Bend stiffener

Bend protection in dynamic environments

When a flexible pipeline, umbilical or cable connects to a structure, normal movement during operation (dynamic loading) or forces incurred during installation and retrieval (static loading) can cause catastrophic failure of the tubular at the termination point. The failure mode can be through collapse, rupture of internal lines or even rupture of the external layers leading to escape of the contents to the environment. This can happen as a result of a single event or be caused through fatigue damage over time.



Bend stiffener

Bend limiting devices are provided to protect the flexible pipeline, umbilical or cable from these situations and perform the following functions:

- Maintain the manufacturers recommended minimum bend radius (MBR) during the life of the project.
- Provide a suitable load path from the flexible pipeline, umbilical or cable to fixed structure.
- Reduce point loading at the termination to an acceptable level.

Bend stiffeners acquired their name because the conical shape gradually increases the overall stiffness of the flexible pipeline, umbilical or cable in order to prevent overbending at the termination point. Manufactured from elastomeric material, a bend stiffener is suited to the constant wave and current induced motion of dynamic installations but can also be used for static applications.

Bend stiffeners are project specific and to provide you with excellent performance, AIS will fully engineer the product to accommodate the defined tension and angle combinations.

AIS' track record in the supply of bend stiffeners, specifically for dynamic applications, is extensive.



Benefits

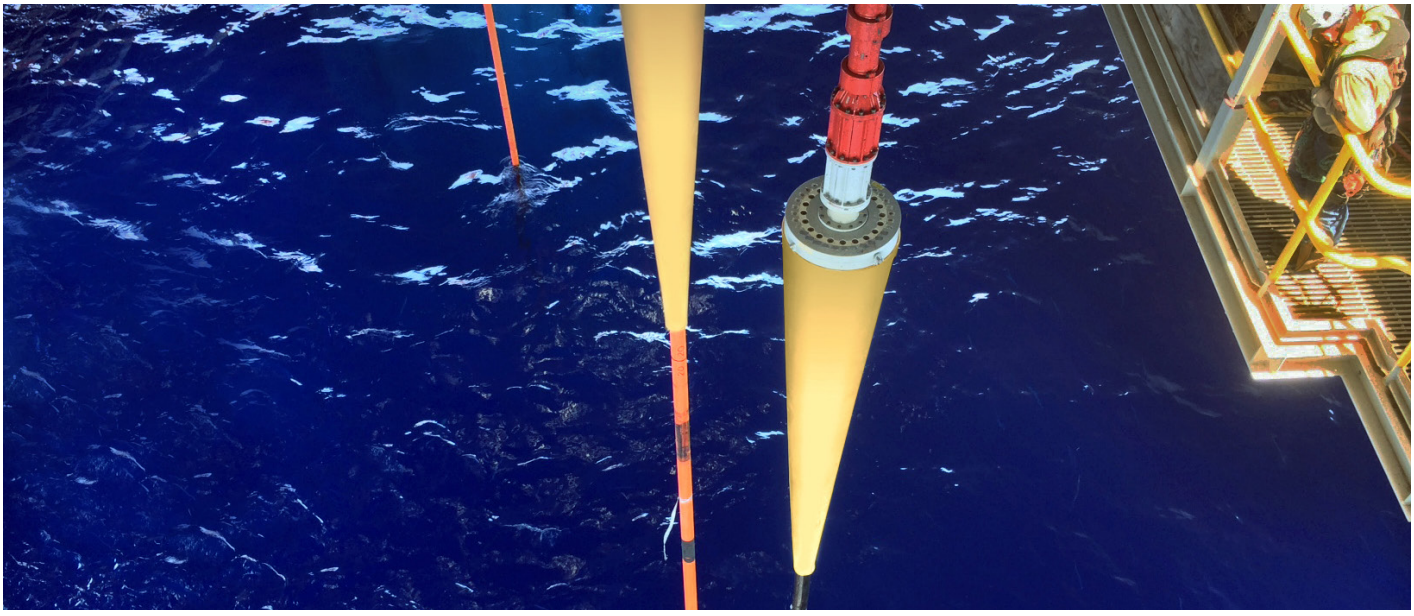
- Added local stiffness to the umbilical or flowline
- Limits bending stresses and curvature
- Prevents structure damage from overbending
- Reduces structure fatigue
- Guaranteed design
- High performance
- Reduces point loading

Applications

- Subsea riser
- Flowlines
- Flexible pipes
- Umbilicals

Achievements

- First dynamic bend stiffener supplied for service in 1994
- Over 3000 dynamic bend stiffeners currently in service
- Bend restrictors operate in locations around the world in ambient temperatures ranging from -20 °C (-4 °F) to 50 °C (122 °F)
- 100% track record with no failures in service
- Lloyd's Register Type Approval.



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