



RAMNÄS STUDLOCK* CHAIN



Still the **Perfect Link** after **20 Years** in Service



After more than 20 years in operation at the Troll B platform in the North Sea, Ramnäs Bruk 152 mm diameter stud link chain still shows top quality with no loose studs and low corrosion impact after inspection.

Some of the chain from the Troll B mooring system has found its way back to Ramnäs Bruk's premises after more than 20 years offshore.

The chain has been meticulously inspected for dimensions, stud-placement and indentations. Very low corrosion impact is shown and the measurements of links dimensions are very consistent and satisfactory, well within requirements. All studs are found without displacement in any direction and the same applies to the perfect impressions and indentations due to **Ramnäs asymmetrical stud design and stud expansion process**.

After inspection of the old Troll B chain at the factory yard in Ramnäs, Marko Laituri, Subcontracting Manager states: "It's a great feeling to have been involved in making this chain back in the 90's, and to see that it still shows such good quality after all these years"



Very low corrosion impact, perfect stud placement, no loose studs and consistent and satisfactory measurements of link dimensions is the result from the inspection.



A perfect stud impression

Troll B Mooring Chain

Manufacturer: Ramnäs Bruk AB
Year of manufacturing: 1993-1994
Dimension: 152 mm stud link chain
Quality: R4 (LC Steel)
Class: DNV certification
Weight: 6,300 tonnes
Weight each link: 315 kgs
Total Length: 12,300 metres
Platform: Troll B in the North Sea, owned by Norsk Hydro

***StudLock** = Ramnäs asymmetrical stud design and stud expansion process



THE LARGEST MOORING SYSTEM



Photo: Øyvind Hagen - Statoil ASA

Troll is a gas and oil field on the Norwegian continental shelf in the North Sea about 80 km northwest of Bergen. The field contains very large gas resources and is one of the largest oil producing fields on the Norwegian continental shelf. The water depth in the area is about 330 metres.

To safely anchor the Troll B platform it was necessary to develop, at that time, the largest mooring system ever. The system was installed within the planned schedule and budget in July 1995 and has so far functioned according to the expectations, as reported by sources from Statoil.

6,300 tonnes of Chains and Shackles

The manufacturing of the mooring chain for Troll B started at Ramnäs Bruk in 1993 and 12,300 metres of chain with a total weight of 6,300 tonnes were delivered to the final destination of the Troll field in the North Sea in 1994. This was the largest order in Ramnäs Bruk order book ever – and at the time also an **international record** for the largest dimension of stud link chain.

StudLock Chain in Long Term Mooring systems

Stud link chain has advantages compared to studless chain and is preferable also for Long Term Mooring systems. The inspection performed on the chain from the Troll B mooring system proves that a stud link can be the perfect link even after more than two decades in service.



Ramnäs Bruk advertising material for Troll B from the late 90's

Advantages for StudLock Chain

- Higher proof load
- Increased fatigue life - at least 3-4 times
- Reduced risk of stress corrosion in the weld
- Improved utilization of the base material ductility
- Increased peak loads without any deformation
- Easy installation, with no kinks or knots



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