Korea monthly shipbuilding magazine

KORSHIP

Shipbuilding · Offshore · Oil & Gas · Offshore wind

2017. 4

Kormarine
Official Magazine
코마린
전시회 공식 매체

115년 전통의 독일가스 전문업체

Continuous measurement of gases

ADOS GTR 210

Application :
Chemical industry, Manufacture of paints and varnishes, Plastics processing plants, Sewage works, Biogas plants, Gas-fired boiler systems, Liquid gas storage houses, Laboratories, Oxygen concentration, measurements, Refineries, Cold storage houses, (ammonia monitoring), Paint spraying booths, Gas tankers, Container ships, Offshore plattforms, Applications in aggressive environments

(주)인터피엔
INTERPEEN

서울시 구로구 디지털로 26길 111 JnK디지털타워 210호
전화 : 02)6124-5750~2 팩스: 02)6124-5753
URL: www.interpeen.co.kr
E-mail: msbang@interpeen.co.kr

월간 KORSHIP 발행

2016년 개정판

조선 & 해양 총람

Offshore & Shipbuilding Guide

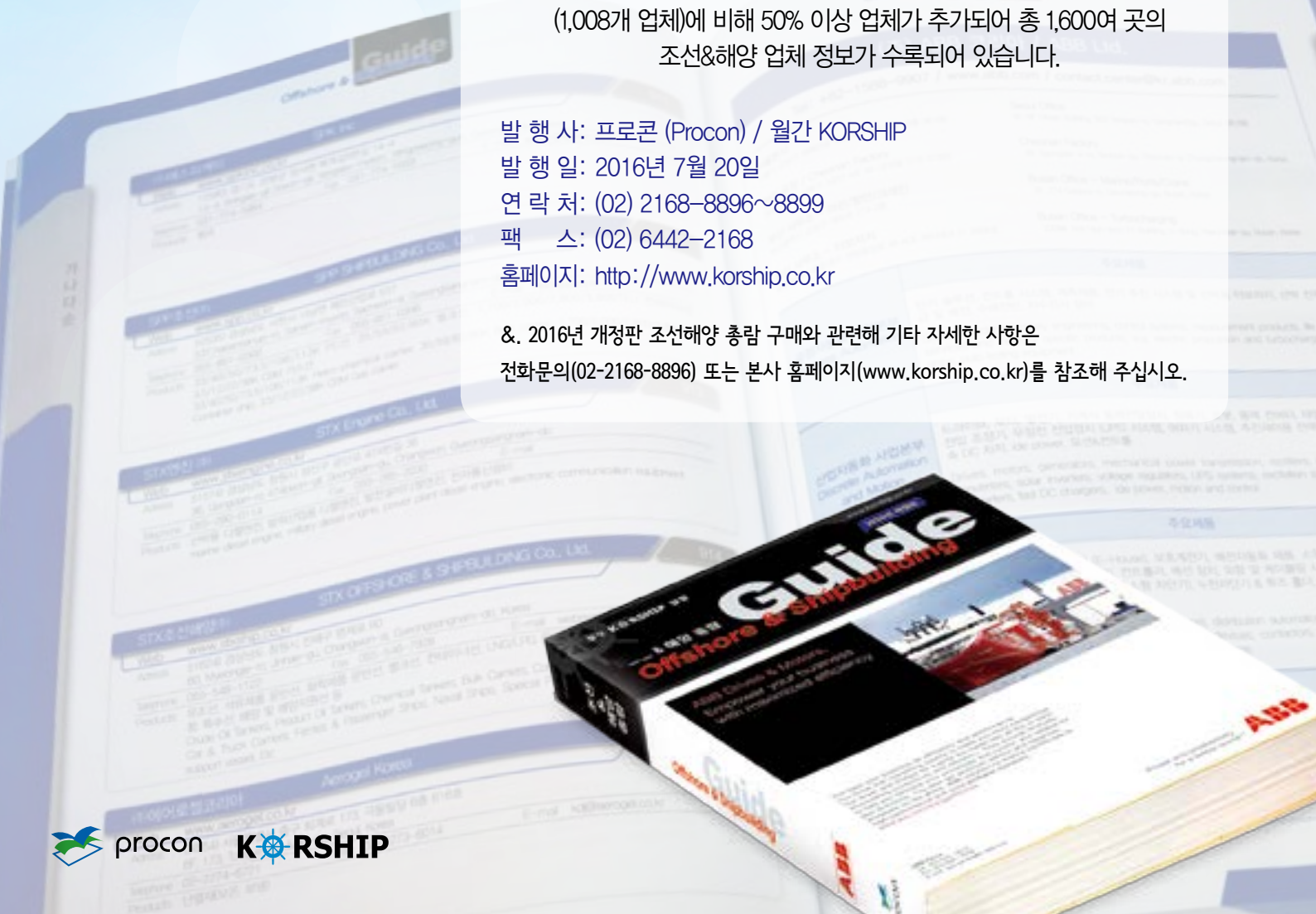
조선&해양 총람 '2016년 개정판' 발행

월간 KORSHIP은 지난 2013년 조선해양 관련업계의 관심과 협조에 힘입어 국내 처음으로 '조선&해양 기업총람(Offshore & Shipbuilding Guide)'을 제작해 발행했습니다.

이번에 월간 KORSHIP은 국내 조선업계의 요구에 따라 '2016년 개정판'을 새롭게 발행하게 되었습니다. 2016년 개정판은 기존 2013년 총람 (1,008개 업체)에 비해 50% 이상 업체가 추가되어 총 1,600여 곳의 조선&해양 업체 정보가 수록되어 있습니다.

발 행 사: 프로콘 (Procon) / 월간 KORSHIP
발 행 일: 2016년 7월 20일
연 락 처: (02) 2168-8896~8899
팩　　스: (02) 6442-2168
홈페이지: http://www.korship.co.kr

&. 2016년 개정판 조선해양 총람 구매와 관련해 기타 자세한 사항은 전화문의(02-2168-8896) 또는 본사 홈페이지(www.korship.co.kr)를 참조해 주십시오.



Welcome aboard

From bow to stern, Alfa Laval has the solutions to keep you ahead in a changing marine industry.

You can easily explore many of our key products via your smartphone.

ALFA LAVAL

www.alfalaval.co.kr

For more information, please visit to www.alfalaval.co.kr

Nexans

생활에 에너지를 전해주는 넥상스

Photos credits: © Thinkstock, SNATCH! & SNATCH! + duke

석유와 가스를 시추하는 해양구조물도 품질과 성능을 보장하는 케이블에서 시작합니다.

더 멀리, 더 깊은 곳에 설치되는 해양구조물에 필요한 것은 안전과 성능입니다. 극동전선이 공급하는 해양용 전선은 화재에 안전하고 극저온에서도 작동가능 할뿐만 아니라, 프로젝트가 요구하는 특성을 만족하는 맞춤형 전선을 제공하여 고객의 가치창출에 기여합니다.

www.cablekukdong.co.kr / www.nexans.co.kr

Kukdong

a Nexans company

KROHNE

measure

정직한 유량계

the facts

▶ OPITBAR PM 5060

Pressure measurement of process pressure, differential pressure, and hydrostatic pressure

- Measure range up to 1000 bar
- Process temperatures up to 200°C / 392°F
- Fully welded metallic process diaphragm
- Extremely quick step response times 〈 85 ms

great partnership

크로네한국지사 | http://www.krohne.co.kr
Tel: 82-2-782-1900

서울 영등포구 여의도동 43 미원빌딩 508호 / mail@krohne.co.kr
부산마린센터 / 여수지부 / 울산지부

FLUENTA SEIKO

지난 프로젝트는 일정과 예산을 초과했습니다.
다음 프로젝트는 규모가 더 큽니다.
더 끔찍한 결과를 겪지 않으려면
이제는 다르게 접근해야 합니다.

IT'S IMPOSSIBLE

프로젝트 확실성(Project Certainty)의 시기. 에머슨은 자본 프로젝트에 새로운 관점으로 접근하여 계획된 예산과 일정을 지킬 수 있도록 돕습니다. 혁신적인 제품과 서비스로 복잡성을 줄이고, 불필요한 비용을 제거하고, 변화를 수용할 수 있는 방법을 제시합니다. 설계, 엔지니어링, 프로젝트 관리를 개선하여 신뢰성 높고 예측 가능한 프로젝트로 만들 수 있습니다. 더 자세한 정보는 **www.emersonprocess.com/projectcertainty**에서 확인하세요.

에머슨 오토메이션 솔루션즈
대표전화 02-3438-4600 www.emersonprocess.co.kr

EMERSON.

EMERSON. CONSIDER IT SOLVED.

최고의 나노기술 아크릴계 수성 나노페인트

나노팜

아크릴계 수성 도료에서는 실현할 수 없었던 꿈!
(완전 수성 일체형 아크릴 에멀젼 페인트)

친환경 나노팜 방오도료
Anti-Pollution

해양 부유물 부착을 방지하여 선박의 운항효율을 증대시킬 뿐만 아니라 선박의 연료 소모량을 줄임으로써 이산화탄소 배출량을 감축하는 탁월한 효과가 있습니다.

나노팜 도료만의 탁월한 장점

- **친환경 수용성 도료**(유기, 유해물질 불포함)
- **강한 접착력**(콘크리트, 목재, 금속, 염화불소, 수지, 섬유 등)
- **다양한 용도**(방오, 방청, 선저방조, 내후성, 내열, 차열)
- **취급이 용이한 "완전수성 액상"**(솔, 롤러, 건등 시공 가능)
- 알루미늄, 스텐, 구리 등에도 사용가능

취급도료 | **수성 방수 도료** | **수성 차열 도료** | **수성 단열 도료** | **수성 절연 도료** | **수성 내열 도료** | **특수 발열 시트** |

제조원 **ナノファーム株式会社**
長野県駒ヶ根市赤穂11476番地23
【お問い合わせ】電話 0265-98-0621 FAX 0265-98-0622
メールinfo@nano-farm.co.jp
【ホームページ】http://www.nano-farm.co.jp/

한국총판 H2C **(주)에이치투** H2 CORPORATION | 서울 서초구 서초대로 48길 89-4 UH빌딩 501호 TEL. 02. **501-1589** / FAX. 02. 501-2554

대리점 HB **한벤하이테크** HAN BEN HIGH TECH | 서울시 마포구 모래내로1길 3 한두빌딩 307호 TEL. 02. **303-0816** / FAX. 02. 303-0814

BOOST PRODUCTIVITY BY 30 PERCENT

Intergraph Smart™ 3D

Gain a competitive edge and accelerate projects with Intergraph Smart 3D, the first and only next-generation 3D plant design solution for the process, power, and marine industries. Smart 3D delivers at least 30 percent more productivity than any other system available today.

Smart 3D now offers powerful rules and relationships that automatre repetitive tasks, enforce design standards, ensure design integrity, and protect design consistency. Benefit from enhanced support for mega-projects thanks to global worksharing, model data reuse, and safety-centric rules.

See demonstrations, case studies, webinars, and more:
www.intergraph.com/go/smart3d

INTERGRAPH KOREA OFFICE
서울특별시 종로구 종로 33(청진동) 그랑서울 타워1 12층 (03159)
김효진 과장/기술영업본부 Tel: +82 2 3489 0337
www.intergraph.co.kr

PART OF HEXAGON

INTERGRAPH®

FLEET XPRESS의 강점

월등한 통신 서비스

Inmarsat의 새로운 해상 위성 통신 서비스는 이전에는 불가능했던 여러가지 통신을 가능하게 합니다. Fleet Xpress는 전 세계에 뛰어난 성능, 심플함과 안정성을 해양업계에 제공해 드립니다.

끊김 없는 통신 | 성능 보장 | 효율적인 비용관리 | 서비스 일체 관리 | 비지니스 어플리케이션

새로운 차원의 글로벌 통신 서비스

inmarsat.com/gxfx

inmarsat
The mobile satellite company

Gastech
Conference & Exhibition

2017년 4월 4 - 7일
마쿠하리 메세 지바현,
일본 도쿄

주 최 : Japan Gastech Consortium

다이아몬드 레벨 스폰서 :

Advancing the World's Gas and LNG Value Chain
전세계 가스 그리고 LNG 가치 사슬의 발전

컨퍼런스 전체 프로그램을 지금 공개합니다!

최고의 업계 전문가들의 통찰력있는 발표 확정

Patrick Pouyanné
최고경영자
Total

Ryan M. Lance
최고경영자
ConocoPhillips

Alexey Miller
최고경영자
경영위원회 회장
Gazprom

Sultan Ahmed
Al Jaber
아랍에미레이트 장관
최고경영자
Abu Dhabi National Oil Company

Maarten Wetselaar
통합 가스 부문 부회장
Royal Dutch Shell

25,000+	2,500+	600+	70+	130+
전시 참가자	컨퍼런스 참가자	글로벌 전시 업체	해외 참가국	컨퍼런스 발표작

일본 가스텍 컨소지엄의 지원과 함께 합니다

JERA · Mitsubishi Corporation · MITSUI & CO. · TOKYO GAS · INPEX · ITOCHU Corporation · JAPEX · JX Group · Marubeni · Sumitomo Corporation

가스텍 컨퍼런스 프로그램을 지금 다운 받으십시오
www.gastechevent.com/korship

survitecgroup Wilhelmsen

AN EXPERT SAFETY PARTNERSHIP YOU CAN TRUST

Introducing SURVITEC MARINE SOLUTIONS

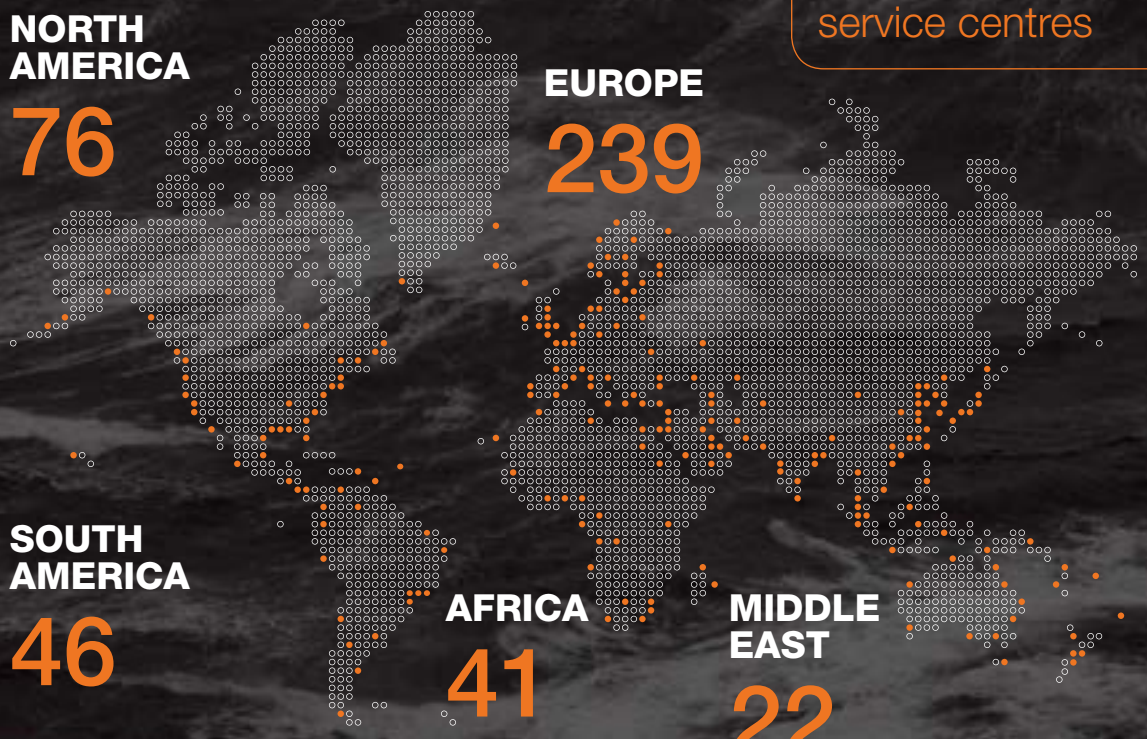
The merger of Survitec Group with the safety business of Wilhelmsen Maritime Services AS forms a new global leader in marine and offshore safety solutions.

Find out more at **survitecgroup.com/news**

Product Portfolio in Marine Safety

Life boats | Rescue boats | Life rafts | Safety clothing | Life-saving equipment | Fire-fighting equipment | Inert gas system | Fire fighting solutions

Over **50** Survitec owned, **500+** partner owned service centres



NORTH AMERICA 76

EUROPE 239

ASIA 64

SOUTH AMERICA 46

AFRICA 41

MIDDLE EAST 22

OCEANIA 27

8 manufacturing locations and **15** offshore support centres

Survitec Group

Email: info@survitecgroup.com

www.survitecgroup.com

EchoLogger

영업파트너 찾습니다

정밀 수중 관측 음향 측심기

-초소형 전문가용 관측 장비
-듀얼(dual) 주파수(200 & 450 kHz)
-USB 타입 / Serial 인터페이스
-퇴적 침식 모니터링
-세굴(scour) 모니터링(댐,교각)
-Bathymetry

고해상도 수중 영상 소나

-실시간 정밀 수중 영상
-수중 탐사/ 구조 (SAR)
-정밀 세굴(scour) 모니터링
-양식장 감시
-항만/발전소 감시용

(주)이오브이울트라소닉스
www.echologger.com TEL:02-3158-3178

All Made in Korea
대한민국에서 만듭니다.

67% 개발시간 단축

mapp TECHNOLOGY 을 경험해 보십시오.

B&R Korea
경기도 안양시 동안구 평촌대로 212번길 55 대고빌딩 11층 tel. 031-476-4768 fax. 031-478-4767

- < 소프트웨어 품질 향상
- < 유지보수 비용 감소
- < 투자 위험 감소
- < 기계 가용성 증가

www.br-automation.com/mapp

PERFECTION IN AUTOMATION
www.br-automation.com

FULL-MULTI SLIM STYLE CONVERTER JC8000

온도 센서로부터 제공받은 값이 JC8000을 통해 기록계와 지시계 및 냉동창고 제어 시스템으로 빠르고 정확하게 전달되어 집니다.

무선 대형 지시계

RF 무선 통신 기능을 통해 어느곳에서든 중앙 제어 장치와 값을 주고 받는 것이 가능합니다.

제약회사에서 JC8000 활용 시 이처럼 분리 된 여러장소로부터 입력 값을 편리하게 받을 수 있습니다.

JY CNS JOOYOUNG CONTROL&SYSTEM 주영씨앤에스(주)

FULL-MULTI SLIM STYLE CONVERTER JC8000

공간절약이 용이한
'슬림형 스타일'

오차범위 **0.05%** 이내의
매우 뛰어난 정확도

ISM밴드(**2.4Ghz**)를 사용하는
RF기능을 탑재하여 자사의
제품들끼리는 **무선연동**이 가능

TC 13가지 RTD 11가지 그 외 4가지
신호가 입력 가능한 **'풀멀티형 컨버터'**

응답속도가 빠르고
안정적(galvanic-ISO)인 신호전달이 가능

스위치를 이용한 손 쉬운 **입력모드**
변환 입력저항이 필요없음.
ex) **mA→volt**

손쉬운 설정부터 POWER 유저를 위한
정밀한 세부설정까지 사용자 편의 위주의
메뉴 설정

JC8000의 적용

로 드 셀

초음파 레벨

유 량

JY CNS
JOOYOUNG CONTROL&SYSTEM
주영씨앤에스㈜

경기도 부천시 오정구 석천로 397 303동 408호 (삼정동, 부천테크노파크 쌍용3차)
TEL: (032)624-3101 FAX: (032)624-3102 E-mail:jooyoung@totalgauge.co.kr
www.totalgauge.co.kr / www.unicell.co.kr

"코닉스가 만들면 다릅니다."

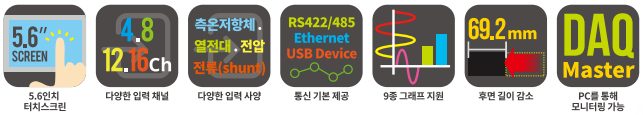
KONICS

컬러는 더욱 강렬해지고, 성능은 더욱 진화되었다!

TFT COLOR LCD 터치스크린 기록계

KRN1000 Series CE KC

- 5.6인치 TFT Color LCD(640X480) 터치스크린 채용으로 높은 시인성과 설정 편의성 제공
- 최대 16개의 입력 채널 및 27종의 입력 사양 {TC, RTD, 전압, 전류(Shunt)} 지원
- 다양한 통신 방식 (USB Device, RS422/485, Ethernet) 기본 제공
- 25~250ms 고속 샘플링, 1~3600초 기록 주기
- 내부 저장 메모리(200MB) 및 외부 SD/USB 메모리 (32GB) 지원
- 외부 SD/USB 메모리에 내부 데이터 백업 가능
- 9종의 다양한 그래프 지원
- 4종의 옵션 입/출력 선택 가능 : 디지털 입력(무접점/유접점), 경보출력, 트랜스미터용 전원 출력
- 콤팩트 설계를 통한 설치 공간 절감 (후면 길이 : 69.2mm)



69.2mm

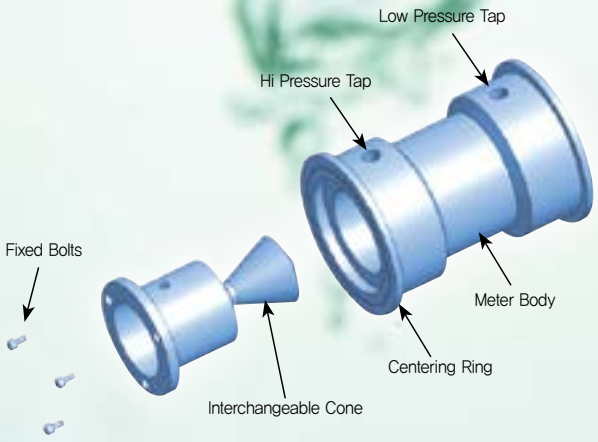
(주)코닉스
본사 / 공장 / 교정실 : 인천광역시 연수구 벤처로 36번길 37
영업팀 TEL : 032-820-2300 / FAX : 032-813-9981
교정실 TEL : 032-820-2411~4 / FAX : 032-811-9700 / A/S센터 TEL : 032-820-2356~7 / FAX : 032-813-9979
www.konics.co.kr

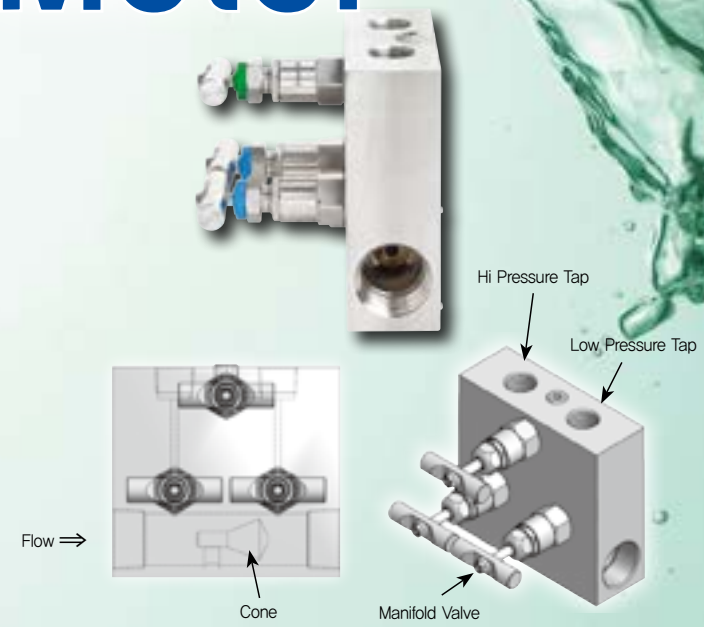
c UL us CE ISO 9001 KOLAS 국가공인교정기관 (인증번호 : KC01 ~ 072)

(주)하이트롤과 함께하는 Oil & Gas Companies

Cameron ExxonMobil Chevron TOTAL bp

Cone Meter





HFV-WM (Wafer type Cone Meter) **IVCM** (Integral Valve Cone Meter)

DP HiCone Meter

DP HiCone Meter는 일반적인 차압유량계의 일종이며 차압유량계와 같은 물리적 원리에 따라 유량을 측정합니다. 조임부 역할을 하는 Cone은 Meter body 중앙에 위치하여 유체의 흐름에 따라 유속을 증가시키고 차압을 발생시킵니다. 두 개의 검출 Tap은 High 와 Low pressure를 DP 전송기로 보내 유량을 지시합니다.

70 % 전단 3D 후단 1D의 짧은 직관부를 가짐에 따라 플랜트 건설에 최대 70 %까지 원가를 절감하는 효과를 가집니다. (미국 CEESI에서 API 22.2 TESTING)

±8 % Cone Meter는 제조공정상의 사소하게 보이는 차이에도 교정하지 않으면 최대 ±8 % 의 오차가 발생할 수 있습니다. 정확도 ±0.5~1 % 수준의 정밀한 유량측정을 위해서는 반드시 교정을 해야 합니다. (미국 CEESI에서 발표한 내용중)

하이트롤에서 생산되는 Cone Meter는 **ISO 17025 국제공인 교정시스템**에 의해 교정하며 ±0.5 %의 정확도를 가집니다.

HFV-WM

HFV-WM은 Meter body의 교체 없이 Cone을 교체하여 유량 범위를 변경할 수 있으며, 과도한 유속 또는 슬러그 뭉치의 충격으로 인한 Cone의 변형에 쉽게 교체 사용할 수 있는 특징을 가지고 있다. 또한, Wafer형태로 설치가 용이하고 모든 구성품이 정밀 기계가공되어 측정정확도가 우수하며, 용접부가 없어 압력부의 건전성이 확보 되었다.

(특 허 : 제 10-0915088호)

IVCM

IVCM은 차압식 유량계의 필연적 구성품인Manifold Valve를 Meter body와 일체형으로 제작하여 공정시 발생할수 있는 연결부의Leak를 최소화 하고, 설치시 공사 비용 및 시간을 줄이는 장점을 가진다.

(특 허 : 제 10-0915089호)

HITROL CO., LTD.

FCC CO., LTD.
FLOW CALIBRATION CENTER

유체 유량(ISO 17025) 국제 교정기관

(주)하이트롤 본사 · 공장 · 연구소
경기도 파주시 조리읍 팔학골길 141
TEL : (031) 950-9700 FAX : (031) 943-0878/5600
http:// www.hitrol.com E-mail : hitrol@hitrol.com

(주)에프씨씨
TEL : (031) 950-9752 FAX : (031) 950-9796
E-mail : fcc@hitrol.com

Analog signals reliable and safe

SIL IEC 61508 PL EN ISO 13849

Shipbuilding 산업에 특화된 아이솔레이터(방폭용 포함)제품군

고객의 장비 및 시스템의 최적화 및 안정적인 기능 구현 제공

: **MACX** 를 통해 신호 필터, 증폭, 아이솔레이팅 기능을 **SIL** 인증 규격에 맞춰 제공 가능합니다.

또한 방폭 위험 지역 내에서 안정적인 신호 구현을 위한 본질 안전 회로가 최적화 되어 있습니다.

피닉스컨택트 주식회사
대표전화: 1899 - 2166
www.phoenixcontact.co.kr

PHOENIX CONTACT
INSPIRING INNOVATIONS

Mission Statement

Korship helps not only to share informations and technologies of shipbuilding & offshore industry between users and potential suppliers but also introduce subscribers up-to-date shipbuilding & offshore related technologies and informations to become a shipbuilding & offshore industry technical journal.

Korship puts advertising domestic companies in touch with abroad buyers and tries to contribute development and growth of domestic shipbuilding & offshore industries by introducing world's new technologies, news, companies and products to superintendents, engineers, Korea branch of abroad companies, domestic shipbuilding & offshore companies and all related companies.

Technology

World's up-to-date indispensible informations of shipbuilding & offshore companies, products and system technology described to help people who engage in the industry.

Special Focus

Provide articles deeply focusing on latest shipbuilding & offshore industry technologies, logistics and port etc.

Company & Comments

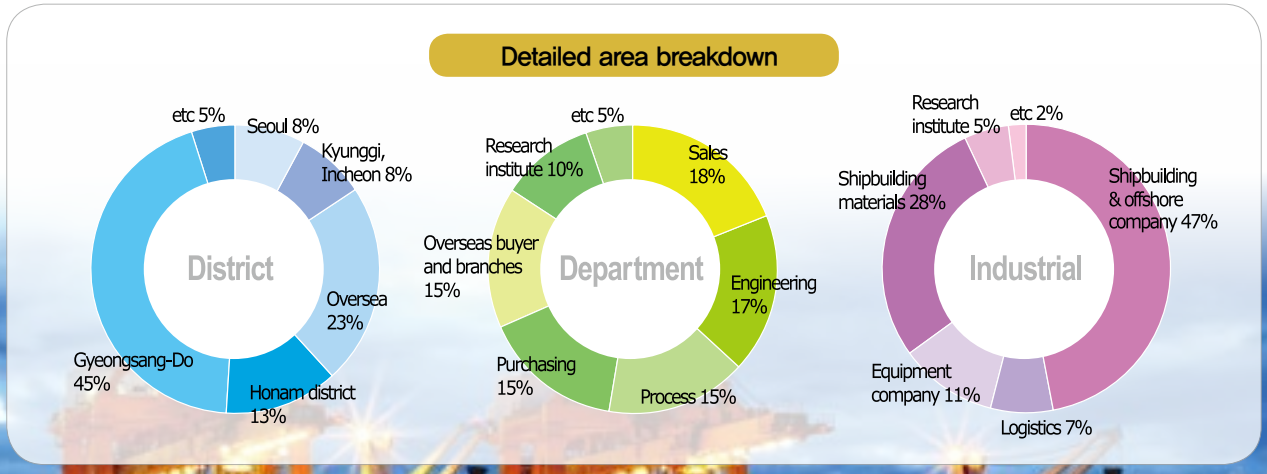
Introduce latest tendency and related news of industry through company interview.

Product

New shipbuilding & offshore industry products overview

Business News

Issues and news articles from global shipbuilding & offshore companies and organizations



Variable combinations for total compatibility with flexible motors and drives packages

To give even more flexibility in complying with safety standards, ABB's all-compatible ACS880 industrial drives offer several good possibilities. The easiest is simply to use an integrated ABB drive/motor package which has been pre-tested, dimensioned and certified together, according to the IECEx and ATEX standards. This combination saves time and money for designers and users in terms of safety certification, reliability and simplicity. http://new.abb.com/drives

ABB Ltd.
drive.sales@kr.abb.com

Power and productivity
for a better world™

KORSHIP | Shipbuilding Offshore Oil & Gas Offshore wind

Contents

Advertisers Index

Maersk Line and HMM's strategic cooperation officially launched

Maersk Group and Hyundai Merchant Marine (HMM) signed on 15 March, an agreement officially launching the strategic cooperation between Maersk Line, MSC and HMM on East-West trades. This strategic cooperation between 2M and HMM will include a series of slot exchanges and slot purchases on East-West routes.

"We are very proud of our strategic cooperation with Hyundai Merchant Marine, Korea's leading container shipping company," said Robbert van Trooijen, Maersk Line's Asia-Pacific Chief Executive. "We believe this strategic cooperation to be a win-win for all parties. Maersk Line's customers will have greater options on Trans-Pacific trades and HMM's customers will be able to leverage Maersk Line's strong Asia-Europe products."

The length of the cooperation is three years with an option to extend and covers key East-West trades.

"Maersk Line has a long history in Korea spanning 87 years. Since 1930, when the first Maersk Line vessel called Korea, Maersk Line has supported the global ambitions of Korean brands. Our partnership with Hyundai Merchant Marine is another link between Maersk Line and Korea," said Robbert van Trooijen.

머스크라인–현대상선, 전략적 협력 공식 출범

머스크 그룹과 현대상선은 머스크라인 (Maersk Line), MSC 그리고 현대상선 간 동서 서비스에 대한 전략적 협력 파트너십을 공식 출범하는 협의서를 지난 3월 15일 샌프란시스코에서 체결했다고 밝혔다. 2M 얼라이언스와 현대상선 간 체결되는 이번 전략적 협력은 동서 항로 서비스에 대한 선복교환과 선복구매를 포함한다.

로버트 반 트루이젠(Robbert van Trooijen) 머스크라인 아태지역 대표이사는 "한국의 대표 컨테이너 선사인 현대상선과 전략적 협력을 체결하게 되어 매우 기쁘다"며, "이번 전략적 협력은 관련 모든 기업에 윈–윈을 가져다 주는 것으로, 머스크라인의 고객은 환태평양 서비스에 있어 더 많은 옵션을 갖게 되며 현대상선의 고객들은 머스크라인의 강력한 아시아–유럽 상품을 활용할 수 있다"고 말했다. 덧붙여 "머스크라인은 당사 선박이 한국에 첫 기항한 1930년을 시작으로 한국에서 87년간의 역사를 자랑하고 있다"며, "머스크라인은 한국 브랜드들이 글로벌 시장 진출 및 확장에 기여해 왔으며, 금번 현대상선과의 전략적 협업으로 머스크라인과 한국 간 협력을 강화할 것"이라고 밝혔다.

이번 전략적 협력 기간은 3년으로 향후 연장하는 옵션을 포함하고, 핵심 동서 서비스를 두루 제공한다.

Emerson breaks ground for new facility in Yongin City, Korea

A groundbreaking ceremony was held in Jukjeon-dong on 22 Feb for a new facility that will consolidate and expand manufacturing, engineering, project execution and service capabilities by U.S.-based Emerson to serve its customers in Korea.

Construction of the 202,000-square-foot (19,000 square-meter) facility is scheduled to be completed in May 2018. The new, world-class facility will replace Emerson's existing office in Seongnam City that provides customer training and service and system staging and engineering of products for customers in Korea and overseas markets. The new building will also feature expanded demonstration and training center facilities, accommodating future growth while ensuring effective and efficient operations.

"Today's ground breaking ceremony represents the beginning of a new milestone as we

Emerson Automation Solutions has chosen to relocate its Korea office and facilities in Yongin City. They recently broke ground at the new site.

plan to integrate our various offices and centers across Korea under one, state-of-the-art headquarters building," said Chung Chen Fai, vice president and general manager, North Asia, Emerson Automation Solutions. "The new facility will better support our customers, as well as provide our employees a better working environment. We are excited to soon be a member of the community in Yongin City and we look forward to supporting Yongin City in its pursuit of high tech and clean city initiatives," said Chung.

한국 에머슨, 용인 신사옥 기공식 개최

에머슨 오토메이션 솔루션즈(Emerson Automation Solutions)는 지난 2월 22일 용인 죽전에서 에머슨의 제조, 공정, 프로젝트 수행 및 서비스 역량을 통합 및 강화하기 위해 신사옥을 건설하는 기공식을 가졌다. 세계적 수준의 신사옥은 19,000㎡(약 5,748평) 규모로 내년 5월에 완공될 예정이며, 국내외 고객을 대상으로 트레이닝 및 서비스, 시스템 스테이징 및 제품 엔지니어링을 제공해온 에머슨의 기존 성남 본사 및 트레이닝 시설을 대체하게 된다. 용인 신사옥에는 시연 및 트레이닝 센터 시설이 확충되어 보다 효과적이고 효율적인 프로그램 운영이 가능해지며, 에머슨 성장에 발판을 제공할 것으로 기대된다.

에머슨오토메이션 솔루션즈 한국 대표이사 겸 북아시아 지부사장 충 첸 화이(Chung Chen Fai)는 "오늘 기공식은 국내 전역에 위치한 에머슨 사무소를 최첨단 시설을 갖춘 본사 건물로 통합하기 위한 새로운 여정의 시작을 의미한다"며, "용인 신사옥은 에머슨 임직원에게 더 나은 근무환경을 제공할 뿐만 아니라, 고객에게 더욱 향상된 서비스를 제공할 것"이라고 말했다.

KR was designated as inspection agency for boilers and pressure vessels exported to Singapore

Korean Register of Shipping (KR) announced on March 14 that it was designated by Singapore's Ministry of Manpower as a third party inspection agency verifying the stability and performance throughout entire processes ranging from design review to production of boilers, pressure vessels, heat exchangers, valves, etc., manufactured in Korea and exported to Singapore.

Acquisition of overseas certification is a prerequisite for export customs clearance, but different standards of each country, including lack of related information and complex procedures, have brought many difficulties to domestic manufacturers. With the designation of KR as a third party inspection agency of Singapore, the export of domestic boilers and pressure vessels to Singapore will be eased significantly.

An official from the KR said, "Recent designation as inspection agency would not have been possible if we did not have technologies and track records of successfully inspecting more than 1,000 boilers and pressure vessels every year. We will make efforts to provide one-stop services underpinning the efforts of domestic manufactures for overseas certification."

KR was designated as inspection agency for boilers and pressure vessels in Europe, India, Japan and Singapore and is currently placed on the list of U.S. Department of Transportation for the agencies inspecting the vessels used to transport hazardous materials.

한국선급, 싱가포르 수출용 보일러 및 압력용기 검사기관으로 지정

한국선급(KR)은 싱가포르 노동청(Ministry of Manpower)으로부터 대한민국에서 제작해 싱가포르로 수출하는 보일러 및 압력용기와 열교환기, 밸브류 등의 설계검토부터 제작까지 안정성과 성능을 검증하는 제3자 검사기관으로 지정되었다고 지난 3월 14일 밝혔다.

해외인증획득은 수출통관에 필수 조건이지만 각 나라별로 상이한 규격 때문에 국내 제조업체들은 그간 관련 정보부족, 복잡한 절차 등 많은 어려움을 겪고 있었다. 이번 한국선급이 싱가포르 제 3자 검사기관 지정됨에 따라 국내 제작 보일러 및 압력용기를 싱가포르로 수출하는데 큰 도움이 될 것으로 기대된다.

한국선급 관계자는 "이번 검사기관 지정은 한국선급이 보유 중인 연간 1,000여건 이상의 보일러 및 압력용기 검사실적 등의 경험과 기술력이 없었으면 불가능했을 것"이라며, "앞으로도 국내 제조업체의 해외인증 획득을 기술적으로 지원하는 One-stop 서비스 제공을 위해 노력하겠다"고 밝혔다.

한국선급은 현재 유럽, 인도, 일본, 싱가포르의 보일러 및 압력용기 검사기관으로 지정된 바 있으며, 미국 운수부(Department of Transportation)로부터 위험물 운송용기 검사기관으로 등록되어 있다.

DSME sells its equity stake in KOMARF to secure liquidity

Daewoo Shipbuilding & Marine Engineering (DSME) is making all-out efforts to carry out its self-rescue plan and secure liquidity for normalization of operations. DSME announced that it decided to dispose of its 35.29% stake in the Korea Marine Fund Corporation (KOMARF) and participate in open bid.

KOMARF was established in 2003 to undertake operations entrusted by ship investment companies, such as ship acquisition, fund borrowing, management and disposal of acquired vessels, etc. It has KRW 8.5 bil-

lion in capital, about KRW 9.5 billion in equity capital, and approximately KRW 2 billion in sales (as of late 2015). DSME plans to select preferred bidder based on outcomes of due diligence to be completed by late March after receipt of the Letter of Intent (LOI) for acquisition by March 2.

An official from DSME said, "We are pouring our efforts into implementing our self-rescue plan and securing liquidity. We will make our utmost effort to dispel rumors about alleged impending crisis in April."

Meanwhile, DSME is poised to move ahead with its self-rescue plan worth about KRW 2.5 trillion this year without disruption, including sales of its subsidiaries such as Welliv, DSME Construction, etc.

대우조선해양, 유동성 확보 위해 한국선박금융 지분 매각

대우조선해양이 경영정상화를 위한 자구계획 이행 및 유동성 확보를 위해 총력을 기울이고 있다.

대우조선해양은 자사가 보유중인 한국선박금융(KOMARF)의 지분 35.29%를 매각하기로 결정하고 공개입찰에 들어갔다고 밝혔다.

한국선박금융은 지난 2003년 선박취득, 자금차입, 취득선박의 관리 및 매각 등 선박투자회사의 업무를 위탁운용하기 위해 설립된 회사다. 자본금 85억원, 자기자본 약 95억원, 매출 약 20억원(2015년말 기준)이다. 대우조선해양은 오는 3월 2일까지 인수의향서를 접수받아 3월말까지 실사 등을 거쳐 우선협상대상자를 선정한다는 계획이다.

대우조선해양 관계자는 "자구계획 이행 및 유동성 확보를 위해 총력을 기울이고 있다"며, "현재 거론되고 있는 4월 위기설 불식을 위해 최선을 다하겠다"고 말했다.

한편 대우조선해양은 웰리브, 대우조선해양건설 등 자회사 매각을 포함해 올해 목표한 2조 5,000억원 규모의 자구계획을 차질없이 진행할 예정이다.

KOGAS signed a MOU with DNV GL, SHI, and KC LNG Tech for LNG bunkering business

Korea Gas Corporation (KOGAS) announced that it has signed a MOU with DNV GL, Samsung Heavy Industries (SHI), and KC LNG Tech to develop Korean indigenous STS (Ship to Ship) LNG Bunkering Procedure. This Procedure refers to the specification for LNG bunkering, such as sequence of LNG bunkering that uses LNG as propulsion fuel, various safety standards, safety facilities, bunkering flow rate, gas quality, etc. Under this MOU, the 4 companies, including KOGAS, plan to complete development of the STS LNG Bunkering Procedure for the first time in Asia within this year.

LNG bunkering is largely divided into 3 types: PTS (Pipe To Ship: transfer to vessels via pipelines onshore), TTS (Truck To Ship: transfer to vessels via tank lorry onshore), and STS for transfer of LNG fuel between vessels at the sea. Among them, STS LNG bunkering is said to be the most preferred by ship operators and expected to become a promising sector of LNG bunker industry in the period ahead.

Meanwhile, KOGAS is promoting purchase briefing sessions, participation in overseas exhibitions, involvement in joint technology development projects, etc., in a bid to underpin export diversification of domestic marine equipment manufacturers concentrated in Busan and Gyeongnam regions. As part of such endeavors, KOGAS entered into a contract worth approximately USD 43 billion for valves, pipes, communication systems, incoming panels, distribution panels and others last year.

(From the left) Goh Doo-yeong, Senior Managing Director of Samsung Heavy Industries (SHI), Heo Jae-yeong, President of Gas Research Institute of Korea Gas Corporation (KOGAS), Tommy Bjornsen, President of DNV GL, and Lee Cheol-hee, President of KC LNG Tech

한국가스공사, DNV GL, 삼성중공업, KC LNG Tech와 LNG 벙커링 사업 위해 MOU 체결

한국가스공사는 지난 2월 27일 DNV GL, 삼성중공업, KC LNG Tech와 '한국형 STS(Ship To Ship, 선박대 선박) LNG 벙커링 절차서 개발 MOU'를 체결했다고 밝혔다.

이 절차서는 LNG를 선박에 공급해 추진연료로 사용하는 LNG 벙커링의 진행 순서와 각종 안전 기준, 안전 설비, 벙커링 유량, 가스 품질 등 LNG 벙커링에 관련 된 내용을 기술한 규격서를 말한다. 한국가스공사를 비롯한 4개사는 이번 MOU 체결을 계기로 연내에 아시아에서 최초로 STS LNG 벙커링 절차서 개발을 완료할 계획이다.

LNG 벙커링은 크게 PTS(Pipe To Ship, 육상에서 배관을 통해 선박에 공급), TTS(Truck To Ship, 육상에서 탱크로리를 통해 선박에 공급), 그리고 해상에서 선박을 통해 다른 선박에 LNG 연료를 공급하는 STS로 나뉜다. 이중 STS LNG 벙커링은 선박을 운영하는 선사들이 가장 선호한다고 알려져 있어서 향후 LNG 벙커링 산업에서 주요 분야가 될 것으로

전망되고 있다.
한편 한국가스공사는 부산, 경남 지역에 밀집되어 있는 조선기자재업체의 수출 판로 다각화를 보다 적극적으로 지원하기 위해 구매설명회, 해외전시회 참가 지원, 기술개발 협력사업 참여 등을 추진하고 있다. 그 일환으로 지난해 밸브, 파이프, 통신시스템, 수배전반 등에 대해 약 430억 원의 계약을 체결한 바 있다.

ABS Advances LNG as Fuel Use with Novel Design Approval

ABS has granted Approval in Principle (AIP) for the Seatransporter-DF, a dual-fuel design concept developed by Algoship Designers Ltd. of Nassau, Bahamas. The design has the capability to accommodate multiple engine types as well as Type-C or membrane containment systems for LNG fuel.

"Technically innovative designs that advance the use of LNG as fuel will play an increasingly important role in the marine sector, and ABS is working alongside industry to enable this critical technological advancement," said ABS Executive Vice President for Global Marine Dr. Kirsi Tikka. "As industry considers future fuel strategies, design concepts that promote the use of LNG as fuel will play an increasingly important role in that mix."

As the marine industry continues to adjust to comply with more stringent air emission requirements, the use of LNG as a fuel will be adopted in more subsectors in the marine industry. Developed to help meet the current and upcoming international air emission standards, the Seatransporter-DF design can be used in Emission Control Areas (ECAs).

Algoship worked with CleanShips LLC of Stamford, CT, to develop a version of the bulk carrier design that would meet specific operational requirements without compromising cargo carrying capacity. The 38,000 DWT version is equipped with a 2,400m^3 LNG fuel containment system that could allow for approximately 100 days' endurance. Algoship is applying the same design philosophy to Panamax, Ultramax and Kamsarmax sized carriers and has determined that the dual fuel technology is also applicable to other vessel types.

Approval in Principle (AIP) for LNG-fuelled Seatransporter-DF

"ABS contributed to this effort as a trusted advisor, engaging early in the process to apply its rigorous engineering and safety standards and verify the feasibility of the design," said Algoship Designers Ltd President Antony Prince. "By working with ABS through its AIP process, we've been able to demonstrate that the Seatransporter was developed with a focus on safety and reliability and will be able to satisfy flag and port state requirements."

KR launches new ICT Center to accelerate development of advanced technology applications for the maritime industry

Korean Register (KR) has opened a new ICT (information communications technology) Center to dramatically enhance the application of advanced information and ICT across the maritime and ship classification industries.

The new high-tech facility has been launched in response to demand from the Korean shipbuilding and marine transport industries, keen to be more competitive in a challenging market. It seeks to address the fact that advanced onshore technologies have been difficult to adapt for maritime applications, because of the poor communication environment at sea and unique attributes of ships.

In line with the International Maritime Organization (IMO)'s e-Navigation strategy, the Korean Ministry of Oceans and Fisheries launched a SMART-Navigation project last year, which will run from 2016-2020 with a budget of 114 million USD. The

project aims to enhance safety around the Korean coastline, and to create a new market for efficient shipping.

As a member of the SMART-Navigation project team, KR is conducting research and development into leading technologies as a basis for new international maritime standards. Initially KR's new ICT Center is working to develop new advanced technologies for maritime Big Data, e-Navigation, ship cyber security and software quality assurance.

Lee Jeong-Kie, ICT Center Chairman and CEO of KR said, "The launch of KR's new ICT Center supports the Korean Government's SMART-Navigation project. Our specialist resources, expert skills and industry knowledge will accelerate the application of advanced technology to improve operational efficiency, dramatically reduce human error and help the industry to manage risk better. It will help us to deliver high quality expert ICT services tailored to the business needs of our customers, which will in turn then benefit the industry and the IMO's E-Navigation strategy".

The ICT Center will focus on finding ways to apply big data to operate vessels more efficiently, to identify safe navigation routes in real time, to understand accident statistics and manage risk better and to predict ocean characteristics, while CBM (condition based monitoring and maintenance) can be used to alert vessels to device failure.

While the application of these new ICT technologies improves safety, reliability, and effectiveness of ships onboard and onshore systems, at the same time it makes those systems increasingly vulnerable to cyber terror or threats, which could be disastrous for both the safety of the ship and human life. The IMO has established an interim standard for ship cyber security, and in direct response, KR is using its expertise to research domestic and foreign cyber securities and developing tailored security guidelines for different situations.

The new ICT Center is also developing new software test standards in line with ISO 25000, to verify the quality of IT software (naked eye and functional tests no longer being adequate) and will soon be able to offer its clients comprehensive software test services.

MacGregor and Rolls-Royce to explore implications of autonomy for container ships

MacGregor, part of Cargotec, and Rolls-Royce have signed a Memorandum of Understanding (MOU) to collaborate on research and development to explore the impact of developments in autonomy for cargo ship navigation and cargo systems onboard container ships. This collaboration will harness both companies' unique experience laying the groundwork for the development of autonomous container ships.

Asbjørn Skaro, Rolls-Royce, Director Digital and Systems, said "Rolls-Royce is pioneering remotely controlled and autonomous ships and believes such a remote controlled ship will be in commercial use by the end of the decade and a common sight on the high seas by 2030. For the full benefits of such a change to be realised many activities currently done today manually will need to be done autonomously. This research will help us explore how that might be achieved."

"As a leading provider of cargo handling solutions and services for container vessels, MacGregor brings a detailed knowledge of the cargo sector and can provide valuable insights into marine cargo operations and the technology and systems needed to make them as efficient and safe as possible," added Skaro.

Pasi Lehtonen, Senior Vice President, Strategy, Business Development and Marketing, MacGregor said "MacGregor wants to reshape and transform the industry to make it much more efficient, safer and more sustainable. In the segments where we operate, we see a lot of unnecessary waste in the forms of inefficiency, damage to cargo, and continuously dangerous working conditions. Our aim is to minimise this waste from the value network and this collaboration on autonomy for container ships is a good example of where industry leaders work together to transform the industry."

MacGregor PlusPartner program illustrates well how we at MacGregor are developing the efficiency by taking a whole-ship approach and working forward from the cargo profile. This must happen at an early stage of the ship project, before any restrictive decisions have been made. As a result of this forward-thinking approach, it is possible to improve the specified loading ability and the efficiency of the entire cargo handling system. Greatest example of this is the record-winning container ship Barzan, the first of United Arab Shipping Company's (UASC) six 18,800 TEU containerships built at Hyundai Samho Heavy Industries (HSHI), which set new standards in fuel and energy efficiency.

Hempel grows in North America

Hempel inaugurated its new North American Central Distribution Centre (CDC). This significant addition to Hempel's worldwide network further demonstrates its continuing commitment to bring trusted solutions closer to its customers.

This new CDC warehouse covers 202,000 sq. ft/18,766 sq m with 32 dock doors, and will be responsible for distributing Hempel's entire range of coatings to customers and stock points across North America. With manufacturing taking place in Dallas and Conroe, Texas, this strategic investment allows orders to be fulfilled and shipped in record time and at reduced cost.

Alongside these benefits, the CDC will also generate more than 30 new jobs in the first year alone - and contribute to the sustainable growth of Northlake and the surrounding local economy.

Henrik Andersen, Hempel Group President & CEO, said "We are delighted to be opening our new CDC here today. This new facility further cements our presence in North America. It takes us a step closer to our goal of achieving our 2020 strategy, Journey to Excellence, and supports our global growth. At Hempel, we are continuously investing in ways to streamline our operations so that we can deliver great customer service at a reasonable cost. This new facility allows us to do just that."

Eric Massey, Hempel's North America Regional Supply Chain Director, said "Today's opening proves that we are serious about achieving our 2020 Strategic Growth Initiative. With the launch of this new facility we will enhance customer focus, while delivering sustainable organic growth and achieving operational excellence. Our new centre utilises 6S methodology, state-of-the-art warehouse management systems and order fulfilment processes. This all leads to an increase in productivity and efficiency, driving business growth for Hempel and our customers."

Hempel delivers trusted solutions to the protective, decorative, marine, container, industrial and yacht markets.

ClassNK appoints new Executive Vice President

On 7 March, Dr. Toshiyuki Shigemi has been appointed as Executive Vice President as well as Executive Director of ClassNK. Yasushi Nakamura has stepped down as Senior Executive Vice President, and has been appointed as an Advisor to the Society.

Dr. Shigemi joined ClassNK in 1981. After a career including roles in plan approval, ClassNK's research institute, and on-site surveys, he took up the position of General Manager of the Development Department in 2008, where he was responsible for overseeing ClassNK's rule development activities for over one decade, at the time when class rules were undergoing major changes, such as development and update of the Common Structure Rules.

Dr. Shigemi graduated from the Department of Naval Architecture, Hiroshima University in 1981, and received his Doctorate of Engineering from Osaka University in 2003.

Increase in cost of raw materials forces paint suppliers to raise their prices

Over the last 12 months, the cost of raw materials used for manufacturing coatings has escalated significantly and affects the coatings industry worldwide, forcing Jotun to increase prices for marine-, protective- and powder coatings.

Prices of raw materials like epoxy, titanium dioxide and copper have increased by more than 20% over the last 12 months,

zinc metal prices have increased by more than 50% and polyester resin prices have increased substantially. Positive economic figures from China, USA, Japan and EU have led to higher demand for some raw materials, at the same time as the supply side has faced challenges. This combination drives marine-, protective- and powder coatings cost significantly upwards.

"We saw this trend and strived to avoid a situation where prices on our products should be affected. But when the costs of key components continue to increase significantly over time, it leaves us with no other option but to raise the prices on our affected products," said Geir Boe, Group Executive Vice President in Jotun Performance Coatings.

"We have tried to postpone price adjustments, and we are working closely with our suppliers with an effort to reduce the effect for our customers. However, at this moment we don't see how we can absorb the cost increase anymore. We do believe that our customers will understand the situation," added Boe.

Selektope® shortlisted for GREEN4SEA Technology Award

Gothenburg-based I-Tech, the inventor and supplier of the pioneering anti-fouling agent Selektope®, has announced that the technology has been shortlisted for the 2017 GREEN4SEA Awards in the category recognizing technological achievement, breakthrough or significant contribution to the maritime environment.

Now in their second year, the GREEN4SEA awards have already won a place in the maritime calendar by basing their appreciation of environmental excellence and sustainable shipping on a public, online vote hosted on the GREEN4SEA website. This year's winners will be announced during a welcome reception and award ceremony on the evening of April 4 2017, ahead of the GREEN4SEA Conference, in Athens.

"Last year was a breakthrough year for Selektope®, whose contribution to added performance in anti-fouling coatings gained increased recognition due to its ability to save costs through both reducing fuel and hull cleaning requirements, in addition to offering unrivalled static fouling prevention performance," said Philip Chaabane, CEO, I-Tech.

"Making the GREEN4SEA shortlist is an important acknowledgement that this unique, bio-repellent active agent that is fully approved for use in the EU and Asia has established a recognized position in the shipping market."

Selektope® is an organic, non-metal compound whose pharmacological mode of action works to combat barnacle settlement by temporarily stimulating the swimming action in barnacle larvae, deterring them from attaching to a ship's hull. It delivers powerful effect using only a few grams per liter of paint,

optimizing hull performance while sharply reducing biocide loadings.

Approved by Japanese, Korean, Chinese and European regulatory bodies progressively through 2014 and 2015, Selektope® has been used in a series of newbuilding and over-coating projects.

Alfa Laval methanol booster systems excel in over 4500 hours of operation

Alfa Laval FCM One Low-Flashpoint (LF) booster systems have been a clear success on methanol-fuelled tankers with ME-LGI engines. Now Alfa Laval is supporting MAN Diesel & Turbo as the engine series is further developed to work with LPG.

In late 2013, Alfa Laval was selected by MAN Diesel & Turbo to deliver Low-Flashpoint Supply Systems (LFSS) for the world's first methanol-fuelled tankers. Since 2012, the two companies had been collaborating broadly on fuel conditioning for MAN Diesel & Turbo's new two-stroke diesel engines with Liquefied Gas Injection (LGI) technology. But when the engine maker contracted to equip nine vessels with methanol-burning ME-LGI engines, methanol came quickly into focus.

"MAN Diesel & Turbo has worked closely with Alfa Laval in development projects like Exhaust Gas Recirculation, where Alfa Laval PureNOx technology cleans the circulation water," said Søren H. Jensen, Vice President and Head of R&D, Two-Stroke Business at

MAN Diesel & Turbo. “That, together with deep expertise in fuel conditioning, made Alfa Laval the natural choice to deliver the Low-Flashpoint Supply Systems for methanol.”

The finished booster technology, the Alfa Laval FCM One Low-Flashpoint (LF), was installed on tankers built at Minaminippon in Japan and Hyundai Mipo Dockyard in Korea. The vessels’ three owners, MOL, Westfal-Larsen and Marinvest, have since logged over 4500 running hours with the FCM One LF in the past three years.

“The effectiveness and market-readiness of our ME-LGI engine technology has been clearly demonstrated by the fleet,” said Kjeld Aabo, Customer Director at MAN Diesel & Turbo. “Alfa Laval’s low-flashpoint booster technology has played a significant role in that success, and we look forward to further cooperation as the application develops.”

In fact, new booster developments are already underway. MAN Diesel & Turbo is currently modifying the ME-LGI engine series to use LPG as an alternative fuel, and once again Alfa Laval is preparing the booster system.

Alfa Laval FCM One LFF - Methanol

After more than one year of development, the first Alfa Laval FCM One LPG will be delivered to the MAN Diesel & Turbo’s Copenhagen test site in the coming weeks.

“Tests of the engine and booster are expected to be completed by the end of 2017,” said Roberto Comelli, Business Manager, Fuel Conditioning Systems at Alfa Laval. “In the meantime, Alfa Laval is preparing to support MAN Diesel & Turbo when the first LPG-related orders come in. We are proud to be associated with LGI engine technology and to help bring more customers access to this low-emission alternative.”

New Two-Stroke Engine Uses VOCs as Fuel

The world’s first ME-GIE ethane combusting two-stroke engine has been delivered from MAN Diesel & Turbo licensee Mitsui Engineering & Shipbuilding Co., Ltd. (MES) in Japan. The Mitsui-MAN B&W 7G50ME-C9.5-GIE is the first engine in a series of three.

Further research has led to new possibilities for this engine leading to exciting new prospects for multi-fuel combustion including the combustion of waste gas.

“The ME-GIE engine was originally designed for the combustion of ethane gas, however, research has revealed that it is possible to operate the engine on volatile organic compounds as well. Accordingly, it is also a potential solution for the propulsion of shuttle tankers and VLCCs,” said René Sejer Laursen, Sales & Promotion Manager at MAN Diesel & Turbo.

The benefits of the diesel-type combustion are now fully exploited in the ability of the two-stroke engine to run on almost any gas quality without efficiency reductions, and in the complete combustion maintained by a relatively high gas injection pressure.

The engine will be able to run on a mixture of LPG, among which are included VOCs, and methane or ethane with unchanged gas mode efficiency. The mixture may contain as much as 50% LPG and the findings so far indicate that even larger amounts of LPG may be added to the gas.

MAN Diesel & Turbo sees significant opportunities in the development of this engine since the engine may also run on almost any form of waste gas. The waste gas could be the light hydrocarbons or volatile organic compounds (VOCs) emitted from crude oil during storage and when loading/unloading of crude oil. This opens for new applications of the engine in for example shuttle tankers, for power generation in remote power plants or in off-shore

The engine top section of a 6-cylinder ME-GIE engine.

applications, such as floating production storage and offloading vessels (FPSOs), where waste gas is abundant and poses a potential environmental hazard.

Tier III operation can also be met in combination with selective catalytic reduction (SCR) systems, either low- or high-pressure SCR. The engine can be delivered in the power range 5-90 MW.

Transas signs Satcom Global partnership to bring connectivity to THESIS

Transas, the innovative digital solutions provider, has signed a partnership agreement with Satcom Global to add integrated connectivity to THESIS on 8 Mar, its unified platform for digital operations on ships and in shore-based offices. Satcom Global is an established provider of global satellite services to the maritime industry.

The agreement will bring the benefits of Satcom Global's Aura VSAT network to vessels using Transas' navigation and voyage optimisation solutions on board, allowing them to connect seamlessly with shore-based fleet operations centres. The integrated bundle will marry Satcom Global's scalable and secure connectivity with Transas' state-of-the-art e-Navigation services, including electronic charts, associated e-Navigation tools, weather services and remote support.

This new relationship will enable Transas to extend the benefits of THESIS, connecting ship owners seamlessly with fleet operations centres as well as enabling a rich range of crew welfare functionalities including voice calls, email and web access.

Transas CEO Frank Coles, said "Joining the dots of the existing fragmented patchwork of standalone e-Navigation and fleet optimisation tools is the primary goal of the THESIS concept. This collaboration will close the circle, linking the dots between ship, fleet operations centres and ship traffic control centres. It adds further value to the platform of solutions Transas and its partners are bringing to the maritime industry. Furthermore, it will provide a solid platform to support the future evolution of fleet operation services as they become available."

Satcom Global CEO Ian Robinson, said "A strategic partnership with Transas marks the start of an exciting period for Satcom Global and is indicative of the direction in which the maritime industry is moving. Transas is committed to delivering innovation through its ecosystem, THESIS, and connectivity plays an indispensable role in its continued development."

Satcom Global will provide access to its global Ku-band network, providing Transas with a defined pathway into high-throughput broadband capacity. Through cost-effective and dedicated bandwidth, the satellite service provider can enable data exchange, such as ECDIS updates at the same time as generous connectivity for crew welfare services and data transfers related to vessel operations.

Frank Coles, Transas CEO, presents at the Transas Global Conference in Malta last week

Ian Robinson continued "This provides vessel owners both cost savings and efficiency gains as we move towards a more connected and safer ship. The collaboration is also an opportunity for us to enhance our maritime value added services offering, with access to Transas' extensive portfolio, reaffirming our commitment to delivering world class solutions to our global customer base."

Shell Is First Lubricants Supplier To Secure MPA Act Accreditation

Shell Marine has become the first company involved in the development, supply and support of marine lubricants to receive accreditation under the International Marine Purchasing Association's IMPA ACT Sustainable Maritime Suppliers scheme. The preferred supplier status is conferred within the IMPA Responsible Supply Chain Management Initiative which seeks to improve the economic, social and environmental sustainability of international shipping and marine industries.

"We, at Shell Marine, are delighted to be the first in our sector to secure accreditation under the scheme," said Jan Toschka, Executive Director Shell Marine. As a global supplier with more than 30 blending plants and a maritime supply network of more than 700 ports in 58 countries, anyone visiting or working with Shell Marine will know how seriously we take our responsibilities as a world citizen.

"However, we also realise it is imperative that our own strict code of ethics is fit to stand up to the scrutiny of external parties. That's why we see this recognition under

Shell's marine lubricant supply network extends to more than 700 ports in 58 countries

the IMPA ACT scheme as particularly important. Our customers also confirm that the IMPA ACT preferred supplier status is being used as a benchmark for quality throughout the supply chain."

Members are leading ship owning and managing companies whose commitment is to implement the IMPA ACT Supplier Code of Conduct both within their company and through their supply chain. Preferred Supplier accreditation is awarded to those organizations that meet the IMPA ACT standards or reach agreed milestones, in a process that is fully audited by IMPA and may be subject to spot checks.

"IMPA ACT is an exclusive community of ship purchasers and suppliers working to become sustainability frontrunners by working towards compliance with internationally endorsed standards," said Stephen Alexander, IMPA Secretary General & COO. "It is an independent initiative representing international best practice and is aligned with UN principles."

Roxtec Services expands in North America

Global safety seal provider Roxtec follows its expansion plan and launches its second specialized service company offering inspections and maintenance of cable and pipe transits. The new Roxtec Services US LLC is a subsidiary of Roxtec Services AB. It is based in Houston, Texas, and will cover ships and offshore units all over North America.

Roxtec Services is aiming to expand into several key markets around the world. Roxtec Services US LLC has experienced a good start and has already begun working on inspection projects. The services include inspections, maintenance and repair work concerning cable and pipe transits.

"We established Roxtec Services AB in 2016 because we know many existing ships and rigs do not meet official safety requirements. By offering our services we can contribute to increased safety for people and assets," sadi Fredrik Timonen, Managing Director of Roxtec Services AB.

Hempel appoints new Chief Commercial Officer

Michael Hansen will take up his position on 1 May as new Executive Vice President & Chief Commercial Officer (CCO) at Hempel, one of the world's leading coatings manufacturers.

Michael Hansen will be part of Hempel's Executive Management Board, reporting directly to Group President & Chief Executive Officer (CEO) Henrik Andersen. He joins Hempel from Maersk, where he most recently held the position of Vice President & Global Head of Sales in Maersk Line.

Based in Hempel's headquarters in Denmark, Michael will cooperate with his colleagues across the world and across Hempel's different coating segments: Protective, Marine (including Container and Yacht) and Decorative. He will play a central role in – and take charge of – executing on the commercial part of Hempel's 2020 strategy Journey to Excellence, which has a clear focus on the customer.

Henrik Andersen, Hempel President & CEO said, "We are pleased that Michael has chosen to join Hempel's management group. His wide experience in the industry, which he has acquired through one of our best global customers, is of great value to Hempel. Hempel will not only benefit from Michael's experience; his ability to run a business is equally important, and we firmly believe that Michael will contribute greatly to creating value for our customers, colleagues and our owner, the Hempel Foundation."

After 19 years in Maersk, Michael will contribute with great knowledge about the marine industry and global sales processes. This is important to Hempel's Journey to Excellence strategy, which involves working even closer with customers to deliver trusted coating solutions that add real value to their business.

Michael Hansen, Executive Vice President & Chief Commercial Officer (CCO), Hempel A/S

28 April
Register Before 28/04 & SAVE £240!

5TH SHIP RECYCLING CONGRESS

26-27 JULY, 2017 - SINGAPORE

Bridging the Gap with Europe
Advancements in South East Asian Ship Breaking

Key Topics Iclude:

- Industry Boom - Keeping up with Recycling Demands & the Correct Choice of Yard
- The Shipowners Conundrum
- European Policies Restricting the Asian Shipyards
- Recent Updates & Developments of Regional Shipbreaking Yards
- Commercial Use & Cash Buyer/ Brokers; Obtaining Peace of Mind
- The Quality Gap
- Increased Performance & Improvements within Asian Shipyards
- The Next Step to Safer & Environmental Friendly Methods & Practices
- Technical Processes to Ensure Complete End-of-Life Cycle
- The European Effect & The Future of the HK Convention

Commercial Opportunities :
Jackson Moris, Phone: +91 (0) 20 6527 2804
E-mail: jmoris@acieu.net

ACI

Registration Contact:
Priyesh Waghmare, Phone: +91 (0) 20 6527 2803
E-mail: pwaghmare@acieu.net

세계 최초 USCG, DNV-GL 인증
“PowerCare Solution™”

선박평형수처리 장치를 위한

독립형 파워서플라이

Shipowners : download your free checklist at kraftpowercon.com.kr/powercaresolution

PowerCare Solution™

CONTACTS
KraftPowercon Sweden AB, Sweden
Tel: +82-41-522-4068, +82-10-8792-4052
www.kraftpowercon.com/kr
Eunkee.Kim@kraftpowercon.com

KRAFT POWERCON

Little environmental impact and greater fuel efficiency!

- Marine fuel regulation slated to come into force by 2020
- Dual fuel engines with wider applications to various vessel types such as VLCC, tanker, etc

ME-GI engine by
MAN Diesel & Turbo

Dual fuel X-series
two-stroke engine by Wärtsilä

Shipbuilding industry has witnessed a constant rise in the demand for dual-fuel engines which can help cope with ever more rigorous environmental regulations. Dual-fuel engines can run on two disparate types of fuels and have advantage of reducing emissions of pollutants.

There has been a heightened interest in dual-fuel vessels over the last few years. However, orders in newbuilding market have been limited to a handful of vessel types, such as LNG carriers, etc., and quantity of vessels ordered has remained low. Dual-fuel engines powered by eco-friendly fuels have started to attract attention again amid recent enforcement of ever more stringent environmental regulations. Specifically, dual-fuel engines have found applications not only to LNG carriers which proved the efficiency of dual-fuel engines but also to other types of vessels such as containerships, VLCCs (Very Large Crude Carriers), tankers, etc. It arouses curiosity to imagine how global shipbuilding market - likely to be affected by IMO's SOx emission regulation slated to come into effect 3 years later - will unfold.

There is a keen interest on whether ever more stringent global environment regulations would bring the shipbuilding industry a respite from hardship arising from persistent order drought. Last year, IMO (International Maritime Organization) decided to drastically reduce upper limit of SOx content in marine fuel from current 3.5% to 0.5% by 2020. To meet requirements of new standards set forth by the IMO, it is necessary to switch from bunker-C oil to marine gas oil (MGO) or LNG.

Currently, MGO is twice as expensive as ordinary bunker-C oil. Therefore, shipbuilding industry pundits expect global shipping companies to place new orders in an attempt to lower SOx emissions rather than operating existing vessels. Ideal solution is electric-powered vessel or LNG-fuelled vessels which are yet to be common. Currently, the most convincing solution is dual-fuel engine-based vessel that can also run on eco-friendly fuels such as LNG, etc.

A silver lining for order drought

Good news was brought to global shipbuilding industry gripped by recession amid the plunge in new order intake and restructuring. The SOx emission regulation proposed by IMO was finally approved and would come into force from 2020. According to shipbuilding industry, MGO is 70-80% more expensive than conventional bunker oil. For ship owners, marine fuel costs have skyrocketed to a level witnessed when oil prices hit USD 80-90 a barrel. By contrast, LNG is about 30% cheaper and can slash carbon dioxide emissions by 20% more, compared to MGO. Ship owners are more likely to order vessels that use LNG fuel, rather than acquiring expensive MGO as marine fuel. This SOx emission regulation, adopted recently, is considered to be one of the most stringent environmental regulations applicable to pre-owned vessels, as well as newbuild vessels.

The latest SOx emission regulation would have more ripple effect whenever there is a demand for ship replacement which once rose to 5,000 units, spurred by the regulation requiring oil tankers to be double-hulled in order to prevent oil spills. Industry experts agree that shipbuilding and shipping industries are facing a tight 3-year time frame before this regulation comes into effect.

Dual-fuel 'HiMSEN Engine'

Hyundai Heavy Industries (HHI) Industries was independently developing and producing HiMSEN engines, a marine diesel engine, from 1993 to 2001. HHI has proceeded with development of dual-fuel engine (H35DF) which has evolved even further without remaining complacent about the development of HiMSEN engines which reached a cumulative production milestone of 10,000 units with 1,000 units exported each year.

The dual-fuel engine developed by HHI can be used for ship propulsion and power supply to vessels and onshore commercial, industrial and residential facilities. This engine can switch freely between gas and diesel fuel, thus allowing fuel costs to be reduced by choosing less costly fuels. Furthermore, it can slash emissions of harmful gases drastically so as to meet requirements of ever more stringent environmental regulations without the need for installing any additional equipment separately.

HHI has analyzed structure of its competitors' engines and remedied the disadvantages of frequent failure and high maintenance costs. That is the result of accommodating the need for engines with high efficiency, high durability and greater ease of operation and maintenance.

Three solutions

Currently, 3 major solutions are being discussed for SOx emission control. The first solution is to switch to MGO, instead of the Bunker C oil, which represents the most direct way. However, MGO which costs twice that of conventional marine fuel cannot be an option for the shipping industry currently beleaguered by recession.

The second solution is to install additional SOx scrubber system on board the vessels. Many companies already launched products, including 'PureSOx' of Alfa Laval, in this market several years ago. However, installation and operation costs put financial strain, making them unsuitable for old vessels aged 20 years or more.

The final solution is for avoiding environmental regulations fundamentally. If conventional eco-friendly fuels are used, such as those for dual-fuel engines or LNG-fuelled vessels, etc., the tough clampdown on sulfur SOx emissions can be avoided. For LNG-fuelled vessels, however, the initial construction cost remains high and infrastructures, such as LNG bunkering, etc., have yet to be established. Meanwhile, those eco-friendly fuels can be economical over the long-term from the standpoint of fuel costs and environmental regulations. Eventually, the interest in dual-fuel vessels is likely to be heightened.

Expansion of ship models adopting duel fuel engines

Marine dual-fuel engines are contributing to expansion of the markets for large LNG carriers, containerships, tankers, etc.,

World's first vessel powered by methanol dual-fuel engine

Hyundai Mipo Dockyard (HMD) delivered 'LINDANGER', the world's first vessel powered by methanol dual-fuel engine, thus solidifying its position as a shipyard specializing in eco-friendly ship construction. This vessel is a 50,000 tonnes PC(Product Carrier) ordered to HMD by Norway-based stfal-Larsen in 2013 and outfitted with dual-fuel engine that can run on both bunker C oil and methanol.

This vessel is distinguished for not generating any air pollutants, such as NOx, SOx, etc., when methanol is used as fuel. Moreover, it can meet requirements of IMO's Tier Ⅲ without the hassle of installing additional NOx-reducing devices.

for reason of operational efficiency and cost-effectiveness. Many engine makers have put dual-fuel engines and propulsion systems onto markets. The most typical dual-fuel engines are ME-GI engine of MAN Diesel & Turbo and X-DF engine of Wärtsilä. LNG carriers outfitted with dual-fuel engines have already proved operational efficiency, and furthermore, most LNG carriers currently being ordered adopt dual-fuel engines.

Recently, LNG carriers are mainly equipped with dual-fuel propulsion engines that can selectively use diesel fuel and gas.

Operational efficiency of vessels is affected significantly by how much boil-off gas generated by evaporation during ship transit can be recovered from LNG storage tank and used as fuel to power engines and whether it can be re-liquefied for re-storage. For that reason, PRS (Partial Re-liquefaction System), an LNG re-liquefaction system, is subdivided into PRS+ and FRS applicable to ME-GI engines, MRS-F applicable to Wärtsilä engines, and PRS for DFDE engines. PRS refers to a device precluding the loss of natural gas in cargo hold when LNG carriers are operating at economic speeds.

X-DF Engine

Hyundai Heavy Industries (HHI) is moving to win orders for eco-friendly LNG carriers using natural gas as main fuel. In particular, HHI installed the gas-injected dual-fuel X-DF engine and LNG fuel supply system to maximize fuel efficiency. X-DF engine has simpler system than existing engines for LNG carriers, which increases the ease of operations while minimizing investment costs and achieving high efficiency. Moreover, X-DF engine can operate with relatively low pressure, thus providing excellent stability. Recently, X-DF engine has been thrust into limelight as next-generation propulsion system in LNG carrier market. Particularly, dual-fuel engine package can be applied to all commercial vessels such as LNG carriers, tankers and containerships, which will meet requirements of ship owners in compliance with ever more stringent environmental regulations.

ME-GI Engine

Daewoo Shipbuilding & Marine Engineering (DSME) has maintained top spot in terms of new order intake in the field of LNG carriers over the last few years, buttressed by its LNG-related technologies such as ME-GI engine and high-pressure natural gas fuel supply system developed independently. Specifically, the fuel gas supply system (FGSS) and PRS, etc., developed with its independent technologies, increased fuel efficiency by about 30% and can reduce emissions of pollutants such as carbon dioxide, NOx and SOx, etc., by more than 30%, compared to existing LNG carriers outfitted with DFDE (Dual Fuel Diesel Electric) engine.

ABB upgrades predictive capabilities of RDS

ABB bringing predictive capabilities of big data for shipping industry with latest update of Remote Diagnostic Services.

ABB is deepening its analytical and predictive approach to vessel maintenance with the latest upgrade of its Remote Diagnostic Service (RDS). ABB is one of the leading advocates of the digitalization of shipping and has already launched Integrated Operation Centers in Asia, Europe and the USA where data produced by ships is received and monitored.

The upgraded software functionalities will give more power and transparency to the shore side operations of ship owners whilst ABB has stepped up its proactive monitoring of the data and predictive analytics. The enhancement of ABB's digital services comes after an internal study found existing remote monitoring of machinery reduced maintenance costs by 50%.

ABB is aiding the development of the shore side operations of shipping companies by giving the opportunity to replicate ABB's Integrated Operations Centers in their own Operational Centers. The latest version of RDS software allows shipping companies to deploy their own analytics, or those from a third party where applicable, with greater ease. ABB has further developed its dedicated hardware for the monitoring of large and small rotating machinery with tight integration to the RDS software. The graphical user interface has also been improved to increase user experience and to give identical views of the detailed data both onboard and onshore.

Integrated Operations Center

To further leverage the data received from vessels, the ABB Digital Service team has been strengthened with more data scientists and architects to promote the search for insight into the health of the monitored assets.

The ABB software used as part of the Remote Diagnostic Services combines the capabilities of a dedicated onboard software with a full analytic engine onshore. Due to this modularity and capability, the software can now run the same analytics onboard as onshore.

For shipping companies with limited bandwidth availability or a high number of data points, ABB is deploying leading edge analytics to seamlessly customize the solution and optimize the data transfer.

An internal study found that by taking a proactive approach to the monitoring of equipment through the use of RDS and its software, customers were able to save up to 50% on maintenance costs. There has also been up to a 70% reduction in visits by ABB engineers to vessels bringing a significant decrease in the cost for customers.

"Through our Integrated Operations Solutions and Centers we aim to be connected to 3,000 vessels by 2020," said Kenneth Nakken, Vice President Digital Services, at ABB's Marine & Ports business. "We develop all our digital solutions with the customer in mind and we believe our new Predict service will strengthen the shore side operations of all involved."

ABB is also launching the new mobile application that will allow the user to monitor the health status of connected marine machinery, starting with Azipod® propulsion.

World's Largest Gas & LNG Event Announces Return to Europe in 2018

Gastech Exhibition & Conference 2018, 17-20 September 2018, Fira Barcelona, Gran Via Venue.

Barcelona, Spain has been announced as host city to the world's largest natural gas & liquefied natural gas (LNG) event - the Gastech Exhibition & Conference - when it will return to Europe between 17-20 September 2018, at the Fira Barcelona, Gran Via Venue.

Hosted by a Consortium of Spain's leading energy stakeholders including Enágas, Gas Natural Fenosa, Repsol - and endorsed by the national gas association, Sedigas - the event (now in its 45th year) returns to Europe after the last three editions were hosted in Asia, reflecting the importance that Gastech places on representing the global gas & LNG industries.

Global LNG demand outlook has revived and forecasts estimate that by 2026 global demand will grow by 50%, to around 430 million tonnes (source: Wood Mackenzie). Further robust growth in Asia, keenly propped up by Indian and Chinese demand, will continue to see increased requirements and improved flexibility across the LNG business. Gastech arrives in Spain at a time of considerable resurgence for the European gas & LNG sectors.

Antoni Peris, the President of the Spanish national gas association, Sedigas, said "It will be a great pleasure for us to host the 30th edition of the Gastech Exhibition & Conference in Spain. This event has proven to be of great relevance when addressing issues around the global gas and LNG industry. Furthermore, the recent creation of an organized gas market in Spain, Mibgas - and its aim to become an LNG European hub - attests the promising future the Spanish Gas industry."

European LNG imports are poised for a second year of growth following years of decline from 2011 to 2015, buoying the LNG market. Marcelino Oreja, the Chief Executive Officer of Enagás stated "It gives me great pleasure to welcome the world's largest meeting place for the global gas and LNG industry to Barcelona in 2018. With almost 50 years' experience in the industry since the construction of Barcelona LNG terminal, pioneer in Europe, Enagás is one of the companies with the most LNG terminals in the world. In the Europe-led transition towards a low-carbon energy model, natural gas plays an essential role as a low emissions source. This fact is a perfect opportunity for our sector."

Rafael Villaseca, the Chief Executive Officer of Gas Natural Fenosa, said "Gas Natural Fenosa, as pioneer multinational founded in 1843, is keen to host such a prestigious event next year. It is important primarily for companies across the world to share experiences, innovate and move the gas industry forward. We also believe this is a unique opportunity for Barcelona and for Spain to be at the forefront of our sector."

Gastech will bring a multitude of markets together to discuss business. The Chairman of Repsol, Antonio Brufau, said "We are honoured to host the 30th edition of the Gastech Exhibition & Conference in Barcelona in 2018; a platform that will provide companies who operate across the up, mid and downstream sectors of the gas and LNG supply chain with the opportunity to meet with and influence highly-focused international decision-makers and buyers."

The first world 'LNG Bunkering Vessel' complete construction

Unrivaled technology in the construction of special-purpose ships such as icebreaker, dive support vessel (DSV) and cable ship.

Hanjin Heavy Industries & Construction (HHIC) announced on Feb 23 that it completed construction and delivered the 5,000 tons LNG bunkering ship at its Yeongdo Shipyard in Busan. As a result, the South Korean shipbuilder is recorded as the first LNG bunkering vessel builder in the world. The company won the bid to build this 5,100m^3 LNG bunkering vessel in 2014.

LNG bunkering means the ship-to-ship transfer of fuel such as LNG. In general, LNG-powered vessels are fueled through a LNG storage tank or undertaking base on land. If a LNG bunkering ship is used, however, they are able to load fuel at sea.

At the time of signing the contract, there were small bunkering or barge ships designed to supply LNG to a certain vessel. However, it's been the first time to build this large LNG bunkering ship around the globe. Therefore, it has drawn a great attention from the world.

The LNG bunkering vessel named 'ENGIE ZEEBRUGGE' was handed over to LNG LINK INVESTMENT AS, a joint venture of Engie (France), Fluxys (Belgium), Mitsubishi Corporation (Japan) and NYK (Japan). It would supply the fuel to the LNG-powered vessels traveling the seas around Northern Europe from the Port of Zeebrugge in Belgium.

5,100m^3 LNG bunkering vessel "ENGIE ZEEBRUGGE" built by HHIC

In particular, the LNG bunkering ship is designed to deliver the fuel in a ship-to-ship mode, which is deemed the most efficient way of transferring fuel. It is capable supplying 5,000 cubic meters of LNG at a time. It features two independent pressurized LNG tanks approved by the International Maritime Organization (IMO), 2 propellers and 1 thruster and uses dual fuels (LNG, MGO bi-fuel), maximizing maneuverability and operating efficiency.

The LNG bunkering ship has been in the highlight in shipbuilding and shipping industries because of the high growth potential of LNG-fueled vessel market. In fact, LNG-powered ships are able to reduce fuel consumption by 20-50%, compared to the conventional vessels which are fueled by fossil fuels. They are also very advantageous from an environmental aspect because they are able to considerably reduce greenhouse gas emissions.

The industry forecasts that LNG-fueled vessel and LNG bunkering markets would sharply increase as the IMO strengthens restrictions on ship exhaust gas, and the supply of LNG becomes stable after the exploration of shale gas around the world.

An official from the HHIC said, "It means something in that we built this LNG bunkering vessel for the first time in the world in the LNG bunkering market which is known as a next-generation green ship and blue-ocean sector in LNG industry." He added, "Based on our unrivaled technology and extensive knowhow in special-purpose vessels such as the nation's first icebreaking vessel 'ARAON', DSVs and cable ships, we are going to keep playing a leading role in the construction of state-of-the-art vessels".

The Republic of the Marshall Islands Registry Now World's 2nd Largest

The Republic of the Marshall Islands (RMI) fleet now stands at 223,262,177 deadweight tons (DWT), making it the second largest registry in the world in terms of DWT.

International Registries, Inc. and its affiliates (IRI) have provided administrative and technical support to the RMI Registry since 1990.

"This is a very significant milestone for the RMI Registry," said Bill Gallagher, President, IRI. "A strong legislative framework, customer driven service ethos, and a commitment to quality have all been key to our continued success," continued Gallagher.

"From long-standing traditional shipowners, particularly our standing as the number one flag for Greek owners, to a new wave of Chinese leasing companies, the RMI Registry is the registry of choice for owners looking for an innovative and quality driven partner," stated Gallagher.

The RMI is not only the world's second largest registry, but the Greek shipping industry's leading flag as well. The RMI has been gaining market share year-on-year and the flag today has 791 ships totaling 62,190,301 DWT (over 18.9% of total DWT of the Greek owned fleet) in its registry, making it the largest flag used by Greek controlled ships.

"Our office in Piraeus is the second largest of the RMI Registry's 27 worldwide offices," said Theo Xenakoudis, Director, Worldwide Business Operations and Managing Director of the Piraeus office. "Prior to registration, we vet the owner, operator and vessel before acceptance in the RMI Registry and during the vessel's time in the Registry we continue to conduct risk assessments and work with our owners and operators to ensure their vessels meet the Registry's quality standards," continued Xenakoudis.

FLAGS	Vessels	DWT	GT
Panama	8,052	340,135,153	221,976,101
RMI	**3,244**	**223,262,177**	**137,913,800**
Liberia	3,277	221,180,339	140,460,970
Hong Kong	2,596	176,342,489	109,308,158
Singapore	3,574	126,695,482	84,489,120

Source: IHS Markit, March 2017.

"This process along with our service oriented philosophy has ensured the RMI Registry has maintained its excellent reputation and as such has attracted quality owners, including the Greek owners to the RMI flag," said Xenakoudis.

"We are delighted that our Greek owners and operators continue to hold the RMI Registry in such high regard which has been reflected in the Greek Shipping Co-operation Committee's March 2017 Greek Controlled Shipping Report which shows the RMI as the number one choice of flag for Greek owners and operators."

In another late breaking development, the RMI Registry has received preliminary confirmation that it will continue its United States (US) Coast Guard (USCG) Qualship 21 status for 2017.

The announcement was made during Intertanko's North American Panel meeting, which meets prior to the beginning of the Connecticut Maritime Association's (CMA's) Shipping 2017 conference in Stamford.

"This is the 13th year in a row that the RMI Registry has held its Qualship 21 status," said Bill Gallagher. "It's significant because this achievement is no easy undertaking for a major registry, whose ships make thousands of US port calls, to maintain less than a 1% detention rate on a three-year rolling average basis."

"The Qualship 21 designation means that ships flying the RMI flag are less likely to be detained in US ports, which assists owners and operators in keeping their ships moving," concluded Gallagher.

SHI successfully completed construction of world's largest containership

Samsung Heavy Industries (SHI) set a record of building the world's largest containership, ushering in the era of 20,000 TEU containership.

The trend towards ultra-large containerships is expected to be sustained despite plunge in containership order placement which has remained persistent since last year. Maersk placed orders at DSME for 20 units of 18,000 TEU vessels in 2011, the year in which shipping industry was gripped by recession. As Maersk reduced costs drastically as a result, other shipping companies have begun to acquire ultra-large vessels.

The market for ultra-large containership with a capacity of over 18,000 TEU has been dominated by Korea's 3 shipbuilding heavyweights including SHI. SHI recently completed construction of the first batch of 4 containerships, each with a capacity of 20,150 TEU, which were ordered by Japan-based MOL (Mitsui O.S.K Lines) in February 2015. On March 15, SHI held a naming ceremony for this vessel at its Geoje shpayrd.

The eventful ceremony gathered 90 from both SHI and MOL, including SHI CEO Dae-Young Park and MOL CEO Junichiro Ikeda, to witness the naming of 'MOL Triumph.'

MOL Triumph, with length of 400m, breadth 58.8m, depth 32.8m, is an ultra-large containership that can transport 20,150 containers. It is the largest containership ever built worldwide and the first vessel opening up the era for 20,000 TEU containership. Particularly, this containership is an eco-friendly vessel outfitted with various energy-saving devices including the propeller developed independently by SHI, stator and rudder valve that controls water flow in the front and rear of propeller to improve propulsive force.

The world's first 20,150 TEU container ship 'MOL TRIUMPH' built in SHI.

SHI has been leading the market with operation-optimized hull design and record-breaking containership size. SHI is well known for world-class employees and class-leading R&D infrastructure including the world's largest commercial towing tank in Daeduk R&D center.

With successful construction of this 20,000 TEU containership, SHI has proved its world's unmatched technological prowess gain. In addition, SHI won praise from the ship owner for completing construction of this vessel without any incident based on rigorous safety control throughout shipbuilding process spanning 15 months since the steel-cutting ceremony held in last January of 2016.

MOL Triumph will be delivered to MOL in March 27th after finishing preparation for maiden voyage. Including this vessel, SHI plans to deliver 10 units of 20,000 TEU containerships this year.

An official from SHI said, "Significantly, we opened up the era of 20,000 TEU containership for the first time in the world. We will do everything possible in terms of process, quality and safety control to ensure successful delivery of the remaining ultra-large containerships."

Meanwhile, shipping companies are scrambling to acquire large oil tankers amid sustained low oil prices. As a series of orders have been placed for VLCC (Very Large Crude Carrier) with a capacity of over 200,000 DWT this year, China's leading oil companies are reportedly mulling over placement of new orders for ULCC which is at least twice larger than VLCC.

As the trend towards large containerships continued in shipping industry to secure maritime cargo traffic volumes, a new trend has been set towards large oil tankers.

Composite Cutterhead Shaft Bearing as good as new after 10 years

After ten years and more than 100,000 operating hours Thordon's dredge cutter head shaft bearing has emerged unscathed.

After ten years and more than 100,000 operating hours dredging up silt, sand, rocks and stones in some of the toughest marine environments imaginable, the Thordon Composite bearing installed on the Al Mirfa's dredge cutter head shaft has emerged unscathed.

In drydock where the NMDC-owned dredger is being upgraded, Thordon Bearings' Dubai-based distributor, Ocean Power International, expected that even the 'unbreakable' might need replacing after such demanding workloads, but it didn't. "The Composite bearing was still in perfect working condition," said Rafid Qureshi, Managing Director, Ocean Power International Inc.

"The water-lubricated Composite bearing was installed in 2007 to the Royal IHC-built vessel, a 97m heavy duty cutter suction dredger. These dredgers operate in some very tough environments, which require a tough, durable bearing capable of withstanding the excessive wear and tear encountered during dredging operations," said Maarten Jansen, Thordon Bearings' Regional Manager.

"These vessel types place inordinately high loads on the cutter shaft bearing which, in the past, often resulted in the replacement of traditional greased bronze and rubber bearings every six to eight months. That the Thordon solution didn't need replacing after ten years of heavy duty service is indicative of the durability and robustness of the materials we use in all our polymer bearings."

The bearing was installed in 2007 to the Royal IHC-built dredger Al Mirfa.

Composite bearing wear rates in the abrasive conditions most dredgers operate are typically half that of rubber bearings, reducing maintenance downtime over the life of the vessel. But performance was not the only reason why the dredging sector has moved away from traditional bearing materials.

"With the emergence of more stringent environmental regulations in the late 1990s most dredgers are now fitted with water-lubricated cutter shaft bearings," said Jansen. "Dredgers have to operate in some very ecologically sensitive environments and owners cannot risk polluting seas and sediments with grease and oil. For dredger owners, a water-lubricated cutter shaft bearing is often a key factor in being awarded these sensitive area projects."

The actual bearing surface is a black homogeneous material called GM2401 which is fused to a stiff, high strength polymer sleeve to provide unprecedented performance and environmental safety. They are available for a wide range of shaft diameters in both tube and stave configuration.

Upgrade work includes the installation of the latest versions of the IHC Dredge Profile Monitor and Automatic Cutter Controller along with the installation of a dredge fleet monitoring system. NMDC opted to install the most recent versions of these automation systems to ensure its vessels are fully up-to-date and to enhance the efficiency of its operations.

The work is scheduled for completion in the first half of 2017.

Nexans connect customers to their cable drums through the IoT

Nexans and ffly4u, the industrial Internet of Things (IoT) specialist, are pioneering a tracking and management service that not only lets DSO customers know the exact location of their drums, it even tells them how much cable is left.

Returnable cable drums are the unsung workhorse of the cable manufacturing Industry. Typically, they provide years of service in transporting cables from the factory to the customer and storing them on site until they are needed. And when empty they are collected and returned to the factory to begin another cycle. It seems a simple and straightforward process. So just why is Nexans interested in working with ffly4u to connect its cable drums to the IoT? The answer lies in the numbers.

For example, a DSO (distribution service operator) like France's Enedis can spend several million Euros a year in renting cable drums. Nexans also incurs major costs in collecting the empty drums and purchasing new ones to replace those lost, stolen or damaged.

Nexans and ffly4u connect customers to their cable drums through the IoT. It became clear to Nexans that anything that could help improve the tracking and management of its cable drum fleet could offer substantial cost savings as well as enhancing traceability. Therefore, around 18 months ago, Nexans joined forces with ffly4u, the industrial IoT specialist, to carry out a pilot program on the Enedis fleet of 40,000 drums.

ffly4u has proven expertise in both developing wireless sensors together with the communications and management infrastructure that supports them. The company worked in partnership with Nexans to develop the tiny battery-powered sensor that is key to the tracking project. This sensor is embedded within each of the wooden drums, two or more metres in diameter, used to carry medium voltage (MV) cables for Enedis' power infrastructure projects.

This sensor provides a unique way of identifying both the drum and the type and quantity of cable it is loaded with. It connects wirelessly to a cloud-based management system that provides Nexans and Enedis with real-time information on the drum's location and its status during a typical 150-day tour of duty on site. Among the information the sensor provides is how much cable has been used and it sends a message when the empty drum is ready for collection.

FFLY4U DeviceOne of the most important financial benefits offered by the tracking service is that it helps reduce the amount of time that empty drums are left on site waiting for pick-up, saving on costs and working capital. The service also lets site operators plan their daily operations more effectively as they can locate the cable drums easily as well as having

detailed knowledge of the type and quantity of cable on each drum. In addition, being able to locate the drums on a large operating site makes the collection logistics much more efficient. This also offers a significant environmental benefit as the drums will never be lost or abandoned. Tracking also helps eliminate the risk of cable theft as it raises an alarm if the drum is moved outside its pre-set perimeter or during non-operational times, such as at night.

A further key operational advantage is that the tracking provides total traceability to confirm that the correct cable has been deployed on a project. It also helps manage the residual lengths of cable on drums held on site, facilitating their reassignment on other neighboring sites in order to minimize transport and scrap.

"Our new sensor-based service is taking cable drum fleet tracking and management to the next level, with cost savings of 20 percent easily achievable for MV drums. And if rolled out to high voltage drums that can cost 10 times as much, the potential savings could be huge," said Olivier Pinto, Nexans Services & Systems Director Europe.

"The concept has already been proved on a project of 100 drums and the next step is to extend it to several thousands. While drums are an immediate objective, the wireless tracking technology could have many other applications for electrical infrastructure such as transformers and generators. This is a very important example of our commitment to extending Nexans' customer offering beyond supplying cables to providing a complete management service."

"The internet of Things is now starting to make a major contribution across all aspect of industry. And as this project with Nexans and Enedis shows, smart thinking allied to cloud-based solutions can take even the most basic logistics operation such as cable drum management to the next level," said Olivier Pages, CEO of ffly4u.

Intergraph® PP&M Honors Customers with 2016 Engineering & Design Tools Excellence Awards

Intergraph® Process, Power & Marine (PP&M), part of Hexagon and the world's leading global provider of enterprise engineering software to the process, power and marine industries, recognizes seven customers with its Engineering & Design Tools Excellence Awards for 2016.

The Engineering & Design Tools Excellence Awards have expanded from Engineering & Schematics to include 3D solutions. This award honors recipients who successfully deploy Intergraph Engineering & Design tools and take advantage of the solutions' capabilities to achieve company goals while also promoting the solutions via Intergraph Technical User Forum (TUF) LinkedIn groups or with HxGN LIVE presentations.

The award winners are chosen annually by members of Intergraph's Engineering & Design team for being valuable contributors in making Intergraph solutions successful – not only for their companies, but also for the entire industry.

Receiving the Intergraph Engineering & Design Tools Excellence Awards are:

- Marion Braun, Bayer AG (Germany)
- Kevin Hooper, Fluor (United States)
- Youngsang Jeong, Samsung Engineering (Korea), etc.

Mattias Stenberg, Intergraph PP&M president, said "We offer our congratulations to these customers for taking full advantage of the benefits that our solutions provide. It is an honor to recognize them with this year's Engineering & Design Tools Excellence Awards, and we look forward to continuing these partnerships for even greater achievements in the future."

Gas operations commence at the newly expanded Alfa Laval Test & Training Centre

On 1 March 2017, marine customers and industry representatives gathered at the Alfa Laval Test & Training Centre in Aalborg, Denmark for the opening of the expansion into gas testing. The expansion, which extends the testing space to five times its original size, makes this the world's most advanced test centre for environmental and combustion technology - regardless of fuel type.

Since its inauguration in 2014, the Alfa Laval Test & Training Centre has been a hub of Alfa Laval research and development in exhaust gas cleaning, ballast water treatment, steam production, fuel cleaning and other key areas. Its original 250m^3 testing space is essentially a full-size machine room on land, equipped with Alfa Laval products that are installed and integrated into major process lines around a 2 MW marine engine.

Now a further 1100m^3 have been added to focus on combustion technologies for gas and other fuel alternatives. Among the new equipment are burner systems, inert gas systems and also the Alfa Laval Gas Combustion Unit (GCU), which is installed at the centre in full scale.

"Our investment in the Alfa Laval Test & Training Centre reflects the extraordinary changes we see in the marine industry," says Peter Leifland, President of Alfa Laval's Marine Division. "Tightening emissions legislation is driving many customers from residual fuels towards LNG and other alternatives. As a comprehensive marine supplier, we must be at the cutting edge in supporting our customers, no matter what fuel they choose."

Alfa Laval Test & Training Centre expansion

New solutions vital for wider gas operations

Already, Alfa Laval has a substantial portfolio of solutions for gas as fuel and gas as cargo. It includes Alfa Laval Aalborg dual-fuel boiler systems, the Alfa Laval FCM One Gas booster system, Alfa Laval Smit inert gas systems and the Alfa Laval GCU, as well as a complete range of heat exchangers for working gas at different pressures. Yet even more will be required in the very near future.

"Within 15 years, it is expected that thousands of vessels will be sailing with LNG as fuel, compared to the hundreds using gas today," said Lars Skytte Jorgensen, Vice President, Alfa Laval Product Centre Boilers. "We can clearly see emission regulations driving the trend. But the success of the transition will depend in large part on

Gas Combustion Unit in the Alfa Laval Test & Training Centre

Alfa Laval Aalborg OS-TCi with gas burner

advanced technology, much of which has yet to be developed."

In the newly expanded Alfa Laval Test & Training Centre, that development is already underway. Alfa Laval is currently testing a new dual-fuel burner for gas-diesel applications on smaller boilers, which will later be developed into a multi-fuel solution in partnership with the Danish Technical University in Copenhagen. Elsewhere in the centre, a development project is running for large burners and boilers, involving comprehensive tests with both gas and diesel flames. The GCU, as well, will be subjected to test flame and heat flow characteristics in different conditions and this way identify possibilities for improving performance even further.

A large measure of commitment

The GCU itself provides some idea of scale when it comes to Alfa Laval's investment in the centre's gas expansion. Designed to deal with LNG boil-off gas in a safe, reliable and environmentally responsible manner, the GCU measures 23m from bottom to top and can burn up to 4.5 tonnes of LNG per hour – the rough equivalent of 60MW. To enable indoor work with the unit, extensive preparations were necessary.

"The GCU fans move 458 cubic metres of air per hour at full load, so automatic systems connect its control with the large doors of the facility, which must be open during operation," said Lars Skytte Jorgensen.

Faster and better innovation for a changing industry

The costs of investing in the centre, however, are far outweighed by the benefits according to Peter Leifland. "After just three years of operation, we can point to many areas where the Alfa Laval Test & Training Centre has accelerated our R&D and improved its quality," said Leifland. "Exhaust gas cleaning, where our Alfa Laval PureSOx platform is fully ready for the 2020 global sulphur cap, is just one example."

Both in meeting new regulations and in paving the way for gas, the centre's technological edge will be vital in bringing customers the most environmental and energy-efficient solutions. "The rate of change in marine legislation is increasing, and ship owners and operators are forced to keep in step," said Leifland. "With the expanded capabilities of the Alfa Laval Test & Training Centre, we will ensure that onboard technologies are ready to meet their technical challenges – whether the fuel is diesel, gas or something else altogether."

한진중공업, 세계 최초로 LNG벙커링선 건조

한진중공업이 최근 LNG벙커링선을 성공적으로 건조 및 인도함에 따라 쇄빙선, DSV(잠수지원선), 케이블선 등 특수목적선 분야에 독보적 기술력을 다시 한 번 입증했다.

한진중공업은 부산 영도조선소에서 5,000톤급 LNG벙커링선(LNG Bunkering Vessel)을 인도했다고 지난 2월 23일 밝혔다. 이로써 한진중공업은 세계 최초로 LNG 벙커링선을 건조한 조선사로 이름을 떨치게 됐다. 이날 인도된 선박은 한진중공업이 지난 2014년 NYK로부터 수주한 5100㎥급 LNG 벙커링선 2척 중 첫 호선이다. 당시 수주규모는 1억 달러였다.

LNG벙커링(Bunkering)이란 LNG를 연료로 쓰는 선박에 가스연료를 공급하는 것을 말한다. LNG연료 추진선박은 보통 육상의 LNG 저장탱크나 인수기지를 통해 연료를 공급받는데, LNG 벙커링선을 이용하면 별도의 인수기지 없이 해상에서 직접 LNG 연료를 공급받을 수 있다.

수주 당시 특정 선박에 LNG 연료를 공급하기 위한 소형 벙커링선이나 바지선은 있었으나, 전 세계적으로 범용 LNG 벙커링 선박이 발주된 것은 처음이어서 조선업계에 큰 화제를 모은 바 있다.

'엔지 제브뤼헤(ENGIE ZEEBRUGGE)'로 명명된 이 선박은 프랑스의 Engie와 벨기에 Fluxys, 일본의 미쓰비시(Mitsubishi Corp.)와 NYK의 합작회사인 LNG LINK INVESTMENT AS에 인도되었으며, 향후 벨기에 제브뤼헤 항에서 북유럽 해역을 항해하는 LNG연료 추진선박에 LNG를 공급하게 된다.

한진중공업이 건조한 5,100㎥급 LNG벙커링선 "엔지 제브뤼헤(ENGIE ZEEBRUGGE)"

특히, 이날 건조된 LNG벙커링선은 가장 효율적인 벙커링선의 형태로 꼽히는 쉽투쉽(ship-to-ship) 방식의 LNG 벙커링선으로 연근해에서 한번에 5,000㎥에 달하는 LNG를 공급할 수 있다. 국제해사기구가 승인한 독립형 압력식 LNG 탱크 2기를 탑재하고, 각 2기의 추진기와 보조프로펠러, 이중연료(LNG/MGO bi-fuel) 사용으로 조종성과 운항효율을 극대화했다.

LNG 벙커링선이 해운과 조선업계에서 주목 받는 것은 바로 LNG연료 추진선박 시장의 성장성 때문이다. LNG연료 추진선박은 연비 면에서 기존 석유 연료에 비해 20%에서 최대 50%까지 연료비를 절감할 수 있고 온실가스 배출도 크게 줄일 수 있어 효율성뿐만 아니라 환경적 측면에서도 뛰어나다.

업계에서도 국제해사기구(IMO)의 선박배출가스 규제 강화 추세와 전세계적인 셰일가스 개발로 LNG 공급이 안정화되면서 LNG 연료 추진선박과 LNG 벙커링 시장이 급성장할 것으로 내다보고 있다.

한진중공업 관계자는 "차세대 그린십이자 LNG 산업의 블루오션으로 꼽히는 LNG 벙커링 시장에서 세계 최초로 LNG 벙커링선을 건조했다는데 의미가 크다"며 "최초의 국적 쇄빙선인 아라온호, DSV(잠수지원선), 케이블선 등 특수목적선 분야에서 쌓아온 독보적 기술력을 바탕으로 향후에도 최첨단 선박 건조에 주도적 역할을 해 나갈 것"이라고 전했다.

삼성중공업, 세계 최대 컨테이너선 건조 '성공'

삼성중공업이 세계 최대 컨테이너선 건조 기록을 수립하고, 2만TEU급 컨테이너선 시대를 열었다.

지난해 수주 절감 여파로 컨테이너선 발주는 급감했지만, 컨테이너선의 초대형화 이슈는 꾸준히 이어질 것으로 보인다. 머스크의 경우 해운업계가 불황에 시달리던 지난 2011년 대우조선해양에 18,000TEU급 선박 20척을 발주한 바 있다. 이를 통해 머스크가 원가를 크게 절감하자 다른 해운사들도 초대형 선박확보에 나서고 있기 때문이다.

현재 18,000TEU 이상 초대형 컨테이너선 시장에서의 삼성중공업을 비롯한 한국 조선3사의 시장 경쟁력은 매우 높다. 지난 2015년 2월 삼성중공업이 일본 MOL(Mitsui O.S.K Lines)로부터 수주한 20,150TEU급 컨테이너선 4척 중 첫 번째 선박 건조가 최근 성공적으로 완료됐다. 이에 따라, 지난 3월 15일 삼성중공업 거제조선소에서 명명식이 개최됐다.

이날 명명식 행사는 삼성중공업 박대영 사장과 MOL 이케다 준이치로(Junichiro Ikeda) 사장 등 양사 관계자 90여 명이 참석한 가운데 진행됐으며, 이 선박은 이 날 'MOL TRIUMPH'호로 명명되었다.

'MOL TRIUMPH'호는 길이 400m, 폭 58.8m, 높이 32.8m로 컨테이너 20,150개를 한 번에 실어 나를 수 있는 초대형 선박이다. 현재까지 전세계에서 건조된 컨테이너선 가운데 가장 큰 선박이며, 컨테이너선의 2만TEU 시대를 연 최초의 선박으로 의미가 크다. 동시에 이 선박은 삼성중공업이 독자 개발한 프로펠러(propeller), 프로펠러 앞뒤 물의 흐름을 제어해 추진력을 향상시키는 러더벌브(rudder valve)와 스테이터(stator) 등 각종 에너지 절감 장치를 장착한 친환경 선박이다.

삼성중공업이 건조한 20,150TEU급 세계 최대 컨테이너선 'MOL TRIUMPH'호

삼성중공업은 대덕선박연구센터에 보유한 세계 최대 규모의 예인수조 등 각종 시험설비와 우수한 연구 인력을 토대로 컨테이너선의 대형화와 선박 운항 계획에 최적화된 선형 개발을 선도해 왔다.

이번에 2만TEU급 컨테이너선 건조도 성공적으로 마무리함으로써 삼성중공업은 세계 최고의 기술력을 다시 한 번 입증했다. 또한, 삼성중공업은 2016년 1월말 강재 절단식 이후 약 15개월에 걸친 건조 과정 동안 철저한 안전 관리를 바탕으로 단 한 건의 사고도 없이 이 선박을 건조해 선주 측으로부터 호평을 받았다.

명명식을 마친 'MOL TRIUMPH'호는 출항 준비 등 마무리 작업을 거쳐 3월 27일 선주사에 인도될 예정이다. 삼성중공업은 이 선박을 포함해 올해 총 10척의 2만TEU급 컨테이너선을 인도할 계획이다.

삼성중공업 관계자는 "컨테이너선의 2만TEU 시대를 세계 최초로 열었다는 점에서 의미가 남다르다"면서 "나머지 초대형 컨테이너선도 성공적으로 인도할 수 있도록 공정과 품질, 안전 관리에 만전을 기할 것"이라고 말했다.

한편 저유가 현상이 장기화되면서 유조선 대형화 경쟁이 치열하게 전개되고 있다. 올해 들어 20만DWT급 이상 초대형원유운반선(VLCC) 발주가 잇따르고 있는 가운데 중국 오일메이저들은 VLCC의 두 배가 넘는 규모의 ULCC 발주도 검토 중인 것으로 알려졌다. 해상 물동량 확보를 위해 벌어졌던 컨테이너선 대형화 경쟁이 유조선으로 이어지고 있는 상황이다.

넥상스, 사물인터넷으로 고객과 케이블 드럼 연결

넥상스와 산업 사물인터넷 전문업체인 fifly4u는 DSO 고객에게 드럼의 정확한 위치와 남은 케이블 양을 알려주는 추적 및 관리 서비스를 최초로 실시한다.

수거 가능한 재활용 드럼은 케이블 제조업계의 귀중한 자원이다. 대표적으로 드럼은 수년간 공장에서 고객에게 케이블을 운송해주는 서비스를 제공하고, 현장에서 필요할 때 쓸 수 있도록 케이블을 보관해준다. 빈 드럼은 수거되어 공장으로 보내지고, 다시 새로운 작업에 들어간다. 이는 간단하고 쉬운 작업으로 보여진다. 그렇다면 넥상스는 왜 fifly4u와 함께 케이블 드럼을 사물인터넷(IoT)과 연결하는 일을 하려고 하는 것일까? 답은 비용에 있다.

예를 들어 프랑스 에네디스와 같은 DSO(배전 서비스 운영업체)의 경우 수 백만 유로를 케이블 드럼 렌탈에 사용하고 있다. 넥상스 또한 상당한 금액을 빈 드럼 수거와 분실 또는 손상된 드럼을 대체하기 위한 새 드럼 구매에 사용하고 있다.

넥상스는 케이블 드럼 추적 및 관리를 개선하는데 도움을 줄 수 있는 것이 있다면, 막대한 비용 절감을 가져올 뿐만 아니라 추적가능성도 높여 준다는 사실에 확신을 가지게 되었다. 그래서 넥상스는 약 18개월 전부터 산업 사물인터넷(Iot) 전문업체인 fifly4u와 협업을 시작해 에네디스로 납품되는 40,000개의 드럼을 대상으로 시험 프로그램을 진행했다.

fifly4u는 통신과 이를 지원해주는 관리 인프라에 사용되는 무선 센서 개발에도 전문

적임을 증명했다. fifly4u는 넥상스와 추적 프로젝트의 핵심이 되는 소형 전지식 센서를 개발하는 파트너십을 체결했다. 이 센서는 에네디스社의 전력 인프라 프로젝트용 고압 전선을 운송하는 직경 2m 이상의 각 나무 드럼에 내장된다. 이 센서는 드럼과 드럼에 있는 케이블 종류 및 양을 식별할 수 있는 고유한 방식을 갖고 있다. 이는 클라우드 관리 시스템과 무선으로 연결되어, 넥상스와 에네디스에 드럼의 위치와 상태에 관한 정보를 실시간으로 기존의 150일 현장 업무 투어 중에 제공한다. 센서가 제공하는 정보에는 케이블이 얼만큼 사용되었는지 알려주는 것이 있고, 드럼이 비어서 수거 준비가 되면 메시지도 보내준다.

추적 서비스를 통해 제공되는 가장 중요한 혜택 중 하나는 현장에 남겨진 빈 드럼이 수거까지 시간이 단축되고, 비용 및 운전자본 절약에 도움을 준다는 점이다. 이 서비스를 통해 간편하게 드럼을 놓을 수 있고, 각 드럼에 있는 케이블의 종류와 양을 자세하게 알 수 있어 현장 운영자들이 일일 업무를 더욱 효율적으로 계획할 수 있다. 게다가 대형 작업장에 드럼을 놓을 수 있어 물류 집하가 더욱 효율적으로 이루어지게 되며, 드럼이 분실되거나 버려지는 경우가 없기 때문에 환경적으로도 큰 도움이 된다. 위치 추적은 드럼이 지정구역 밖으로 또는, 저녁이나 작업시간 이외에 옮겨지면 알람을 울려 케이블 절도 위험을 없애는데

도 도움이 된다.

또 하나의 핵심적인 강점은 위치 추적으로 해당 프로젝트에 알맞은 케이블이 사용되었는지를 확인해주는 전체 추적 서비스를 제공하는 것이다. 또한 이는 현장에 있는 드럼의 남아있는 케이블 길이를 관리해주며, 운송과 스크랩을 최소화하기 위해 주변 공장에 재 할당하는 방법도 모색해준다.

"넥상스의 새로운 센서 기반 서비스로 고압 케이블 드럼의 경우 20% 비용절감을 보장하며, 케이블 드럼 추적 및 관리의 새로운 장을 열게 되었다. 만약 이것이 10배 더 비싼 초고압 케이블 드럼에 적용되면, 예상 절감 비용은 더욱 클 것이다. 드럼 100개를 대상으로 한 시범 시행으로 이 프로젝트의 개념이 증명되었고, 이를 수천 개로 확대 적용해나갈 예정이다"라고 넥상스 유럽지역 서비스&시스템 이사 올리비에 핀토(Olivier Pinto)는 말했다.

"현재는 드럼이 일차적인 목표이지만, 무선 추적 기술은 변압기, 발전기 등 다른 전기 인프라로 적용 대상을 확대할 수 있다. 이는 넥상스가 케이블 납품을 넘어, 전체 관리 서비스를 제공하며 고객 지향을 실현하는 일례"라고 덧붙였다.

"사물인터넷(IoT)는 이제 전 산업분야에 걸쳐 중대한 공헌을 하기 시작했다. 그리고 넥상스와 에네디스의 프로젝트가 보여준 것처럼, 클라우드 기반 솔루션과 연계된 스마트한 사고는 케이블 드럼 관리와 같이 가장 기본적인 물류 작업 조차 한 단계 발전시켜준다. 더욱이 이는 ffly4u의 솔루션이 사업적 가치, 한 마디로 서플라이 체인 데이터 기반의 고객 가치를 창출할 수 있는 역량을 보여준다"라고 ffly4u CEO 올리비어 페이지(Olivier Pages)는 말했다.

현대중공업, 올해 매출목표 14조9,561억원

현대중공업은 지난 3월 24일 '제 43기 정기 주주총회'를 개최했다. 이날 주주총회에서 강환구 대표이사 사장과 가삼현 사장을 사내이사로, 최 혁 서울대학교 경영학과 교수를 사외이사로 선임했다. 최 혁 이사는 감사위원회 위원으로도 선임됐다. 이날 주주총회에서는 이사 선임과 감사위원회 위원 선임의 건 외에도 재무제표 승인, 이사 보수한도 승인 등 총 4개 안건이 가결됐다.

현대중공업 강환구 사장은 인사말을 통해 "지난해 해운시장의 침체와 저유가 등으로 조선 · 해양사업의 일감이 십 수 년 만에 최저 수준을 기록하고, 다른 사업 역시 글로벌 경기 침체의 여파로 기대에 미치지 못하는 실적을 거둬 주주들에게 죄송스럽다"고 말했다. 이어 "올해는 수익성 강화에 총력을 기울이고 사업분할을 통해 본원적인 경쟁력을 강화함으로써 옛 명성 회복하고, 위기를 넘어 새로운 미래를 열어 나가겠다"고 강조했다.

이날 발표된 영업보고에 따르면, 현대중공업은 지난해 매출 19조5,414억원, 영업이익 3,792억원, 당기순이익 2,849억원을 기록했으며, 자산총액은 29조5,669억원으로 전년 대비 2.05% 감소했다. 또한 현대중공업은 2017년 경영 계획을 매출 14조9,561억원으로 발표했다.

한편, 현대중공업은 지난 2월 임시 주주총회에서 업종 특성이 상이한 사업의 분할을 확정했으며, 오는 4월 1일 현대중공업(주), 현대일렉트릭앤에너지시스템(주), 현대건설기계(주), 현대로보틱스(주) 4개 독립법인으로 분리돼 새롭게 출범한다.

슈나이더, 한국 산업용 사물 인터넷 시장 리더십 강화

차세대 에코스트럭처 플랫폼은 통신이 가능한 커넥티드 제품부터 스마트한 현장 및 원격 제어, 상위 의사 결정을 위한 어플리케이션, 분석툴 및 서비스까지 3단계로 이루어진 통합 솔루션이다.

지난 3월 14일 슈나이더 일렉트릭 코리아는 그랜드 힐튼 서울 호텔에서 개최된 '라이프 이즈 온 이노베이션 서밋'(Life is On Innovation Summit)에서 산업용 사물인터넷(IIoT) 기능을 극대화한 차세대 에코스트럭처(EcoStruxure) 통합 솔루션을 발표했다. 동시에 에코스트럭처를 이루는 다양한 제품 중 하나인 스트럭처온(StruxureOn), 파워태그(PowerTag), 알티바 머신 ATV320(Altivar Machine ATV320)도 함께 출시했다.

에코스트럭처는 사물인터넷을 접목하여 효율적인 에너지 관리와 공정을 최적화하여 생산성을 향상시키는 3단계의 기술 플랫폼이다. 1단계에서는 통신이 가능한 스마트 제품들이 서로 연결되고, 2단계는 연결된 제품들로부터 데이터가 올라가 모바일 또는 원격으로 이를 최적화하고 제어하는 엣지 컨트롤(Edge Control), 마지막 3단계는 최상위 레벨에서 방대한 데이터를 실시간 분석하고 복잡한 의사결정을 지원하는 어플리케이션과 분석 툴/서비스로 이루어진다. 에코스트럭처는 2007년에 출시되어 전세계 각지에서 약 45만개 포인트에 설치되어 사용되고 있는데, 사물인터넷 기술의 발달에 따라 클라우드, 실시간 데이터 분석 및 액션, 엣지 컨트롤 등을 강화해 재출시하는 차세대 기술 플랫폼이다.

슈나이더 일렉트릭 코리아 김경록 사장

슈나이더는 마이크로소프트, 인텔 등 유수의 기업들과 파트너십을 바탕으로 에코스트럭처 커뮤니티를 결성해 어플리케이션, 분석 및 서비스를 강화해 보다 심층적인 데이터 분석과 전략을 제시했다. 이외에도 다양한 파트너와의 협력을 도모하여 개발자와 데이터 과학자뿐만 아니라 하드웨어 및 서비스 파트너에게 접근을 허용하여 어플리케이션을 새롭게 개발하는 등 개방된 플랫폼을 운영한다.

에코스트럭처를 구성하는 다양한 신제품도 함께 출시되었는데, 스트럭처온(StruxureOn)은 데이터센터나 서버실 등 전력 유지가 매우 중요한 인프라를 슈나이더 일렉트릭 클라우드와 연결해 모니터링하는 디지털 서비스이다. 사물인터넷 기술로 데이터를 실시간 수집 및 분석하고, 모바일에 최적화된 커뮤니케이션으로 고객은 스마트폰을 통해 24시간 원격으로 장비 상태를 살펴 보고, 필요시 슈나이더 일렉트릭의 전문 엔지니어와 논의할 수 있다. 문제 발생시에 고객이 현장에 직접 가보지 않아도, 슈나이더 일렉트릭의 엔지니어가 즉시 상황을 통보하고, 현장 서비스 조직을 배치하여 신속히 문제

를 해결한다. 또한 정확한 상태 진단 및 히스토리 분석을 통해, 설비의 문제나 고장 가능성을 미리 예측하고 예방함으로써 사고 가능성을 획기적으로 줄일 수 있다.

파워태그(PowerTag)는 세계 최초의 초소형 무선 에너지 센서로 통신이 가능하지 않았던 기존 전력기기를 사물인터넷 시대의 제품으로 변환시켜 준다. 빌딩의 기존 차단기나 배전반에 손쉽게 부착하면, 무선으로 에너지 사용량, 전압, 전류, 역률 등의 데이터를 실시간으로 모니터링함으로써 빌딩의 에너지 효율을 높이고 전력 시설의 상태를 개선할 수 있다.

알티바 머신 ATV320(Altivar Machine ATV320) 은 세계 최초의 서비스 지향 스마트 인버터인 알티바 제품이 기계 제작에 특화된 버전이다. 알티바 머신은 이더넷 네트워크를 기반으로 하는 웹서버 인터페이스를 탑재한 것이 특징이다. 사물인터넷 기술을 적용해 인터넷이 연결된 곳에선 언제 어디서나 손쉽게 인버터를 모니터링하고 제어할 수 있다. 또한 기계 설계와 엔지니어링 비용을 최적화하는 제품으로, 비용과 운영 효율성을 고려하는 기계 제작업체에 적합하다.

이 밖에도 전력 소모를 80% 낮춘 그린 컨택터, 인공지능 기술을 이용한 데이터센터용 DCIM 쿨링 옵티마이즈(Cooling Optimize), 증강 현실 기술을 적용한 비제오 360(Vijeo 360), 가상현실 기술을 적용한 아이심(EYESIM), 석유 및 가스 등 안전이 중요한 제조 현장의 비상정지시스템 트라이콘 CX(Tricon CX) 등도 선보였다.

슈나이더 일렉트릭 코리아 김경록 사장은 "슈나이더 일렉트릭은 1997년부터 이더넷 통신으로 연결된 공장을 구현해 산업용 사물인터넷을 접목한 솔루션을 공급해 일찍이 4차 산업혁명을 준비해왔다. 슈나이더 그룹 매출의 45%가 사물인터넷 관련 제품에서 나오고 있다"며, "한국에서도 산업용 사물 인터넷 리더십을 강화해 차세대 에코스트럭처가 전력망, 빌딩, 공장, 데이터센터 등 다양한 산업

슈나이더 일렉트릭의 알티바 머신 ATV320 (Altivar Machine ATV320)

현장에서부터 상위 의사결정 단계까지 아우르는 사물인터넷 기반의 솔루션을 통해 모든 단계에서 혁신을 이루는데 기여할 것으로 기대한다"고 말했다.

성동조선해양 선주사 스콜피오 탱커스 8만 달러 감사 후원금

성동조선해양의 선주사인 스콜피오 탱커스(Scorpio Tankers)가 지난 3월 20일 115,000톤급 정유운반선의 명명식에서 성공적인 프로젝트의 마무리와 높은 품질을 위해 노력한 임직원들의 노고에 대한 감사로 후원금 8만 달러를 쾌척했다.

스콜피오 탱커스는 지역의 어려운 이웃을 돕기 위해 통영시와 고성군에 각각 1만 달러씩, 힘든 여건 속에서도 프로젝트의 성공적인 마무리와 고품질의 선박을 건조하기 위해 최선을 다해준 성동조선해양 임직원을 위해 2만 달러, 그리고 임직원들이 일에 전념하고 사회의 미래를 준비하는 성동마리아차코스 어린이집의 아이들이 좀 더 좋은 환경에서 성장할 수 있도록 써달라며 4만 달러를 전달했다.

이날 명명식에서 스콜피오 탱커스의 선박건조를 담당하는 소트리오스 카사라스(Sotirios C. Katsaras) 수석 감독관은 "선박을 성공적으로 건조해준 성동조선해양 임직원들에게 감사하며, 지역사회의 어려운 분들을 위해 사용해 달라"라는 말과 함께 후원금을 전달했다.

성동조선해양 관계자는 "함께 생활하는 지역 이웃에게 사랑을 실천할 수 있는 계기가 마련되어 큰 보람을 느낀다"며 "조선산업이 어려운 시기이지만 최고 품질의 선박건조로 선주사와의 신뢰관계를 돈독히 하고 고객만족을 통해 이 어려운 시기를 헤쳐나가겠다"고 말했다.

스콜피오사는 지난 2014년 18만톤급 벌크케리어 6척, 11만5천톤급 탱커 2척 등 총 8척의 선박을 발주하며 성동조선해양과 연을 맺어왔다.

Cruise Control

The Rolls-Royce Blue Ocean team has challenged conventional design thinking for small vessels in the luxury cruise segment. Their new concept offers a unique experience for passengers and the best in fuel efficiency with low emissions for operators.

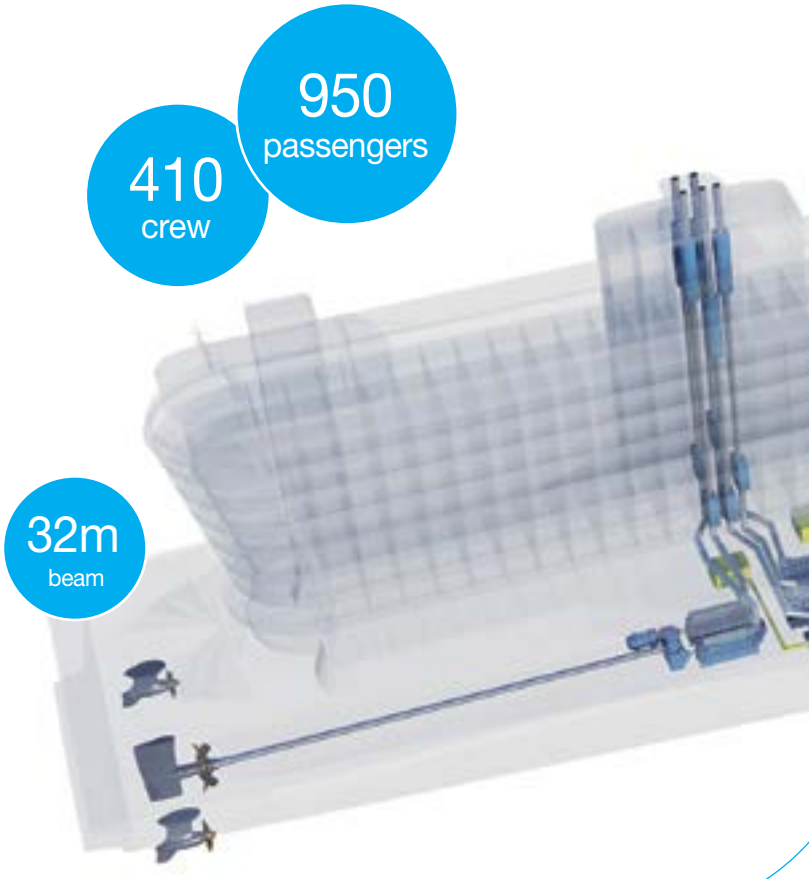
Rolls-Royce

The Sapphire Blue cruise concept from Rolls-Royce is LNG fuelled and can carry up to 950 passengers in comfort. Modular build and construction is a key part of the design philosophy, and four alternative propulsion systems enable the ship design to be closely matched to individual requirements for the lowest running costs.

One of the goals for the Blue Ocean team at Rolls-Royce was to design a cruise vessel where every one of up to 950 passengers would have a spacious cabin with plenty of natural light, as well as access to their own balcony.
The ship would also have to be cost-efficient to build, using a form of modular construction, and fuel-efficient to operate. That's where the Sapphire Blue cruise concept was born.
This innovative design provides novel cabin layout, generous seaside decks, and a unique combination of indoor and outdoor spaces. It also meets the shipowner's need for a revenue-maximised vessel of moderate size and capital cost that has a high fuel efficiency and minimum emissions.

Governed by function

"Cruise vessel design is all about best use of space and volume," says Oskar Levander, VP of Innovation, Engineering & Technology. "With a superstructure much narrower than the beam of the ship, the shape of our innovative cruise concept is governed by function. The idea is that all the passenger cabins run through the width of the superstructure, with windows to port and starboard in each case, maximising the spaciousness and natural light. There are no inside cabins or tiny portholes. Instead lifts and staircases give access to small groups of cabins by walkways and one-way glass protects privacy."
Decks of cabins extend upwards rather than sideways. Public rooms are on one deck in the full width of the hull, and also on the first deck of the narrower superstructure surrounded by a broad promenade deck where the infinity swimming pool, running the width of the ship, is located. There is further open passenger deck space on the outdoor rooftop above the accommodation, and for the adventurous, a spectacular waterslide will deliver them from here to the pool.
At the lower public deck level are the show lounge, conference and business centre, casino and library, play area and lobby/atrium, reception and main dining room and galley. At promenade deck level in the superstructure are the lido cafe, bars and shops which can be accessed from the open deck or the central corridor to give a feeling of informality. The layout maximizes passenger space by allowing compact service areas.
Compared to many of today's cruise vessels carrying thousands of passengers and competing for space in major ports, this ship can enter smaller and more interesting harbours thanks to its moderate size and good manoeuvrability. Essentially a vessel for warm water cruises of up to three weeks duration, for example in the Caribbean. It also has the range to cross the Atlantic on its sole fuel – LNG – to reposition for cruises in the Mediterranean.

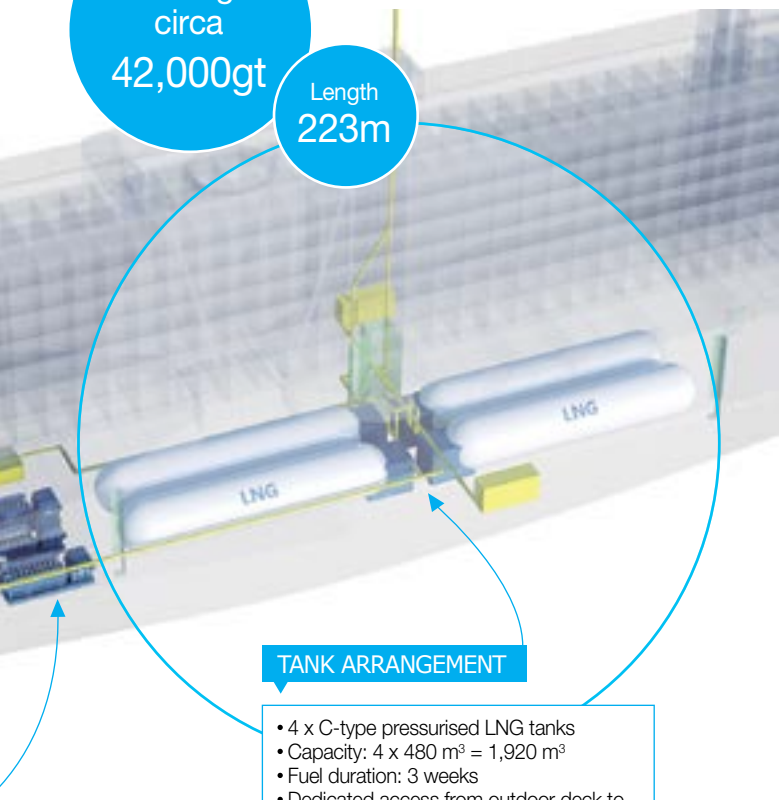


LNG FUELLED PROPULSION

Depending on the propulsion system selected, four or five gas engines provide all the power. Promas with wing thrusters are illustrated.

LNG fuelled propulsion

The ship is about 42,000gt and has cabins for a maximum of 950 passengers, plus a crew of 410. It is 223m long and has a 32m beam.
"The Sapphire Blue cruise concept is based on a pure LNG power plant," says Esa Jokioinen of the Blue Ocean Team. "Running costs of the machinery is very attractive compared to diesel or heavy fuel. Emissions are also substantially lower, compared with diesel, and of importance to a cruise vessel close to shore or in port, NOx is greatly reduced, sulphur emissions are zero and there is no smoke."
Power levels have been selected to give a 19 knot design speed and maximum endurance at 16 knots, with 20-21MW of installed power to cover propulsion and hotel loads. In



TANK ARRANGEMENT

- 4 x C-type pressurised LNG tanks
- Capacity: 4 x 480 m^3 = 1,920 m^3
- Fuel duration: 3 weeks
- Dedicated access from outdoor deck to tank storage compartments – no access from inside the ship.

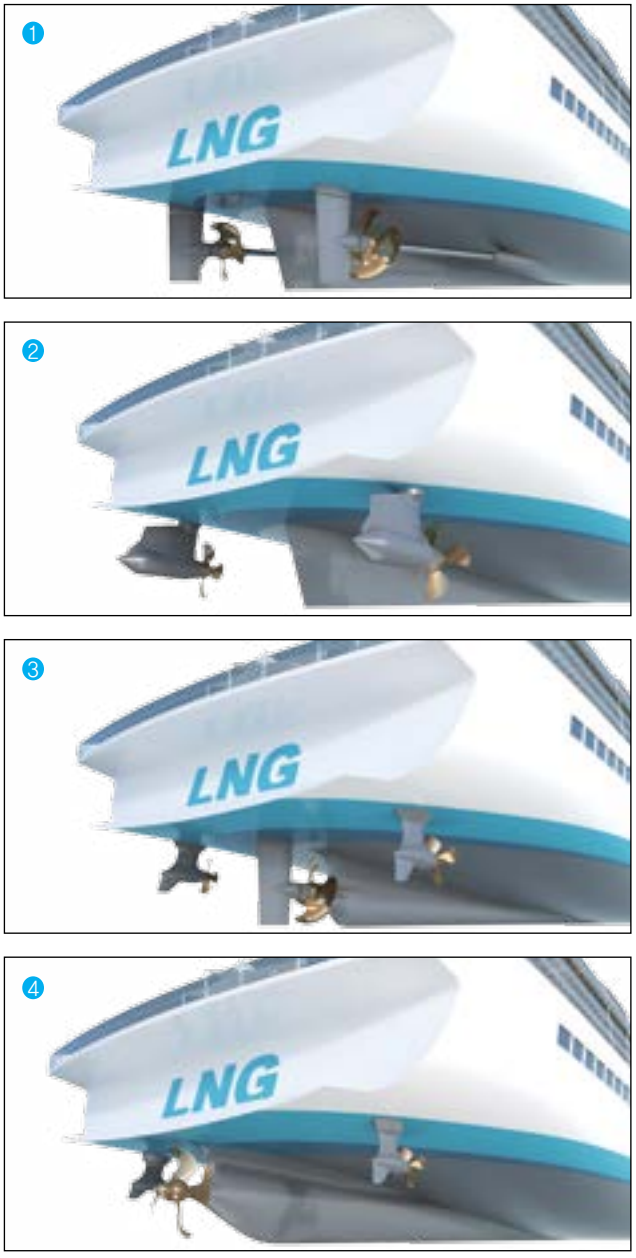
each case the power is provided by Bergen B35:40 pure gas engines. Four LNG tanks, each of around 500m^3 capacity, are located in the hull ahead of the engine rooms and are well protected against potential collision damage, with bunkering connections both port and starboard. For safety, access to the tank spaces is only from outside, with no doors to other decks.

Four propulsion system options

Four propulsion system options are illustrated, in each case based on LNG fuel. In combination with a low-resistance hull design, all of them offer good fuel efficiency and effective manoeuvring and the choice depends on the type of cruise itinerary and the operator's preference.

"This article originally appeared in In-Depth, the marine customer magazine of Rolls-Royce."

PROPULSION SYSTEM OPTIONS



1 TWIN ELECTRIC PROMAS
- High reliability
- Low investment cost
- Good efficiency

2 TWIN PODS
- High propulsion efficiency
- Low noise
- Good manoeuvring

3 PROMAS/WING THRUSTERS
- High propulsion efficiency
- Excellent manoeuvring
- Proven technology
- Good total economy

4 LAP/WING THRUSTERS
- Best propulsion efficiency
- Low prop loads - low noise
- Good manoeuvring
- Best total economic performance

Marine Industry: Monitoring of SO_2 and CO_2

- We are on your wavelength

ABB

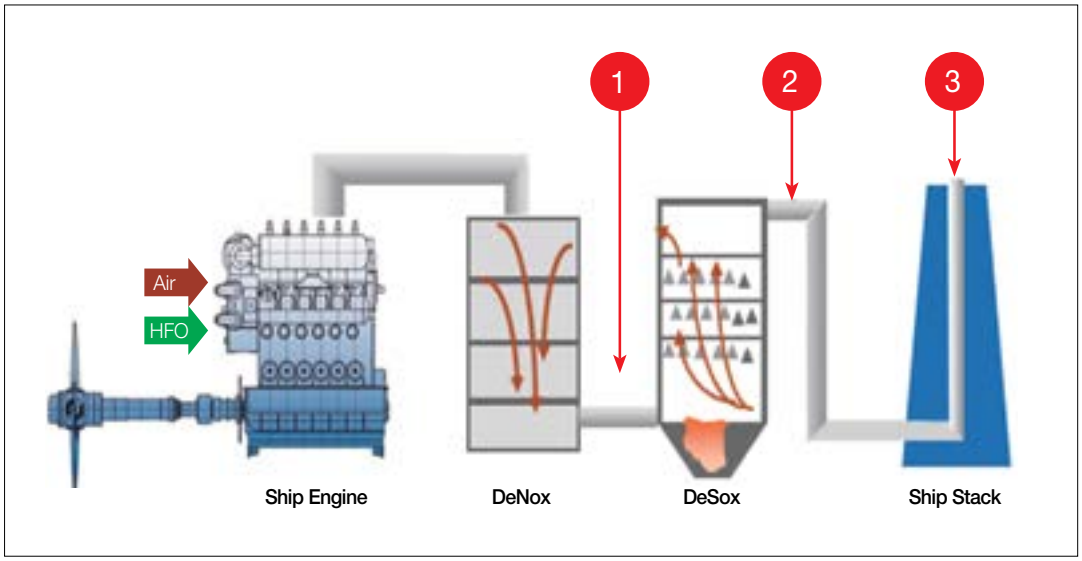
By Fabiano de Melas, ABB Measurement & Analytics Global Product Manager

Scrubber manufactures are challenged by ship operator and ship owners to deliver exhaust gas cleaning systems (EGCS) allowing vessels to abate emissions of SO_2 from their Heavy Fuel Oil fuelled engines. With every EGCS on board of vessels, a continuous emissions monitoring system (CEMS) for measurement of SO_2 and CO_2 is required.

The IMO has specified:
- Which components has to be monitored
- Which analysers can perform the required measurements
- Which equipment shall be used to provide the necessary information
- How data shall be stored, in essence how CEMS can help ship operators to be environmental complaint.

Measurement of SO_2/CO_2

Measurement of SO_2 and CO_2, as mentioned above, is a subsequent of reporting their ratio given as quotient SO_2



Measuring points between engine and stack

(ppm)/CO_2 (vol.%).
The marine legislation asks for measurement of SO_2 downstream (scrubber) and for CO_2 either upstream (when the scrubber is demonstrated to partially remove also CO_2) or downstream of the scrubber.
Most of the time CO_2 is washed out as well, therefore the most plausible application foresees a tap point after the scrubber for SO_2 measurement and a second tap point at the scrubber inlet for CO_2 measurement. Both sample lines are sent to the chosen analyzer AO2000- Uras26 that is configured with two separated gas paths and two internal gas cells one in parallel to the other.
The possible measuring needs might be:
1) CO_2 before the DESOx and SO_2 after DESOx
2) CO_2 and SO_2 immediately after the DESOx
3) CO_2 and SO_2 after the DESOx, at the Stack(s)

SO_2 and CO_2 and their ratio SO_2 (ppm)/CO_2 (vol%) can be measured with AO2000-Uras26 integrated into a system – care must be taken also to engineer a solution capable to carry out a representative sampling and precise analysis, therefore please contact Product Management.
The analytical system to monitor SO_2 and CO_2 values is part of the ECGS and therefore it has to be certified according to MEPC 184(59) by a classification society along with the scrubber.

Engineering a proper solution

The local specifications from scrubber manufactures or ship operators can be very different, it is therefore appropriate to engineer customized solutions depending on:
- *Number of scrubbers after the engine,*
- *Number of funnels for each scrubber*
- *Distances between sampling points and analytical unit*
- *Environmental conditions*

The cabinet has to be installed in space to be identified on board of each specific vessel and it is typically narrow and exposed to external ambient conditions. Care must be taken to find appropriate space covered by marine splashes.


Example of a DeSOx Scrubber

The most appropriate installation area for CEMS on vessels is typically one of the decks, ideally the one as close as possible to the stack to be monitored, ideally well ventilated, and repaired from sunshine, within a distance of 10 meters from the sample probe.
The cabinet must be properly locked to the floor and to the wall, taking care of foreseeing vibration dampers, to cut unwanted vibrations.
The components that need to be put together for engineering an analytical solution for marine emission monitoring are:
- *Heated Probe with back- purge capability*
- *Heated line*
- *Cooler with peristaltic pump and condensates bottle*
- *Membrane Pump*
- *Moisture dosing system*
- *Analyzer for SO_2/CO_2 measure – AO2000- Uras26*
- *Analyzer for O_2 analysis - optional (only necessary for combustion optimization purposes, not required by legislation) – AO2000- Magnos26*
- *Robust and conditioned cabinet*

Complying with legislation - key technical aspects

The MEPC184 (59) foresees two schemes for ship operators for complying with SOx emission controls:
- *Scheme A: daily spot checks*
- *Scheme B: continuous measurement*

Daily spot check involve many more maintenance aspects than monitoring, therefore Scheme B is mainly adopted and Continuous Emission Monitoring System (CEMS) has to be installed on board along with exhaust gas scrubbers – also defined by IMO as Exhaust Gas Cleaning Systems (ECGS).

Exhaust gas scrubbers

ECGS can be installed to remove sulphur from the engine exhaust gas using seawater or freshwater and/or chemicals which are pumped through the scrubber (wet scrubbers).
Dry scrubbers are also available, where hot exhaust gas is fed through a packed- bed absorber filled with lime in the form of granulate pellets which reacts with the SOx and produces gypsum, a soft sulphate mineral.
The scrubber allows the ship to use cheaper, readily available high sulphur fuel. Besides removing nearly all sulphur from the exhaust, a scrubber also removes a large part of soot and particulate matter. However, the system takes up space, is a significant investment and requires additional energy to run.
Scrubbers are generally bulky and require alterations on board, such as additional tanks, pipes, pumps and a wash-water treatment system. The sulphur is released overboard with the discharge wash water, and in open waters this is generally appreciated to be unproblematic from an environmental point of view.
The sludge produced is categorized as special waste, to be disposed of at dedicated shore facilities. Scrubbers can be installed on new buildings as well as retrofitted to ensure ECA compliance for existing ships.
All scrubbers installed for abating sulphur concentration in the emission gases must be equipped with a continuous emission monitoring system, measuring SOx and keeping track of the measured values.

Reference measuring principle

The reference principles for marine emission measurements set by IMO are given in the MEPC documents. When it comes to analysis of SO_2 and CO_2 the MEPC 184 (59) and the NTC 2008 report what follows, in respect to reference technologies:
- *SO_2 → NDUV and NDIR*
- *CO_2 → NDIR*

and specify that:
- *measurement of SO_2 and CO_2 must continuously monitored and recorded*

It is therefore appropriate to choose an AO2000- Uras26 for

measuring both SO_2 and CO_2 gas concentrations. The analyzers performances requested by legislation are indicated here:

- *Accuracy: max. ± 2% deviation of reading or max. ± 0.3% deviation F.S.*
- *Precision: Conc. >100ppm - > max ± 1% of FS, Conc. <100ppm - >max ± 2% of FS*
- *Noise: Peak- to- peak not to exceed 2% FS on all ranges*
- *Zero Drift: max ± 2%/h of FS on lowest range used*
- *Span Drift: max ± 2%/h of FS on lowest range used*

These requirements are greatly met by the AO2000- Uras26.

Measuring ranges

Typical ranges for DeSOx application are:

- *Downstream Scrubber:*
- *SO_2: 0- 200 ppm*
- *CO_2: 0- 10%v*
- *H_2O: 0- 10%v*

Upstream Scrubber:

- *SO_2: 0- 5000 ppm*
- *CO_2: 0- 10%v*
- *H_2O: 0- 70%v*

The legislation calls for measurement after the scrubber, however some customers might be interested to monitor SO_2/CO_2 values in both positions. It is also allowed by legislation to monitor CO_2 before the scrubber and the SO_2 after it, when it is proven that the scrubber can reduces CO_2 values.

IMO has also set the value of sulphur content in fuels to 0.1 vol% for the "Emission Costal Areas" (ECAs) or, which is equivalent, to a value of SOx (ppm)/CO_2 (vol.%) ratio to be met by EGCS of 4.3 within the ECAs.

According to the NTC2008 Appendix VIII Pt. 2.2.2, the analyzer range should be chosen ensuring that the measured typical emission value is within 15% - 100% of the range used. Assuming the CO_2 after the scrubber to be about 6 %, and considering that with a 0.1 %vol Sulfur fuel, the equivalent SO_2/CO_2 ratio as per MEPC 184 (59) must be 4.3, then it is clear that the expected SO_2 concentration in ppm shall be 6 x 4.3 = 25.8 ppm. This implies that the SO_2 range to be chosen for 0.1 vol% sulfur fuel shall not be bigger than 0-200 ppm.

Fuel Oil Sulphur Content (% m/m)	Ratio Emission SO_2 (ppm)/CO_2 (% v/v)
4.5	195.0
3.5	151.7
1.5	65.0
0.5	21.7
0.1	4.3

IMO table linking Fuel Sulphur Content with equivalent SO_2/CO_2 Ratio

Calibration

Calibration set up shall be foreseen wet. A zero point calibration with nitrogen shall be foreseen.

A wet calibration gas has to be put in place, by adding constant moisture to the dry calibration gas: the first calibration when the classification society validates the analyzer calibration must be carried by artificially adding a constant and controlled amount of moisture to the dry gas supplied by the test gases. By doing this the losses of SO_2 in the cooler must be measured and proven to be constant when gas flow and temperature are kept constant.

Once this is measured and recorded a dry gas calibration shall be carried out turning off the moisture step, therefore allowing for a simplified approach for daily operations.

Gas drying

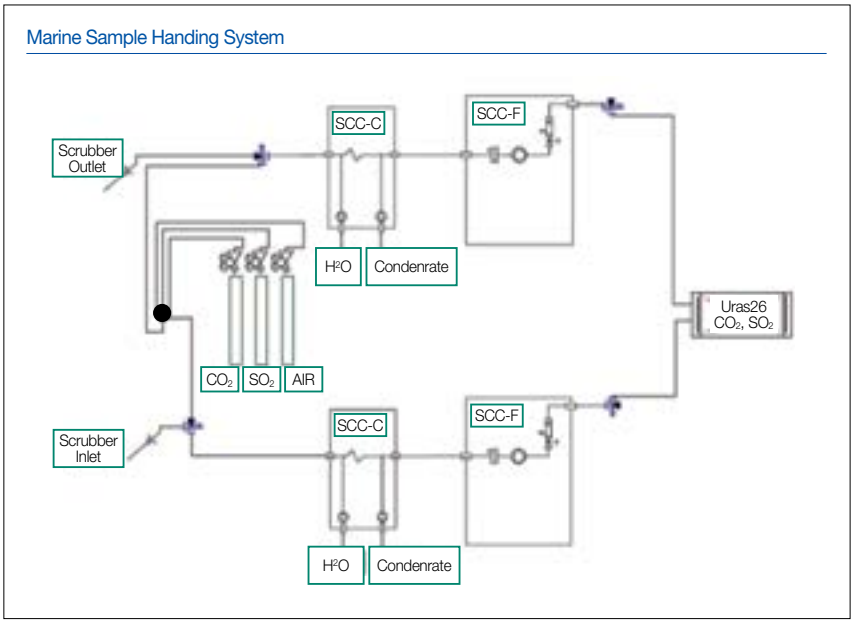
When measuring SO_2 and CO_2 dry measurement is always allowed; the wet measurement is permitted only for SO_2 measurements.

Hence when employing an AO2000- Uras26, the measurements are performed on a dry basis, therefore the sample must be treated before entering the optical cells. The legislation allows for gas drying by use of "drying devices" with minimal and controlled effects on the composition of the measured gases. (NTC2008, Appendix III Pt. 1.6). Cooling units are specifically allowed as mean to remove water from exhaust gas samples, by making sure that cooler temperature is kept between 0°C and 4°C. (NTC2008, Appendix III Pt. 1.2.13).

Measuring points

The scenarios for measuring points can very different. They will depend from the number of engines, number of scrubbers and if the ship owner has decide to equip each engine funnel with a scrubber or if a single scrubber is used to wash exhaust gases coming from different engines.

The typical scenarios are:



Drawing of a typical gas sampling system with two tap points

1) One main engine and other two/three auxiliary engines or boilers, each of them equipped with a single scrubber, each scrubber with one funnel
2) One main engine and other one/two auxiliary engines all connected to one larger scrubber with one funnel
3) One main engine and other two/three auxiliary engines all connected to one larger scrubber with multiple funnels
4) One main engine and other auxiliary engines all connected to one scrubber + one alternative "clean fuel" engine directly emitting to atmosphere.

On each scrubber funnel gas measurements can be carried out:
i) SO_2/CO_2 after the scrubber
Ii) SO_2 after the scrubber, CO_2 before
iii) SO_2/CO_2 at the stack, (where two or more scrubbers are conveyed together)
Case i) and ii) are realistic and most likely. Case iii) is less requested as in case of off- spec, failure source can't be rapidly identified.
There a number of documents that the ship owner must have ready for the authority for certification purposes. These are:
- *SECP SOx Emission control compliance*
- *ETM EGC SOx Technical Manual Sch. B*
- *EGC record book or Electronic Logging System*
- *OMM On board Monitoring Manual*

In the OMM, details on the CEMS must be reported:
- *Type of analyzer*
- *Position in the ship*
- *Service requirements*
- *Maintenance aspects*
- *Calibration procedure*

Data recording and processing

The Data recording shall fulfill following requirements:
- *Acquisition rate must be not less than 0.0035 Hz (which corresponds to 4.76 minute)*
- *Data shall be recorded against the Global Navigational Satellite System (GNSS)*
- *Data should be retained for a period of not less than 18 months from the date of recording*

Also the data logger associated with CEMS must be capable of downloading a copy of the recorded data and reports in a readily useable format.
Copy of the data and reports must be available upon request to the Administration and Port State Authorities.

AUTROL
DUON System Co., Ltd. since 1989

SIL2

국내 지능형전송기 선두주자 안전무결성 등급

SIL2 인증 획득

APT3500

APT3200

APT3100

SIL2 인증서

Safety Integrity Level

IEC 61508:2010 Ed.2 & IEC 61511:2003

두온시스템㈜의 SIL2 인증은 안전성이 반드시 요구되는 각 종 화학, 정제 플랜트 및 중요 라인의 필수 요건을 충족 시킵니다.

다양한 현장에 Chemical Seal도 적용 가능하며, 각 기기는 SIL2 요구조건을 충족시키고(HFT=0,1oo1), SIS에서 요구되는 SIL3 조건은 이중화 구성(HFT=1,1oo2)으로 적용 가능합니다.

www.autrol.com

두온시스템(주) 경기도 군포시 공단로 298-29(금정동)

T:(031)389-6100 F:(031)429-7200 E:autrol@duon.co.kr

대리점 및 특약점

서울 · WISE 우진 (02)2614-5110 | 경기 · (주)에스앤케이이엔지 (070)8270-0666 · 씨에스 오토메이션 (043)276-1332 | 전북 · 지아이 (02)871-8934 | 전남 · 한양계전 (061)683-4268 · 우진산전 (061)685-9900 · 정한시스템 (061)793-9293 | 진우시스템 (062)676-0245 | 광양 · (주)한텍 (070)7753-7195 | 포항 · (주)세화계전 (054)278-4755 · 유엔아이시스템 (054)289-2580 | 울산 · 이엔아이주식회사 (052)277-8003 · 원엔지니어링 (052)258-1996 · (주)세인텍 (052)287-0601 · 코발이앤에스 (052)900-5807 | 마산 · (주)삼우인스텍 (055)276-6661 | 울진 · 신화계전 (054)783-0226 | 대구 · KDD (053)604-5662 | 부산 · 다영자동화기기(주) (051)808-1885 · (주)삼주이엔지 (051)303-0911 | 제주 · 동원기계상사 / 삼익엔지니어링 (064)726-0985

Ergonomic compact angle grinders for continuous use

FEIN presents compact angle grinders with a new grip concept: 'FEIN ErgoGrip' low-fatigue, powerful, reliable and durable

C. & E. Fein GmbH

Compact angle grinders with FEIN ErgoGrip are powerful cutting tools

Compact angle grinders with FEIN ErgoGrip: fatigue-free working

The extended handle narrows to the rear making FEIN ErgoGrip tools very ergonomic and allowing users to work continuously without tiring. The grinders are particularly suitable for industrial users and manual trades in applications involving a lot of heavy-duty grinding and cutting.

Ergonomic handle shape for continuous use

North Americans have been using so-called “rat tail” tools for decades. This handle shape, hardly ever seen in Europe, allows users to safely grip and guide the tool when holding it in a defined position: angle grinders are not clasped around the motor housing like rod-shaped tools, but are held by the extension of a narrow handle. All the force can then be applied in the direction of work. FEIN is the first manufacturer to include angle grinders of this design in its range at all power ratings between 1100 and 1500 W, even for stainless steel processing.

The power tool manufacturer has more than 100 years of experience in the development of angle grinders. “We trialled various grip designs in extensive studies and practical tests to find the optimum handle shape. Our main priority was maximum contact between the palm and handle. Thanks to the slim grip zone with large contact face, for which a patent is pending, the user has to exert less force and doesn’t tire as quickly,” says Rainer Warnicki, head of product development at FEIN. Weighing upwards of 2.4 kg, the tools are among the lightest on the market.

Improved control and safety

The new compact angle grinders with FEIN ErgoGrip have a narrow, convex handle. With a handle length of 120 mm, users can guide the tools with ease even when wearing thick welder’s gloves. They can maintain a good grip and work flexibly on even complex components. Angle grinders with FEIN ErgoGrip are available with a lockable switch or dead man’s switch which has to be continuously actuated. Tools with a dead man’s switch cut out immediately if the user releases the switch. They were developed especially for industrial sectors with very stringent safety requirements, for example refineries and container construction. To reduce effort, both variants are operated with two fingers.

Compact angle grinders with FEIN ErgoGrip: fatigue-free working

Compact angle grinders with FEIN ErgoGrip

Industrial quality compact angle grinders

All FEIN angle grinders are developed, manufactured and assembled at the company's headquarters in Germany. Even under load, FEIN compact angle grinders run at a high and stable speed and, thanks to the high copper content of the motor, will remove up to 30 percent more material than competitor products in the same performance class. Their carbon brushes also last up to 30 percent longer because the central components, the motor, gearbox and special ventilation unit in the collector carbon brush system, work perfectly together. A solid metal gearbox head makes the tools particularly robust and durable for tough jobs. The gearbox head can be turned in steps of 90 degrees to allow an ergonomic working position to be adopted for cutting and grinding work. They are fitted with a spindle lock and their safety hood can be removed yet will not twist. All equipment packages are supplied with a 4 m H07 industrial cable.

Three product lines

Compact angle grinders with FEIN ErgoGrip are available in the same product lines as the rod-shaped models, each with a lockable switch or dead man's switch.

Compact angle grinders with FEIN ErgoGrip from the Solid entry-level line are ergonomic angle grinders with 1100 W of power and basic functions for deburring, grinding and cutting work. They have a rated output of 1100 W and are designed for grinding disc diameters of 125 mm.

Compact angle grinders with FEIN ErgoGrip from the Power product line have in-built POWERtronic tacho electronics, giving them 400 W more power than Solid models of the same size. A wide range of functions designed to protect the user are also integrated. A soft start enables the tool to be started up gently and safely. If the power supply has been interrupted, the restart protection system requires the angle grinder to be switched back on manually - ruling out the possibility of an unintended restart. Should the disc catch, the blockage monitoring system shuts the tool down so it doesn't spin in the user's hand. Electronic overload protection prevents the motor from being damaged. They are available with a 1500 W rated output and disc diameters of 125 or 150 mm.

Compact angle grinders with FEIN ErgoGrip from the Inox product line were developed with a variable speed setting for stainless steel processing. Their speed can be electronically adjusted in an infinitely variable manner between 2500 and 8000 rpm. The larger mechanical gear reduction also ensures a stable speed at low speeds. This makes the tools ideal for grinding, satin-finishing and brushing stainless steel.

About company

The world's first power tool was invented by C. & E. Fein GmbH. Wilhelm Emil Fein founded the Company in 1867. In 1895, FEIN invented the electric hand drill, the first-ever power tool. Today this long-standing Company is a world-renowned power tool manufacturer. The German manufacturer of premium products develops and produces application solutions for the metal working, interior outfitting and automotive sectors and is the specialist for professional and extremely reliable power tools for industry and manual trades. FEIN holds more than 800 active industrial property rights, including around 500 patents and patent applications. FEIN markets its products through 19 international subsidiaries and more than 50 representations around the globe. For over 140 years, FEIN has been synonymous with application solutions and premium quality.

"AUTOMA 신사옥 준공"

20여년 고객과 함께 성장해온 오토마
2015년 신사옥 준공과 이전으로 새로운 20년을 준비합니다

All about Automatic Valves & Accessories

지난 20년간 자동밸브와 함께해 온 오토마! 신사옥 준공, 이전으로 고객의 가치창조에 한 걸음 더 나아가겠습니다.

LIMIT SWITCH BOX FM APPROVALS

FM Approvals®

주식회사 오토마

· **본사/공장 :** 경기도 부천시 원미구 평천로 862번길 21 (도당동 72-6)
· TEL : 032-653-6477 FAX : 032-653-6478
· 홈페이지_http://www.automa.co.kr · 이메일_automa@automa.co.kr

견적 및 구매 문의 (032)653-6477

AUTOMA
Automatic Valve & Accessories

ABB to power and remotely monitor new BW Group LNG FSRU vessel

ABB will supply the power and electric propulsion system to a new Floating Storage and Regasification Unit (FSRU) for BW Group, which will also be remotely connected to ABB's Collaborative Operations Centers. The equipment onboard will provide data to the shore-side Centers allowing ABB and the vessel owner to take a proactive approach to maintenance throughout the lifetime of the vessel.

"The modern power system must be both efficient and connected," said Juha Koskela, Managing Director of ABB's marine and ports business. "Our hardware will optimize fuel efficiency onboard whilst the Collaborative Operations Centers will monitor the vessel allowing a more informed approach to maintenance."

ABB's power generation and distribution system, along with the electric propulsion system, will work in conjunction with the duel-fuel diesel engine plant to maximize uptime. Much of ABB's scope of supply of generators, switchboards, transformers, main propulsion drives and motors will transmit performance data via sensors. This information is automatically monitored from shore at the Collaborative Operations Centers and ABB will work with the customer during routine and urgent maintenance cases.

The 174,000 cubic meter capacity FSRU has been ordered from Daewoo Shipbuilding & Marine Engineering (DSME). The membrane-

type vessel is expected to be delivered by DSME's Okpo yard in 2019.

Erik Bolstad, Vessel Segment Responsible at ABB said, "ABB's track record in commissioning and servicing LNG installations at South Korean shipyards, coupled with end-user recommendations and the reputation of the ABB brand all played a key role in securing this substantial order."

HSHI secured an order for 4 LNG-fuelled oil tankers

Hyundai Samho Heavy Industries (HSHI) won USD 240 Million order for the World's First LNG-fueled Aframax Tankers. HSHI announced on May 20 that it recently won an order to build four 114,000 DWT Ice-Class IA aframax tankers from Sovcomflot, the Russia's state-owned shipping company.

The world's first LNG-fueled aframax tankers, measuring 250 meters in length, 44 meters in width and 21 meters in height, are scheduled to be delivered from the third quarter of 2018. By running on LNG, the Ice-Class IA tankers can emit 90% less SOx, 80% less NOx, 15% less CO_2 along with 50% reduced engine noise.

An HSHI official said, "We believe the winning of the world's first LNG-fueled aframax tankers is the proof of our world's leading eco-friendly shipbuilding technology. As the demand for eco-ships increases with tightening environmental regulations, we will further accelerate our efforts to win eco-ship orders."

Hyundai Heavy Industries Group has dominated the LNG market since it secured first order for LNG carrier in 1991. It successfully completed construction of the world's first LNG-FSRU (Floating, Storage & Regasification Unit) for Norway-based Höegh in 2014 and added to its orderbook a LNG-FSRU late last year and another unit in the beginning of this year. Moreover, Hyundai Mipo Dockyard (HMD) won an

order for LNG bunkering vessel late last year and Hyundai Heavy Industries(HHI) clinched an order for a LNG carrier this year, thus continuing to receive orders from this segment.
HHI plans to participate in Gastech 2017 - an international gas and LNG exhibition - which is slated to open in Japan next month to make its presence felt as a leader in LNG sector and launch sales campaign to win new orders. Since its first order of six 41,000 DWT bulk carriers in 1989, Sovcomflot has been maintaining close business partnership with HHI Group by ordering 65 ships in total to date.

현대삼호중공업, LNG추진 유조선 4척 수주

현대삼호중공업은 최근 러시아 국영 해운사인 소브콤플로트(Sovcomflot)로부터 114,000톤급 LNG추진 유조선 4척을 약 2억 4,000만 달러에 수주하는데 성공했다.
이번에 수주한 선박은 길이 250미터, 폭 44미터, 높이 21미터로 수면의 얼음이나 빙산에 대비한 내빙기능(아이스클래스 1A 등급)을 갖추었다. 이 선박은 오는 2018년 3분기부터 차례로 인도될 예정이다.
대형 선박으로는 세계 최초로 LNG연료 추진 방식을 적용해 강화되고 있는 환경규제에 대응한 친환경 · 고효율 선박으로 주목 받고 있다. 이 선박은 기존 연료 대비 황산화물(SOx) 배출 90% 이상, 질소산화물(NOx) 배출 80% 이상, 이산화탄소(CO_2) 배출 15% 이상 감소시킬 수 있다. 또한 엔진에서 발생하는 소음도 50%까지 줄일 수 있다.
현대삼호중공업 관계자는 "업계 최초로 LNG추진 대형 유조선을 수주함으로써 친환경 선박 시장에서 기술력을 입증했다"며, "환경규제 강화로 친환경선박(eco-ship)에 대한 수요 증가가 기대되는 상황으로, 기술력을 바탕으로 수주에 더욱 박차를 가할 것"이라고 밝혔다.
현대중공업그룹은 1991년 국내 최초 LNG선 수주를 시작으로 LNG분야 시장을 선도해왔다. 2014년 세계 최초로 노르웨이 회그(Höegh) LNG로부터 수주한 LNG-FSRU 건조에 성공했으며, 지난해 말과 올해 초 LNG-FSRU를 1척씩 수주했다. 또한 현대미포조선이 지난해 말 LNG벙커링선을 수주하기도 했으며, 현대중공업도

올해 LNG선 1척을 수주하는 등 이 분야에서 성과를 이어가고 있다.
현대중공업은 다음달 일본에서 개최되는 국제가스박람회 '가스텍(Gastech) 2017'에 참가해, LNG분야의 경쟁력을 알리고 수주활동에 적극 나설 계획이다.
한편, 러시아 소브콤플로트社는 지난 1989년 41,000톤급 벌크선 6척을 현대중공업그룹에 발주한 후 지금까지 총 65척을 발주하며 오랜 파트너 관계를 유지해오고 있다.

DSME won an order for 2 LNG carriers

Daewoo Shipbuilding & Marine Engineering (DSME) announced on March 2 that it won an order from an European ship owner for 2 units of 173,400㎥ LNG carriers. This contract includes an option for 2 vessels, raising expectation for additional orders. Including the 2 optional vessels, this contract is valued at approximately USD 740 million.
Moreover, Norway-based shipping company Frontline Ltd reached an agreement with DSME to take the delivery of 2 units of VLCCs (Very Large Crude Carriers), currently under construction at DSME's shipyard, which had been cancelled in August last year. As a result, actual value of this contract exceeds USD 900 million. The successful award of this contract to DSME is attributable to vigorous efforts of DSME President Jung Seong-rip who set out on a globe-trotting sales campaign again only 2 weeks after he visited Houston, London, etc., on February 11.
DSME President Jung Seong-rip said, "We are seeing a rebound in the market for gas carriers, such as LNG carriers, LNG-FSRU (Floating, Storage &

Regasification Unit), etc., where DSME has strength. Using this contract as a springboard, we will step up our efforts to put our operations back on track.

DSME executed a Letter of Intent with U.S.-based Excelerate Energy for building 7 units of LNG-FSRU, including optional vessels on February 7 and will enter into main contract for the first batch in the following month. Prominent overseas ship owners placed orders at DSME even for vessels to be delivered at least 3 years later, reflecting deep trust in DSME and recognition of the shipbuilder's strong competiveness and high survivability, which is contrary to the concerns mounting in Korea towards DSME.

DSME plans to strengthen its sales efforts targeting its long-term clients and strive to secure liquidity through rigorous implementation of its self-rescue plan such as early collection of trade receivables for delivery, sale of its subsidiaries and assets.

Last year, DSME received approximately KRW 700 billion in delivery amount as a result of its drive for early collection of trade receivables from world's renowned shipping and energy companies. Additionally, DSME is moving to map out a comprehensive plan in constant consultation with creditors in an attempt to expedite normalization of operations and overcome liquidity crunch.

The LNG carrier ordered to DSME recently measures 295m in length and 46m in width, which will be built at Okpo shipyard on Geoje island and delivered to the ship owner by the second half of 2019. This vessel is the eco-friendly and next-generation LNG carrier which uses natural gas as main fuel and incorporates the latest technologies including high-pressure gas injection type engine (ME-GI) of MAN Diesel and PRS (Partial Re-liquefaction System) of DSME.

대우조선해양, LNG운반선 2척 수주

대우조선해양은 유럽지역 선주로부터 173,400㎥ 규모의 LNG운반선 2척을 수주했다고 지난 3월 2일 밝혔다. 이번 계약에는 2척의 추가 계약이 가능한 옵션이 포함돼 있어 조만간 추가 수주도 기대되는 상황이다. 2척의 옵션까지 포함하면 총 수주금액은 약 7억 4,000만 달러이다.

또한 노르웨이의 해운회사인 프론트라인(Frontline Ltd)도 지난 해 8월 계약이 취소됐으나 대우조선해양이 건조중인 초대형원유운반선(VLCC) 2척도 인수하기로 합의했다. 이에 따라 이번 계약의 실질적인 규모는 약 9억 달러를 넘는다.

대우조선해양 정성립 사장은 지난 2월 11일 휴스턴, 런던 등을 방문하며 영업활동을 펼친지 2주만에 또 다시 해외출장에 나서 가시적인 성과를 일궈냈다. 정성립 사장은 "현재 LNG운반선 및 LNG-FSRU 등 대우조선해양이 강점을 갖고 있는 가스선 시장이 살아나고 있는 분위기"라며, "이번 수주를 시작으로 경영 정상화를 위한 노력에 더욱 박차를 가하겠다"고 밝혔다.

대우조선해양은 지난달 7일 미국의 엑셀러레이트 에너지(Excelerate Energy)와 옵션포함 총 7척의 LNG-FSRU에 대한 건조의향서를 체결했고, 다음달 그 첫 호선의 본 계약도 예정되어있다. 대우조선해양을 불안해하는 국내 여론에 비해 해외 유력 선주들은 3년 이후에나 인도받을 제품들을 발주하며 이 회사의 경쟁력과 생존 가능성에 대해 굳은 신뢰를 보이고 있다.

대우조선해양은 이렇듯 오랜 기간 거래를 지속해온 우량 고객들을 대상으로 영업을 강화하고, 인도대금의 조기수령, 자회사 및 자산 매각 등 자구계획의 철저한 이행 등을 통해 유동성 확보에 노력할 계획이다.

대우조선해양은 지난해에도 세계 굴지의 해운, 에너지회사들을 대상으로 인도대금 조기 입금을 추진해 총 7,000억원 가량을 수령한 바 있다. 또한 채권단과 지속적으로 협의해 경영정상화와 유동성 위기 극복을 위한 종합적인 방안도 마련할 계획이다.

한편 이번에 대우조선해양이 수주한 LNG운반선은 길이 295m, 너비 46m 규모로 거제 옥포조선소에서 건조되어 2019년 하반기까지 선주측에 인도될 예정이다. 특히 천연가스를 주연료로 사용하는 친환경·차세대 LNG운반선으로, 만디젤의 고압가스분사식 엔진(ME-GI)과 대우조선해양의 천연가스 재액화장치(PRS, Partial Re-liquefaction System) 등 대우조선해양이 자랑하는 최신 기술들이 집약돼 있다.

Fleet Management Limited selects Inmarsat's Fleet Xpress

Inmarsat' Fleet Xpress has been specified by Hong Kong-based Fleet Management Limited (FML), one of global shipping's largest independent third-party ship managers.

FML, which manages a large fleet of over 400 vessels consisting of bulk carriers, container vessels, general cargo ships, oil tankers, gas carriers and chemical tankers, with over 14,000 crew, has successfully upgraded all vessels previously equipped with Inmarsat's XpressLink Ku-band service to Fleet Xpress. FML expects to roll out Fleet Xpress to the majority of its fleet globally by 2018. The service will use a Cobham 1m GX antenna for Ka-band connectivity combined with a FleetBroadband terminal for L-Band back-up.

Launched in 2016, Fleet Xpress sets a new standard in maritime communications. The service enhances vessel efficiency, crew welfare and safety, and facilitates 'connected ship' applications by delivering the highest levels of reliable high-speed broadband connectivity available from a single supplier on a global scale.

"We have been working with Inmarsat for more than 20 years, so they have proven they are the most reliable satellite communication service provider and partner in the world," said Mayank Mishra, General Manager at Fleet Management Limited. "We have been thoroughly impressed with the service provided by Inmarsat and expect to implement internet connectivity across the majority of our fleet as quickly as possible. We are committed to delivering the best possible on-board user experience and look forward to bringing a new level of high-speed connectivity to our vessels."

Gerbrand Schalkwijk, Chief Sales Officer, Inmarsat Maritime said,

"Fleet Xpress brings specific benefits for fleet managers. Ship managers are ideally placed to exploit high-speed, ultra-reliable connectivity that puts big data at the heart of operating decisions and cost-controlled connectivity in the hands of seafarers. They also get new hands-on management capability via high quality voice and video calls, while CCTV on-board is also live. Fleet Xpress even enables real-time status checking via an app on superintendent smartphones."

"Inmarsat is proud to be the primary satellite communication provider for FML and we're very happy that they've chosen Fleet Xpress to be their preferred solution for the vessels under their management," concludes Schalkwijk.

WE Tech equips Ektank's chemical tankers with innovative technology and reliable solutions

On 14 March, WE Tech Solutions has received an order to deliver its Permanent Magnet Shaft Generator solution to two new 18600 DWT chemical tankers with an option for another two. The tankers are built by China State Shipbuilding Corporation (CSSC) Chengxi Shipyard for the Swedish ship owner Ektank AB. WE Tech's equipment delivery to Hudong Heavy Machinery Co., Ltd. will commence in October 2017.

"The solution from WE Tech is important for us to build the next generation chemical tankers, in terms of energy efficiency and sustainability. These

vessels will meet all known future demands from governments, the industry and from our customers", said Jörgen Johnsson, Managing Director of Ektank AB.

WE Tech's solution is based on variable frequency drive technology (WE Drive™) and the direct drive Permanent Magnet Shaft Generator. The solution allows the main engine to run at variable speed while the electrical network is generated by the Shaft Generator. Therefore, there is no need to run the auxiliary engines or generators when sailing. This creates tons of fuel savings and reduces operational and maintenance costs. In case the Main Engine is out of operation, the solution uses the Shaft Generator as motor - a reliable and cost-effective Auxiliary Propulsion Drive (APD) to ensure the vessels' safe return to port.

This solution also brings an efficient method to distribute power to bow thrusters and cargo handling system of the tankers. The method is to connect these large electrical consumers' inverter units to the common DC link of WE Drive™. Furthermore, when the tankers are in the harbour, the solution allows the use of cleaner shore power. This versatile and flexible solution will save tons of fuel and reduce emissions both at sea and harbour environment.

"WE Tech is proud to be a pioneer to supply the most energy efficient solutions. We, as well as our customers, strongly believe that our innovative technology and reliable solutions are the future for the marine industry," said Martin Andtfolk, Sales Manager of WE Tech.

Evoqua Secures Seacure® System Contract For South Korean Tanker Newbuilds

Evoqua Water Technologies has secured an order from a South Korean shipyard for the supply and installation of SeaCURE® ballast water management systems (BWMS) to two 115,000 DWT crude oil tankers under construction for a Singapore-based ship owner.

Each vessel will feature a 3000m³/h capacity SeaCURE BWMS, which Evoqua will deliver for installation this summer during the vessels' early construction phase. The vessels are scheduled for delivery in 2018.

Matt Granitto, Evoqua's Business Manager, Ballast Water Treatment, said "We are delighted to have been awarded this contract. The order is indicative of the confidence the tanker segment has in our SeaCURE system as a ballast water management solution that does exactly what it has been designed to do. We now have tanker references on newbuilds and existing tonnage."

"With so many different ballast water treatment technologies and systems available, ship owners do need to be confident that the system selected is not only compliant, but capable of meeting ship-specific operational and budgetary requirements. The electrochlorination pro-

3000m³/h capacity Evoqua SeaCURE ballast water management solutions will be installed on tankers under construction at a South Korean shipyard.

cess at the heart of Evoqua's SeaCURE system is proven technology, capable of handling the high flow rates and variable water quality we encounter during operations."

JaeWook Bae, Team Manager of the BWMS Business at Krosys, Evoqua's Korea-based partner that secured the order, added "The driver for awarding Evoqua the project was the side-stream technology inherent to the SeaCURE system. The side stream which will feed the system will be from the sea chest in the engine room when the ship is in marine water, and from the aft peak tank when in brackish or fresh water. This process perfectly fits the operational profile of this ship type, while offering shipbuilders a compliant solution that is more cost-effective and easier to install than comparable systems."

According to Lars Nupnau, Evoqua's Global Business Development Director, Ballast Water, an influencing factor was the SeaCURE systems ability to treat the vessels' aft peak tank without the need for an additional electrochlorination unit.

SeaCURE BWMS utilises a patented process that injects biocide into ballast seawater before it reaches the large surface filter intakes to reduce the growth marine organisms that become harmful to filters.

Available as a compact skid or as modular components, the system is suitable as a newbuild or retrofit installation since biocide generation takes place in small side streams from the main ballast water thus reducing system footprint and optimizing available space.

The Evoqua SeaCURE system can also be configured to provide marine growth protection for critical onboard seawater cooling systems.

USCG 형식 승인으로 알파라발의 PureBallast retrofit 수주

STAMCO Ship Management는 자사가 소유한 선박의 밸러스트 수처리를 위해 미국해안경비대(USCG) 형식 승인을 획득한 알파라발의 PureBallast 3.1을 선택했다. 이 계약에 따라 PureBallast 3.1 시스템은 STAMCO Ship Management 선대의 Ro-Ro선(11척)에 새로이 장착될 예정이다. STAMCO Ship Management는 USCG가 PureBallast 형식 승인을 내린 후 이와 같은 결정을 했다.

안데르스 린드마크(Anders Lindmark), 알파라발 PureBallast 선박 사업부 책임자는 "이번 수주는 PureBallast의 USCG 형식 승인과 직접적인 관련이 있다. 내용이 발표된 후 알파라발 시스템에 대한 문의가 크게 증가했다"고 말했다.

지난해 12월 PureBallast 3 제품군이 USCG 형식 승인을 획득함으로써, 알파라발은 USCG가 승인한 시스템을 제공하는 최초의 공급업체 중 하나가 되었다. IMO의 선박평형수관리(Ballast Water Management)가 2017년 9월부터 적용됨에 따라, 공급업체의 역량도 중요한 사안이 되었다.

"PureBallsat 에 대한 관심이 높아졌다는 것은 retrofit 시장이 열리고 있다는 것을 의미한다. 알파라발은 형식 승인을 획득한 시스템과 더불어 다년간의 경험과 글로벌 조직 등 모든 면에서 준비가 되어 있다"고 안데르스 린드마크는 말했다.

The best choice for your safety !!

NORD-LOCK®

SUPERBOLT®

Advantages

- Achieves maximum safety when locking fasteners
- Same temperature characteristics as standard bolt/nut
- Reusable
- Easy of assembly and disassembly
- Resist loosening caused by vibration
- Minimum surface marring or scratching
- Positive locking at a low and high preload level
- Locking function is not lost by lubrication

Applications

Construction/Mining Equipment/Automobile assembly/Farm Equipment/Manufacturing Equipment/Offroad /Robot/ Semi-conductor Equipment High speed trains(KTX) ,Railway/Ship-building ,Marine engines,Offshore ,Korea Kwang-an Bridge /Thermal Power,Nuclear Power ,Wind Power generation, Gas-turbine/ Plant

The optimal solution for bolt securing

"Check with Nord-Lock to find out who our authorized partners and distributors are"

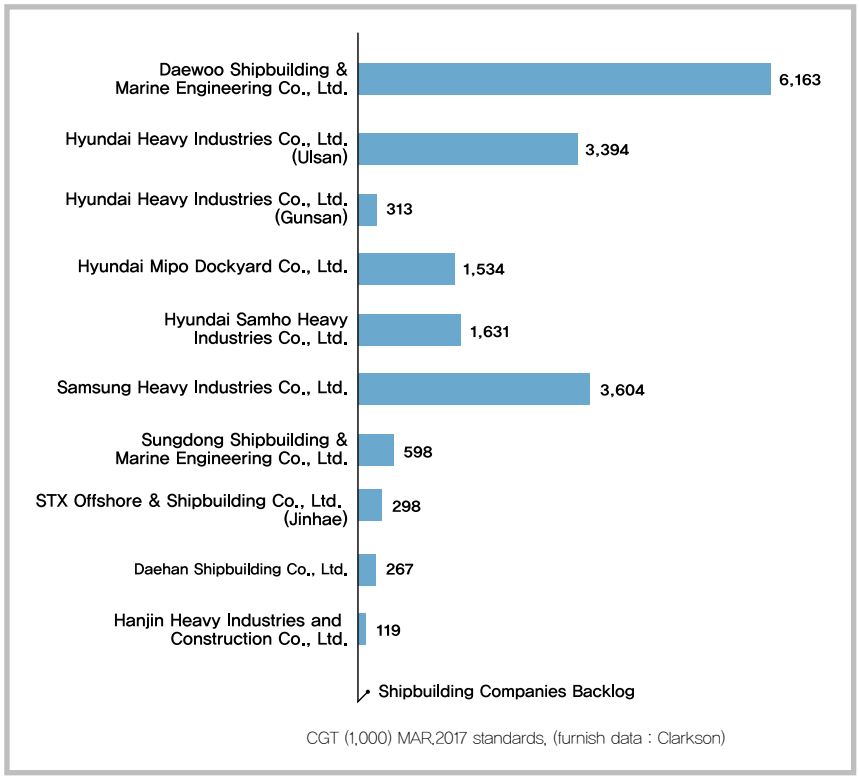
The Nord-Lock Group celebrates 30 years of quality

Nord-Lock Korea

www.nord-lock.co.kr

TEL: 051)796-2211
TEL: 02)518-2214
FAX: 051)796-2215

According to Clarkson, global ship-building orders stood at 600,000 CGT with 31 vessels in January this year. New orders at Korean shipyards stood at 330,000 CGT with 7 vessels including 2 FSRUs, 2 VLCCs, and 3 product carriers (PCs), which represents the largest share of global market. Korean shipyards carved out 55.5% share of global market, widening the gap with Chinese shipyards (110,000 CGT, 18.3%) and Japanese shipyards (20,000 CGT, 4.1%). Global order backlog stood at 81.87 million CGT in January this year, an all-time low in 12 years and 5 months after 80.99 million CGT was recorded in late August 2004.



Volumes of vessels delivered in the same period reached 5.02 million CGT, increasing sharply from the monthly average of 2.89 million CGT recorded last year. Volumes of vessels delivered tend to decrease in December and increase drastically in January of the following year due to ship model based on year of production, etc. In January last year, volumes of vessels delivered reached 4.50 million CGT. Newbuilding prices fell noticeably for oil tankers and LNG carriers. Newbuilding prices for VLCC and LNG carrier slid about USD 2.50 million and USD 3.50 million, respectively, from the previous month.

Here, we take a close look at the performance of major domestic shipyards, the world's leading players with strong growth in new orders as shown currently in the Clarkson data, such as Hyundai Heavy Industries (HHI), Daewoo Shipbuilding & Marine Engineering (DSME), Samsung Heavy Industries (SHI) and others based on the order backlog data.

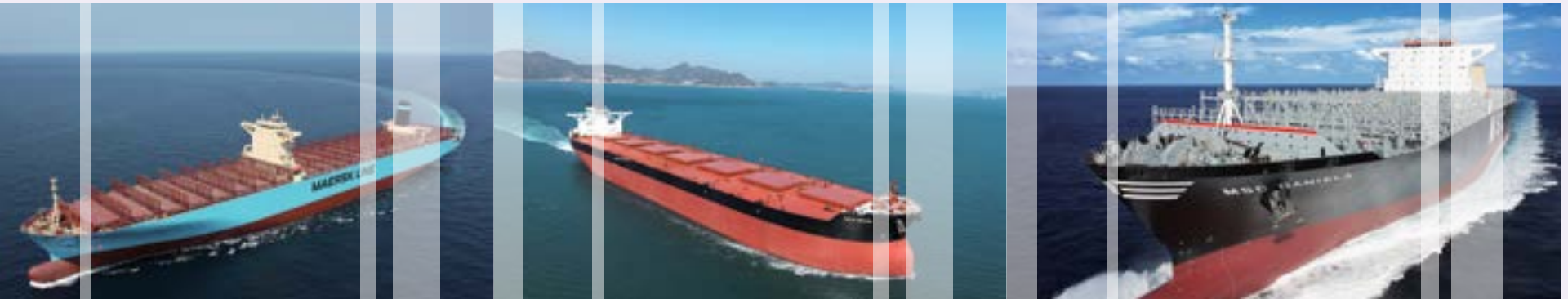
Photo: Hyundai Mipo Dockyard Co., Ltd.

Korea Shipbuiling Orders awarded to domestic shipyards in 2015~2017

Data		Type	Number of vessel	Amount	Ship owner	Delivery	Shipyard
2015	Jan	174,000m³ LNG carriers	2 vessels	USD 400 million	Korea Line Corporation, Korea	The end of 2017	Daewoo Shipbuilding & Marine Engineering
		174,000m³ LNG carriers	2 vessels	USD 400 million	Hyundai LNG Shipping, Korea	The end of 2017	Daewoo Shipbuilding & Marine Engineering
		19,200 TEU container ships	3 vessels	USD 450 million	Scorpio Group, Monaco	-	Samsung Heavy Industries
		LNG carriers	2 vessels	USD 416 million	SK shipping, Korea	The end of 2017	Samsung Heavy Industries
		319,000 DWT VLCCs	2 vessels	USD 198 million	Maran Tankers Management, Greece	-	Daewoo Shipbuilding & Marine Engineering
	Feb	158,000 tons oil tankers	5 units (2 optional vessels)	USD 330 million	-	2017s	Sungdong Shipbuilding & Marine Engineering
		174,000m³ LNG carriers	1 vessel	USD 200 million	-	-	Daewoo Shipbuilding & Marine Engineering
		74,000 DWT oil products carriers	2 units (1 optional vessels)	USD 46 million	Valles Steamship, Hong Kong	-	STX Offshore & Shipbuilding
		300,000 DWT VLCCs	2 vessels	USD 192 million	Metrostar Management, Greece	The end of 2016	Hyundai Heavy Industries
		1,800 TEU container ships	4 units (2 optional vessels)	-	Cosmoship Management S.A, Greece	-	Dae Sun Shipbuilding & Engineering
		180,000m³ LNG carriers	1 vessel	-	Mitsui O.S.K Lines, Japan	2018s	Daewoo Shipbuilding & Marine Engineering
	Mar	38,000m³ liquefied petroleum gas and ammonia carriers	2 vessels	-	Asian ship owner	-	Hanjin Heavy Industries & Construction
		20,100TEU container ships	4 vessels	USD 619.57 million	Mitsui O.S.K Lines, Japan	2017. August	Samsung Heavy Industries
		LR1 tankers	2 vessels	KRW 320 billion	BW, Singapore	2016 ~ 2017	STX Offshore & Shipbuilding
	Apr	319,000 DWT VLCCs	2 vessels	USD 198 million	Maran Tankers Management, Greece	The end of 2016	Daewoo Shipbuilding & Marine Engineering
		20,600 TEU container ships	3 vessels	-	CMA CGM, France	The end of 2017	Hanjin Heavy Industries & Construction (HHIC)-Phil's Subic Shipyard
		21,100 TEU container ships	6 vessels	USD 950 million	OOCL, Hong Kong	The end of 2017	Samsung Heavy Industries
		10,500 TEU container ships	5 vessels	-	Hapag-Lloyd, Germany	-	Hyundai Samho Heavy Industries
		Pure Car/Truck Carriers	2 vessels	USD 130 million	Norwegian Car Carriers, Norway	The end of 2016	Hyundai Samho Heavy Industries
		11,000 TEU container ships	6 vessels	-	Asian and European ship owners	2016 ~ 2017	HHIC-Phil's Subic Shipyard
	May	156,000 tons oil tankers	2 vessels	-	Maran Tankers Management, Greece	-	Daewoo Shipbuilding & Marine Engineering
		5,200 ton training vessel	1 vessel	-	-	-	Hanjin Heavy Industries & Construction
		74,000 tons LR1 tankers	8 units (4 optional vessels)	USD 375 million	Marshall Islands-based ship owners	The end of 2016	STX Offshore & Shipbuilding
	Jun	300,000 DWT VLCCs	10 units (5 optional vessels)	USD 1 billion	The National Shipping Company of Saudi Arabia	2017s	Hyundai Samho Heavy Industries
		19,630 TEU container ships	11 vessels	USD 1.1 billion	Maersk Line A/S, Denmark	2018s	Daewoo Shipbuilding & Marine Engineering
		Tankers	2 vessels	-	Arcadia Shipmanagement, Greece	-	Hyundai Heavy Industries
		300,000 DWT VLCCs	6 units (4 optional vessels)	USD 540 million	John Fredriksen	-	STX Offshore & Shipbuilding
		174,000 CBM LNG carriers	3 units (1 optional vessels)	-	Teekay LNG Partners, Canada	First quarter of 2019	Hyundai Samho Heavy Industries
		155,000 DWT tankers	3 vessels	USD 330 million	-	2018. February	Samsung Heavy Industries
		84,000m³ VLGCs	4 vessels	USD 320 million	China Peace, China	-	Daewoo Shipbuilding & Marine Engineering
	Jul	173,400m³ LNG Carriers	1 vessel	USD 195 million	Chandris, Greece	The end of 2018	Daewoo Shipbuilding & Marine Engineering
		14,000 TEU container ships	9 vessels	USD 1.1 billion	Maersk Line A/S, Denmark	2017	Hyundai Heavy Industries
	Aug	Product Carriers	4 vessels	USD 144 million	Scorpio Tankers, U.S.A	The first of 2017	Hyundai Mipo Dockyard
	Sep	84,000m³ LPG Carriers	2 vessels	-	Asia ship owner	2017s	Daewoo Shipbuilding & Marine Engineering
		74,000 tons LR1 tankers	4 units (2 optional vessels)	-	Greece ship owner	The second half of 2017	STX Offshore & Shipbuilding

	Oct	173,400m³ LNG Carriers	2 vessels	USD 400 million	BW Group, Singapore	The first half of 2019	Daewoo Shipbuilding & Marine Engineering
		84,000m³ LPG carriers	2 vessels	-	Asia ship owner	2017s	Daewoo Shipbuilding & Marine Engineering
	Nov	319,000 tons VLCCs	2 vessels	-	Maran Tankers Management, Greece	2017s	Daewoo Shipbuilding & Marine Engineering
	Dec	114,000 tons products carriers	2 vessels	-	Sea Tankers Group	2017. September	Daehan Shipbuilding
2016	Feb	158,000 DWT oil products carriers	2 vessels	-	Ditas Shipping, Turkey	2018s	Hyundai Heavy Industries
	May	40,000 DWT products carriers	2 vessels	-	Greece ship owner	-	Hyundai Mipo Dockyard
		159,000 DWT oil tankers	2 vessels	-	AMPTC, Kuwait	2018s	Hyundai Heavy Industries
	Jun	75,000 tons product carriers	4 vessels	USD 170 million	Tsakos, Greece	The first of 2018	Sungdong Shipbuilding & Marine Engineering
		180,000m³ LNG carriers	2 vessels	USD 400 million	SK E&S, Korea	The first of 2019	Hyundai Heavy Industries
		50,000 tons bulk carrier	1 vessels	-	Ilshin Marine Transport, Korea	The end of 2017	Hyundai Mipo Dockyard
	Jul	31,000 tons Car ferry	1 vessels	-	Weidong Ferry	The end of 2018	Hyundai Mipo Dockyard
	Sep	180,000m³ LNG carriers	2 vessels	USD 367 million	Europe ship owner	-	Samsung Heavy Industries
	Oct	2,800 ton convoy	1 vessel	USD 297 million	Korean Navy	The end of 2020	Daewoo Shipbuilding & Marine Engineering
		2,600 ton frigates	2 vessels	USD 324 million	Department of National Defense, Philippines	2020s	Hyundai Heavy Industries
		Patrol killer medium	3 vessels	USD 173 million	Korean DAPA	2019s	Hanjin Heavy Industries & Construction
		157,000 DWT oil tankers	2 vessels	USD 220 million	Viken, Norway	-	Samsung Heavy Industries
		113,000 DWT oil tankers	2 vessels				
		157,000 DWT oil tankers	3 vessels	USD 170 million	Nordic American Tankers Limited, Norway	-	Samsung Heavy Industries
	Dec	14,500 TEU container ships	4 vessels	700 million	IRISL, Iran	2th quarter 2018	Hyundai Heavy Industries
		49,000 tons products carriers	6 vessels				Hyundai Mipo Dockyard
		LNG Bunkering Vessel	1 vessel	-	Bernhard Schulte, Germany	The end of 2018	Hyundai Mipo Dockyard
2017	Jan	114,000 tons product carriers	2 vessels	-	SFL, France	3th quarter of 2019	Daehan Shipbuilding
		50,000 tons oil tankers	1 vessel	-	Japan, Fukujin Kisen	-	Hyundai Mipo Dockyard
	Feb	RO-RO Ship	2 vessels	USD 117.8 million	CLdN, Luxembourg	The first of 2017	Hyundai Mipo Dockyard
		50,000 DWT product carriers	1 vessel	-	Greece ship owner	-	Hyundai Mipo Dockyard
		300,000 DWT VLCCs	2 vessels	-	Greece, Enesel	The end of 2018	Hyundai Heavy Industries
	Mar	173,400m³ LNG carriers	2 vessels	-	Europe ship owner	The end of 2019	Daewoo Shipbuilding & Marine Engineering
		114,000 tons oil tankers	4 vessels	240 million	Russia, Sovcomflot	3th quarter of 2018	Hyundai Samho Heavy Industries

*Note : Based on the press release and public announcements of each shipyards, internal estimation of Monthly KORSHIP (estimation until Mar 15, 2017)



Offshore plant orders awarded to domestic shipyards in 2011-2017

Data		Type	Number of vessel	Amount	Ship owner	Delivery	Shipyard
2011	Jul	Drillship	2 vessels	USD 1.1225 billion	Maersk, Denmark	July 2014	Samsung Heavy Industries
	Aug	LNG-FSRU	1 vessel	USD 280 million	Excelerate Energy, U.S.A	First quarter of 2014	Daewoo Shipbuilding & Marine Engineering
	Sep	Semi-submersible Rig	2 units	USD 1.1 billion	Songa Offshore, Norway	Second hallf of 2014	Daewoo Shipbuilding & Marine Engineering
		Well Intervention Vessel	2 vessels	USD 420 million	Eide Marine Services AS, Norway	2013	STX Finland
		Drillship	1 vessel	KRW 600 billion	Noble Drilling, U.S.A	Second half of 2014	Hyundai Heavy Industries
	Oct	Fixed Offshore Platform	-	USD 1.4 billion	Chevron, U.S.A	Second half of 2014	Daewoo Shipbuilding & Marine Engineering
		Drillship	1 unit	USD 550 million	Offshore drilling company, Americas	-	Daewoo Shipbuilding & Marine Engineering
		Platform Supply Vessel	1 unit	-	Troms Offshore Supply AS, Norway	First half of 2013	STX OSV
		Offshore Plant Module	2 units	-	-	From 2013 to 2014	STX OSV
		Platform Supply Vessel	4 units	KRW 2 trillion	Island Offshore, Norway	Consecutively from the 3rd quarter	of 2013 to the 1st quarter of 2014
	Nov	Pipe Laying Support Vessel	2 units	USD 500 million	Odebrecht, Brazil	August of 2014	Daewoo Shipbuilding & Marine Engineering
	Dec	Offshore facilities (Gas platform and various facilities)	-	USD 900 million	Major multinational oil companies	2nd half of 2014	Hyundai Heavy Industries
2012	Jan	CPF (Central Processing Facility)	-	KRW 2.6 trillion	INPEX, Australia	4th quarter of 2015	Samsung Heavy Industries
		Semi-submersible rig	1 unit	USD 620 million	Odfjell, Norway	by mid 2014	Daewoo Shipbuilding & Marine Engineering
	Feb	LNG-FSRU	-	-	Hoegh, Norway	-	Hyundai Heavy Industries
	Mar	Offshore Platform	1 unit	USD 560 million	DONG E&P A/S, Danish	April 2015	Daewoo Shipbuilding & Marine Engineering
		FPSO	1 unit	USD 2.0 billion	INPEX, Australia	April 2016	Daewoo Shipbuilding & Marine Engineering
	Apr	Drillship	1 vessel	USD 645 million	Ensco plc	Third quarter 2014	Samsung Heavy Industries
	May	Semi-submersible Drilling Rig	2 units	USD 1.1 billion	Songa Offshore, Norway	Mid 2015	Daewoo Shipbuilding & Marine Engineering
		Drillship	1 vessel	USD 600 million	Seadrill, Norway	Second half of 2014	Samsung Heavy Industries
		Drillship	1 vessel	USD 655 million	Diamond Offshore Drilling Limited., U.S.A	4th quarter of 2014	Hyundai Heavy Industries
	Jun	Semi-submersible drilling rig	1 unit	USD 700 million	Fred Olsen Energy, Norway	March 2015	Hyundai Heavy Industries
		LNG-FPSO	1 unit	-	Petroliam Nasional Berhad, Malaysia	June 2015	Daewoo Shipbuilding & Marine Engineering
	Jul	Drillship	1 vessel	USD 645 million	Ensco plc	-	Samsung Heavy Industries
		Gas Compression Platform	1 unit	USD 420 million	(Letter of Award)	Second half of 2015	Hyundai Heavy Industries
	Aug	LNG-FSRU	8 vessels	-	Excelerate, U.S.A	Between early 2015~2017	Daewoo Shipbuilding & Marine Engineering
	Sep	Drillship	1 vessel	USD 620 million	Rowan, U.S.A	First half of 2015	Hyundai Heavy Industries
		Drillship	1 vessel	USD 623 million	-	-	Samsung Heavy Industries
	Oct	Drillship	4 vessels	USD 2.06 billion	Transocean, U.S.A	One-by-one from mid 2015	Daewoo Shipbuilding & Marine Engineering
		Drillship	1 vessel	USD 560 million	Atwood Oceanics, U.S.A	-	Daewoo Shipbuilding & Marine Engineering
		LNG-FSRU	1 vessel	USD 270 million	Hoegh LNG, Norway	First half of 2015	Hyundai Heavy Industries
	Nov	Drillship	1 vessel	USD 700 million	-	2nd half of 2015	STX Offshore & Shipbuilding
	Dec	offshore platform (Top side)	1 unit	USD 1.77 billion	Statoil, Norway	The end of 2016	Daewoo Shipbuilding & Marine Engineering
2013	Jan	Gas Production Platform (topside)	1 unit	USD 1.1 billion	Statoil, Norway	Mar 2016	Hyundai Heavy Industries
		LNG-FSRU	1 vessel	-	BW Maritime, Singapore	2015	Samsung Heavy Industries
	Mar	Floating Production Unit (FPU)	1 unit	USD 1.3 billion	Total, France	First half of 2016	Hyundai Heavy Industries
		Tension Leg Platform (TLP)	1 unit	USD 700 million	Total, France	First half of 2015	Hyundai Heavy Industries
	Apr	FPSO	1 unit	USD 1.9 billion	Chevron, U.S.A	-	Hyundai Heavy Industries

	May	Semi-Submersible Drilling Rig	1 unit	USD 750 million	Diamond Offshore, U.S.A	Nov of 2015	Hyundai Heavy Industries
	Jun	Ultra-deepwater Drillship	1 unit	USD 515 million	Ensco, United Kingdom	Third quarter of 2015	Samsung Heavy Industries
		FPSO	1 unit	USD 3.0 billion	Nigeria	Second half of 2017	Samsung Heavy Industries
		Jack-up Rig	2 units	USD 1.3 billion	Statoil, Norway	-	Samsung Heavy Industries
	Jul	Ultra-deepwater Drillship	2 units	USD 600 million	Seadrill, Norway	Second half of 2015	Samsung Heavy Industries
		Semi-Submersible Rig	1 vessel	USD 718 million	Stena, Sweden	First half of 2016	Samsung Heavy Industries
		Ultra-deepwater Drillship	1 unit	USD 570 million	Atwood Oceanics, U.S.A	The end of 2015	Daewoo Shipbuilding & Marine Engineering
	Sep	Drillship	1 unit	USD 550 million	-	Dec of 2015	Samsung Heavy Industries
		Ultra-deepwater Drillship	1 unit	USD 600 million	Ocean Rig, Greece	Dec of 2015	Samsung Heavy Industries
		Jack-up Rig	1 unit	USD 530 million	Maersk Drilling, Denmark	The middle of 2016	Daewoo Shipbuilding & Marine Engineering
	Oct	Drillship	2 vessels	USD 1.24 billion	-	Second half of 2015	Daewoo Shipbuilding & Marine Engineering
		Drillship	1 vessel	USD 520 million	Transocean, U.S.A	The middle of 2016	Daewoo Shipbuilding & Marine Engineering
		LNG-FSRU	1 unit	-	Gas Sayago (Joint venture)	Sep of 2016	Daewoo Shipbuilding & Marine Engineering
	Dec	LNG-FSRU	1 unit	-	BW Maritime, Singapore	Early 2016	Samsung Heavy Industries
		LNG-FSRU	1 unit	-	Mitsui OSK Line, Japan	The middle of 2016	Daewoo Shipbuilding & Marine Engineering
2014	Feb	LNG-FPSO	1 unit	USD 1.45 billion	Petroliam Nasional Berhad, Malaysia	2018	Samsung Heavy Industries
	Apr	Drillship	2 vessels	USD 1.29 billion	Oceania	First half of 2017	Samsung Heavy Industries
	Jul	Central Processing Platform	2 units	USD 700 million	Hess E&P Malaysia, Malaysia	The end of 2016	Hyundai Heavy Industries
		Fixed offshore platform	4 units	USD 1.94 billion	ADMA-OPCO, UAE	The end of 2019	Hyundai Heavy Industries
	Nov	Fixed Offshore Platform & Subma-rine Cable	4 units	USD 1.9 billion	ADMA-OPCO	Second half of 2019	Hyundai Heavy Industries
		Offshore Platform	1 unit	USD 700 Million	Royal Dutch Shell	-	Samsung Heavy Industries
		FPU	1 unit		-	-	
2015	Jun	Offshore Platform	2 unit	USD 1.06 billion	Statoil, Norway	The end of 2018	Samsung Heavy Industries
	Jul	FLNG	3 unit	USD 4.7 billion	Royal Dutch-Shell	-	Samsung Heavy Industries
2016	Dec	LNG-FSRU	1 unit	USD 587 million	Maran Gas Maritime, Greece	First half of 2020	Daewoo Shipbuilding & Marine Engineering
2017	Jan	FPU	1 unit	USD 1.27 billion	British Petroreum, United Kingdom	Augst of 2020	Samsung Heavy Industries
		FSRU	1 unit	USD 230 million	Höegh LNG, Norway	May of 2019	Samsung Heavy Industries
		FSRU	1 unit	USD 230 million	Höegh LNG, Norway	4th quarter of 2018	Hyundai Heavy Industries
	Feb	FSRU	1 unit	-	Turkey	-	Hyundai Heavy Industries

*Note : Based on the press release and public announcements of each shipyards, internal estimation of Monthly KORSHIP (estimation until Mar 15, 2017)

Yacht, the crystal of marine leisure industry

- Stimulation of small-to-medium ship market

Marine leisure industry has come into the limelight as a blue ocean waiting to be unlocked amid the increase in leisure time, income, and heightened interest in various marine leports. Marine leisure industry encompasses all industries associated with various leisure activities in aquatic waters, including the sea. Global marine leisure market is estimated to be worth about USD 50 billion per year.

Yacht, called the crystal of marine leisure industry, was classified as luxury item which hindered stimulation of industry. Korean government has recently decided to ease tax standards for leisure vessels in a bid to simulate marine leisure industry and support small and medium-sized shipyards that manufacture yachts.

New Product

New decking solution for the cruise industry

Bolidt Synthetic Products & Systems

Bolidt, has launched a unique and 'world-first' glow-in-the-dark decking solution for the cruise industry whose luminosity by night harvests solar energy stored during the day.

The decking and flooring specialist has released Bolideck® Glow to coincide with Seatrade Cruise Global - 2017, the largest cruise event on the shipping industry calendar. The new solution, launched following a two-year research and development project at Bolidt's Henrik Ido Ambacht innovation center, can be integrated with the Bolideck® Select and Bolideck® Future Teak decking systems that are already used extensively on cruise ships worldwide.

As well as being eye catching and aesthetically striking, Bolideck® Glow offers energy efficiency savings by reducing lighting requirements. When used outside, it can also harvest energy, storing solar energy generated by day that can be converted into exterior lighting at night. It could also bring safety benefits, Bolidt points out, by illuminating escape routes and signage, as the luminous material ensures decking areas remain highly visible in the dark.

Already, a contract for Bolideck® Glow has been placed by Royal Caribbean International for some of its newest vessels. RCI will fit the material on both Harmony of the Seas before the end of 2017, plus on the fourth ship in the Oasis class – likely to be named Symphony of the Seas and due for delivery in Spring 2018 from STX France. In both cases, the product will be installed in a 350m^2 area to add the 'wow' factor for cruisers at the top of the 10-deck 'Ultimate Abyss' slide, which will also be used in the dark.

The new luminous decking product is suitable for use in numerous areas onboard cruise ships, including jogging tracks and as signage, as well as around key features and attractions to ensure they make maximum impact. Bolidt points out that Bolideck® Glow can also be poured into the extraordinary variety of shapes and designs used for Bolideck® Future Teak and many other systems available from the company.

-TEL: +31-78-684-5444
-http://www.bolidt.com

New XPR300 for X-Definition Cutting on Mild Steel, Stainless, and Aluminum

Hypertherm Inc.

Hypertherm announced its most significant advance in mechanized plasma cutting ever, with the introduction of an entirely new class of plasma called X-Definition. This new plasma is available for the first time in a 300 amp plasma system called the XPR300.

X-Definition class plasma combines engineering advances and refined high definition plasma processes to deliver unmatched plasma cut quality on mild steel, stainless steel, and aluminum. Laboratory testing shows ISO-9013 Range 2 cut quality on thin mild steel and extended ISO Range 3 cuts on thicker metals. To reach this point Hypertherm engineers had to develop a number of new patent-pending processes like Vented Water Injection™ (VWI), plasma dampening, and Vent-to-Shield technologies. The end result is squarer cut edges, markedly less angularity, and excellent surface finish on non-ferrous metals like aluminum and stainless steel.

X-Definition Plasma is available in Hypertherm's new XPR300. New technology makes it more efficient than any other plasma system. The XPR300 cuts faster and uses power more efficiently than earlier Hypertherm systems like the HyPerformance HPR260XD. Piercing capability is also improved thanks to increased power and an exclusive argon-assist process which enables 30 percent thicker piercing on mild steel and a 20 percent increase on stainless steel.

Additionally, consumable life and cut quality over the life of the consumables get a dramatic boost from advances such as Cool Nozzle and Arc Response Technology. The latter of which protects consumables from the negative impact of ramp down errors, a regular occurrence in real-life cutting. By reducing the impact of ramp down errors, XPR consumables can last up to last three times longer than on competitive, older generation systems.

Despite being Hypertherm's most advanced system yet, the XPR300 is easy to use. Sensors in the power supply deliver refined diagnostic codes and significantly enhanced system monitoring information. This reduces troubleshooting time and provides proactive data to improve overall system optimization and uptime. Additionally, the system is designed with fewer consoles and connections so operators can spend less time setting-up and more time cutting.

-TEL: +65-6841-2489
-http://www.hypertherm.com

New Product

New radar options from Emerson improve New accuracy measuring solids in tall vessels

Rosemount 5402 Non-Contacting Level Transmitter

Rosemount 5402 Non-Contacting Level Transmitter

Emerson Automation Solutions has introduced new options for its Rosemount 5402 Non-Contacting Level Transmitter to improve performance and accuracy for solids level measurements where the distance from the transmitter to the product can be up to 105 feet (32m).
The new parabolic antenna option for the transmitter focuses energy output in a narrower beam to extend its practical reach, particularly in tall and narrow vessels. A swivel mount option simplifies installation where the tank roof is slanted, requiring critical aiming. Internal signal processing capabilities are optimized for measuring solids where irregular surfaces can make accurate level measurements difficult.

-TEL: +82-2-3438-4600
-http://www.emersonprocess.co.kr

New Oil-in-Water Monitor

Rivertrace Ltd.

Smart PFM 107 Oil-in-Water Monitor

UK-based Rivertrace will be show casing its new Smart PFM 107 Oil-in-Water Monitor, at the Offshore Technology Conference (OTC) from 1-4 May 2017 in Houston, Texas.

Currently undergoing sea trials in the Norwegian North Sea Sector, the monitor measures particulates in the sample stream on a continuous basis by passing the process fluid through a proprietary photo optical measuring cell, developed by Rivertrace Technologies.

Using a combination of optical recognition algorithms and light intensity it is possible to differentiate between oil particles, gas/air bubbles and solid particulates in the range 0-500 microns. Unlike conventional monitors using light scatter or UV fluorescence, the PFM 107 requires no re-calibration if the oil varies from the standard calibration fluid making it an ideal monitor for offshore platforms, drill ships and FPSO's. Flow and particulate characteristics can also be visualised live via remote access and via optional dedicated software on any Windows PC.

Oil concentration, pressure, temperature and oil alarm status are displayed on an easy to read LCD touch screen display. Oil concentrations, alarms and any faults are logged and stored within the system to comply with the reporting requirements of IMO resolution MEPC 107 (49) and can be accessed remotely or downloaded onto a pc via LAN or USB for further analysis. When connected to the internet it is possible for remote diagnostics to be performed by the manufacturer or an approved service centre.

The Smart PFM offers a choice of auto cleaning methods to ensure the accuracy is maintained at all times. Dependant of the utilities available you can choose from an air driven solenoid, electronic actuator or high power ultrasonic cleaning method. The cleaning is fully automatic and operates whenever the system senses contamination of the optical windows.

Mike Coomber, Managing Director of Rivertrace, said "The Smart PFM 107 Oil-in-Water Monitor is the only PFM on the market that comes with a choice of cleaning options as standard, preventing fouling, the most common failure of any PFM. We are committed to ongoing development to ensure that these products remain at the forefront of available technology, and consistently push the boundaries for oil-in-water analysis."

-TEL: +44-(0)-1737-775-500
-http://www.rivertrace.com

KOMEA (Korea Marine Equipment Association)
Member List

AMIR Marine Co., Ltd.
Location : YEONGDO-GU, BUSAN
Website : www.amir.co.kr
Main Products : Piston Ring
TEL : +82 51 413 9600

AMS Co., Ltd.
Location : HAEUNDAE-GU, BUSAN
Website : www.albatros.co.kr
Main Products : Unit Toilet/Wall & Celling Panel, Heat Exchangers (Plate Shell & Tube), etc.
TEL : +82 51 293 1035

A-TECH
Location : GANGSEO-GU, BUSAN
Website : www.atech2004.co.kr
Main Products : Small davit, Air motor, Air winch
TEL : +82 51 832 0723

BC TAECHANG IND. Corp.
Location : JUNG-GU, BUSAN
Website : www.bcinternational.co.kr
Main Products : Ultimate solution for onboard crew maintenance, Deck scaling machine
TEL : +82 51 442 6191

Bethel Engineering Co., Ltd.
Location : NAMYANGJU-SI, GYEONGGI
Website : www.nmg.kr
Main Products : Magic Grating (Steel grating)
TEL : +82 31 593 2712

B-I INDUSTRIAL Co., Ltd.
Location : GANGSEO-GU, BUSAN
Website : www.b-i.co.kr
Main Products : Fire Detection System, Gas Detection System, Navigation Watch Alarm System, Moisture Detection System
TEL : +82 51 441 5670

BIP INDUSTRIES Co., Ltd.
Location : GEUNJEONG-GU, BUSAN
Website : www.bn-bip.com
Main Products : Wall panel, Ceiling panel, Bathroom unit, Cabin unit, Floating floor, TLQ, Marine furniture, Marine door, etc.
TEL : +82 51 519 2000

BOGO Co., Ltd.
Location : SAHA-GU, BUSAN
Website : www.bogoco.co.kr
Main Products : Telephone system, Lighting fixture
TEL : +82 51 294 7771

BO MYUNG METAL Co., Ltd.
Location : GANGSEO-GU, BUSAN
Website : www.bmmetal.co.kr
Main Products : Cooper & Cooper-Alloy Pipes & Plates, Fittings, Flanges
TEL : +82 51 266 4101

Bumhan Industries Co., Ltd.
Location : CHANGWON, GYUNGNAM
Website : www.bumhan.com
Main Products : Air compressor, N2 generator, High pressure control valve
TEL : +82 55 251 6070

BY CONTROLS, Inc.
Location : GIMHAE-SI, GYUNGNAM
Website : www.bycontrols.com
Main Products : Watertight door, Pilot door, Hydaulic hatch, etc.
TEL : +82 55 345 6110

BYT Co., Ltd.
Location : GANGSEO-GU, BUSAN
Website : www.byhd.co.kr
Main Products : HARDWARE, OUTFITTING, MARINE OUTFITTING, NEW PRODUCTS
TEL : +82 51 974 5000

CENTURY Corp.
Location : YANGSAN-SI, GYUNGNAM
Website : www.capeind.com
Main Products : Cylinder liner, Man B&W Sulzer (Wartsila) Type www.capeind.com YANGSAN-SI, GYUNGNAM
TEL : +82 55 370 1234

CHK Co., Ltd.
Location : GANGSEO-GU, BUSAN
Website : www.chkj.co.kr
Main Products : Ref. container socket, Juction box
TEL : +82 51 831 9500

ChungSol Marine Co., Ltd.
Location : GANGSEO-GU, BUSAN
Website : www.chungsolmarine.co.kr
Main Products : Window wiper, Straight line type, Clear view screen, Window, Door, Hatch
TEL : +82 51 832 2226

ChungSong Industry Co., Ltd.
Location : GIMHAE-SI, GYUNGNAM
Website : www.koweld.co.kr
Main Products : Welding auto carriage, LWS, etc.
TEL : +82 55 329 9500

CMR KOREA Co., Ltd.
Location : KUMJUNG-GU, BUSAN
Website : www.cmrkorea.com
Main Products : Marine telephone system, Public address system, Communal aerial system, Marine CCTV system, Marine clock system, Anemometer system, Rudder angle indicator system, Temperature sensor, Pressure sensor
TEL : +82 51 521 2883

Dae Chang Metal Co., Ltd.
Location : SAHA-GU, BUSAN
Website : www.dcm.co.kr
Main Products : Propeller boss, Chain wheel cam, Dummy ring, Valve body, etc.
TEL : +82 51 264 0831

Dae Heung Cooler Co., Ltd.
Location : POCHEON-SI, GYEONGGI
Website : www.cooler.co.kr
Main Products : Heat exchanger
TEL : +82 31 532 9667

DAE KWANG IND Co., Ltd.
Location : GANGSEO-GU, BUSAN
Main Products : SUS PIPE FITTING FLANGE
TEL : +82 51 831 5886

Daechun Industrial Co., Ltd.
Location : GIMHAE-SI, GYUNGNAM
Website : www.daechun.co.kr
Main Products : Multi-core tube, Stainless steel tube
TEL : +82 55 345 2288

DAEHA Co., Ltd.
Location : GANGSEO-GU, BUSAN
Website : www.daehatech.co.kr
Main Products : Hydraulic Pressure Testing Equipment, Cylinder, Pump, Torque Wrench
TEL : +82 51 326 1870

DAEJIN SAT Co., Ltd.
Location : ULJU-GUN, ULSAN
Website : www.daejinsat.com
Main Products : Ceiling panel
TEL : +82 52 225 2361

DAEJUNG Co., Ltd.
Location : SASANG-GU, BUSAN
Website : www.daejung.net
Main Products : Fiber Rope, Pet/PP Mat, Sports Net
TEL : +82 51 304 2511

DAEJUNG VALVE Co., Ltd.
Location : DALSEO-GU, DAEGU
Website : www.djvalves.com
Main Products : Butterfly Valves, Oil Field flow-line components, Control Valves, Actuators, Special Valves
TEL : +82 53 584 2276

Daemmstoff Industrie Korea Ltd.
Location : SAHA-GU, BUSAN
Website : www.daemmstoff.com
Main Products : KVM SEALING COMPOUND, MANGANA TETAINING COMPOUND (PUTTY, FIRE STOP, PANDA-90, etc.)
TEL : +82 51 261 7073

Daeyang Electric Co., Ltd.
Location : SAHA-GU, BUSAN
Website : www.daeyang.co.kr
Main Products : Lighting fixtures, Instruments, SAUV, UUV
TEL : +82 51 200 5221

DAEYANG INSTRUMENT. Co., Ltd.
Location : SAHA-GU, BUSAN
Website : http://dic.daeyang.co.kr/08_affiliate/affiliate_01.php
Main Products : Precision instruments - Anemometer, Rudder angle indicator, etc.
TEL : +82 51 200 5212

DaiHan Anchor Chain MFG. Co., Ltd.
Location : NAM-GU, INCHEON
Website : www.dhac.co.kr
Main Products : Anchor chain, Offshore mooring stud, etc.
TEL : +82 32 862 0091

DHMC Co., Ltd.
Location : GIMHAE-SI, GYUNGNAM
Website : www.dhmc-rudder.com
Main Products : Rudder, Block, etc.
TEL : +82 55 346 3663

DECKWIN. Co.
Location : YEONGDO-GU, BUSAN
Website : www.deckwin.com
Main Products : Cable winch, Windlass, Mooring Winch, Capstan etc.
TEL : +82 51 405 7890

DINGJIN MPTECH
Location : GIMHAE-SI, GYUNGNAM
Main Products : Part for Marine Engine, Shaft System
TEL : +82 55 720 7000

DK Tech Corporation
Location : GIMHAE-SI, GYUNGNAM
Website : www.dklok.com
Main Products : Instrumentation fitting & valve
TEL : +82 55 338 0114

DMC Co., Ltd.
Location : GIMHAE-SI, GYUNGNAM
Website : www.dongnam-crane.co.kr
Main Products : Offshore crane, Deck cranes, Floating cranes
TEL : +82 55 720 3000

DNP Co., Ltd.
Location : GANGSEO-GU, BUSAN
Website : www.dnpco.kr
Main Products : Accommodation system
TEL : +82 51 831 4551

Dong Hae M-Tech Co., Ltd.
Location : SEO-GU, INCHEON
Website : www.east-sea.co.kr
Main Products : Grab bucket, Orange grab, Motor grab, Wood grab, etc.
TEL : +82 32 583 8061

Dong Kang M-Tech Co., Ltd.
Location : GANGNAM-GU, SEOUL
Website : www.dkmtech.com

Main Products : Water jet, Night navigator
TEL : +82 2 553 0181

Dong Woo Machinery & Engineering Co., Ltd.
Location : CHANGWON, GYUNGNAM
Main Products : Engine room overhead crane, F.O hose handling davit, etc.
TEL : +82 55 295 3261

Dong-A Valve Ind. Co.
Location : GANGSEO-GU, BUSAN
Website : www.donga-valve.com
Main Products : Manufactured low & high pressure valves, Flap check (duo-check) valve, etc.
TEL : +82 51 831 1500

Dongbang Marine Co., Ltd.
Location : GANGSEO-GU, BUSAN
Website : www.dbmarine.co.kr
Main Products : MARINE FIRE DETECTION & ALARM SYSTEM, MARINE FIRE EXTINGUISHING SYSTEM
TEL : +82 51 205 1585

DONGHWA ENTEC
Location : GANGSEO-GU, BUSAN
Website : www.dh.co.kr
Main Products : Heat exchanger, Plate cooler, etc.
TEL : +82 51 970 1000

DongHwa Pneutec Co., Ltd.
Location : GANGSEO-GU, BUSAN
Website : www.dhkomp.co.kr
Main Products : Air/gas compressor
TEL : +82 51 974 4800

D-I Industrial. Co., Ltd.
Location : JINJU-SI, GYEONGNAM
Website : www.d-i.co.kr
Main Products : Marine Transmission, Power Take off, Steering System
TEL : +82 55 760 5500

DooSan Engine Co., Ltd.
Location : CHANGWON, GYUNGNAM
Website : www.doosanengine.com
Main Products : Marine diesel engine, Diesel engines for power generation
TEL : +82 55 260 6000

DRB Holding Co., Ltd.
Location : YEUNGDEUNGPO-GU, SEOUL
Website : www.drbworld.com
Main Products : Marine rubber fender, Industrial rubber sealing & gasket, Industrial rubber track, Rubber damper
TEL : +82 2 2168 9133

ELSCOM Inc.
Location : SASANG-GU, BUSAN
Website : www.elscom.co.kr
Main Products : Explosion-Proof Products, Distribution Board Components, Solar Cable/PV JB
TEL : +82 51 329 8990

Emerson Process Management Korea Ltd.
Location : SEONGNAM-SI, GYEONGGI
Website : www.emersonprocess.co.kr
Main Products : Pressure, Temperature, Level, Analytical & Flow Measurenet, Valves, Tank radar level guaging, etc.
TEL : +82 2 3438 4600

ENTECH (Engineering & Technology Co., Ltd.)
Location : CHANGWON-SI, GYEONGNAM
Website : www.tkhic.com
Main Products : Engine Bed/Frame box, Crane Pedestal, Tubular (SAW Pipe), Air Reservoir, Jacket, Pile, Wind Tower
TEL : +82 70 4628 8844

ESAB SeAH Corp.
Location : CHANGWON, GYUNGNAM
Website : www.esab.co.kr
Main Products : Flux cored wire
TEL : +82 55 289 8111

Flutek, Ltd.
Location : SEONGSAN-GU, GYEONGNAM
Website : www.flutek.co.kr
Main Products : Axial piston pumps, Axial piston motors & reduction gear, Electro-hydraulic steering gear, Deck machinery, Staffa motor, ECO servo
TEL : +82 55 570 5800

FRIEND Co., Ltd.
Location : GANGSEO-GU, BUSAN
Website : www.thefriend.co.kr
Main Products : Engine valve spindle, Cable tray
TEL : +82 51 974 7911

GASTRON Co., Ltd.
Location : GUNPO-SI, GYEONGGI
Website : www.gastron.com
Main Products : Installation-Type Detector, Portable Gas Detector, Acid Leak Detecting Paint, Alarm Signalling
TEL : +82 31 490 0800

G.S HIGH-TECHER Co., Ltd.
Location : MIRYANG-SI, GYENGNAM
Website : http://gshightecher.koreasme.com
Main Products : Air vent head, Convex coupling
TEL : +82 51 832 0456

GENERAL MARINE BUSINESS
Location : NAM-GU, INCHEON
Website : www.gmbmarine.com
Main Products : Marine system (ship shore comm. system, emergency shutdown system, etc.), Defense Eng. (Control & monitoring system integration, etc.),Manufacturing & services (new shipbuilding, module production)
TEL : +82 52 270 3500

GESKO Co., Ltd.
Location : GANGSEO-GU, BUSAN
Main Products : CNG Transportation&Refilling, Fire Fighting system, Engineering for Fire fighting system & Ballast treatment system, Annual inspection
TEL : +82 51 973 9913

GS-Hydro Korea Ltd.
Location : GANGSEO-GU, BUSAN
Website : www.gshydro.com
Main Products:Flare flange system, Retaining ring system
TEL : +82 51 266 8221

TECH FLOWER Co., Ltd.
Location : SASANG-GU, BUSAN
Website : www.haean21.com
Main Products : Marine crane, Deck machinery
TEL : +82 51 320 8222

Haewon Ind. Co., Ltd.
Location : SAHA-GU, BUSAN
Website : www.haewon.net
Main Products : Water seal, Inflatable/mating ring
TEL : +82 51 831 4600

Halla Industrial Co., Ltd.
Location : SAHA-GU, BUSAN
Website : www.hallaiq.co.kr
Main Products : Non seal canned motor pump, Gear pump
TEL : +82 51 264 2201

Han Jo Co., Ltd.
Location : YOUNGDO-GU, BUSAN
Website : www.hanjoms.co.kr
Main Products : Lubication oil filter, Fuel oil filter, Filter elements
TEL : +82 51 414 7201

Hankook Flexible Co.
Location : SASANG-GU, BUSAN
Website : www.hkflex.com
Main Products : Metalic flexible hose, Metallic expansion joint, Manufacturing of Metalic flexible hose assemblies
TEL : +82 51 508 6291

HanKuk Miboo Co., Ltd.
Location : GANGSEO-GU, BUSAN
Website : www.hankukmiboo.co.kr
Main Products : Spiral duct, Cold chamber, Deck covering, Level
TEL : +82 51 263 3621

HANLAIMS Co., Ltd.
Location : GANGSEO-GU, BUSAN
Website : www.hanlaims.com
Main Products : Instruments (Level gauge/Level switch) Tank remote sounding system/Cargo monitoring system, valve
TEL : +82 51 601 7016

HANSHIN ELECTRONICS Co., Ltd.
Location : YOUNGDO-GU, BUSAN
Website : www.ehanshin.com
Main Products : Public address sys., Telephone sys.
TEL : +82 51 412 5551

HANSUN ENGINEERING Co., Ltd.
Location : GANGSEO-GU, BUSAN
Website : www.slok.co.kr
Main Products : Instrument Tube Fittings, Instrument Valves, Filters, Condensate Pot
TEL : +82 51 899 6700

HEARTMAN Co., Ltd.
Location : GANGSEO-GU, BUSAN
Website : www.heartman.co.kr
Main Products : Fuel injection nozzle for marine diesel engine, Fuel injection plunger ass'y for marine diesel engine
TEL : +82 51 264 8826

HI AIR KOREA Co., Ltd.
Location : GIMHAE-SI, GYUNGNAM
Website : www.hiairkorea.co.kr
Main Products : Air handling unit, Spot cooler, Refrigeration condensing unit, Fire damper, Provision refrigeration plant, MGO cooling system, Packaged air conditioner, Ventilation fan, Spiral duct
TEL : +82 55 340 5000

Hi Tech Co., Ltd.
Location : GYUNGJU-SI, GYUNGBUK
Main Products : T-Bar, Gas Protect Plate
TEL : +82 54 776 5310

HOSEUNG ENTERPRISE Co., Ltd.
Location : GANGSEO-GU, BUSAN
Website : www.hosent.co.kr
Main Products : Sewage Treatment System, Plasma Bilge Separator, E/R Package Unit, Tank Package Unit, Ventilator
TEL : +82 51 831 2233

HODU INDUSTRIAL Co.
Location : GANGSEO-GU, BUSAN
Website : www.hoducompany.com
Main Products : Catering furniture, Galley hood W/fire fighting, Galley E/Q (Deep fat fryer/Cooking range, etc.)
TEL : +82 51 271 3342

Hy-Lok Corporation
Location : GANGSEO-GU, BUSAN
Website : www.hy-lok.com
Main Products : Tube fitting & valve, Double lock & bleed valve, Cryogenic valve
TEL : +82 51 970 0800

HYUNDAI HEAVY INDUSTRIES Co., Ltd.
Location : DONG-GU, ULSAN
Website : www.hhi.co.kr
Main Products : Marine diesel engine & machinery w
TEL : +82 52 202 7291

Hyundai Elevator Co., Ltd.
Location : ICHEON-SI, GYEONGGI
Website : www.hyundaielevator.co.kr
Main Products : Lifts (elevator, escalator, moving walk), Logistics automation system, Parking system (automobiles, bicycles), SOC infrastructure systems (platform screen door, automatic folding canopy, gap zero, etc.)
TEL : +82 31 644 5114

Hyundai Fitting Co., Ltd.
Location : GIJANG-GUN, BUSAN
Website : www.hdfco.co.kr
Main Products : Flange
TEL : +82 51 831 0891

HLB Co., Ltd.
Location : ULJU-GUN, ULSAN
Website : www.hdboat.com
Main Products:Lifeboat , GRP rigid-type rescue boat
TEL : +82 52 240 3500

Hyundai Marine Machinery Co., Ltd.
Location : SEO-GU, INCHEON-SI
Website : www.hmmco.co.kr
Main Products : W.O. incinerator, Aux/blower, F.D fan
TEL : +82 32 583 0671

HYUNDAI WELDING Co., Ltd.
Location : GANGNAM-GU, SEOUL
Website : www.hyundaiwelding.com
Main Products : Covered electrode arc welding consumables, Sub-merged arc welding flux & wire, Soild wire arc welding consumables, Flux cored wire, MIG TIG arc welding consumables, Welding machines
TEL : +82 2 6230 6883

I.M.E. CORPORATION
Location : GIMHAE-SI, GYUNGNAM
Website : www.promarine21.com
Main Products : Engine valve spindle & seat
TEL : +82 55 346 1127

ILJIN AND Co., Ltd.
Location : GIJANG-GUN, BUSAN
Website : www.iljinamst.co.kr
Main Products : Fire detection system, Gas detection system, Emission monitoring system, Water spray & cargo spray system, etc.
TEL : +82 51 755 6191

ILSHIN ENGINEERING Co., Ltd.
Location : SIHEONG-SI, DYEONGGI
Website : www.ilshineng.com
Main Products : Chemical equipment and Tanks
TEL : +82 31 499 4502

ILSUEUNG Co., Ltd.
Location : GANGSEO-GU, BUSAN
Website : www.ilseung.co.kr
Main Products : Sewage Treatment plant, Fresh water generator, Oil purifier
TEL : +82 51 831 4110

IL-SUNG IND. Co.
Location : SASANG-GU, BUSAN
Website : www.ilsunghs.co.kr
Main Products : Hot water calorifier, Silencer (For M/E, G/E, fan), Mist eliminator, Washable
TEL : +82 51 312 4056

International Machine Tool Co.
Location : SASANG-GU, BUSAN
Website : www.clampimt.com
Main Products : Vertical clamp, Horizontal clamp, etc.
TEL : +82 51 314 2038

INTRA PRECISION MANUFACTURE Co., Ltd.
Location : DONG-GU, BUSAN
Website : www.intraspare.co.kr
Main Products : PISTON CROWN, CYLINDER LINER, CYLINDER COVER, PISTON SKIRT, WATER JACKET
TEL : +82 51 466 4635

JHK Inc.
Location : YANGSAN-SI, GYUNGNAM
Main Products : Container fittings, Lashing fittings
TEL : +82 55 346 2225

JINSEONG LINER & PISTON
Location : DAEDEOK-GU, DAEJEON
Website : www.jinseong.com
Main Products : Cylinder liner, Piston
TEL : +82 42 931 8558

JONGHAP MACHINERY Co.
Location : YANGSAN-SI, GYUNGNAM
Website : http://jonghap.biz
Main Products : Sewage treatment plant, T-bar auto welding machine
TEL : +82 55 370 2600

JUNG GONG IND. Co., Ltd.
Location : SAHA-GU, BUSAN
Website : www.jung-gong.com
Main Products : Marine window, Fire-resistant window, Marine wiper, Clear view screen,
TEL : +82 51 261 2911

JUNG-A MARINE
Location : GANGSEO-GU, BUSAN
Website : www.jung-a.co.kr
Main Products : Accommodation ladder, Pilot slant ladder, Wiper, CVS, Sunscreen davit,
TEL : +82 51 970 6420

JUNGSAN ENTERPRISE Co., Ltd.
Location : ULJU-GUN, ULSAN
Website : www.jungsan.com
Main Products : Marine engine parts
TEL : +82 52 254 3290

K.C. Ltd.
Location : GANGSEO-GU, BUSAN
Website : www.iccp-mgps.com
Main Products : Impressed current cathodic protection (I.C.C.P) system, Anti-fouling system (M.G.P.S), Shaft earthing device
TEL : +82 51 831 7720

Kangrim Heavy Industries Co., Ltd.
Location : CHANGWON, GYUNGNAM
Website : www.kangrim.com
Main Products : Marine boiler, Plant, LPG tank
TEL : +82 55 269 7700

Kangrim Insulation Co., Ltd.
Location : GIJANG-GUN, BUSAN
Website : www.kangrim.com
Main Products : Tank, Pipe insulation, Cold provision store
TEL : +82 51 200 6000

Keonchang Industry Co., Ltd.
Location : SAHA-GU, BUSAN
Website : www.keonchang.co.kr
Main Products : TOP CHARGING EQUIPMENT, HOPPER & CONVEYER, SIDE GUIDE ASS'Y
TEL : +82 51 203 0161

Keum Yong Machinery Co., Ltd.
Location : BUK-GU, DAEGU
Website : www.beumyong.com
Main Products : Exh. valve complete with spindle
TEL : +82 53 382 9044

Key Sung Metal Co., Ltd.
Location : GANGSEO-GU, BUSAN
Website : www.deysungmetal.com
Main Products : Marine valve
TEL : +82 51 831 3391

Keystone Valve (Korea)
Location : ANSEONG-SI, GYEONGGI
Website : www.keystonekorea.com
Main Products : All kinds of valves for offshore and shipbuilding
TEL : +82 51 604 4000

KHAN Co., Ltd.
Location : GEOJE-SI, GYEONGNAM
Website : www.khan-offshore.com
Main Products : Engineering services, Sea-trial & commissioning service, Facility for fabricaton, Modification
TEL : +82 55 639 7600

Kion Printing & Packaging Inc.
Location : GIMHAE-SI, GYUNGNAM
Website : www.kiwon.com
Main Products : Marine equipment & vacuum system
TEL : +82 55 313 9913

KOC ELECTRIC Co., Ltd.
Location : GANGSEO-GU, BUSAN
Website : www.kocelec.com
Main Products : H/V transformer (ATEX, WATER COOLED TYPE), UPS (Uninterruptible Power Supply), Bus way/Bus duct
TEL : +82 51 970 6302

Kokaco Co., Ltd.
Location : YOUNGDO-GU, BUSAN
Website : www.kokaco.com
Main Products : Exhaust Valve Spindle&Bottom Piece Grinding Machine
TEL : +82 51 403 4114

Komeco Co., Ltd.
Location : GIJANG-GUN, BUSAN
Website : www.komeco.net
Main Products : Tacho sys., Electronic equip.
TEL : +82 51 724 5070

Kongsberg Maritime Korea Ltd.
Location : GIJANG-GUN, BUSAN
Website : www.km.kongsberg.com
Main Products : Alarm monitoring system, Cargo monitoring system, Offshore technology
TEL : +82 51 749 8600

KOREA FILTER Co., Ltd.
Location : GIJANG-GUN, BUSAN
Website : www.korea-filter.co.kr
Main Products : STRAINER, OIL FILTER, AIR FILTER, AUTO STRAINER
TEL : +82 51 727 8360

KOTO Technical Co.
Location : SAHA-GU, BUSAN
Website : http://kotofft.com
Main Products : Maintain & repair items (all hydraulic systems, Adjust alignment, centering)
TEL : +82 51 417 8501

KORVAL Co., Ltd.
Location : SAHA-GU, BUSAN
Website : www.korval.co.kr
Main Products : Control Valves, Regulating Valves, Heat Sensor, Shut-Off Valves
TEL : +82 51 790 9700

KSP Co., Ltd.
Location : GANGSEO-GU, BUSAN
Website : www.kspvalve.com
Main Products : Exhaust valve complete, Exhaust valve spindle
TEL : +82 51 831 6274

KSV (Korea Special Valve) Co., Ltd.
Location : YOUNGDO-GU, BUSAN
Website : www.ksv-valve.co.kr
Main Products : Valve spindle and Valve seat for marine diesel engine
TEL : +82 51 415 4466

KTE Co., Ltd.
Location : GANGSEO-GU, BUSAN
Website : www.kte.co.kr
Main Products : High voltage swichboard, Side thruster, Low voltage swichboard, Side thruster control system, Group starter panel, Alarm monitoring system, Electric equipment, etc.
TEL : +82 51 265 0255

Kuk Dong Elecom Co., Ltd.
Location : SAHA-GU, BUSAN
Website : www.kukdongelecom.com
Main Products : Lighting fixture
TEL : +82 51 266 0050

KTMI Co., Ltd.
Location : GANGSEO-GU, BUSAN
Website : www.saejinintech.com
Main Products : Emergency towing system
TEL : +82 51 971 9911

KUKDONG ELECTRIC Co., Ltd.
Location : JINCHEON-GUN, CHUNGBUK
Website : www.nexans.co.kr
Main Products : WIRE All kinds of cables for offshore and shipbuilding including JIS, BS, IEC, DIN, IEEE, etc.
TEL : +82 2 2140 3064

KUMGOKSTEEL INDUSTRY. Co., Ltd.
Location : SEO-GU, INCHEON
Website : www.kgsi.co.kr
Main Products : Steel Gratings, Manhole Covers and Steel Products
TEL : +82 32 564 6759

Kum Kang Precision Co., Ltd.
Location : SAHA-GU, BUSAN
Website : www.kkmarine.co.kr
Main Products : Marine valve, valve for engine, air reservoir tank
TEL : +82 51 262 4894

KANGNAM JEVISCO Co., Ltd.
Location : BUSANJIN-GU, BUSAN
Website : www.jevisco.com
Main Products : Shop primer, Anti-corrosive coatings, Anti-fouling coatings, etc.
TEL : +82 51 892 4221

Kwanglim Marine Tech. Co., Ltd.
Location : GANGSEO-GU, BUSAN
Website : www.klmt.co.kr
Main Products : Steel Door, Hull Apteher Blank, Radar Mast, Hi-Pressure Water Mist Fire Fighting System
TEL : +82 51 313 0055

KWANG SAN Co., Ltd.
Location : GANGSEO-GU, BUSAN
Website : www.kwangsan.com
Main Products : AIR VENT HEAD, EXP. JOINT, HEATING COIL, AIR VENT HEAD, EXP. JOINT, HEATING COIL, PIPE SPOOL, ETC.
TEL : +82 51 974 6316

Kwang Seong Co., Ltd.
Location : GIMHAE-SI, GYUNGNAM
Website : www.ikwangsung.com
Main Products : PIPE CABLE HANGER, SPARE PART SEAT, ETC.
TEL : +82 55 338 2271

Kyung Eun Ceramics Co., Ltd.
Location : GIMHAE-SI, GYUNGNAM
Website : www.ke-ceramics.com
Main Products : Ceramic packing
TEL : +82 55 345 7761

Kyungjin Shipping Co., Ltd.
Location : CHANGWON-SI, GYEONGNAM
Website : www.kyungjinshipping.com
Main Products : Exports & Imports of Marine Equipment, Shipping Agent Service, Shipbroking Service, Trading
TEL : +82 55 224 4383

Kyungsung Industry Co., Ltd.
Location : GANGSEO-GU, BUSAN
Website : www.e-clamp.com
Main Products : LNG carrier sus corner & anchor strips & Pipe clamp, etc.
TEL : +82 51 831 4960

LDC-KOREA Co., Ltd.
Location : HAEUNDAE-GU, BUSAN
Main Products : Traders (Marine Equipment), Ship Repair
TEL : +82 51 266 4037

Leeyoung Industrial Machinery Co., Ltd.
Location : ULJU-GUN, ULSAN
Website : www.leeyoung.co.kr
Main Products : Lashing bridge, T-bulkhead block, Covered-block, Engine casing & funnel, Upper deck & module unit, etc.
TEL : +82 52 231 5800

LHE Co., Ltd.
Location : GIMHAE-SI, GYUNGNAM
Website : www.lhe.co.kr
Main Products : Plate heat exchanger, Fresh water generator
TEL : +82 55 340 0625

LS Cable & System
Location : ANYANG-SI, GYEONGGI
Website : www.lscns.com
Main Products : Power cable, Marine & offshore cable, Telecom cable, SUBMARINE CABLE, WINDSOL, SUPERCONDUCTIVITY
TEL : +82 51 310 6781

LUXCO Co., Ltd.
Location : SAHA-GU, BUSAN
Website : www.luxco.co.kr
Main Products : Electrical equipment for internal combustion engines, Magnetic products, etc.
TEL : +82 51 260 1300

MIN SUNG Co., Ltd.
Location : GANGSEO-GU, BUSAN
Website : www.minsung.co.kr
Main Products : Steel outfitting, Access hatch, Swing away hatch, Cable tray, Electric cable box, etc.
TEL : +82 51 305 8862

Mirae Industries Co., Ltd.
Location : HAMAN-GUN, GYEONGNAM
Website : www.miraewinch.com
Main Products : Winch, Chain Stopper, Capstan
TEL : +82 55 587 8520

MODERN INTECH Co., Ltd.
Location : SASANG-GU, BUSAN
Website : www.mo-dern.com
Main Products : Fire retardant curtain, Mattress, Upholstery furniture, Fire retardant fabric, Carpet, Rubber flooring
TEL : +82 51 325 0260

MRC (Marine Radio Co., Ltd.)
Location : YOUNGDO-GU, BUSAN
Website : www.mrckorea.com
Main Products : Public address system, Auto telephone sys.
TEL : +82 51 414 7891

MSL Compressor Co., Ltd.
Location : POCHEON-SI, GYEONGGI
Website : www.mslcomp.com
Main Products : Breathing air compressor
TEL : +82 31 541 7000

Mt.H Control Valves Co., Ltd.
Location : GANGSEO-GU, BUSAN
Website : www.mth.co.kr
Main Products : Main starting valve, Crankcase relief valve, Cyogenic safety valves & control valve
TEL : +82 51 974 8800

NK Co., Ltd.
Location:SAHA-GU, BUSAN
Website:www.nkcf.com
Main Products:Ballast water treatment sys., CO_2 sys.
TEL:+82 51 200 0152

NOW Co., Ltd.
Location : YANGSAN-SI, GYEONGNAM
Website : http://nowcan.co.kr
Main Products : Duct, Damper, Fitting, Piston, Ring, Cylinder
TEL : +82 55 387 4811

ONNURIPLAN Co., Ltd.
Location : BUCHEON-SI, GYEONGGI
Website : www.onnuriplan.com
Main Products : Dust & Gas Masks, Sanitary Mask Covers, etc.
TEL : +82 32 681 7780

Oriental Precision & Engineering Co., Ltd.
Location : GANGSEO-GU, BUSAN
Website : www.opco.co.kr
Main Products : Crane, Windlass & Mooring Winch, Life Boat Davit
TEL : +82 51 202 0101

OSCG Co., Ltd.
Location : SASANG-GU, BUSAN
Website : www.oscg.net
Main Products : Cable gland and accessories, GRP junction box
TEL : +82 51 305 3910

OTS Co., Ltd.
Location : SUNCHEON-SI, JEONNAM
Website : www.otshi.co.kr
Main Products : Crane, Winch, A-Frame
TEL : +82 61 724 4100

PANASIA Co., Ltd.
Location : GANGSEO-GU, BUSAN
Website : www.worldpanasia.com
Main Products : Ballast water treatment system/level instrument, Seawater coarse filtration/ Emission gas control system, Engineering services
TEL : +82 51 831 1010

Pie Plus Co., Ltd.
Location : GANGSEO-GU, BUSAN
Website : www.piplus.co.kr
Main Products : Crankshaft, Rudder stock, Motor shaft
TEL : +82 51 831 9338

PROSAVE Co., Ltd.
Location : GIMHAE-SI, GYEONGNAM
Website : www.prosave.co.kr
Main Products : Crankcase Explosion Relief Valve, Smart High Velocity Pressure/ Vacuum Relief Valve, Air Release & Vacuum Breaker Valve
TEL : +82 55 313 3511

S&W Co., Ltd.
Location : SAHA-GU, BUSAN
Website : www.snwcorp.com
Main Products : Cam/cam shaft, Valve/seat ring, Engine bolts/ nuts, Bolts
TEL : +82 51 205 7411

S. A. M-Tech
Location : NAMDONG-GU, INCHEO
Website : www.samartkr.com
Main Products : Engine control lever, Engine control cable, Hydraulic steering system, Stern drive, Helm pump, Cylinder, etc.
TEL : +82 32 815 3614

SG Safety Corp.
Location : PYEONGTAEK-SI, GYEONGGI
Website : www.sgsafety.net
Main Products : Inflatable rubber products, Ship ballast water treatment system, Life rafts, Speed boats, River boats, Fishing boats, Water tanks, High-speed boats
TEL : +82 31 651 3012

SAMGONG Co., Ltd.
Location : GANGSEO-GU, BUSAN
Website : www.sam-gong.co.kr
Main Products : Oil purifier, Ship window, Ship accommodation ladder, Cathodic protection system, Elevator type tower gangway, Ship ballast water treatment system, Quick release mooring hook & road monitoring system
TEL : +82 51 200 3040

Samin Information System Co., Ltd.
Location : HAEUNDAE-GU, BUSAN
Website : www.saminis.com
Main Products : EcoInspection, Ecoserver Package
TEL : +82 70 7771 2104

SAMKUN CENTURY Co., Ltd.
Location : MIRYANG-SI, GYEONGNAM
Website : www.samkunok.com
Main Products : F.W. supply unit, BWTS, PE coating, Paint
TEL : +82 70 4034 0226

SAMYANG METAL IND. Co., Ltd.
Location : SAHA-GU, BUSAN
Website : www.cuniship.com
Main Products : flanges, fittings
TEL : 82 51 266 6655

Samyoung Machinery Co., Ltd.
Location : GONGJU-SI, CHUNGNAM
Website : www.sym.co.kr
Main Products : Cylinder head, Cylinder liner, Piston & carrier, etc.
TEL : +82 41 840 3000

Samyoung M-TEK Co., Ltd.
Location : HAMAN-GUN, GYEONGNAM
Website : www.symtek.co.kr
Main Products : MBS, Chain wheel, Cylinder cover, etc.
TEL : +82 55 589 7000

SAMYUNG ENC Co., Ltd.
Location : YOUNGDO-GU, BUSAN
Website : www.samyungenc.com
Main Products : AIS/GMDSS radio equip, etc.
TEL : +82 51 601 5555

Sandong Metal Industry Co., Ltd.
Location : GUMI-SI, GYEONGBUK
Website : www.smi-sdhitec.com
Main Products : Manifold, Plug valve, Choke valve, Integral Fittings
TEL : +82 54 472 8311

Saracom Co., Ltd.
Location : YEONGDO-GU, BUSAN
Website : www.saracom.net
Main Products : GMDSS equipment
TEL : +82 51 600 9000

Scana Korea Hydraulic Ltd.
Location : GIMHAE-SI, GYUNGNAM
Website : www.scana.co.kr
Main Products : Actuators, HPU and local control panel, Offloading systems/winches and mooring system/turret/swivel, etc.
TEL : +82 55 343 9007

SEJIN IND Co., Ltd.
Location : CHANGWON, GYUNGNAM
Website : www.sejin89.co.kr
Main Products : Tank top unit, Module unit, Purifier unit, Supply unit, etc.
TEL : +82 55 239 4700

Seobu Electric Ind. Co., Ltd.
Location : SAHA-GU, BUSAN
Main Products : Ground Monitor
TEL : +82 51 264 0670

SEOUL ELECTRIC CABLE Co., Ltd.
Location : UMSUONG-GUN, CHUNGBUK
Website : www.seoulcable.com
Main Products : Offshore & shipboard cables
TEL : +82 43 879 7200

Seun Electric Co., Ltd.
Location : SAHA-GU, BUSAN
Website : www.seunelectric.co.kr
Main Products : Battery charger, Alarm sys.
TEL : +82 51 208 4641

SEWON INDUSTRIES Ltd.
Location : HAMAN-GUN, GYEONGNAM
Website : www.sewon-ind.com
Main Products : High velocity P/V valve, Air vent head, Expansion joint, Flame arrester / Breather valve
TEL : +82 55 580 7200

SHINHAN HEAVY INDUSTRIES Co., Ltd.
Location : ULJU-GUN, ULSAN
Website : www.shinhanheavy.co.kr
Main Products : Deckhouse, Rudder
TEL : +82 52 240 5000

Shin Heung ENG Co.
Location : GANGSEO-GU, BUSAN
Website : www.shinheungeng.co.kr
Main Products : Curtain, Upholstery, Sofa & Chair, Mattress, Carpet, Roller blind
TEL : +82 51 817 6455

Shin Myung Tech Co., Ltd.
Location : YANGSAN-SI, GYUNGNAM
Website : www.smdavit.com
Main Products : Air motor, Winch, Davit, Crane, Reel, Capstan, Pump, etc.
TEL : +82 55 363 7091

Shin Sung eng Co., Ltd.
Location : GANGSEO-GU, SEOUL
Website : www.ishinsung.com
Main Products : Air Con. Plant, Ref. Plant
TEL : +82 2 2600 9602

Shin Yeong Co., Ltd.
Location : GIMHAE-SI, GYUNGNAM
Website : www.sy-ind.com
Main Products : Manhole, Access hatch
TEL : +82 55 346 0034

Shin-A Co., Ltd.
Location : SAHA-GU, BUSAN
Website : www.shina-ent.com
Main Products : Navigational/communication equip.
TEL : +82 51 204 6221

Shin-A Metal Tech Co., Ltd.
Location : BUK-GU, ULSAN
Website : www.shinametal.com
Main Products : Engine metal bearing, Bearings for medium & small engines, Main bearing shells, Segment & segment holder, Guide shoe, Top & bottom end bearing, Mesta bearing
TEL : +82 52 298 2100

Shindong Digitech Co., Ltd.
Location : YEOUNGDO-GU, BUSAN
Website : www.shindong.com
Main Products : Navigation & communication, Internal communication equipment
TEL : +82 51 461 5141

Shinshin Machinery Co., Ltd.
Location : GIJANG-GUN, BUSAN
Website : www.sspump.com
Main Products : VID (Cooling F.W & S.W pump), EHC (Volute casting centrifugal pump), NLG (External gear pump)
TEL : +82 51 713 0000

Silla Metal Co., Ltd.
Location : GANGSEO-GU, BUSAN
Website : www.sillametal.com
Main Products : Fixed pitch propeller (FPP), Controllable pitch propeller (CPP, Shafting, Stern equipment)
TEL : +82 51 831 5991

Simulation Tech Inc.
Location : GEUMCHEON-GO, SEOUL
Website : www.simulationtech.co.kr
Main Products : Voyage data recorder
TEL : +82 2 3281 0960

SKMARINTEC Co., Ltd.
Location : GIMHAE-SI, GYUNGNAM
Website : www.skmarintec.co.kr
Main Products : Electrolytic Sewage Processing Eqiupment
TEL : +82 55 314 4620

SMECO Co., Ltd.
Location : YEONGI-GUN, CHUNGNAM
Website : www.smecopiston.com
Main Products : Piston, Piston liner
TEL : +82 44 864 3030

SMS Co., Ltd.
Location : SAHA-GU, BUSAN
Website : www.sms-marinesystem.com
Main Products : Hatch cover, Lashing bridge, Ro-Ro equipment, Hydro door
TEL : +82 51 290 1000

CAPE INDUSTRY Ltd.
Location : YANGSAN-SI, GYUNGNAM
Website : www.capeind.com
Main Products : Cylinder Liner
TEL : +82 55 370 1234

SPECS Corporation
Location : BUNDANG-GU, SEONGNAM
Website : www.specs.co.kr
Main Products : Oil Mist Detection System for Engine Room (AOMD), Oil Mist Detection System for Diesel Engine (COMD), Shaft Torque Power RPM Meter (TPM), etc.
TEL : +82 31 706 5211

STACO Co., Ltd.
Location : GANGSEO-GU, BUSAN
Website : www.staco.co.kr
Main Products : Wall & ceiling panel, Unit toilet
TEL : +82 51 831 7000

STACO CHALMERS Co., Ltd.
Location : GANGSEO-GU, BUSAN
Website : www.staco.co.kr
Main Products : Unit Cabin, Unit Toilet, Marine Door
TEL : +82 51 831 7000

STX Engine Co., Ltd.
Location : CHANGWON, GYUNGNAM
Website : www.stxengine.co.kr
Main Products : Marine diesel engine, Military diesel engine, power plant diesel engine, electronic communication equipment
TEL : +82 55 280 0114

STX Heavy Industries Co., Ltd.
Location : CHANGWON, GYUNGNAM
Website : www.stxhi.co.kr
Main Products : Turbocharger, Diesel engine parts, Industrial components, Shipuilding machinery, Cargo pump system, Casting parts
TEL : +82 55 280 0700

Suh Han Ind. Co., Ltd.
Location : SAHA-GU, BUSAN
Website : wwww.suhhani.co.kr
Main Products : Cable tray and duct, Hot dip galvanizing, Ship window
TEL : +82 51 204 1920

SUNBO INDUSTRIES Co., Ltd.
Location : SAHA-GU, BUSAN
Website : www.sunboind.co.kr
Main Products : Package module unit, Tank top unit, E/R block, etc.
TEL:+82 51 260 5551

Sung Jin Geotec Co., Ltd.
Location : GANGSEO-GU, BUSAN
Website : www.sgtkor.com
Main Products : Ship block, Fin tube, Header pipe
TEL : +82 52 228 5801

Sung Kwang Bend Co., Ltd.
Location : GANGSEO-GU, BUSAN
Website : www.skbend.com
Main Products : Butt welding pipe fittings
TEL : +82 51 330 0200

Sung Mi Co., Ltd.
Location : GIMHAE-SI, GYUNGNAM
Website : www.sung-mi.co.kr
Main Products : Door frame, Wall panel, Ceiling panel, Door hardware, Unit toilet
TEL : +82 55 329 1117

SUNG SIN INDUSTRIES Co., Ltd.
Location : GYEONGJU-SI, GYEONGBUK
Website : http://sungsin.koreasme.com
Main Products : Hatch coaming, T-Block, Water mist catcher, Water separator, Louver
TEL : +82 54 776 6441

Sungil SIM Co., Ltd.
Locatio : GANGSEO-GU, BUSAN
Website : www.sungilsim.com
Main Products : Pipe bending, Pipe spool, Marine Engine, Gas turbine
TEL : +82 51 831 8800

Suro Propeller & Machinery Co.
Location : YOUNGDO-GU, BUSAN
Website : www.suropump.co.kr
Main Products : Propeller, Propeller shaft
TEL : +82 51 415 0445

T.K. Corporation Co., Ltd.
Location : GANGSEO-GU, BUSAN
Website : www.tkbend.co.kr
Main Products : Butt-welding fittings, Forged fittings, Flanges
TEL : +82 51 831 6600

TAE KWANG Co., Ltd.
Location : GANGSEO-GU, BUSAN
Website : www.tkbend.co.kr
Main Products : Pipe Fittings, Fitting & Valve
TEL : +82 51 831 6550

TAE YOUNG TRADING Ltd.
Location : NOWON-GU, SEOUL
Website : www.marine-matarial.com
Main Products : Receptacles & wire accessories, Flood light, Deck light, Reflector lamps, HRF mercury lamps, Sodium lamps, Marine electrical equipment
TEL : +82 2 2272 1960

Taekyung Heavy Industries Co., Ltd.
Location : CHANGWON-SI, GYUNGNAM
Website : www.tkhic.com
Main Products : Engine Bed/Frame Box, Air Receiver/Gas ReceiverSteel Outfittings, Tubular(SAW Pipe), etc.
TEL : +82 70 4628 8844

TANKTECH Co., Ltd.
Location : SAHA-GU, BUSAN
Website : www.tanktech.co.kr
Main Products : Water-mist fire fighting system for engine room and accommodation, LNG fuel tank system, Offshore steel structure
TEL : +82 51 979 1600

TechMarine S/W Co., Ltd.
Location : DONG-GU, BUSAN
Website : www.techmarine.net
Main Products : Loading computer program, CAOS, Stowage program, LOFOS, LMS
TEL : +82 51 467 7003

Techcross Inc.
Location : GANGSEO-GU, BUSAN
Website : www.techcross.com
Main Products : Ballast water management system
TEL : +82 51 603 3500

TETRADYNE
Location : GURO-GU, SEOUL
Website : www.tetradyne.co.kr
Main Products : Marine Monitor, Marine Panel PC
TEL : +82 2 323 4972

TMC Co., Ltd.
Location : CHEONAN-SI, CHUNGNAM
Website : www.tmc-cable.com
Main Products : Marine cables, Oil & rig cables, Onshore cables, Special cables, Optical fiber cables
TEL : +82 41 589 6500

TOPSAFE Co., Ltd.
Location : GIMHAE-SI, GYUNGNAM
Website : www.topsafe.co.kr
Main Products : High-velocity pressure vacuum valve, Breather valve, Flame arrestor, Emergency vent cover, Detonation flame arrestor
TEL : +82 55 338 9986

TTS INTERNATIONAL Corp.
Location : GANGSEO-GU, BUSAN
Website : www.ttsi.co.kr
Main Products : Cuni Pipe, Cuni Flange, Cuni Fitting
TEL : +82 51 832 9977

VISER Co., Ltd.
Location : GIMHAE-SI, GYUNGNAM
Website : www.viser.co.kr
Main Products : PHE GASKET, Valve seat, Dust packing, etc.
TEL : +82 55 346 5575

WARTSILA ACCOMMODATION SYSTEMS KOREA, Inc.
Location : GOSEONG-GUN, GYEONGNAM
Website : www.waskorea.co.kr
Main Products : Unit toilet, Unit cabin, Wall panel, Ceiling panel
TEL : +82 55 673 7315

WhaYoung Co., Ltd.
Location : MIRYANG-SI, GYUNGNAM
Website : www.whayoung.co.kr
Main Products : Fuel pump ass'y for ship engine
TEL : +82 55 359 1100

WONIL Co., Ltd.
Location : MASAN-SI, GYEONGNAM
Website : www.ms-wonil.com
Main Products : Cylinder cover, Common rail unit, Silencer, Spraying plate, Rotor shaft
TEL : +82 55 253 1500

Woo Chang Ind. Co., Ltd.
Location : GIMHAE-SI, GYUNGNAM
Main Products : Weather-tight steel door, Louver vent, Steel window box, Mooring fitting
TEL : +82 55 337 1651

WOOJOO M & E Co., Ltd.
Location : SAHA-GU, BUSAN
Website : www.wjme.com
Main Products : Exp. junction box, Warning alarm, etc.
TEL : +82 51 264 9130

Yoo Won Industry Ltd.
Location : SAHA-GU, BUSAN
Website : www.yoowonind.com
Main Products : Steering gear, Filter, Deck M/C
TEL : +82 51 205 8541

You Jeon Industry Co., Ltd.
Location : CHANGWON, GYUNGNAM
Main Products : Marine engine parts, Engine bed
TEL : +82 55 297 2121

YoungkWang Machine Co., Ltd.
Location : GYEONGJU-SI, GYEONGBUK
Website : www.ykmc.com
Main Products : Skid unit, Pressure vessel, Heat exchanger
TEL : +82 54 776 6456

Younglim Timber Co., Ltd.
Location : NAMDONG-GU, INCHEON
Website : www.younglim.com
Main Products : Wood Fire Retardant, Flooring Board, Furniture, Wood for Interiors
TEL : +82 32 811 9051

YOUNGIL PRECISION Co., Ltd.
Location : HAMAN-GUN, GYEONGNAM
Website : http://youngilco.kr
Main Products : Valvetrain components for all kinds of 4-Stroke Diesel Engine's
TEL : +82 55 585 2915

DAEWOO SHIPBUILDING & MARINE ENGINEERING CO., LTD.

• Address : 85, Da-dong, Jung-gu, Seoul, Korea • Tel : +82-2-2129-0114 • Fax : +82-2-2129-0077~8 • http://www.dsme.co.kr
• Products : *LNG Carriers, LNG-RVs, LNG-FPSOs/FSRUs, LPG Carriers, LPG-FPSOs, ULCCs, VLCCs, Suezmax/Aframax/Panamax Tankers, Shuttle/Chemical Tankers, Product Carriers, Containerships, Capesize/ Kamsarmax/ Supramax Bulk Carriers, Ore Carriers, VLOCs, Ro-Ro Ships, PCTCs, Passenger Car Ferries, FPSOs, FSOs, FPUs, Drill Ships, Semi-Submersible Drilling Rigs, Fixed Platforms, Submarines, Submarine Rescue Vessels AUVs, Destroyers, Battle Ships*

HYUNDAI HEAVY INDUSTRIES CO., LTD.

• Address : 1, Jeonha-dong, Dong-gu, Ulsan, Korea • Tel : +82-52-202-2114 • Fax : +82-52-202-3470 • http://www.hhi.co.kr
• Products : *Bulk Carriers, Containerships, Tankers, VLCCs, Product Carriers, Multi-purpose Cargo Ships, OBO Carriers, Pure Car Carriers, LPG Carriers, Ro-Ro Ships, Chemical Tankers, Offshore Rigs/Barges, LNG Carriers, Passenger Ships, Drill Ships, Special & Naval Ships, FPSO, FSO, Semi-submersible Drilling Rig, Other Vessels*

SAMSUNG HEAVY INDUSTRIES CO., LTD.

• Address : 1321-15, Seocho-Dong, Seocho-Gu, Seoul, Korea • Tel : +82-2-3458-7312 • Fax : +82-2-3458-7319 • http://www.shi.samsung.co.kr
• Products : *Arctic Shuttle Tankers, VCLLs, Crude Oil Tankers, Container Vessels, LNG/LPG Carriers, FPSO, FSO, Drillships, etc., LNG FPSO, Offshore Platforms, TLP, SEMI, Cruise Ships & Ferries, Steel Structures, Bridges & Building, Cargo & Material Handing Equipment*

HYUNDAI SAMHO HEAVY INDUSTRIES CO., LTD.

• Address : 1700, Yongdong-ri, Samho-eup, Yeongam-gun, Jeollanam-do, Korea • Tel : +82-61-460-2114 • Fax : +82-61-460-3701
• http://www.hshi.co.kr
• Products : *Tankers, VLCCs, Product Carriers, Chemical Tankers, Containerships, LNG Carriers, LPG Carriers, Pure Car Carriers, Bulk Carriers, Other Vessels*

HYUNDAI MIPO DOCKYARD CO., LTD.

• Address : 1381, Bangeo-dong, Dong-gu, Ulsan, 682-712 Korea • Tel : +82-52-250-3031~3040 • Fax : +82-52-250-3056 • http://www.hmd.co.kr
• Products : *Product/Chemical Tankers, Containerships, Self-Unloading Bulk Carriers, Multipurpose Cargo Carriers, Drillships, Cable Layers, Pipe Layers, FPSOs, Car Ferry & Passenger Ships, LPG Carriers, Pure Car / Truck Carriers, General Cargo Carriers, Ro-Ro Vessels*

STX OFFSHORE & SHIPBUILDING CO., LTD.

• Address : 100 Wonpo-dong, Jinhae, Gyeongnam, Korea • Tel : +82-55-548-1122 • Fax : +82-55-546-7928 • http://www.stxship.co.kr
• Products : *Crude Oil Tankers, Product Oil Tankers, Chemical Tankers, Bulk Carriers, Container Ships, LNG/LPG Carriers, Pure Car & Truck Carriers, Ferries & Passenger Ships, Naval Ships, Speical Purpose Ships, Offshore and offshore support vessel, Etc*

SUNGDONG Shipbuilding & Marine Engineering CO., LTD.

• Address : 940, Gongdan-ro, Gwangdo-myeon, Tongyeong-si, Gyeongsangnam-do, 53006, South Korea
• Tel : +82-55-647-7435/7415 • Fax : +82-55-647-5065 • http://www.isungdong.com
• Products : *Crude Oil Tankers, Product Carriers, Chemical Tankers, Shuttle Tankers, Container Carriers, Bulk Carriers, FSO*

HANJIN HEAVY INDUSTRIES & CONSTRUCTION CO., LTD.

• Address : 29, 5-ga, Bongnae-dong, Yeongdo-gu, Busan, Korea • Tel : +82-51-410-3240 • Fax : +82-51-410-8477 • http://www.hanjinsc.com
• Products : *Container Carriers, Product/Chemical/Crude Oil Tankers, LNG/LPG Carriers, Cable Ships, Supply Boats, Semi-Submersible Drilling Rigs, Dredgers, Navel Ships, Special Purpose Ships, Bulk Carriers*

DAESUN SHIPBUILDING & ENGINEERING CO., LTD.

• Address : 12, 4-ga, Bongrae-dong, Yeongdo-gu, Busan, Korea • Tel : +82-51-419-5090~1 • Fax : +82-51-416-7965 • http://www.daesunship.co.kr
• Products : *Container Ships, Bulk Carriers, Tankers, MPC & General Cargo Ships, Gas Carriers, Ro/Ro ships, Tug Boats, Fishing Boats/Vessels, Special Purpose Vessels*

KORSHIP
Shipbuilding
Offshore
Oil & Gas
Offshore wind

Registration No. : Youngdungpo Ra 00220
Published on Apr. 5. 2017
Publisher Yoseob Choi
Editor-in-Chief Chunghoon Lee
Senior Editor Chanyoung Choi
Designer Hyunju Seo
Marketing Manager Sungsu Park
Kijong Seo
Jongki Hong

Printed by Hyung-Je Art Printing
Printed (CTP) by Hyung-Je Art Printing
Published by PROCON

Address: Room. 708 ACE Techno Tower, 12, Dangsan-ro 2-gil, Yeongdeungpo-gu, Seoul, Korea (Postcode: 07299)
Tel : +82-2-2168-8898
Fax : +82-2-6442-2168
International : +82-10-5604-7311 (Chanyoung Choi)

www.korship.co.kr www.procon.co.kr
E-mail : korshipeditor@gmail.com
Price per Copy : ₩10,000
Annual Subscription Fee : ₩100,000

Bank of receipt	
Kiup Bank	083-038571-04-013
Kook Min Bank	757-21-0285-181
Shin Han Bank	284-05-012954
Woo Ri Bank	182-07-168838
* Deposit person : PROCON (Choi Yo Seob)	

Application of Subscription

Company's Name :

Applicant :

Address :

Term of Subscription : From M/Y ~ To M/Y

Tel : Fax :

Rate of Subscription : 1 Month / 10,000(Korean Won)
1 Year / 100,000(Korean won)
(Air postage will be charged for foreign countries.)

Inquiry : Tel / +82-2-2168-8898
Fax / +82-2-6442-2168
E-mail : victory@procon.co.kr

Monthly Korship, Korea's only Offshore & Shipbuilding monthly magazine in English

Monthly Korship keeps readers up to date with the latest news on Offshore & Shipbuilding industry and various companies swiftly. Korea, a small country on the planet, is leading the world's Offshore & Shipbuilding industry, powered by its economic growth.

This small but impactful Monthly Korship which is published in Korea, the world's largest Offshore & Shipbuilding country, will help keep your pulse on the Offshore & Shipbuilding industry around the globe.

Seoul Office

TEL : +82-2-2168-8898

FAX : +82-2-6442-2168

www.korship.co.kr

Offshore & Shipbuilding Magazine

KORSHIP