

# worldexp<sup>ro</sup>

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## Every last drop

Making the most of mature oil fields



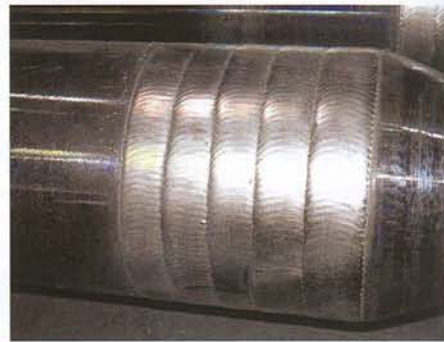


## New wear solutions

Today's offshore drilling, with the use of directional technology, gives big cost and logistic advantages. However it also greatly increases wear on the drill string and casing. Wear and friction are critical to the drilling efficiency operation. Weld overlay hardbanding is the common solution but improvements are needed in wear life and friction levels. Castolin Eutectic has specialised in solving wear problems for more than 100 years. Its international OilTec Industry team, which is directly active with customers in the field, plus its R&D department, have recently developed innovative materials and processes for hardbanding. They are:

- **Weld overlay OTW12.** A novel alloy wire composition that has low cracking and gives improved drill collar lifetimes, low friction and lower casing wear.
- **Plasma transferred arc (PTA).** Advanced plasma technology that gives lower dilution with base metal, uniform microstructure and a smoother surface. New, patented powder alloys such as OTP 5 give the lowest casing wear and are friction coefficient.
- **Patented non-magnetic powder.** Deposited with PTA to give excellent bonding and wear resistance without disturbing the non-magnetic base metal. Laser coating quality without the laser cost and reliability problems.
- **Hardbanding machine.** The only hardbanding machine in the world with a closed loop system, and capable of performing automated sequences of hardfacing, ensuring the highest product quality.

Castolin Eutectic's R&D facilities also include purpose-built hardbanding wear simulation test equipment, which is used to screen development alloys before expensive field testing.



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The group has recently made several big investments that support the OilTec activities, including a new greenfield, state-of-the-art wire and powder production plant in Ireland and the launch of a new, advanced PTA equipment range.

The company's latest acquisition, Trio OilTec Services in Stavanger, Norway, is a strong partner for maintenance and repair services in the offshore industry and can apply these innovative hardbanding materials. ●

### [ Further information ]

Castolin Eutectic  
Tel: +41 21 694 11 05 | Fax: +41 21 691 55 71  
Email: [marketing@castolin.com](mailto:marketing@castolin.com)  
Website: [www.castolin.com](http://www.castolin.com)

## Realistic numerical solutions

Complex Flow Design develops state-of-the-art methods and software tools for making realistic numerical simulations of multiphase flow in process, hydraulic and sedimentation engineering. The framework for these numerical simulations is based on the general-purpose computational fluid dynamics (CFD) software suite Flow-3D, developed by Flow Science Inc, USA.

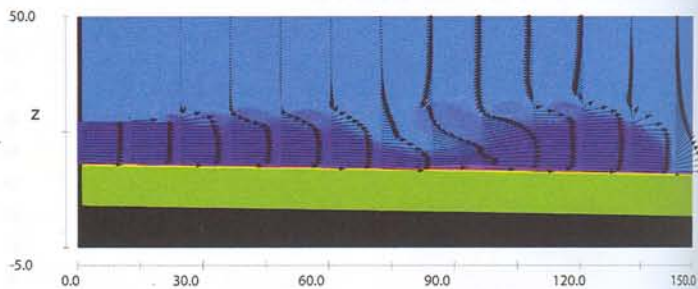
### SoS – Separation offshore Survey

Complex Flow Design provides analysis of offshore separation and performs detailed numerical simulations of oil/water/gas separators.

SoS – Separation offshore Survey is a numerical simulation and analysis tool that provides enhanced focus on and understanding of multiphase flow and separation efficiency in gravity separators.

Many practical, design and redesign applications for gravity separators can be performed by CFD modelling and simulations. Examples of this are:

- development of vessel inlet configurations that improve the uniformity of the gas and liquids flows
- sensitivity of separator design to changes in operating conditions
- influence of internal equipment on hydraulic efficiency and separation performance.



Deep-water petroleum reserves – deterministic process modelling.

### Deterministic process modelling – MassFlow-3D

- test play concepts and reduce uncertainty of geological models
- improve the understanding of mass flow processes
- simulate transport and spatial distribution of sediments
- visualise the evaluation of the whole depositional system.

Sedimentary successions of ancient gravity-flow deposits are important reservoir rock hosting hydrocarbon resources in many parts of the world, which renders the submarine mass flow processes to be of great interest to the petroleum industry. Reliable numerical modelling of sediment gravity flows and their deposits is needed. ●

### [ Further information ]

Complex Flow Design AS  
Tel: +47 73 546 366 | Fax: +47 73 546 367  
Email: [cfcd@cfcd.no](mailto:cfcd@cfcd.no) | Website: [www.cfcd.no](http://www.cfcd.no)





Lab wear tested



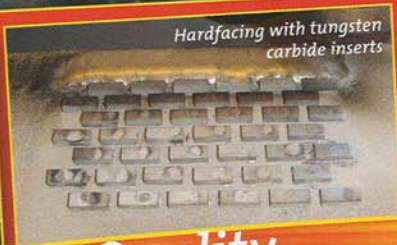
Plasma powders



Hardbanding Service



High velocity oxy fuel thermal spraying



Hardfacing with tungsten carbide inserts



Hardbanding Machines

Technology

Quality

Service

# Exciting New Wear Solutions for Oil and Gas...



**Stronger, with**  
Castolin Eutectic

Lowest Casing Wear - Low friction  
High wear resistance

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