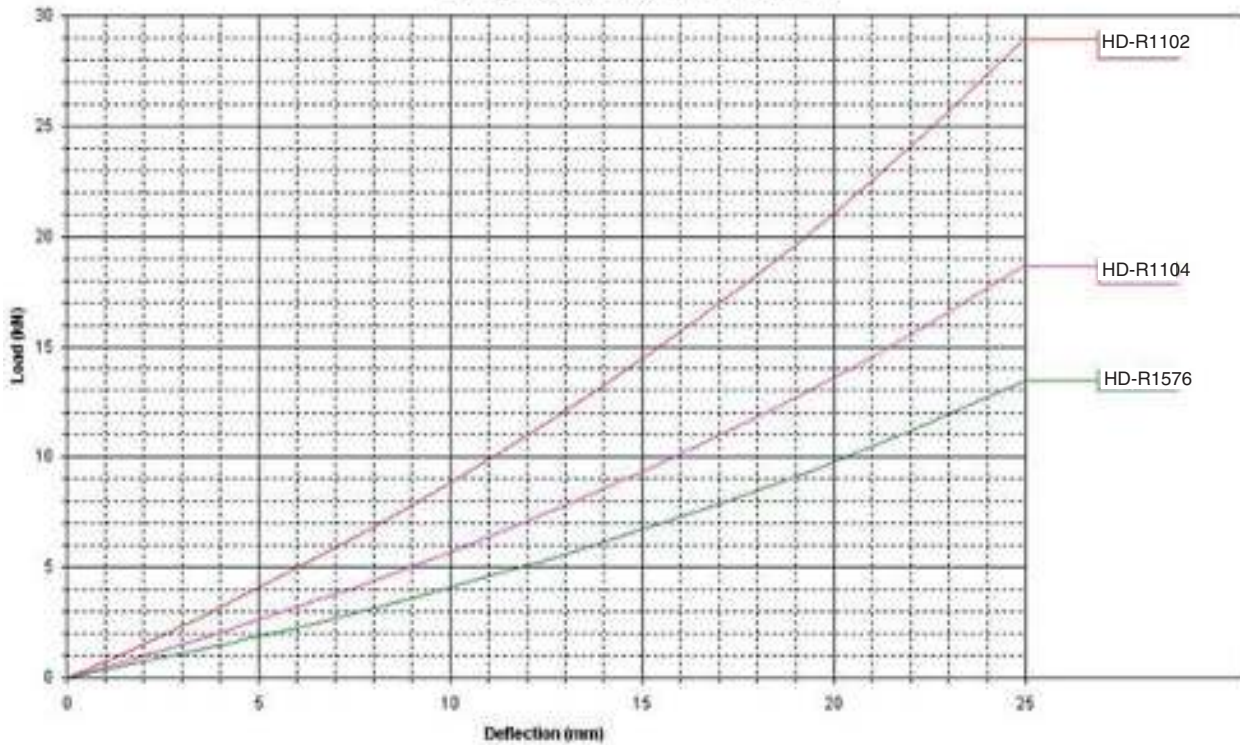
HD SERIES - Bolted Fitment



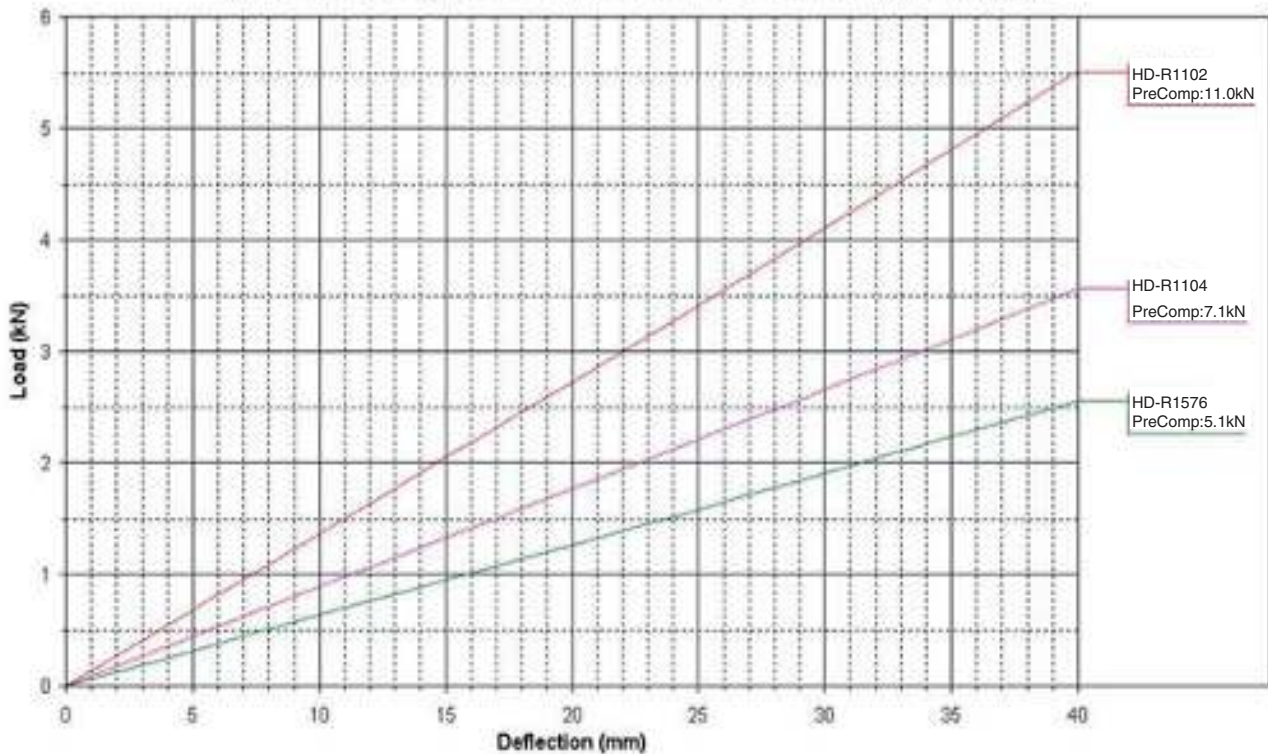
Part Number	Vertical Load, P_z , kN	Vertical Deflection, d_z , mm
HD-R1576	5	12
HD-R1104	7	12
HD-R1102	11	12

EXAMPLE MECHANICAL PROPERTIES

Compression Loads - HD Series

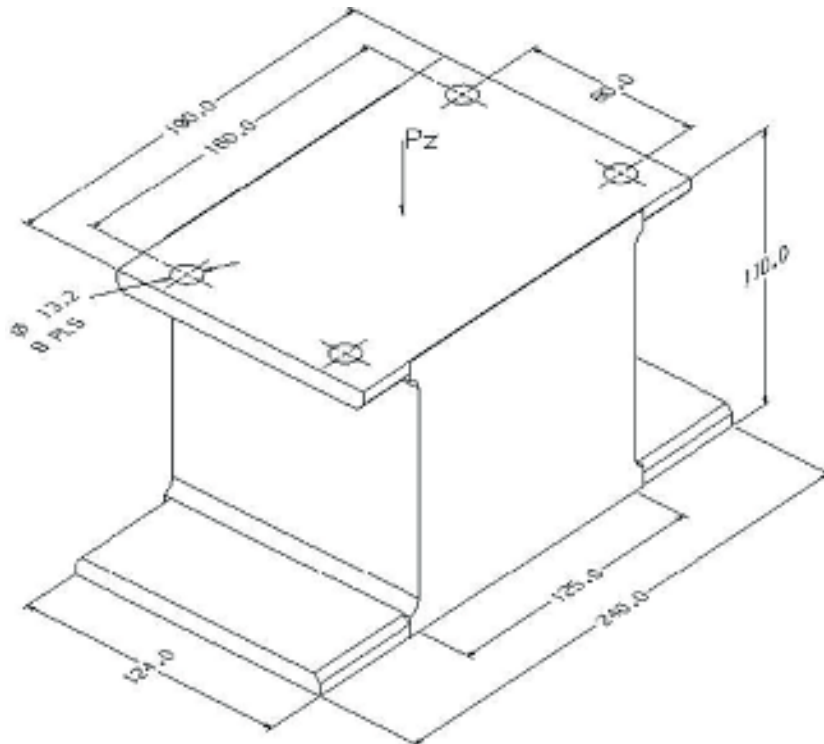


Shear Loads - HD Series
(At Fixed PreCompression Load to achieve 12mm Nominal Deflection)



HULL ISOLATION MOUNTS

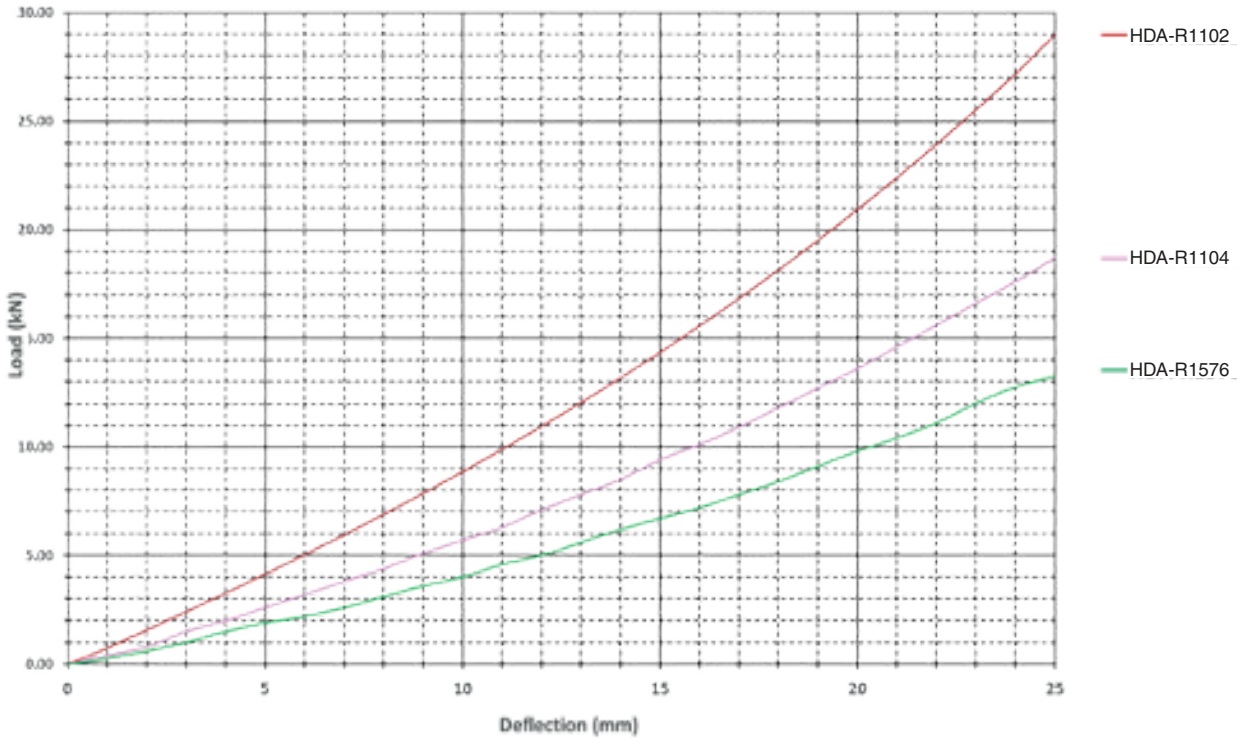
HDA SERIES Bolted & Welded Fitment



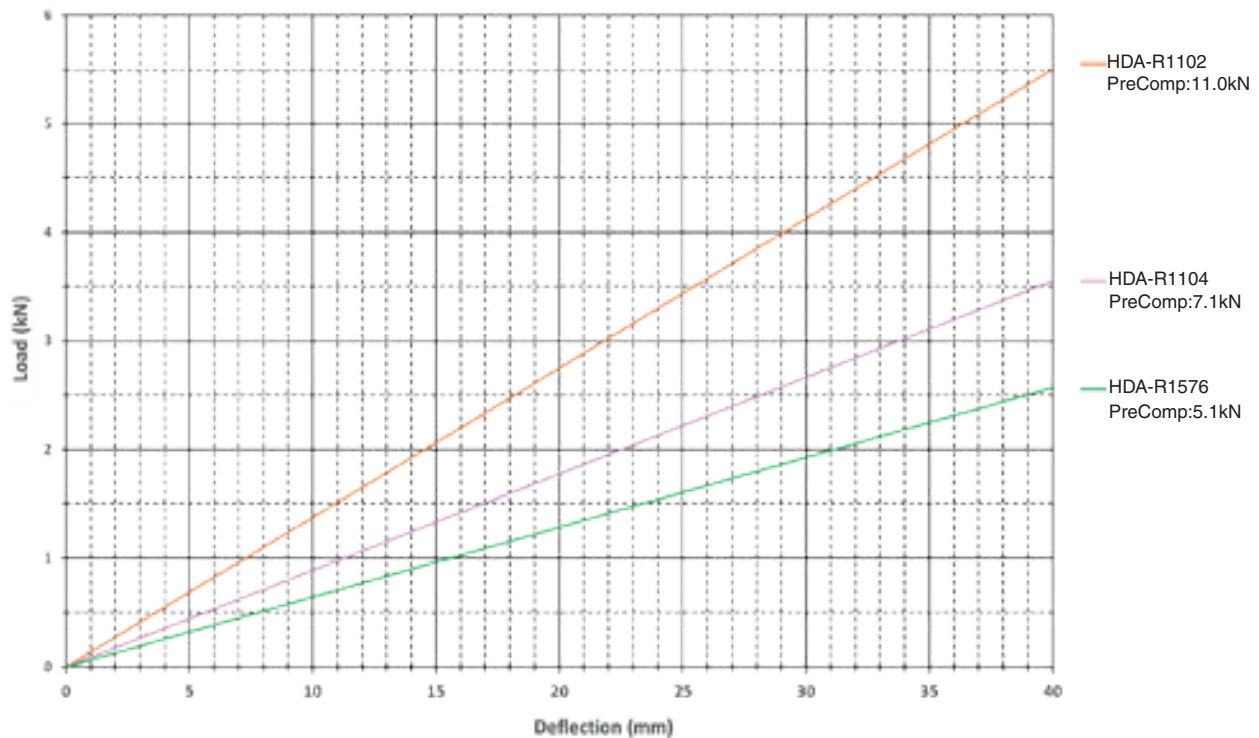
Part Number	Vertical Load, P_z , kN	Vertical Deflection, d_z , mm
HDA-R1576	5	12
HDA-R1104	7	12
HDA-R1102	11	12

EXAMPLE MECHANICAL PROPERTIES

Compression Loads - HDA Series



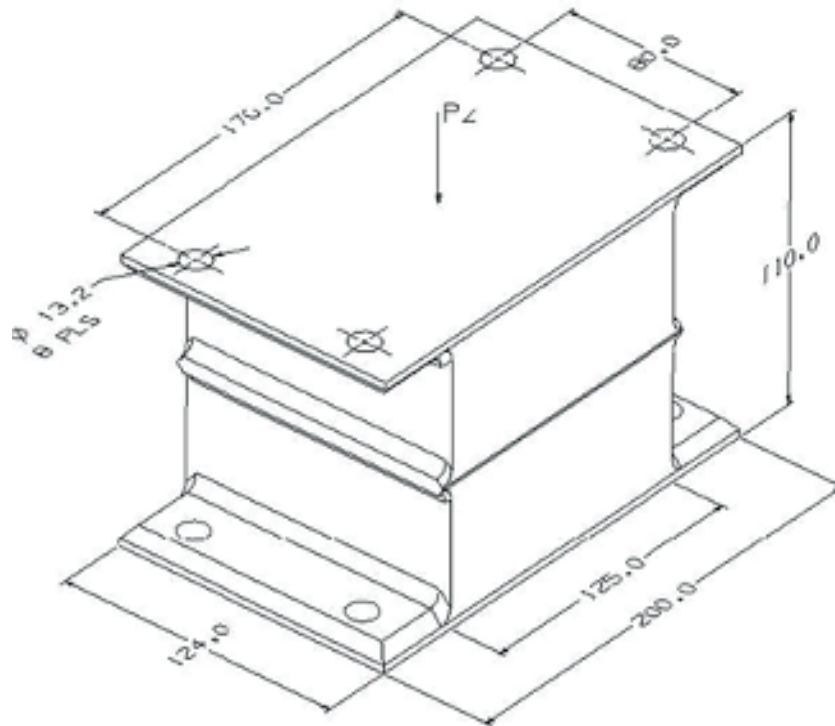
Shear Loads - HDA Series
(At Fixed PreCompression Load to achieve 12mm Lateral Deflection)





HULL ISOLATION MOUNTS

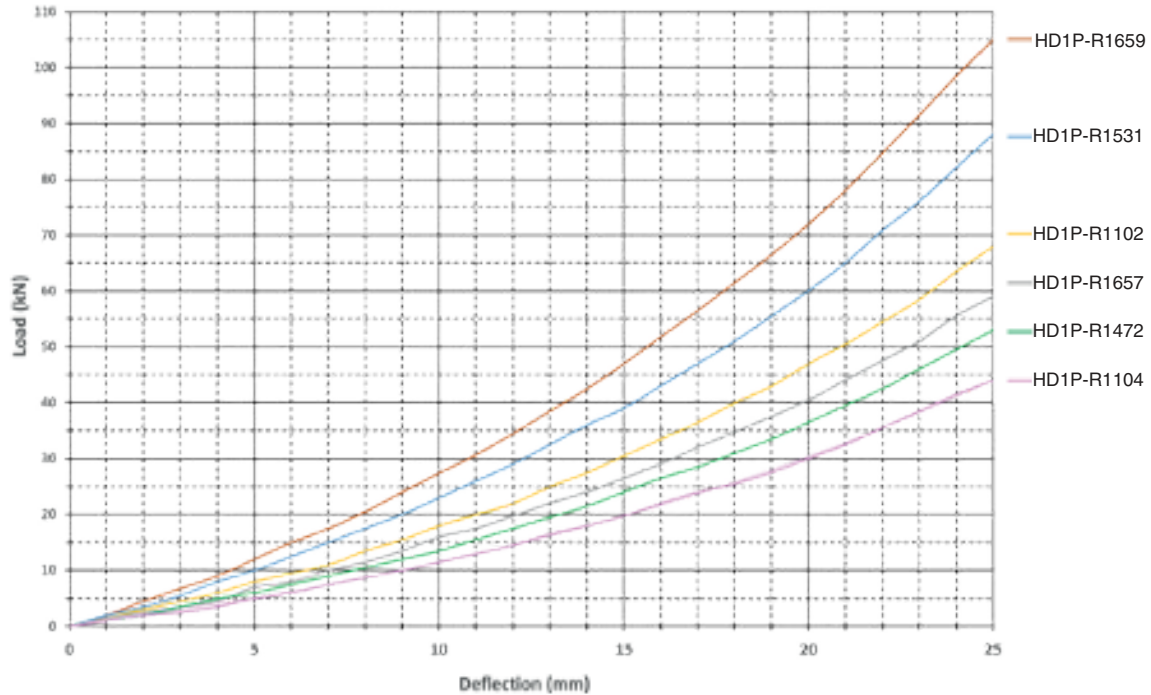
HD1P SERIES - Bolted Fitment



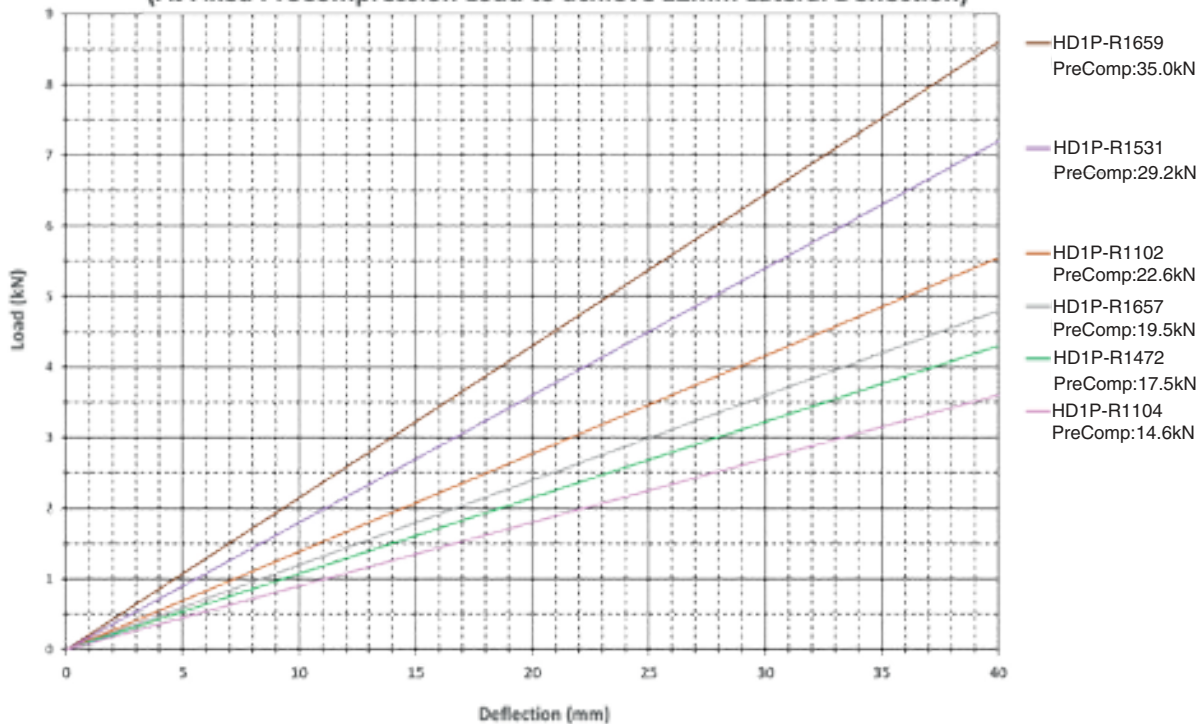
Part Number	Vertical Load, P_z , kN	Vertical Deflection, d_z , mm
HD1P-R1104	15	12
HD1P-R1472	17	12
HD1P-R1657	20	12
HD1P-R1102	23	12
HD1P-R1531	29	12
HD1P-R1659	35	12

EXAMPLE MECHANICAL PROPERTIES

Compression Loads - HD1P SERIES

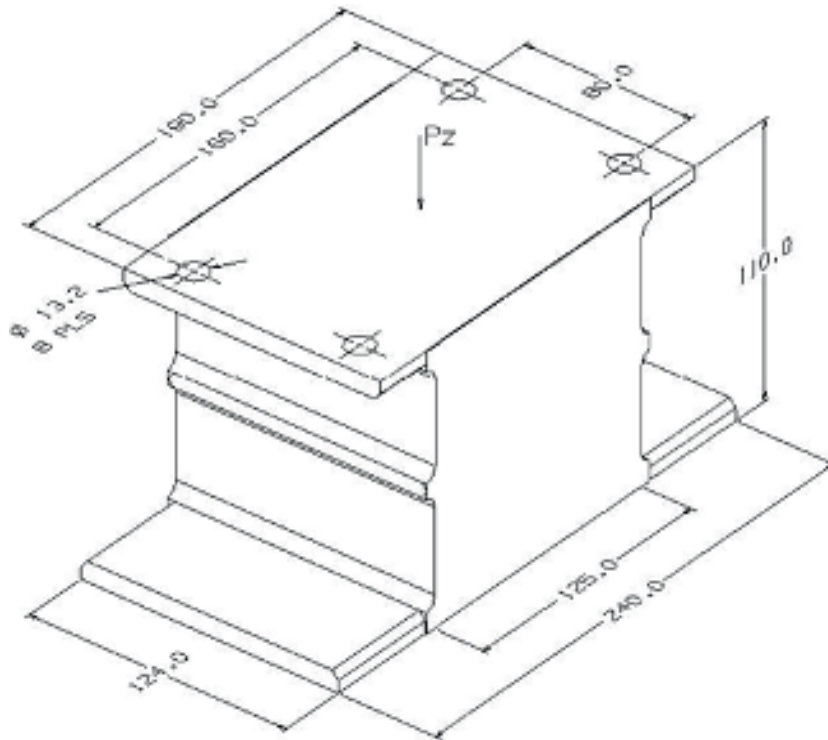


Shear Loads - HD1P SERIES (At Fixed PreCompression Load to achieve 12mm Lateral Deflection)



HULL ISOLATION MOUNTS

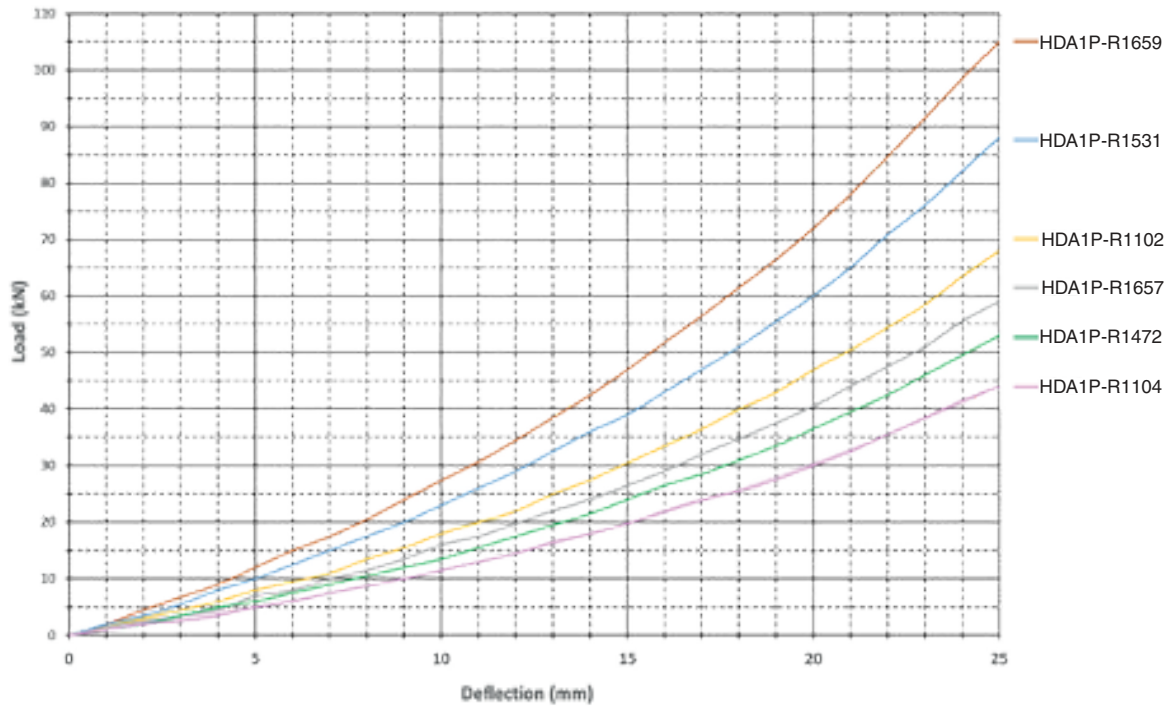
HDA1P SERIES - Bolted & Welded Fitment



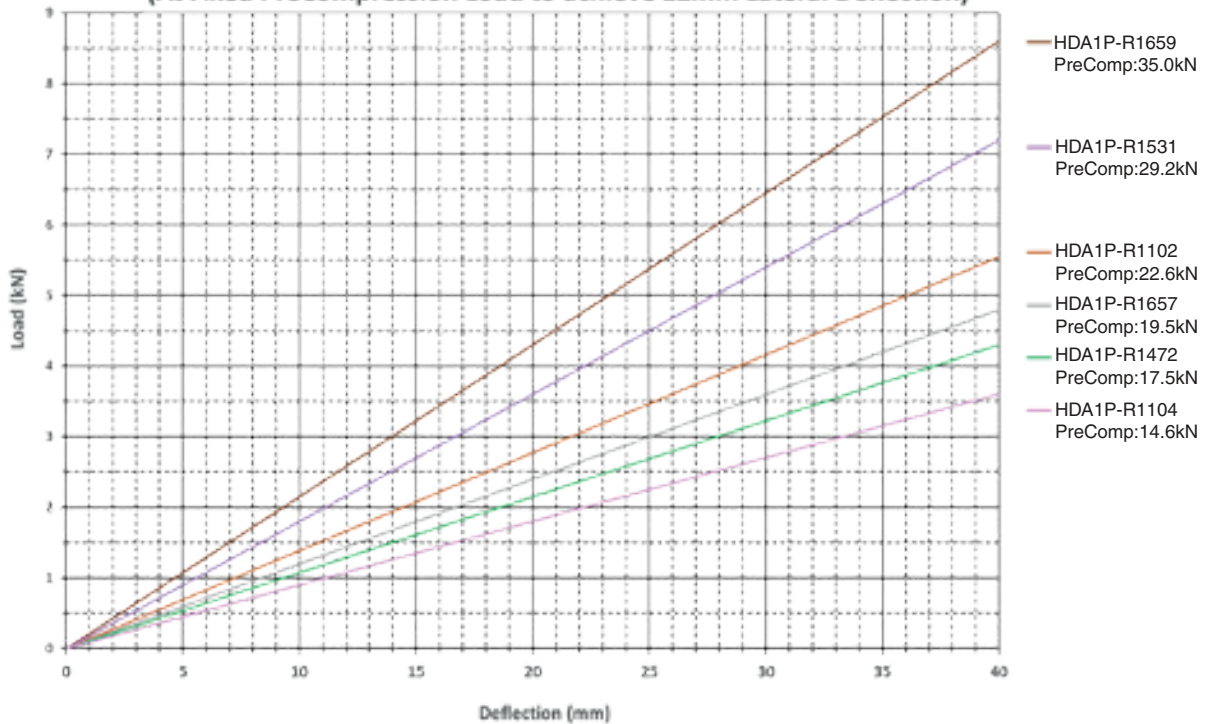
Part Number	Vertical Load, P_z , kN	Vertical Deflection, d_z , mm
HDA1P-R1104	15	12
HDA1P-R1472	17	12
HDA1P-R1657	20	12
HDA1P-R1102	23	12
HDA1P-R1531	29	12
HDA1P-R1659	35	12

EXAMPLE MECHANICAL PROPERTIES

Compression Loads - HDA1P Series



Shear Loads - HDA1P Series
(At Fixed PreCompression Load to achieve 12mm Lateral Deflection)





Hull Isolation Mounts should not be used at both maximum vertical load capacity and maximum shear deflection.



RECREATIONAL
MARINE ENGINE
MOUNTS



Mackay Consolidated Industries operate a policy of continuous improvement and development. We reserve the right to change design and specification of our products without prior notification or alteration of literature. We will not be held responsible for any danger or damage incurred through improper use or installation.

ENGINEERING CAPABILITIES

“WE DO DIFFICULT”

A key capability and discriminator for Mackay is our Technical Department. The department comprises of two key entities, being Engineering and the Laboratory. Our Engineers from Mackay Technical Services are highly experienced in conceptual designs right through to finished products. A number of tools and services are utilised to fulfil this service:

► **Mathematical modelling:**

FEA (ANSYS), stress-strain analysis, modal analysis, thermal modelling, curing times, shrinkage, crack propagation and mould design.

Computational Fluid Dynamics (CFD).

ADAMS Kinematic Modelling, with track module.

PolyFlow.

► **Drawing office with 3D solid modelling:**

Unigraphics (NX8)

Solidworks

Solidedge.

► **Off-site analytical assessments and vibration measurement to aid with data collection for customers without this capability.**

► **PolyWorks: metrology software.**

► **Zscan: 3D non-contact laser scanner.**



MACKAY



Quality

- AS/NZS ISO9001:2015
- ISO/IEC 17025:2017 (NATA accredited Laboratory)

- AS/NZS ISO14001:2015

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