

OFFSHORE PRODUCTS

FLOATOVER SOLUTIONS



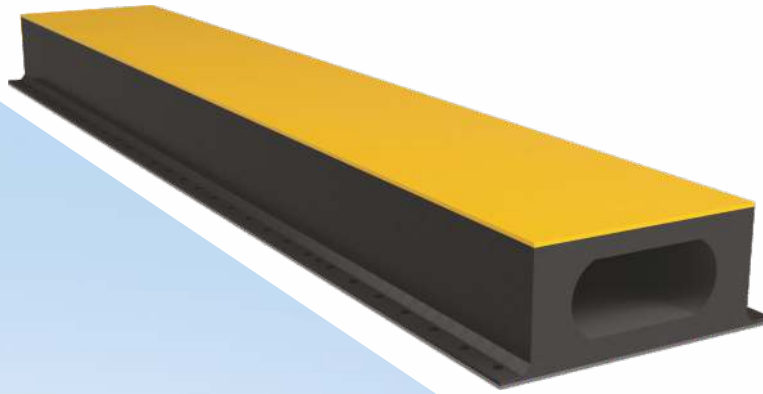
Where
Innovation
is Tradition



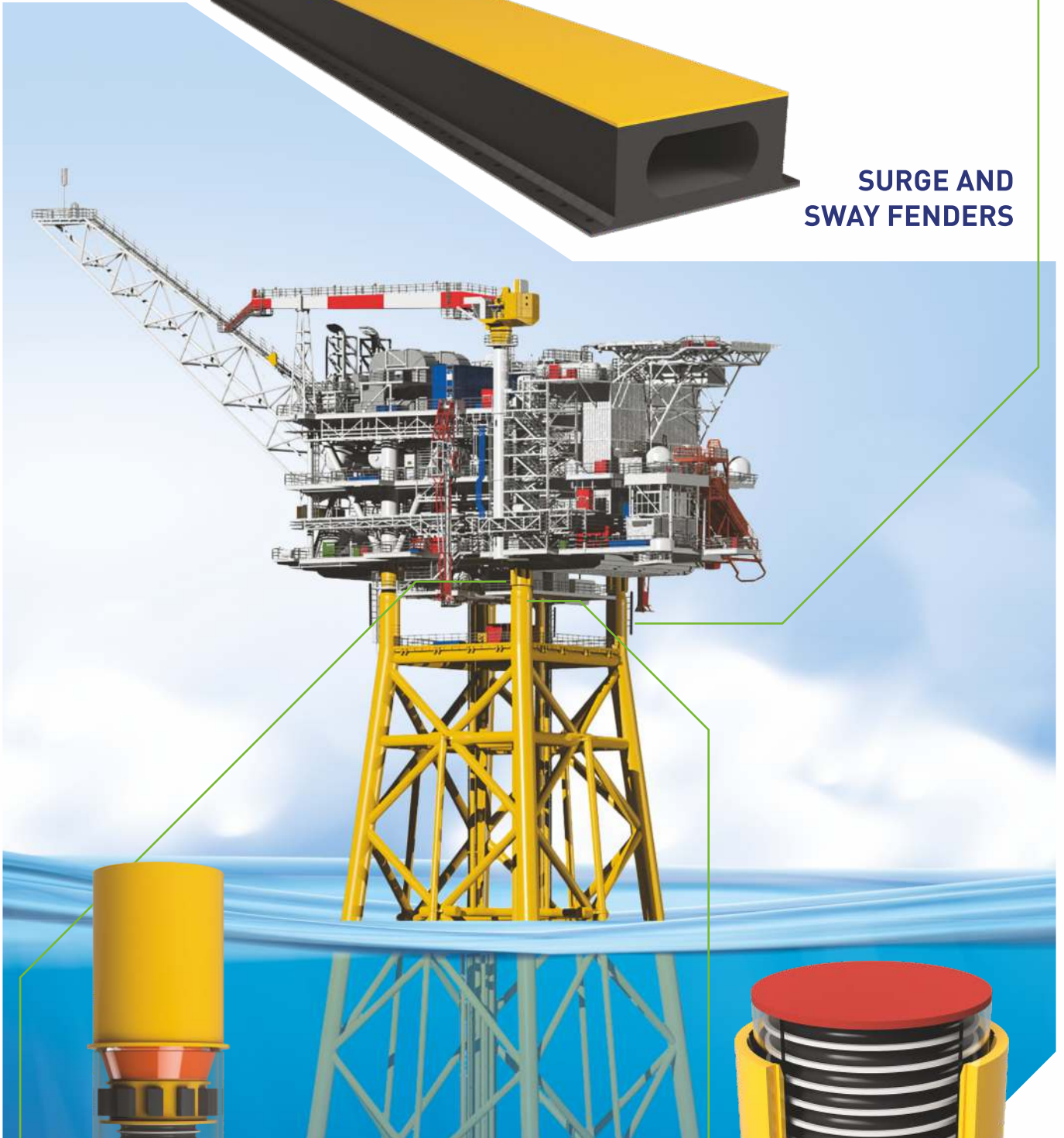
FLOATOVER PLATFORM INSTALLATION

Hi-Tech products helps in
smooth and secure float over operations.

Float over operation is the most critical part of topside installation, thus there is no possibility of error. Hi-tech has inhouse design and testing team equipped with all modern engineering tools like FEA analysis, GA analysis, creep testing, 3000 cycle test, temperature controlled model testing, etc. which assures best in class product and assures performance in field.



SURGE AND SWAY FENDERS



LEG MATING UNITS



DECK SUPPORT UNITS



SWAY AND SURGE FENDERS (SSF)

Surge and sway fenders are used in float-over operations in the installation of offshore topsides. Surge and sway fenders absorb the impact of the barge on the offshore structure and help in preventing damage to either of the important structures. They are also used to limit the movement between the barge and the offshore jacket. Specially formulated rubber compounds are used for specific projects.

Hitech has pioneered composite sway fenders for the first time in the world which will allow for no need for a steel panel, UHMWPE sliding surface for lower coefficient of friction, and better energy absorption capacity. Hitech special sway fenders can be manufactured up to 7 meters in length in a single shot which can allow for lower overall cost, ergonomic design, and increased safety of performance.

FEATURES

- Protects the jacket and transport barge during float-over operation
- Safely absorbs the berthing loads
- Decreases relative movement of the barge
- Smoother mating operation
- Easy to install and remove after float over operation

APPLICATIONS

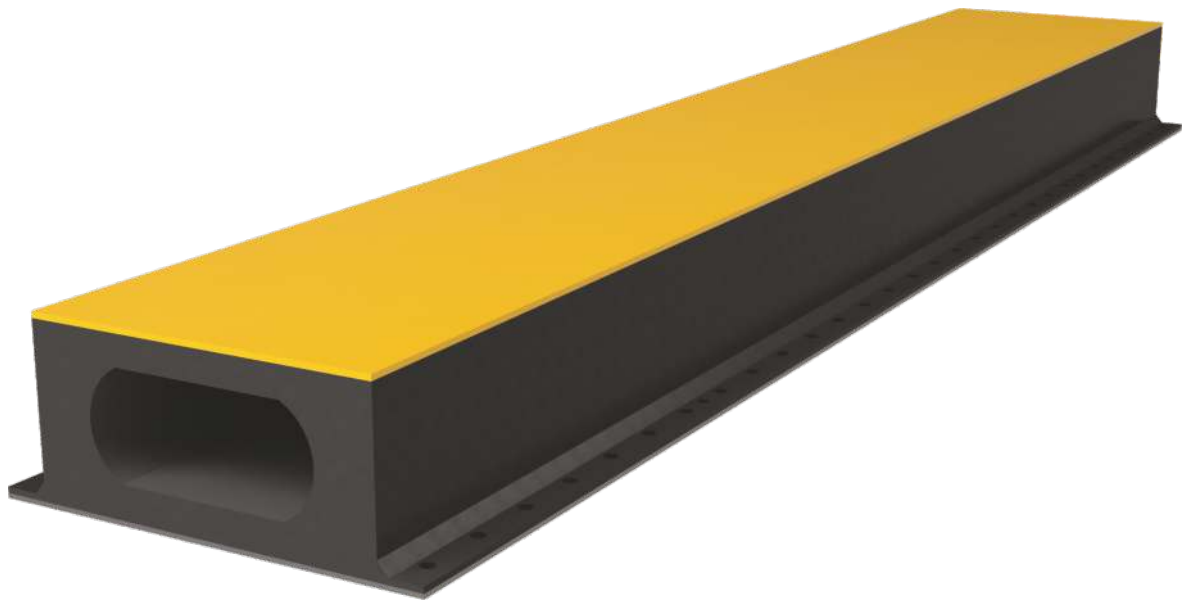
- Offshore platform jacket structure
- Transportation barge
- Offshore Wind jackets
- Decommissioning of topside

FLOATOVER SOLUTIONS

SWAY AND SURGE FENDERS (SSF)

TYPES OF SURGE FENDERS

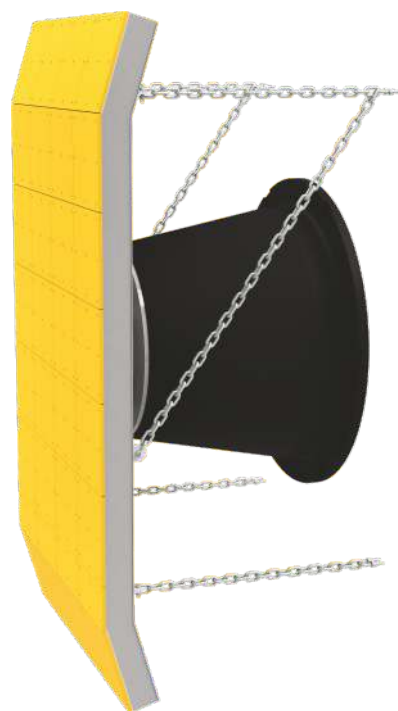
1. SURGE AND SWAY FENDER (SSF)



2. ARCH FENDERS (HXAT-UB)



3. CONE FENDERS (HNC)





DECK SUPPORT UNITS (DSU)

Deck support units are sliding supports that are often deployed on the topside and barge's legs. DSU consists of a rubber element on top of which is a sliding material with a low coefficient of friction. A secure and firm connection will be formed when the topside leg rests on the DSU and compresses the rubber element to a preset limit. During the transit of the topside, this connection will prevent any lateral movement. The DSU will assist in load transfer in the topside leg during the float-over operation as the topside transfers the loads to the LMU. The DSU's top has a sliding surface that will aid in the barge's easy sliding movement when the load transfer is complete.

FEATURES

- Supports topside placed on an integrated deck frame
- Allows horizontal movement between topside and barge
- Lower risk of damage during adverse weather in transportation
- Allow horizontal movement between the topside and deck support frame during and after the mating process
- Customized rubber compounds for custom load requirements
- Full-scale testing compression at our in-house testing facility

APPLICATIONS

- Offshore float-over operation
- Offshore terminal construction
- Offshore wind farm topsides
- Offshore wind installations

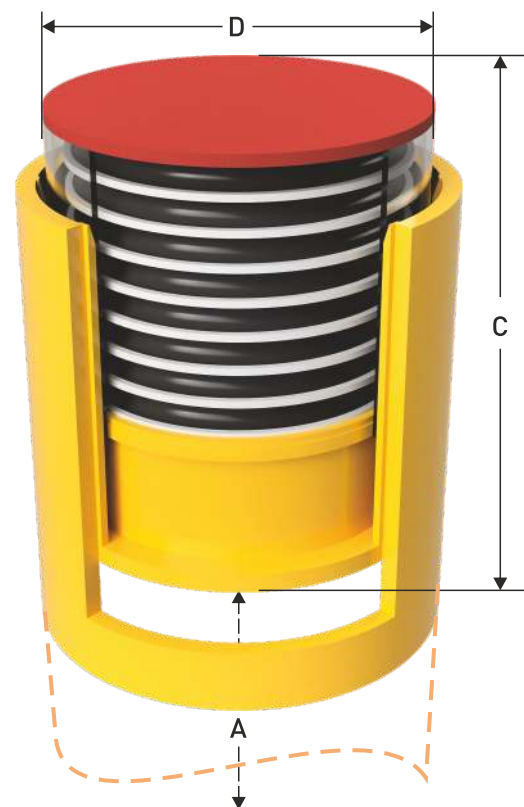
FLOATOVER SOLUTIONS

HITECH DECK SUPPORT UNITS (HDSU)

HITECH DSUs are engineered and UNIQLY customized for every individual project, consisting of a stack of elastomeric pads installed between two steel casings. DSUs are installed onto the deck support frame of a barge. The topside is then loaded onto this deck support frame and the DSU absorb the weight of the topside during load transfer process. DSU allow relative horizontal movement between the topside and the deck support frame during the transportation and mating process which absorbs any sudden loads that may occur, also the DSU may be equipped with a sliding surface on both the mating surfaces that provide very low coefficient of friction. This sliding surface absorbs the horizontal motion and ensure smooth load transfer of topside to jacket.

RFQ Requirements for a DSU

- A. DSF Leg and Deck Leg diameter and wall thickness
- B. Required Stroke
- C. Overall height restriction in Jacket or Deck Leg
- D. Lateral Offset of Sliding Surface
 - Number of Units
 - Scope Definition
 - Relevant Standards
 - Functional Requirements
 - Min and Max Vertical Loads
 - Lateral Load
 - Deflection Tolerance
 - DAF and Test Factor
 - Steel and Fabrication Requirements
 - Delivery Terms
 - Loose vs. Tight Slot



DSU Installation



Before Load Transfer



After Load Transfer



LEG MATING UNITS (LMU)

Hitech leg mating units are an integral part of an offshore float over the operation. During a floatover operation the barge is positioned over the jackets legs with LMU already welded to either the jacket leg or the topside legs. the LMU receptor cone is positioned over the receptor cone and then ballasting is done to lower the topside on the legs. this process is time consuming and done in open sea, therefore the LMU absorb the vertical as well as horizontal loads of the topside.

Lmu consists of vertical and horizontal rubber elements especially formulated to take immense loads and low creep. once the topside load transfer is complete and placed securely on the jacket the LMU rubber elements are in loaded condition, sand can be released from the sand release valve which leads to the plunger assembly lower, and loads on the rubber element are released.

multiple customization options are possible like different types of rubber elements depending on the load and application, sand release valve and sand filling chamber, horizontal elastomers, etc.

LMU are fully custom products designed by our in-house design experts individually for every project.

FEATURES

- Custom designed to take immense loads of topsides
- Most efficient and cost-effective solution for heavy topsides
- Performs even in adverse weather conditions
- Removes the need for expensive and time-consuming offshore cranes
- An optional sand jack can be manufactured for releasing the loads on rubber elements
- Different types of rubber elements can be custom-made depending on the load and conditions
- Optional stabbing cone assembly can also be supplied

APPLICATIONS

- Float-over operation
- Installation of heavy topsides

FLOATOVER SOLUTIONS

LEG MATING UNITS (LMU)

Hitech float-over solutions help to ensure the transportation and installation goes smoothly, including keeping the topside and jacket safe during the mating process. As the weather and sea conditions can be harsh in an offshore environment,.

Hitech float-over hardware are of paramount importance during the mating process for the float-over the operation. As the barge aligns the LMU and stabbing cone ballasting of the barge is started. As soon as the load transfer is started the LMU absorbs the vertical as well as horizontal loads via compression of the elastomeric stack. The LMU starts to compress and deck support unit starts to decompress at the same time, assuring smooth weight transfer.

LMUs consists of a steel structure incorporating elastomeric pads, it can be installed either in the topside, or in the substructure. They can absorb immense loads and minimize the risk of damage created when the topside's load is transferred to the jacket. The elastomeric pads in LMUs are designed to absorb the static and dynamic forces of the topside structure and relieve the horizontal forces generated by the sea surface movements during the float-over mating operation. After the installation is completed, the sand is released from the sand valve and the loads on the elastomers are released. After sand release the topside leg cans are welded to the substructure.

LMUs are tailored to each individual project, with the highest engineering levels, and subjected to rigorous testing to provide performance guarantees. Designed and built to the highest standards in polymer engineering. LMUs have been used in many projects around the world, demonstrating their safety, reliability and quality.

TYPES OF LEG MATING UNITS

1. WITHOUT SAND CAN



2. WITH SAND CAN



3. WITH SHOCKCELL



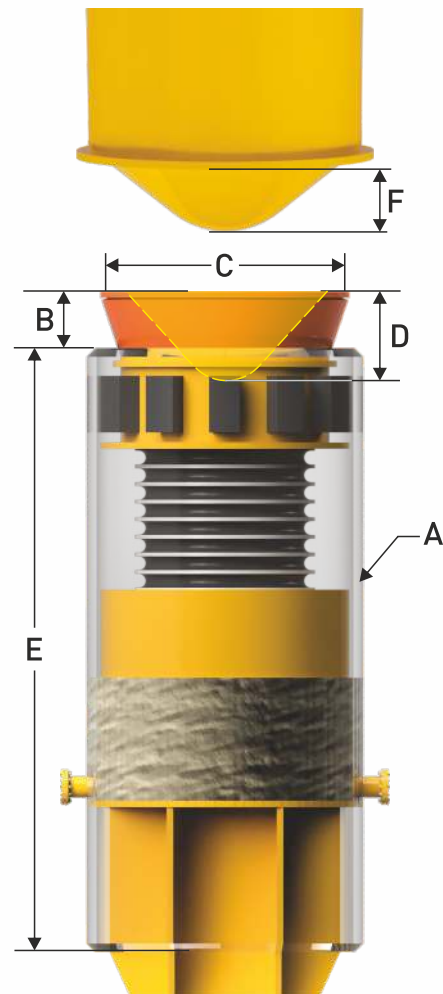
Note: Dimensions and specifications are provided by Hi-Tech office on a project on project basis as these are special polymer solutions and every project is bespoke and unique.

FLOATOVER SOLUTIONS

LEG MATING UNITS (LMU)

RFQ Requirements for a LMU

- A. Jacket Leg (Deck Leg) diameter and wall thickness
- B. Required Upstand & Stroke (No Sand Can: Upstand = Stroke) and whether Sand Can is required or preferred
- C. Watch Circle or Capture Radius
- D. Receptor Depth and intended contact location
- E. Overall height restriction in Jacket or Deck Leg
- F. Stabbing Cone height
 - Number of Units
 - Scope Definition
 - Relevant Standards
 - Functional Requirements
 - Min and Max Vertical Loads
 - Lateral Load
 - Deflection Tolerance
 - DAF and Test Factor
 - Steel and Fabrication Requirements
 - Delivery Terms
 - Sample Float-Over Hardware Specification



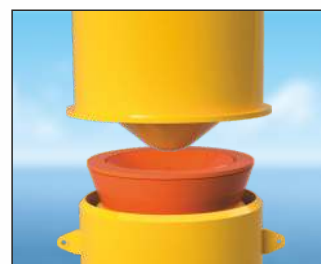
LMU Installation



1. Initial Alignment



2. Begin Ballasting



3. Initial Capture



4. Continue Ballasting



5. Impact Loading



6. Begin Load Transfer



7. Full Load Transfer

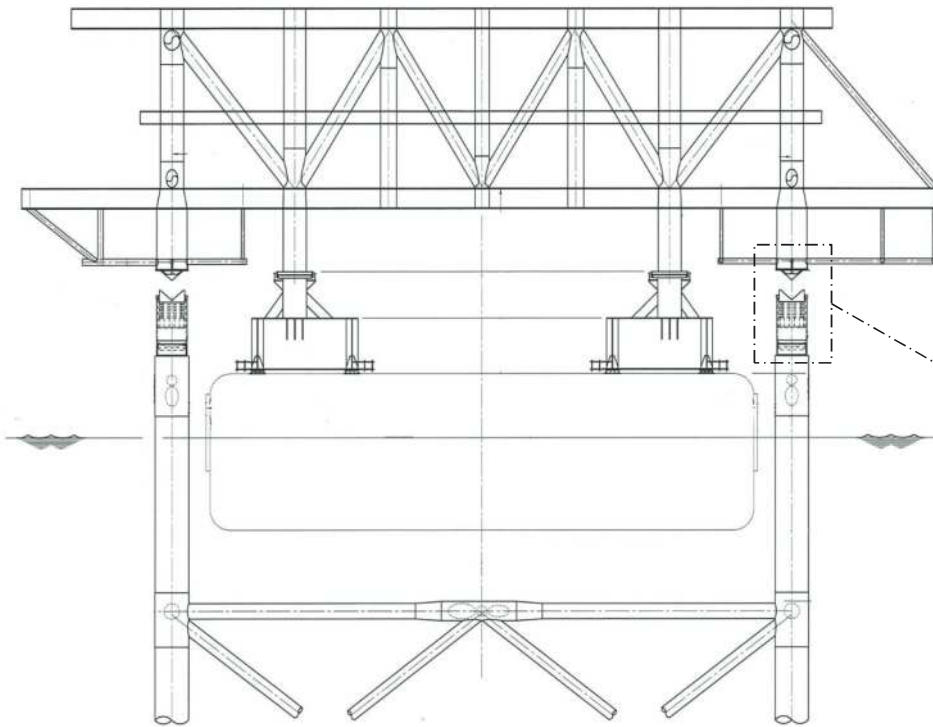


8. Sand Release for Final Closure

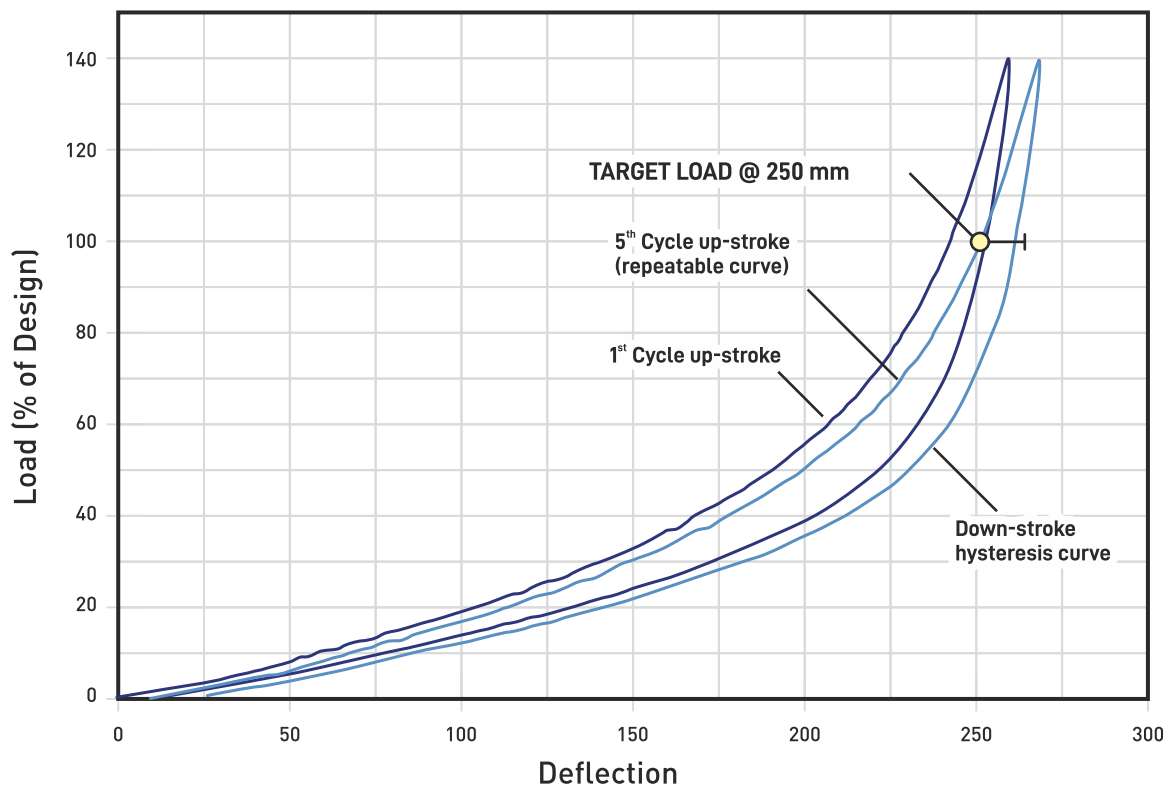
FLOATOVER SOLUTIONS LEG MATING UNITS (LMU)

LMU & DSU Functionality

Installation Vessel aligned over Jacket and LMUs



Load Vs. Deflection Curve Determination



Note: This curve is just for presentation basis, for real curves of your project please contact Hi-Tech office.

FLOATOVER SOLUTIONS

TESTING, RESEARCH & DEVELOPMENT

Hitech believes in real scale model testing which is the only way of knowing if the actual product will perform as designed in the operation, thus we have commissioned the largest testing press in house where all projects will be safely and efficiently tested.

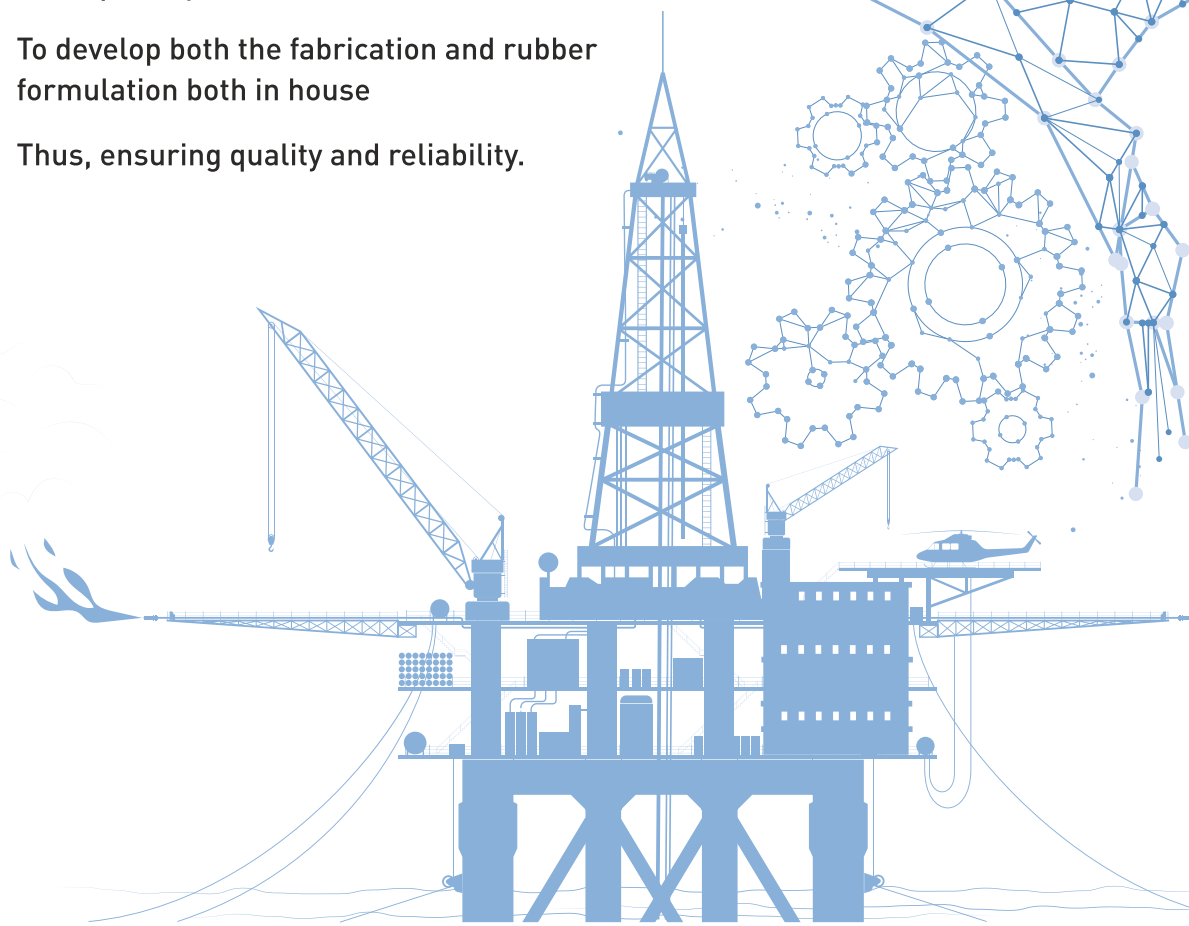
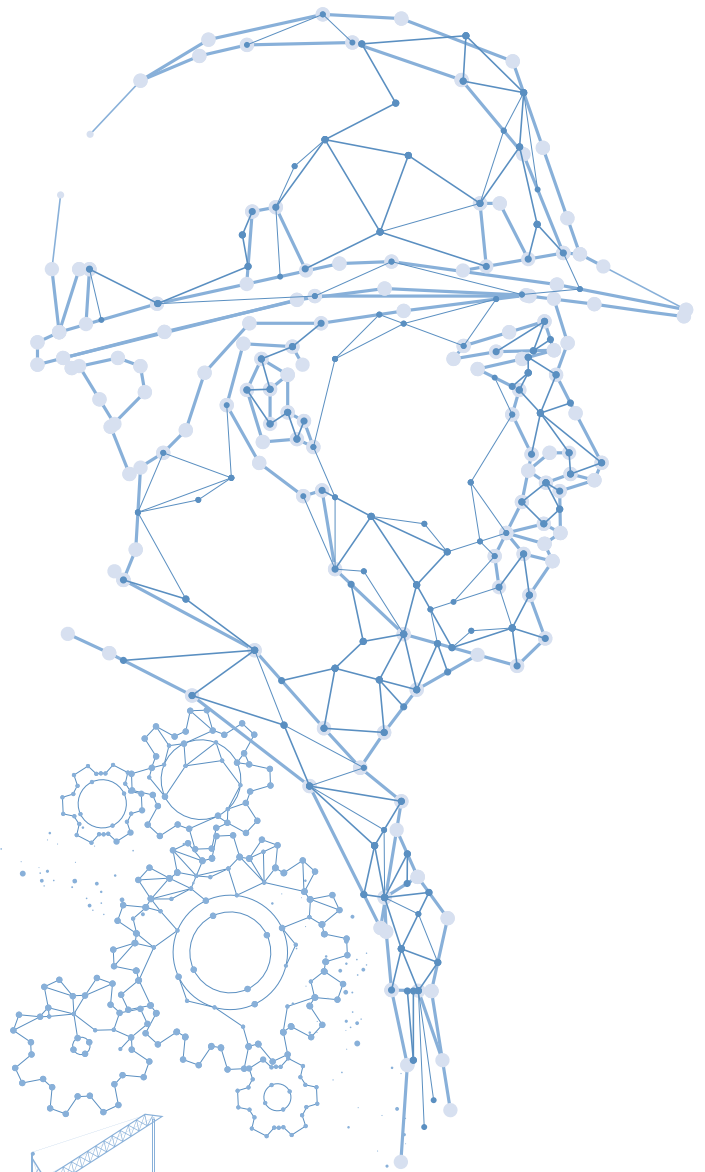
Our in-house department formulates unique rubber polymers for each float over project we work on, in order to ensure that our solutions are designed to meet and exceed our customers' expectations.

Our in-house design team offers the best-in-class design capabilities with 3-D drafting, TGA analysis, FEA analysis etc., which is very important for polymers of this critical application.

Hitech is one of the very few companies that have the capability.

To develop both the fabrication and rubber formulation both in house

Thus, ensuring quality and reliability.



PRODUCT INSTALLATION PICTURES







HI-TECH ELASTOMERS LTD.

WHERE INNOVATION IS A TRADITION

OFFICE

227, Hitech Elastomers, Santej-Vadsar Road,
Gandhinagar, Gujarat, INDIA - 384004.

Phone : +91-9824 654 671

Email : vpsales@hitechelastomers.com
sales1@hitechelastomers.com
sales@hitechelastomers.com

MANUFACTURING PLANT I:

798, Sola-Kalol Highway, Rakanpur,
Dist.: Gandhinagar, Gujarat, INDIA - 384002.

MANUFACTURING PLANT II:

227, Santej-Vadsar Road, Santej,
Dist. Gandhinagar, Gujarat, INDIA - 384004.

www.hitechelastomers.com

