

VIV Suppression Strakes



Lankhorst Strakes

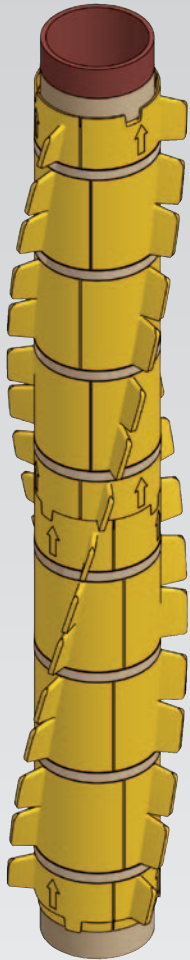
Cylindrical structures, such as free-standing riser pipes or flowlines in free spans, interact with a uniform fluid such as seawater and shed Karman vortex sheets. If the vortex shedding frequency is close to the cylinder's natural frequency, the structure will start to oscillate, or vibrate.

The VIV oscillations of submerged pipes are known to increase drag and may lead to structural fatigue. One proven means of suppressing this vibration is the use of strakes, which modify the flow along the pipe, tripping the production of Karman vortices so that they act less coherently.

Lankhorst strakes are typically recognized for their perpendicular intermittent vanes, wound around the pipe in a triple helix. The pitch of these helices is equal to 16 times the pipe OD, however alternative pitches are possible.

The standard Lankhorst vane height will deliver a suppression efficiency that is well beyond the generally required 90% compared to bare pipe. The drag increase is relatively low.

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Optimized for installation

Lankhorst strakes have been designed with ease and speed of installation as a key design feature in order to minimize the expense of offshore installation time. By using the tri-shell concept, strakes are light and installation speed is optimized. Tri-shells also have a high packing density, so that the number of supply barge movements offshore and needed deck space can be kept to a minimum.

In case of installation with heavy loads, such as by roller boxes on a J-lay tower or an S-lay stinger, Lankhorst can provide solutions with materials that have proven to withstand the loads. Further load and impact testing can be done in-house by the Lankhorst stinger roller test rig or the impact tower.

Special features

Lankhorst strakes can be delivered with additional – qualified and often patented – features, such as:

- CP shielding prevention system for pipelines with a thin coating, such as FBE coating
- Spring system for pipelines with a thick coating that shows shrinkage or creep under hydrostatic pressure
- Anti-fouling coating for strakes installed in areas where there is normally known to be marine growth
- UV stabilization, in case VIV strakes will be stored outside in the sun for an extended period



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References

Many projects all over the world have been executed, where strakes have been delivered for production risers, flowlines, drilling risers, tendons, caisson structures, and subsea jumpers.

Examples of recent projects are:

- Tendons of Shell Mars B, Chevron Big Foot
- Chevron Jack St Malo export lines
- Shell Mars B TTRs, Cardamom SCRs
- Petrobras P-55 flowlines and risers, Petrobras Guara Lula risers
- Jumpers of ExxonMobil Kizomba Satellites, Tullow Jubilee 1A, Total GirRi, Encana Deep - Panuke, Shell Gumusut
- Xcite Bentley drilling risers



And many others. A full reference list is available upon request.

Lankhorst Mouldings Offshore

Lankhorst Mouldings Offshore have a proven track record in providing the offshore industry with innovative polymer based technical solutions that stand the test of time. Lankhorst Mouldings has for over 30 years been producing products using our unique thick-walled plastic moulding technology. We can supply high-performance innovatively engineered products to

meet the demands of the offshore industry. Lankhorst Mouldings products utilize field proven technology and experience to provide superior technical solutions. The company's technical solutions are designed not only to meet the customers' requirements, but are also foreseen to be used again and again.



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Design features

- Identical tri-shell piece design
- Fully interlocking, self aligning system
- Non CP shielding design available
- Low unit weight & positive buoyancy
- High impact and abrasion resistant
- UV stabilised for outdoor storage
- Compact design for low volume transport
- Fast, safe installation < 1 minute/section
- Anti-fouling coating available
- 25+ years service life
- Can be recycled upon decommissioning

Geometry (to customer specification)

- Vane height 0.15 to 0.25 x diameter
- Strake pitch 5 to 18 x OD

Design Verification

- Tow tank testing
- CFD analysis
- Stinger roller load testing
- Impact testing
- Friction testing

