



## CERTIFICATE OF APPROVAL

This is to certify that the following product has been reviewed and approved by Fearnley Procter FZE and an NS-1™ Technical Review Committee.

**Date of Approval:** 16/8/2011

**Cert/NS-1™ Approval Number:** 0052/11-2

**Valid Until:** 15/8/2013

**Reviewed Against:** AA.03.30.00.1110 Rev. 09

**Review Number:** FP FZE 454

NS-1™ Quality and Inspection Requirements for New and Refurbished Drilling and Well Completion Equipment, Edition 2 – January 2006

**Product:** OTW-12 Hardbanding

**Candidate:** Castolin Eutectic – Hardbanding Division, PO Box 178, Hammaren 13, 4056, Tanager, Norway

**FEARNLEY PROCTER NS-1™ LEVEL 2 PRODUCT APPROVAL**  
**(OTW-12 Alloy Hardbanding - New Application for Tool Joints Only )**

**Scope:**

The procedure followed has been to compare the specific requirements of the relevant Fearnley Procter NS-1™ documentation with the submitted information, and to perform certain testing on the product.

The evaluation of the application procedures for OTW-12 Alloy Hardbanding on drill pipe has been performed in compliance with the general requirements and recommendations as stipulated in NS-1™ Supplementary Requirements, AA.03.30.00.1110 (Rev. 09) Section 5.0, and Sub-Specification 90.1, 90.3 and 160.

The following data was supplied and tests performed by Castolin Eutectic to Fearnley Procter, for this approval.

1. Casing Wear Analysis Data, 2. Hard-banding Adhesion Test Results, 3. Welding Procedures/Guidelines, 4. Inspection Guidelines, 5. Acceptance/Rejection Criteria, 6. Hardness Test Results, 7. Field Data on use

Reference Documents: Castolin Eutectic Hardbanding Manual Version 1.2 June 2010 – MOHR Engineering Wear Test Report, Project No. 1701021.

As a result of the review Castolin Eutectic OTW-12 Alloy Hardbanding has been granted approval and is listed as an NS-1™ Level 2 approved product and deemed suitable for service when applied as per the processes and procedures reviewed and the requirements of NS-1™.

**Approved By:**

A handwritten signature in black ink, appearing to read 'Kevin Fearnley', is written over a dotted line.

**Kevin Fearnley**  
(Chairman NS-1™ Technical Review Committee)

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