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# Statoil Multi Dope Yellow

Multi-functional thread compound



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# 1 Product Introduction and Applications

MULTI DOPE YELLOW is the result of a project run by Statoil Lubricants aimed at addressing both the severe technical and environmental challenges with which constructors have to cope. Statoil has designed a new product with ultimate technical performance and environmental adaptation.

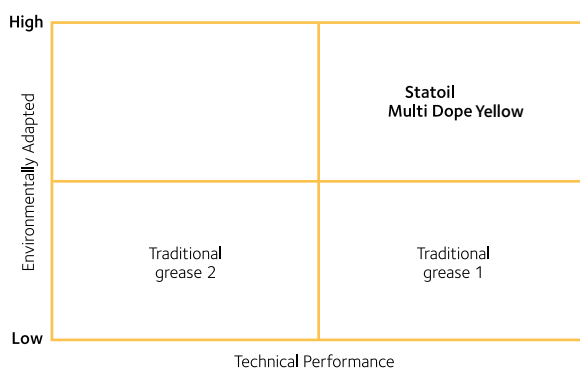


Statoil Multi Dope Yellow is a lubricating grease, especially developed for use in offshore and marine applications, as a thread compound for drill pipes, casing and tubing.

Statoil Multi Dope Yellow is formulated with readily biodegradable synthetic esters and a specially developed thickener system. It contains non-metallic solids to separate the surfaces and to provide good lubricity.

***Statoil Multi Dope Yellow has been developed to work in a number of applications:***

- As a thread compound for drill pipes, casing and tubing.
- For greasing of gear pinion teeth and leg rack teeth on jack-up platforms.
- For greasing between skid beams and cantilever, during skidding of the cantilever.



**Figure 1** Comparison Statoil Multi Dope Yellow – Traditional greases

**Most extensive technical performance.**

Statoil Multi Dope Yellow provides a safer drill pipe connection than traditional greases due to its very low friction factor. It also withstands a very high torque, yet still able to break out the connection. It has been tested successfully to cope with a large number of make-ups and break-outs. These excellent technical features give advantages such as vast savings on equipment costs and time savings, in connection with make-ups and break-outs.

**Environmental adaptation.**

The grease has been designed using the most environmentally friendly components in order to provide a product 100% environmentally adapted, addressing the most demanding environmental challenges. Figure 1.

The result is a product with both excellent technical performance and environmental advantages. The product is already in use on platforms both in Denmark and Norway where it shows excellent technical performance and helps constructors to improve their daily activities and to save money.

# 2 Advantages and Features

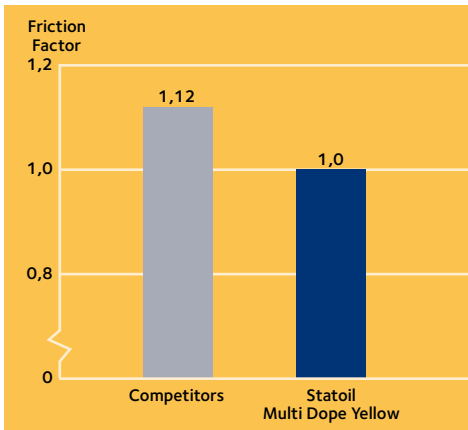


Figure 2 Comparison Friction API- Factor

### Summary of advantages

- Safer connection
- High torque properties
- Environmentally adapted
- Rust protective
- Easy to apply
- Easy to detect
- Easy to remove
- One product for several applications

- *Safer connection.* Statoil Multi Dope Yellow is characterized by a very low friction API-factor, giving a safer drill pipe connection (Figure 2).
- *High torque properties.* Statoil Multi Dope Yellow has been shown to withstand a very high torque, yet still able to break out the connections. It has also proven to be able to stand a large number of make-ups and break-outs without destroying the threads.

These features give vast savings on equipment costs as well as being very time saving in connection with make-ups and break-outs.

- Statoil Multi Dope Yellow is a product designed with the *most environmentally adapted components* available, without compromising on the technical properties. Statoil Lubricants has designed a product with the most extensive technical performance, together with environmental adaptation (Figure 3)
- Statoil Multi Dope Yellow has shown good rust protection properties in field tests making it excellent even for storage of tubes.
- *Reduction of inventory stocks.* Statoil Multi Dope Yellow is a multifunctional grease that can be used for multiple applications (drill pipes, casing and tubing) resulting in reduction of inventory stocks and facilitating the handling and management of lubricant stocks.
- *Easy to apply.* Statoil Multi Dope Yellow is easy to pump in an automatic greasing system and easy to apply by brush.
- *Easy to detect.* The white colour of Statoil Multi Dope Yellow makes it easy to detect whether or not the entire surface is lubricated.
- *Easy to remove.* It is also easy to remove from the surface using high-pressure hot water.

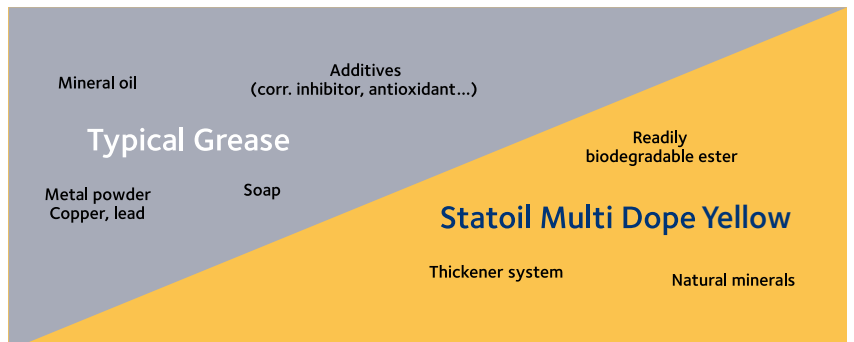


Figure 3 Comparison between typical thread grease components and Statoil Multi Dope Yellow components



# 3

## Test Results



**Figure 4** Drill pipe after first break-out

### 3.1.

#### Test 1: Make-up & Break-out tests

This test was set up to initially determine the performance of the product in real make-ups and break-outs. The test results were extremely satisfactory. The product made it very easy to perform the break-outs even after the highest torques.

- *Test location:* Franks International, Den Helder, Holland.  
The test was carried out with a 5" drill pipe, NC 50 connection.
- *Number of sequences:* 80
- *Torque:* from 15 000 - 32 000 ft-lbs

#### *Result:*

- Break out torque appr. 2/3 of Make-up torque
- No metal screaming between the thread and shoulder surfaces
- No changes to threads and shoulder after 80 sequences
- A layer of lubricant remaining on the surface after break-out (*Figure 4*)



**Figure 5** Connection after break-out

### 3.2.

#### Test 2: Extreme torque tests

From the promising results in the previous tests, it seemed interesting to find out how the product performs under extreme torque loads. Even after applying as high torque to the connection that the box was deformed, it was still able to break-out the connection.

- *Test location:* Franks International, Den Helder, Holland.  
The test was carried out with a 5" drill pipe, NC 50 connection.
- *Number of sequences:* 1
- *Torque:* 90 000 ft-lbs (*Figure 6*)
- *Result:* Deformation of the box due to the high torque, but still able to break out (*Figure 5*)



**Figure 6** Torque at 90000 ft-lbs



**Figure 7** Dope condition of top drive saver sub & main shaft

### 3.3.

#### Test 3: Field test at Maersk Exerter

To confirm the results in the laboratories, a field test was carried out at the Maersk Exerter platform. Statoil Multi Dope Yellow was applied to the saver sub at the top drive, and all other heavyweight drill pipe connections where the torque loads are most severe. (Figure 7)

Statoil Multi Dope Yellow proved to perform as expected, giving smooth break-outs.

- *Result:* No problems to make up or break-out.

### 3.4.

#### Test 4: Additional Make-up and Break-out tests

Further tests carried out at another tube manufacturer.

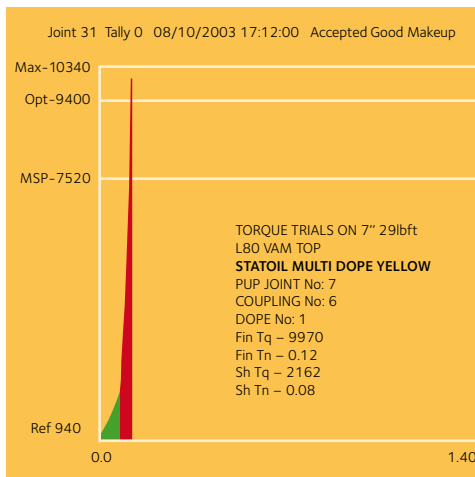
- *Test location:* Vallourec & Mannesmann Tubes, France

The test was carried out with 5" FH VAM EIS tubes.

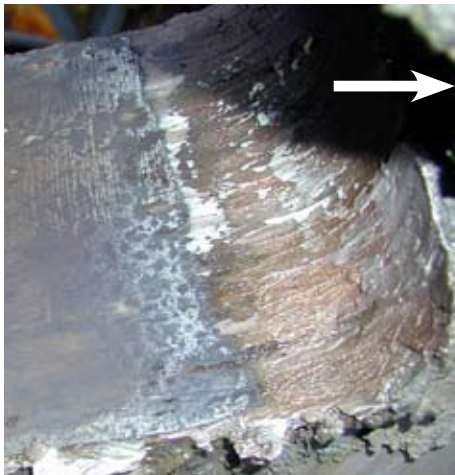
Reference tests with common competitor.

##### Test 1

- *Number of stages:* 12
- *Torque:* from 5 000 - 65 320 ft-lbs
- *Result:* No problems to make-up or break-out with Statoil Multi Dope Yellow. Appr. 30% less grease quantity needed. Only light deformations on the pin nose at 60 000 ft. lbs
- The competitor showed wear on the phosphatation on the pin thread after 3 make-up and break-outs



**Figure 8** Results casing and tubing tests



**Figure 9** Field test on Jacking systems

### Test 2

- Number of stages: 5
- Number of make-up and break-outs: 50
- Torque: 38 824 ft.lbs
- Result: No wear on the connection with Statoil Multi Dope Yellow

## 3.5.

### Test 5: Casing & Tubing tests

Statoil Multi Dope Yellow is also designed for use in casing & tubing applications. To confirm the performance comparative tests were carried out.

Test location: BJ Completion Assembly Services, Aberdeen

#### Result:

- Easy to apply by brush
- Good cleaning ability
- Good connection
- Low shoulder torque
- Low break out torque
- Very low interference
- Consistent graph (Figure 8)
- Excellent performance on high chrome or nickel alloys

## 3.6.

### Test 6: Field test on Jacking systems

Due to its extremely good EP-properties, Statoil Multi Dope Yellow should be suitable for greasing pinion teeth and leg rack teeth on jack-up platforms. This had to be confirmed in field tests.

Test location: Maersk Giant

Result: No problem pumping the grease in the automatic grease system.

No difference in performance between Statoil Multi Dope Yellow and the standard grease.

- No wear marks on the teeth (Figure 9)





Figure 10 Sticker 130x60 Statoil Multi Dope Yellow

### 3.7. Predopeing of casing and tubing

The excellent rust protection properties of Statoil Multi Dope Yellow, makes it suitable for predoping directly from the pipe manufacturer.



Figure 11 Swivel Joints

### 3.8. Swivel Joints

Extending lifetime on swivel joints more then 3 times!