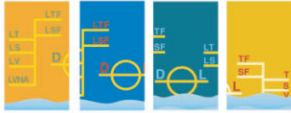




OIL FILTRATION SYSTEMS

# CJC™ Application Study

## Hydraulic Oil - Submarine



### MARINE

*Application Study  
written by:  
Rob Deurloo  
C.C.Jensen A/S  
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2000

### CUSTOMER

**Submarine:** "Hr.Ms. BRUINVIS".  
**Owner:** The Royal Dutch Navy.

### THE SYSTEM

Three hydraulic systems (vital, general and reserve steering). Interconnected return tanks. Hydraulic oil, military type H-576.

### THE PROBLEM

The main hydraulic system of a submarine is evidently vital to the operation of the vessel and the goal of the test was to clean the oil of both solids and water, increasing the system reliability.

### THE SOLUTION

**CJC™ Filter HDU 15/25 PM** with  
**CJC™ FilterInsert BG15/25** (3µm abs.). Flow: 120 ltr./h.

### THE TEST

Prior to the installation of the CJC™ Filter the oil cleanliness was ISO Code 15/14. The majority of the large particles were of glass (possibly introduced to the system during previous service work). In addition the oil was water contaminated (287 ppm).

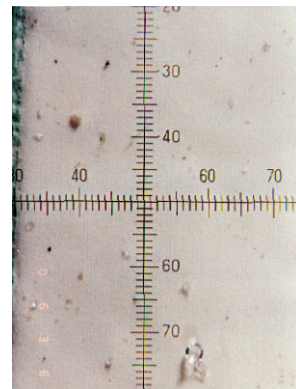
Because of the interconnected tanks it was possible to service the entire system with one CJC Offline unit only.

### THE RESULT

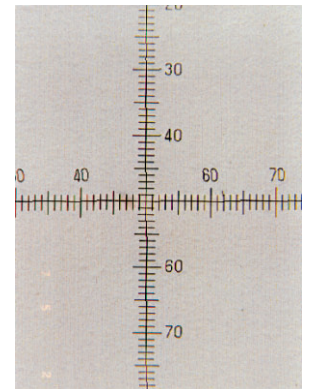
The filter was installed on May 28 and an oil sample was drawn before filtration start. The last sample was taken on July 6. In that short time the CJC™ FineFilter managed to improve the oil cleanliness to a very satisfying ISO Code 12/9 and dry it down to 49 ppm (see result table).



"Hr. Ms. BRUINVIS"



Before CJC™ Filter.



After CJC™ Filter.

### THE RESULT

Samples:	Particles >5 µm	Particles >15 µm	ISO 4406	Water Cont. ppm.
<b>No 1 Before filtration:</b>	25,225	9,406	15/14	287
<b>No 2:</b>	7,896	2,198	13/12	48
<b>No 3:</b>	3,298	253	12/9	49

By Filtrex Services Laboratory, NL.

### THE EFFECT

*The achieved contamination level is well below the guidelines for hydraulic servo systems of ISO 15/12 and leveling with the recommendations for aeronautical systems, 12/9, recommended by, among others, the Danish Technological Institute. The conclusion is that the system is now stabilized at a level considerably better than the required and will maintain the reliability expected for this type of application.*

