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KORSHIP Nov 2013 Vol.53

Feature Story | KORMARINE 2013, the cradle of shipbuilding and offshore industries

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Korea monthly shipbuilding magazine

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2013. 11  
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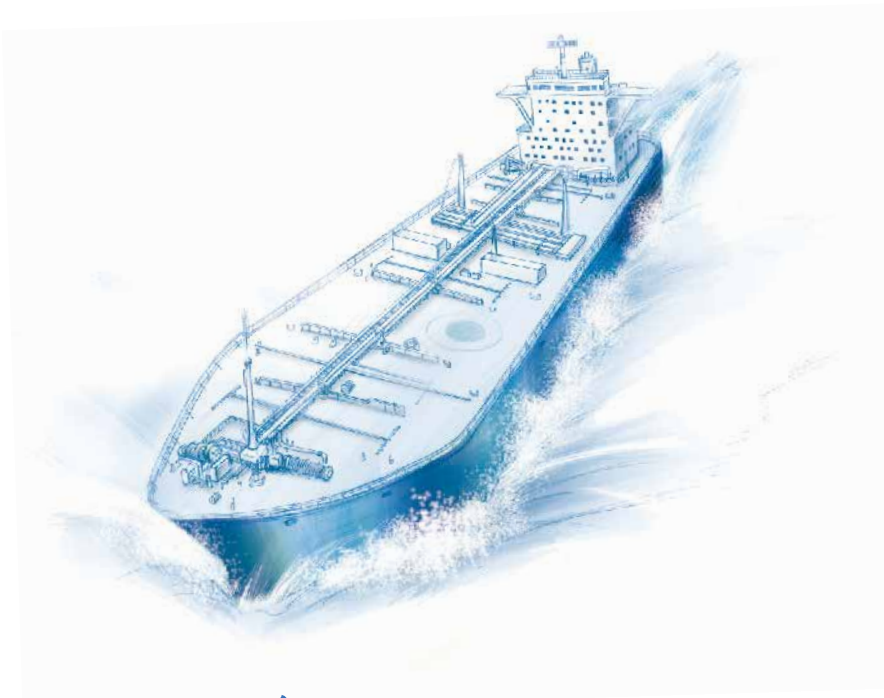


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280M ~ 315M	IIB	110 ~ 132kW	110 ~ 160kW	110 ~ 132kW	75 ~ 90kW
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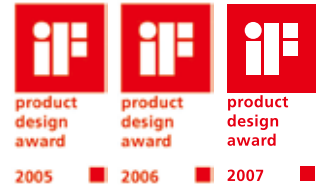
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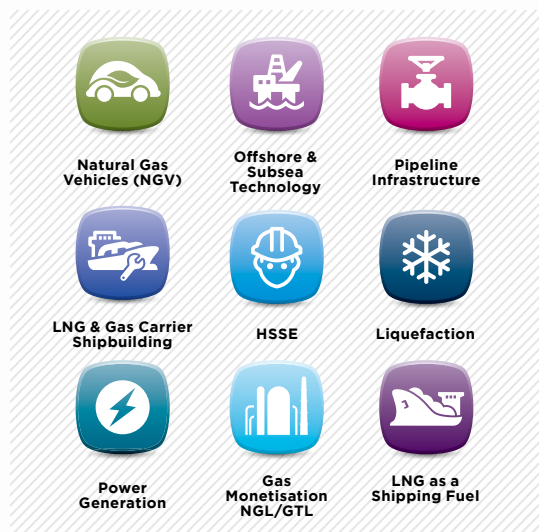


### Gastech Exhibition Seminars Driving Awareness of Innovation & Advancement in Gas Technology

Gastech Exhibition |  
Tuesday 25 to Thursday 27 March 2014

- **9 Highly focussed technical seminars** on the exhibition showfloor
- **Delivering knowledge, education and awareness** of technological innovations
- **Showcasing industry expertise** and the latest developments in gas technology

### Streams at CoTEs



## Contractors and Suppliers Exchange (CaSE)



### Connecting The Gas Supply Chain

Gastech Exhibition | Monday, 24 March 2014  
13:30 - 16:00 followed by a Networking Reception

- **An insight on forthcoming projects** and the bid and tender processes
- **Face-to-face dialogue between contractors and suppliers** on key requirements and best practices to do business together
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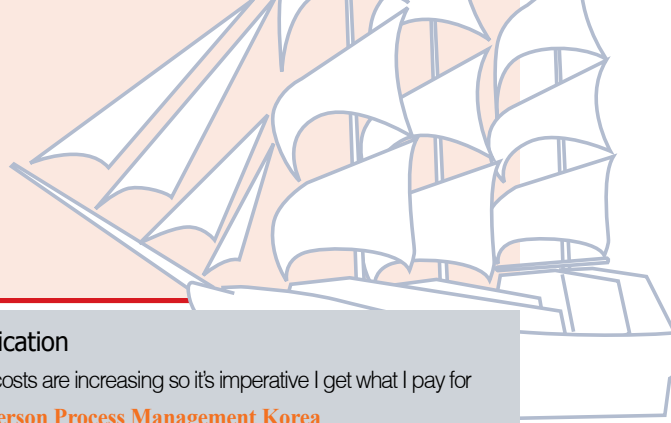
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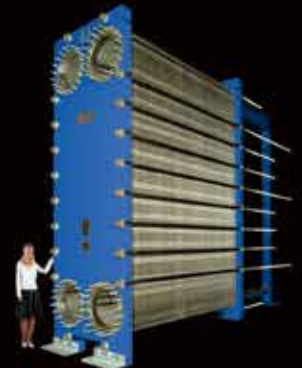
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Korship helps not only to share informations and technologies of shipbuilding & offshore industry between users and potential suppliers but also introduce subscribers up-to-date shipbuilding & offshore related technologies and informations to become 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.

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World's up-to-date indispensable 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.

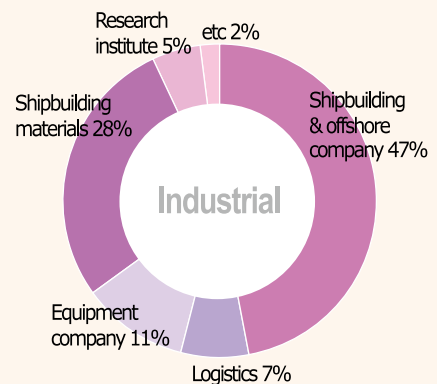
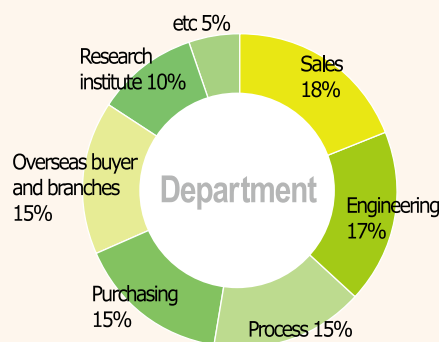
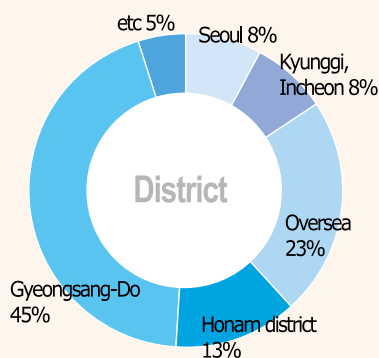
## Product

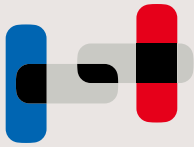
New shipbuilding & offshore industry products overview

## Business News

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

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## Major International Gas Event Announces Korea 2014 Conference Programme

The Gastech 2014 conference programme, is pleased to welcome a wealth of leading international speakers and ground-breaking new project presentations.

Taking place from 24-27 March 2014 in Seoul, Korea, and hosted by Korea Gas Corporation (KOGAS), the Gastech Conference & Exhibition enters its 42nd year as one of the world's premier gas and LNG events.

The 2014 conference programme has been selected by Gastech's international governing body, which faced the challenging task of sourcing the strongest 70 commercial and technical papers from more than 500 submissions made by the international gas community. Such was the level of interest in Gastech Korea that voting on all the papers took many months, but has now resulted in the most keenly anticipated industry programme in 2014.

The Korea focused presentations and speakers include:

- Host Company Welcome Address: Seok-Hyo Jang, Chief Executive Officer and President, KOGAS
- Realising Ambitions: Enabling Power Market Optimisation in Korea Through Natural Gas: Chris Gunner, Country Chairman & General Manager, Shell Korea
- Type B Tanks - Meeting the Demands for Storage with the Growth of FLNG Projects: Joon Kyoo Kang, Energy System R&D Leader, Daewoo Shipbuilding & Marine

Engineering

- LNG Bunkering Feasibility Analysis for Korea's Coasts: Developing a National Infrastructure: Kidong Kim, Principal Research, KOGAS
- The Successful Development of a New Membrane-Type Containment System for LNG Tankers: K.H Joh, Principal Engineer, Samsung Heavy Industries

Gavin Sutcliffe, Gastech Korea's conference director, said "The growing urgency in demand for new sources of gas and LNG in Asia has been reflected in the outstanding conference programme we've seen developed for Gastech Korea. By taking the event to the epicentre of gas and LNG demand growth, we can connect the global supply chain to the lead consumers in the Asia-Pacific region, led by example by our hosts, KOGAS, as one of the leading consumers of LNG in the world. The programme carefully reflects the projects, plans and ambitions that will help drive economic growth in the region and we believe that the 2014 programme truly reflects the interests of gas consumers in Asia to help them

achieve those goals."

The strength of the Gastech conference programme is based around its effectiveness in connecting the commercial and technical worlds, and next year's programme highlights this more compellingly than ever."

The Gastech conference & exhibition takes place at KINTEX 1, Seoul, Korea, between the 24th and 27th March 2014. (For further information visit [www.gastechkorea.com](http://www.gastechkorea.com) or contact [marketing@gastech.co.uk](mailto:marketing@gastech.co.uk))

### Gastech Korea 2014 컨퍼런스 프로그램 발표

Gastech 2014 컨퍼런스 프로그램이 발표되었다. Gastech 운영위에 따르면, 이번 컨퍼런스를 위해 전 세계 가스 및 LNG 관련 업체들로부터 500편 이상의 논문이 제출되었다. Gastech 이사회는 컨퍼런스 편성을 위해 신중한 심사와 투표를 거쳐 기술, 상업 부문에 있어 가장 영향력 있고 우수한 논문 70편을 선정했다. 다수의 수준 높은 논문이 Gastech 컨퍼런스 프로그램에 제출되어 선정하는데 다소 시일이

걸렸으나 2013년 10월 8일, 최종 컨퍼런스 프로그램이 발표하게 되었다고 전했다.

주요 컨퍼런스 발표자로는 Woodside의 최고 경영자 Peter Coleman, Chevron Gas & Midstream 사장 Joseph Geagea, 도쿄 가스 부사장 Shigeru Muraki, BG 그룹 최고 운영 책임자 Martin Houston, Shell 업스트림 소속 전무 Andy Brown, 그리고 최근 신입된 KOGAS 장석효 사장 등이 있다.

Gastech Korea 컨퍼런스 디렉터인 Gavin Sutcliffe는

"세계 LNG 산업을 이끄는 공기업인 KOGAS의 주축으로 LNG 수요의 중심지 한국에서 2014년 Gastech 컨퍼런스가 열리게 되었다. 아시아 지역내 LNG 가스 수요를 배경으로 이번 Gastech Korea 컨퍼런스 프로그램에는 수준 높은 논문이 다수 편성되었다. 이를 통해 아시아 태평양 지역내 가스산업 공급자와 주요 고객간 연결 통로가 형성되리라 생각한다."고 말했다. 덧붙여 그는 "Gastech 컨퍼런스에서는 최신 프로젝트 계획 및 동향을 심층적으로 파헤쳐



아시아 지역내 경제 성장기류를 형성할 것이다. 아시아 가스 고객의 수요와 관심을 심분 반영하여 산업계 상업, 기술 부문 관계자간 비즈니스 교류를 도모하고자 프로그램이 준비되었다. 내년에 있을

Gastech 컨퍼런스 프로그램은 그 어느 해보다 네트워킹 부문에 초점을 맞췄고, 이를 강점으로 삼고 있다.”고 전했다.

Gastech 컨퍼런스 & 전시회는 극동아시아 지역에

서 최초로 KOGAS (한국가스공사)의 주최로 2014년 3월 24일~27일(4일간) 킨텍스 제 1 전시장에서 개최될 예정이다.



## Lyu Jung-Hyung, President of STXOS, took office

Lyu Jung-Hyung, who came onboard as new President of STX Offshore & Shipbuilding (STXOS), reiterated his determination to spur the normalization of management, help the company emerge stronger earlier from voluntary restructuring agreement and achieve independent survival of the company in the inauguration ceremony held at Jinhae shipyard of STXOS on October 2.

He stressed, “I will strive to ensure that the company emerges stronger earlier from voluntary restructuring agreement based on correct judgment and action as I know the company’s circumstances more than anyone else. I will be fully dedicated with all of you to laying the foundation for independent survival of the company.”

In addition, he put forth the visions necessary for quickly bringing the business back to normal. He stressed the business substance, trust of customers, and accident-free workplace for the normalization of management.

Moreover, he emphasized the need to

strengthen the business substance through the business restructuring, saying, “Previously, the company put the primary focus on the diversification and expansion of business. But now, we will shift the focus to the area where we have competitive edge, such as the construction of commercial vessels, special purpose vessels, small and medium-sized offshore supply vessel, etc., to further ramp up our competitiveness in those sectors.” He went on saying, “We will take the customer satisfaction as top priority. To regain the trust of customers amid the difficulties facing the company, we will build excellent quality vessels and ensure on-time delivery.”

Lyu Jung-Hyung, President of STXOS, offered words of encouragement. He said, “Our company has strong competitiveness



The inauguration ceremony for Lyu Jung-Hyung, President of STXOS, was held in the auditorium of Jinhae shipyard of STXOS.

and great potentials, despite the temporary difficulties facing us. We will think out of the box with a mindset that we can float the vessels even against the head wind, and open the door to new tomorrow of STXOS.” Lyu Jung-Hyung, President of STXOS, was named as new President by the Board of Directors on September 27 after he was appointed as the registered director at the extraordinary meeting of shareholders on the same day.

### STX조선해양, 류정형 대표이사 취임

유정형 STX조선해양 신임 대표이사가 지난 10월 2일 STX조선해양 진해조선소에서 열린 취임식에서 회사의 조속한 경영정상화를 통한 자율협약 조기졸업과 이후 독자생존에 대한 강력한 의지를 피력했다.

유정형 대표이사는 “회사 사정을 누구보다 잘 아는 만큼 정확한 판단과 실행으로 자율협약 조기졸업을 위해 매진하겠다”면서 “임직원 여러분과 함께 강력한 의지를 모아 회사가 반드시 ‘독자생존’의 기반을 마련하도록 하겠다”고 강조했다.

이와 함께 회사의 조속한 경영정상화에 필요한 비전도 제시했다. 유 대표이사는 경영정상화를 위해

사업 내실화, 고객신뢰 회복, 무재해 사업장 조성의 필요성을 강조했다.

또한 그는 “지금까지 회사는 사업 다각화와 확장에 초점을 두었으나 이제는 상선과 특수선, 중소형 해양지원선 건조 등 우리가 경쟁력을 갖춘 분야에 집중해 이 분야에서 확실한 경쟁력을 갖도록 해야 할 것”이라며 사업구조 개편으로 사업내실화에 중점을 두겠다는 의지를 드러냈다. 덧붙여 “고객만족을 가장 중요한 기준으로 삼겠다”며 “회사가 어려움에 처하면서 훼손된 고객의 신뢰 회복을 위해 우수 품질의 선박을 납기 내에 건조하는 우리의 임무에 충실하도록 하자”고 말했다.

마지막으로 유정형 대표이사는 임직원들에 대한 격려와 응원의 말도 잊지 않았다. 그는 “지금 이 순간 회사가 일시적인 어려움에 처해 있지만, 우리는 경쟁력과 저력이 있는 조직이라면서 “무겁게 끼입은 관습의 틀을 벗고, 역풍에도 배를 띄우겠다는 기개로 STX조선해양의 내일을 향한 힘찬 항해를 시작하자”고 당부했다.

한편, 유정형 STX조선해양 신임 대표이사는 지난 달 27일 열린 임시주주총회에서 등기이사로 선임된 뒤 같은 날 열린 이사회에서 신임 대표이사로 임명됐다.

## Rockwell Automation and STXOS to jointly develop SW-based 'Continuous Emission Monitoring' solution

Rockwell Automation entered into MOU (Memorandum of Understanding) with STX Offshore & Shipbuilding (STXOS) to jointly develop the software-based CEM (Continuous Emission Monitoring) solution that utilizes the Pavilion product. Under this MOU, both companies will jointly develop the prototype of Software CEM and push forward the real application after the completion of exhaust gas monitoring test in ship by 2014.

Rockwell Automation' CEM is the PEMS (Predictive Emissions Monitoring System) based on the software modeling of the patented Pavilion8®, and is a more reliable solution than the hardware sensor-based CEMS (Continuous Emissions Monitoring Systems).

Recently, the exhaust gas emissions from

ship have been rigorously regulated by IMO (International Maritime Organization) and MARPOL (Marine Pollution). Under these circumstances, shipyards need to build the stable and sustainable system for monitoring the exhaust gas emissions from ship.

Pavilion8® uses the powerful modeling analysis engine to calculate the predict-

ed emissions value of major harmful gases, such as carbon dioxide and nitrogen oxides, discharged from ship and various



Soon-reul Lee, Marketing director, Rockwell Automation Korea (left), Jae-ik Lee, System engineering R&D team, STX Marine & shipbuilding (light)

plants with high reliability, thus helping meet the requirements of rigorous global emissions standards.

### 로크웰 오토메이션, STX조선해양과 SW 기반의 'Continuous Emission Monitoring' 솔루션 공동 개발

로크웰 오토메이션은 STX조선해양과 Pavilion를 제품을 활용한 소프트웨어 방식의 선박용 CEM (Continuous Emission Monitoring) 솔루션의 공동 개발을 위한 MOU를 체결했다. 양사는 본 양해각서를 통해 소프트웨어 CEM의 프로토타입을 공동 개발하기로 합의했으며, 2014년까지 선박 내 배출 가스 모

니터링 테스트 후 실제 적용까지 진행할 예정이다. 로크웰 오토메이션의 CEM은 특허 출원된 Pavilion8®의 소프트웨어 모델링 기반의 PEMS (Predictive Emissions Monitoring System)로서, 하드웨어 방식의 센서 기반의 CEMS(Continuous Emissions Monitoring Systems)의 대안으로 보다 신뢰할 수 있는 솔루션이다.

최근 IMO(International Maritime Organization) 및 MARPOL(Marine Pollution)를 중심으로 선박을 통한

배기가스 배출에 대한 규제가 강화 되고 있는 상황에서, 조선사는 안정적이고 지속 가능한 선박의 배출 모니터링을 위한 시스템을 구축해야 하는 과제에 직면해 있다.

Pavilion8®은 강력한 모델링 분석 엔진을 사용하여 선박 및 각종 플랜트에서 배출되는 이산화탄소 및 질소산화물 등의 주요 유해가스를 높은 신뢰성으로 예상 배출 값을 산출하여 강화된 국제 배출가스 관련 규정을 충족시킬 수 있다.

## TECHCROSS, ECS Acquires AMS from USCG

The USCG (United States Coast Guard) announced that TECHCROSS' ECS was accepted as AMS (Alternate Management System) on October 4, 2013. AMS was created by USCG to protect US waters from ballast water discharge standards before USCG Type Approval independent of the IMO BWM Convention.

TECHCROSS received AMS for all ECS models including explosion-proof type. As of October 2013, there are only 3 compa-

nies possessing AMS for explosion-proof type, so this should be good news to tanker ship owners who have to voyage to the US. TECHCROSS expects to continue expanding the sales market with AMS, and now aims to acquire US Type Approval for ECS.





## 테크로스, AMS 획득

지난 10월 4일, 테크로스는 전기분해 기술을 사용한 선박평형수 처리장치인 ECS 제품에 대해 AMS(Alternate Management System)를 획득했다고 발표했다. AMS는 미국연안경비대(USCG: United States Coast Guard)가 IMO 승인과는 별도로, 미국의 엄격한 환경규제에 대응하기 위해 각국의 선박평형수 처리장치 메이커들에게 발행하는 인증서이다. 지난 2012년 3월, USCG는 선박평형수 처리장치 탑

재규정에 대한 법안을 발표했으며, 현재 IMO D-2 기준과 동일한 이 법안은 IMO 선박평형수 관리협약의 발효여부와 상관없이 2012년 6월 21일부터 발효되었다. 따라서 미국 연안을 항해하는 선박들은 USCG에서 발행한 인증서를 획득해야 한다. 그 이전까지 USCG로부터 AMS를 인증받고, IMO D-2 기준에 만족하는 장비의 경우 5년간 미국에서의 장비 사용이 허가된다.

이번에 테크로스가 AMS를 받은 제품은 ECS의 최

초 모델인 ECS A타입부터 최근에 개발된 B타입은 물론, 방폭형 모델들도 포함된다. 2013년 10월 기준으로 방폭형 모델의 AMS를 획득한 업체는 테크로스를 비롯해 총 3개 업체에 불과하다.

한편, 테크로스는 이번 AMS 획득과 함께 미국 시장을 포함하여 다양한 국가에서의 활발한 영업활동에 박차를 가할 수 있을 것으로 기대하고 있으며, 향후 USCG에서 발행하는 인증서 획득을 위해 준비하고 있다.

## Bosch Rexroth opens new headquarters in Busan

Bosch Rexroth ceremonially opened the new headquarters with large manufacturing and logistics areas On October 15. With its presence in Busan, the company strengthens its local development and production of industrial and mobile hydraulic applications, factory automation as well as machinery applications and engineering in East Asia. The new construction triples the previous production and office space and includes more than 17,000 square meters. Bosch Rexroth has invested 17.5 million euros here and employs approximately 110 associates at the site.

The new construction reflects the growing importance of South Korea for global mechanical engineering. "Bosch Rexroth has been present in South Korea for more than 20 years and, since then, has been continually expanding the local development, logistics and production capacity," said Dr. Bertram Hoffmann, Member of the

Executive Board of Bosch Rexroth AG. "As a longtime partner of South Korean equipment manufacturers and end users, we assure that our products and solutions are adapted to the local requirements and produced here locally."

In Busan, Bosch Rexroth produces hydraulic power units and control blocks. "Now at our site, we can produce even more powerful units for large presses, material handling, marine & offshore applications, energy, stage technology or infrastructure projects, such as channel locks. This complements our established series production and enables new applications in mobile



Bosch Rexroth has opened the new headquarters and production plant in Busan

hydraulics and factory automation," said Albrecht Benz, Representative Director of Bosch Rexroth in South Korea. Along with the site in Busan, the company also assembles customized automation solutions for industrial applications at its plant in Ansan. In all, Bosch Rexroth employs some 190 associates in South Korea.

## 보쉬렉스로스코리아 부산 신공장 이전으로 새로운 도약

보쉬렉스로스코리아는 넓은 생산 시설과 물류 시설을 갖춘 부산 신공장 준공식을 지난 10월 15일 거행했다. 부산 신공장 준공과 함께 동아시아 지역 현지에서 산업 유압, 중장비 유압, 공장자동화 그리고 산업기계 엔지니어링 분야의 개발 및 생산을 강화하게 되었다. 특히 17,000㎡ 이상의 대지에 생산 시설, 물류시설, 사무동을 포함하고 있는 신공장 건설에 보쉬렉스로스는 약 1,750만 유로를 투자했다. 신공장 준공은 글로벌 기계 엔지니어링 분야에서

한국의 성장된 중요성을 반영하고 있다. 보쉬렉스로스 독일본사 경영이사회의원인 베르트람 호프만 박사는 "보쉬렉스로스는 한국에서 사업을 시작하지 20년 이상 되었으며, 그 동안 현지에서의 개발, 물류 및 생산 물량은 꾸준히 증가해왔다. 한국의 장비 제조사 및 최종 사용자의 오랜 파트너로서, 우리의 제품과 솔루션을 한국에서의 요구사항과 생산환경에 맞춰 공급해왔음을 자부한다."고 말했다.

보쉬렉스로스코리아의 대표이사인 알브레히트 벤츠 사장은 "신공장에서 보쉬렉스로스는 대형 프레스, 하역 운송 장비, 조선 및 해양 산업, 첨단 이동식 무대

장치 그리고 발전설비, 수문분야와 같은 사회기반 시설 산업분야에 필요한 보다 강력한 파워 유니트를 생산할 수 있다. 그리고 중장비 유압 및 공장자동화 분야에서는 기존의 양산 제품뿐만 아니라 새로운 응용분야 개발도 가능하게 되었다."고 소감을 밝혔다. 한편 보쉬렉스로스의 안산공장에서는 공장 자동화 솔루션을 위한 어셈블리 커스터마이징 시설을 갖추고 있으며, 한국 내에는 총 190 여명의 보쉬렉스로스 임직원들이 근무하고 있다.

## DSME held the ceremony to mark its 40th anniversary

Daewoo Shipbuilding & Marine Engineering (DSME) held the ceremony to celebrate its 40th anniversary at Okpo shipyard in Geoje island on October 24. This ceremony was held under the slogan, "Move beyond the miracle of Okpo Bay", drawing about 1800 people including Goh Jae-ho, President of DSME, Seong Mahn-ho, labor union leader of DSME, employees of DSME, and subcontractors. During the ceremony, DSME looked back on the 4-decade history of the shipyard which has become the world's third largest since the groundbreaking ceremony held at a desolate fishing village on October 11, 1973, and renewed the determination to become the leader in the ocean era by 2023 under its mid and long-term goal.

In May, DSME adopted the 'World leader in ocean technology' as its new visionary slo-

gan. This slogan epitomizes the strong intention of DSME to evolve into the world's best EPCIC(design, purchasing, manufacturing, transportation, installation) contractor keeping up with the global trend that the focus is being shifted to the inexhaustible value of sea and the creation of value in ocean amid the depletion of resources on land. On the same day, DSME unveiled the blue whale, its mascot symbolizing the new vision.

Goh Jae-ho, President of DSME, said in his congratulatory address, "We took the



adversities and hardship as springboard for another leap forward and laid the foundation for unique corporate culture of DSME. Let us go to the basics with enthusiasm and pride and help the company evolve into a leader dominating the era of ocean based on our 4-decade history."

### 대우조선해양, 창립 40주년 기념식 개최

대우조선해양이 창립 40주년을 맞아, 지난 10월 24일 거제 옥포조선소에서 기념식을 개최했다.

'옥포만의 기적을 넘어'라는 공식명칭 하에 진행된 이날 행사에는 고재호 사장과 성만호 대우조선해양 노동조합 위원장부터 임원, 직원, 그리고 협력사 관계자를 포함해 1800여 명이 참석했다.

1973년 10월 11일 열린 옥포조선소 기공식 이후 황량한 어촌 마을을 세계 3대 조선소로 키워낸 대

우조선해양의 40년 역사를 되짚고, 중장기 비전인 '2023년 대해양 시대의 주역으로 우뚝 서겠다'는 대우조선해양의 결의를 다졌다.

대우조선해양은 지난 5월 '대해양 시대의 주역, 대우조선해양 (World leader in ocean technology)'을 새로운 비전 슬로건으로 채택했다. 이는 육지자원 고갈로 각국이 바다의 무궁무진한 가치에 주목하고 있는 시대적 흐름에 발맞춰 해양에서 가치를 창출하는 세계 최고의 EPCIC(설계, 구매, 제작, 운송, 설치)

기업으로 거듭나겠다는 의지가 담겨있다. 한편 이날 대우조선해양은 새로운 비전 슬로건을 상징하는 캐릭터로 '흰수염 고래'도 공개했다.

고재호 사장은 축사를 통해 "우리는 고난과 역경이 닥칠 때마다, 이를 도약의 계기로 삼아 딛고 일어서 이는 대우조선해양의 고유한 기업문화를 형성하는 토대가 됐다"며 "열정과 자존심을 갖고 일하던 때의 초심을 되찾아, 40년 역사를 이어 대해양 시대를 이끌어 나가는 기업으로 거듭나자"고 말했다.

## Domestic shipbuilding industry bottomed out in the third quarter

The market is turning cautiously optimistic that domestic shipbuilding industry started to bottom out in the third quarter of this year. The 3 major domestic shipyards saw their sales increase 0.6% year-on-year despite the prediction of decline.

According to the shipbuilding industry, Hyundai Heavy Industries (HHI) is expected to register KRW 13 trillion 284.5 billion in sales and KRW 307 billion in operating

income in the third quarter of this year, and Samsung Heavy Industries (SHI) is expected to register KRW 3 trillion 711.8 billion in sales and KRW 263.4 billion in operating income in the same period which represents an increase by 8.5% compared to the same period of the previous year. Meanwhile, Daewoo Shipbuilding & Marine Engineering (DSME) is expected to register KRW 3 trillion 742.2 billion in sales, a 18.0%

increase year-on-year in the third quarter of this year.

According to the Ministry of Commerce, Industry and Energy (MCIE) and Korea Offshore & Shipbuilders' Association (KOSHIBA), the orders placed at domestic shipyards stood at 10.86 million CGT (tonnage converted in value-added term) worth USD 30.36 billion until the third quarter of this year, accounting for 36% of the

orders placed worldwide. The newbuilding price index which indicates the ship price trends has risen from June this year and recovered to 130 points as of September.

### 국내 조선업계 3분기 '회복세'

국내 조선업계가 올해 3분기 바닥을 찍었다는 전망이 조심스럽게 나오고 있다. 올 3/4분기 국내 조선박3의 실적이 다소 부진할 것으로 전망과 달리 전년 동기 대비 매출액이 0.6% 증가했다.

조선업계에 따르면 올 3분기 현대중공업의 매출액은 13조 2845억원, 영업이익이 3070억원으로 예측되고 있으며, 삼성중공업은 매출액 3조7118억원, 영업이익

Particularly, HHI won orders worth USD 13.67 billion in the shipbuilding and offshore sectors until October, which is only USD 80 million short of its annual new order

의 2634억원으로 전년동기 대비 8.5% 증가했다. 대우조선해양은 전년 동기 대비 매출액은 18.0% 증가한 3조 7422억원이 예상되고 있다.

산업통상부와 한국조선해양플랜트산업회에 따르면 한국 조선산업 3분기까지 1086만CGT의 선박을 수주해 세계 발주량의 36%를 차지했으며, 수주 금액은 303억 6000만 달러에 달한다. 선박 가격 흐름을 나타내는 신조선가지수는 올 6월부터 상승해 9월

target of USD 13.75 billion. If the options (worth USD 3.8 billion) are included, HHI is expected to achieve 120% of its annual new order target by the end of this year.

기준 130포인트를 회복했다.

특히나 현대중공업은 10월 현재까지 조선과 해양 부문에서 136억 7000만 달러를 수주해 목표(137억 5000만 달러)에 8000만 달러 차이로 근접했다. 옴션(38억 달러) 등을 감안하면 올 연말까지 목표의 120% 달성을 눈앞에 뒀다.

## CEOs of world's leading energy companies visited HHI

CEOs of the world's leading energy companies visited Hyundai Heavy Industries (HHI) in a row.

Steve Bolze, President and CEO of U.S.-based GE Power & Water, met with Lee Jai-seong, President of HHI, along with the executives of HHI, and exchanged ideas on matters of common interest on October 15. GE has strength in gas and steam turbine sector, and HHI has strength in plant EPC sector. Both companies agreed to strengthen cooperation and had a discussion on the measures for new business.

On October 14, Philippe Cochet, President of France-based Alstom Thermal Power and Executive Vice-President of Alstom, visited HHI and had a discussion on technical cooperation in power generation sector such as steam boiler, etc., showing an

interest in the PPS (Packaged Power Station) of HHI.

The Presidents of GE and Alstom visited Korea to participate in the World Energy Congress 2013 held in Daegu and explored the cooperation measures with HHI, the business partner. In March, John Rice, Vice-Chairman of GE, visited HHI with Visal Leng, President of GE Oil & Gas Asia Pacific, and Gang Seong-wook, General



Commemorative photographing for the visit to HHI. Steve Bolze (7th from the left), President and CEO of U.S.-based GE Power & Water

Manager of GE Korea, etc., and discussed the cooperation measures.

### 세계적인 에너지 기업의 CEO, 현대중공업 방문

전세계 에너지 산업을 주도하고 있는 기업들의 CEO가 잇달아 현대중공업을 방문했다.

미국 GE사의 스티브 볼츠(Steve Bolze) 전력수력부문 사장 일행은 지난 10월 15일 현대중공업 이재성 사장을 비롯한 현대중공업 경영진들과 만나 공동 관심사에 대해 의견을 나눴다. 이 자리에서 양사는 가스 및 스팀터빈 분야에서 강점을 지닌 GE사와 플

랜트 EPC 분야에서 강점을 가진 현대중공업과의 상호 협력을 강화하고, 신사업 추진 방안에 대해 협의했다.

앞서 10월 14일에는 프랑스 알스톴(Alstom)사의 필립 코쉘(Philippe Cochet) 발전플랜트부문 사장 일행이 방문. 스팀 보일러 등 발전사업 분야의 기술협력에 대해 논의하고 현대중공업 이동식발전설비(PPS, Packaged Power Station)에 대해 관심을 나타냈다. GE사와 알스톴사의 사장 일행은 대구에서 열리고

있는 '세계 에너지 총회(World Energy Congress 2013)' 참석을 위해 한국을 방문해 비즈니스 파트너사인 현대중공업과의 협력 방안을 모색했다.

한편 현대중공업에는 지난 3월에도 GE사의 존 라이스(John Rice) 부회장이 비잘 렌(Visal Leng) CEO 일행과 가스 부문 아시아태평양지역 사장과 강성욱 CEO코리아 총괄사장 등 GE측 주요 경영진들과 동행해 사업협력 방안을 논의한 바 있다.

## Emerson and SeaTec Repair Services announce cooperative relationship to support marine customers

Emerson Process Management and SeaTec Repair Services have formed a cooperative relationship to offer marine customers no-hassle installation of Micro Motion® fuel measurement solutions on a global scale. Emerson's Micro Motion fuel measurement solutions provide accurate measurement of heavy fuel oil, in bunkering and control of fuel burn, which help customers save on operating expense and ensure accurate billing. SeaTec Repair Services, a part of V.Group, is recognized as global marine afloat repair and installation leader. SeaTec will install Emerson's bunkering, fuel consumption, and viscosity offerings to help customers meet tight deadlines and keep projects on sched-

ule and within budget. "By working with Emerson and SeaTec, customers can upgrade the vessels in their fleet faster and work with an expert installation partner experienced in the marine business and with Micro Motion products," said Martin Stafford, V.Group director of marine services. "The Emerson and SeaTec Repair Services cooperative relationship helps us offer installation scope, scale and speed



for marine fuel measurement solutions and increased value to customers globally," said Neal Ingram, president of Emerson's Micro Motion business.

### 에머슨, SeaTec Repair Services사와 해양 산업 고객을 위한 지원 협력 체결

에머슨 프로세스 매니지먼트와 시텍 리페어 서비스(SeaTec Repair Services)사가 전 세계의 해양 산업 고객들을 대상으로 Micro Motion® 연료 측정 솔루션의 원활한 설치를 돕기 위해 협력 관계를 체결했다. 에머슨의 Micro Motion 연료 측정 솔루션은 연료 벙커링 및 연소 제어시 정확한 중유 측정을 제공하여, 고객들의 운영 비용 절감과 정확한 거래 금액 산출

을 도모하고 있다. V.Group의 시텍 리페어 서비스사는 다국적 해양 설치 및 보수 전문 기업으로 인정받아 왔다. 이번에 자사 고객들의 촉박한 프로젝트 일정을 충족하면서, 동시에 예산 내에서 수행이 가능하도록 돕기 위해 에머슨의 벙커링, 연료 소비, 점도 측정 제품을 설치할 계획이다. V.Group의 해양 서비스 부문 마틴 스태퍼드(Martin Stafford) 이사는 "이번에 체결한 에머슨과의 공조 협약으로, 우리의 고객들은 선단 내 선박의 보다 신속한 업

그레이드가 가능해졌다. 뿐만 아니라 해양 산업에서 경험이 풍부한 전문 협력사와 공동으로 작업할 수 있게 되었고, 에머슨이 제공하는 Micro Motion 제품의 우수한 기능적 혜택을 누릴 수 있게 되었다."고 설명했다. "에머슨은 시텍 리페어 서비스사와 체결한 협력 관계를 통해 해양 연료 측정 솔루션의 설치 범위, 규모, 속도를 강화하는 것은 물론, 전 세계 고객들에게 더 큰 가치를 제공할 수 있게 되었다."고 에머슨의 Micro Motion 사장인 닐 잉그램(Neal Ingram)은 말했다.

## Korea Eximbank introduced the ship bond guarantee for the first time worldwide

The Export-Import Bank of Korea (Korea Eximbank) announced on September 30 that it provide the ship finance worth USD 300 million to the U.S.-based Scorpio Tankers that purchased 18 product carriers (PCs) from 3 major domestic shipyards such as Hyundai Mipo Dockyard (HMD), etc. The ship fund consists of direct loan worth USD 175 million and world's first ship bond guarantee worth USD 125 million. The ship bond guarantee is a system that allows the overseas ship owners to issue the bond to secure the funds needed to purchase the vessels built at domestic ship-

yards. Under this system, the Korea Eximbank provides the repayment guarantee for the principal and interest on the ship bond. The liability guarantee of Korea Eximbank relates to the repayment guarantee to commercial banks for the loan granted to overseas importers, thus stimulating the involvement of domestic and overseas commercial banks in bank loan. Meanwhile, bond guarantee is undertaken to guarantee investors the repayment of financial obligations on overseas importers in capital market. Until now, the Export-Import Bank of the United States, Export Credits Guarantee

Department (ECGD), and French Export Agency (Coface) have undertaken the guarantee bond to support the export of their domestic aircrafts, but Korea Eximbank has become the first financial institute worldwide to introduce the guarantee bond for the export trade of ship. As the introduction of the ship guarantee bond leads to the expansion of the funding source from the bank loan market to the capital market, Korea Eximbank plans to actively leverage the bond guarantee system to support the shipbuilding order placements as necessary. In addition,

Korea Eximbank will utilize this bond guarantee system even for the shipbuilding contract entered into between domestic shipping companies and domestic shipyards in an attempt to help domestic shipping companies acquire fuel-efficient eco-friendly vessels.

An official from Korea Eximbank said, "The ship guarantee bond system will help bolster the effort of domestic shipyards striving to win new orders based on their fuel-efficient eco-friendly vessels, ultimately widening the gap between Korean shipyards and overseas shipbuilding competitors."

Korea Eximbank recently provided external liability guarantee to Korea Exchange Bank to stimulate the involvement in ship finance loan, thus increasing the support to domestic shipyards in both financial market and capital market.

### 한국수출입은행, 선박채권보증 세계 최초 도입

한국수출입은행은 현대미포조선 등 국내 조선사 3곳에서 정유운반선(PC탱커) 18척을 구매한 미국 스키포오탱커스(Scorpio Tankers)에 총 3억 달러의 선박금융을 제공한다고 지난 9월 30일 밝혔다. 이번 금융 제공의 특색은 직접대출 1억 7500만 달러와 함께 세계 최초로 선박채권보증 1억 2500만 달러를 제공했다는 점이다.

'선박채권보증'은 국내 조선사가 제작하는 선박을 구매하는데 필요한 자금을 조달하기 위해 해외선주가 채권(Bond)을 발행하고, 한국수출입은행이 이 채권의 원리금 상환을 보증하는 제도다.

한국수출입은행의 채무보증은 국내외 상업은행들

의 대출(Bank Loan) 참여를 유도하기 위해 이들 상업은행에게 외국 수입자의 대출금 상환을 보증하는 제도인 반면 채권보증은 자본시장에서 투자자에게 외국 수입자의 원리금 상환을 보증하는 것이다.

지금까지 미국 수출입은행(Export-Import Bank of the United States)과 영국 수출신용보증국(ECGD), 프랑스 수출보험공사(Coface)가 자국 항공기 수출지원을 위해 채권보증을 활용한 바 있으나, 선박수출 거래에 채권보증을 도입한 건 한국수출입은행이 세계최초다.

선박채권보증 도입을 통해 재원조달 수단이 대출시장(Bank Loan Market)에서 자본시장(Capital Market)으로 확대된 만큼, 한국수출입은행은 앞으로 선박

수주지원을 위해 필요시 채권보증 제도를 적극 활용할 계획이다. 아울러, 국내해운사가 국내 조선사에 발주하는 거래에 대해서도 이번 채권보증 제도를 활용함으로써 국내 해운사의 고연비 예코십 확보도 지원한다는 방침이다.

한국수출입은행 관계자는 "선박채권보증 제도가 고연비 예코십 건조능력을 바탕으로 수주 확대에 안간힘을 쏟고 있는 국내 조선사에 힘을 보태 조선 경쟁국과의 격차를 더욱 벌릴 것"이라고 말했다.

한국수출입은행은 최근 외환은행에 대외채무보증을 제공하여 선박금융 대출 참여를 이끌어 내는 등 선박금융 선도기관으로서 금융시장과 자본시장을 넘나들며 국내 조선사의 수주를 지원하고 있다.



## AVEVA Electrical interfaces with ETAP for improved engineering productivity

AVEVA announced that it is collaborating with ETAP to create a complementary interface between AVEVA Electrical and ETAP's enterprise solution for electrical power systems. The new interface will deliver industry-leading capability for the efficient design, development and production of the most complex electrical installations in all types of process and power plants, ships and offshore facilities. Plant contractors and shipbuilders will gain increased productivity, while their customers can use the same applications for increased efficiency in the lifecycle management of their electrical installations.

Electrical engineers will be able to create and manage detailed design information and production deliverables using AVEVA Electrical, and analyse their design using

ETAP. The interoperability between such powerful applications reduces design effort and enables higher design quality and more accurate early confirmation of materials requirements. AVEVA's approach to openness and inter-disciplinary design enables this integration to offer users a completely flexible approach to electrical engineering and design.

"ETAP's reputation as the industry-leading electrical analysis tool will make this new interface a very popular addition to the AVEVA portfolio" said Bruce Douglas, Senior Vice President, EDS Strategy and Marketing, AVEVA. "The new interface will allow equipment created in AVEVA Electrical or ETAP to be viewed and edited within each system. Electrical engineers will enjoy the confidence that

comes from combining the most user-friendly electrical design software on the market, with ETAP's high-quality electrical engineering analysis."

AVEVA Electrical is a feature-rich software suite for electrical engineering and design. Its advanced graphical user interfaces, and its use of design rules and catalogues for data creation, offer maximum workflow flexibility, improving project productivity and design quality. It is part of the Integrated Engineering & Design product suite that includes AVEVA Everything3D (AVEVA E3D), which handles routing and cable segregation in the 3D model. Via a two-way interface, this seamlessly integrates 3D model to create accurate design information.

# ITT / Bornemann Pump

## from Germany since 1853



<p><b>Bornemann(Germany)</b></p>	<p><b>Borex(Germany)</b></p>	<p><b>Kral(Austria)</b></p>	<p><b>Roper(U.S.A)/1857</b> THE WORLD'S FIRST GEAR PUMP</p>
<p><b>Twin Screw Pump</b></p> <ul style="list-style-type: none"> <li>• Application : Polymer, Slop oil, Asphalt, etc</li> <li>• Capacity : ~Max, 2,800m<sup>3</sup>/h (~20')</li> <li>• Viscosity : 2,000,00 cst</li> <li>• Press. : Max, 100 bar</li> <li>• Temp. : Max, 450</li> <li>• Material : Cl, Dl, CS, SS, Bronze</li> </ul>	<p><b>Mohno Pump</b></p> <ul style="list-style-type: none"> <li>• Application : High Visco, Waste water, Paper, etc</li> <li>• Capacity : ~Max, 300m<sup>3</sup>/h (~8')</li> <li>• Viscosity : 1,000,000 cst</li> <li>• Press. : Max, 100 bar</li> <li>• Material : Cl, CS, SS</li> </ul>	<p><b>Three Screw Pump</b></p> <ul style="list-style-type: none"> <li>• Application : Oils, Ship building, power plant</li> <li>• Capacity : ~Max, 170m<sup>3</sup>/h (~8')</li> <li>• Viscosity : 20,000 cst</li> <li>• Press. : 100 bar</li> <li>• MAG Drive Pump</li> </ul>	<p><b>External Gear Pump</b></p> <ul style="list-style-type: none"> <li>• Application : Paint, Molasses, Asphalt, Oil, Chocolate, Oil tank terminal</li> <li>• Capacity : ~Max, 560m<sup>3</sup>/h (~8')</li> <li>• Viscosity : Max, 200,000 cst</li> <li>• Press. : Max, 140 bar</li> <li>• Temp. : -60°C~300°C</li> <li>• API676</li> </ul>



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Enwa Water Maker 50 m<sup>3</sup>/day



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Approval from:



For engine cooling water and your HVAC systems

### EnwaMatic® Maritime

- Filtration to 5 $\mu$
- Fully automatic
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- No corrosion
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**ENWA**  
WATER TREATMENT



# KORMARINE 2013, the cradle of shipbuilding and offshore industries

## - A close look into the exhibition

KORMARINE 2013 successfully ended on its big run of 4 days. During the show, BEXCO in Busan was bustling with about 70,000 visitors. KORMARINE 2013 served as a bridge between foreign buyers and domestic marine equipment manufacturers, and cemented its status as the world's largest exhibition that specializes in shipbuilding and offshore industries.

This year's event presented a large number of innovative solutions related to environment, energy efficiency, etc., which have emerged as big issues in shipbuilding and offshore markets. Particularly, there was a significant increase in the number of exhibitors related to offshore, oil and gas sectors, which reflects the ongoing shift of focus to the offshore sector and leads to the prediction of strong offshore market in the period ahead.

Hoping for even greater KORMARINE 2015, we take a look at the products that drew attention during this year's show.





ABB Booth



A100 Turbocharger

and reduce the size of switchboard to satisfy the growing demand for power in the shipbuilding and offshore sectors. Therefore, internal switchboard has an increasing importance in the panel. With this switchboard being more compact in size, the panel and on-board booth also become smaller, thus increasing the efficiency of space. An official from ABB explained that it was designed to have 26% smaller volume compared to the exiting breakers (1600 ampere), reducing the overall size by about 18%.

Emax 2 is the pin-type easily connectable by plugging in the cable wire. Conformant to IEC61850 international standard, it is compatible with communication protocol and supports the power control of communication made in multiple ways.

In addition, ABB also exhibited the turbocharger, a leading product which has gained ground in global market. A100 series achieve high efficiency based on high compression ratio even at low output, and therefore reduce fuel consumption of engine and lower the temperature to increase the durability of engine components. A200, the next-generation product, can reduce the cost by 25%, compared to existing A100.



Ultra-compact Emax 2

ABB showcased 'Emax 2', the world's smallest air circuit breaker in KORMARINE 2013. New SACE Emax 2 is the solution that can be linked with smart grid which ABB is pushing forward, such as SCADA, EMS, etc.

Particularly, it was designed to enable the high interrupting capacity and large capacity,



Alfa Laval Booth



PureDry waste oil treatment system

In this exhibition, **Alfa Laval** showcased the products such as the 'PureSOx' and 'PureDry' which are the ship waste oil management systems,

'PureBallast 3.0' that is the ship ballast water management system, thereby presenting the methods for energy efficient use.

PureBallast 3.0 is the next-generation product developed in collaboration with Wallenius Water and is the world's first product that does not use chemicals unlike the existing BWMS solutions. It reduced the size and improved the performance based on the experience gained from on-board application of the existing 'PureBallast' product.

PureDry, which is the ship waste oil treatment system, dries up waste oil streams on board, signaling a paradigm shift in separator design. PureDry recovers fuel oil from a dedicated waste fuel oil collection tank and returns it to the bunker tank for reuse after normal treatment. For the ship owner, it means a reduction of up to 2% in the total volume of fuel oil consumed – and a corresponding reduction in the ship's fuel bill. In addition, 'PureSOx', which reduces the sulfur content in the exhaust gas from the operating vessels and decreases harmful gases, attracted the attention of visitors.

**Donghwa Entec** showcased the Braze Plate-Fin Heat Exchanger during the exhibition. This Braze Plate-Fin Heat Exchanger drastically reduced the size compared to existing shell and tube type heat exchanger, and has the structural advantage that it can withstand the high pressure compared

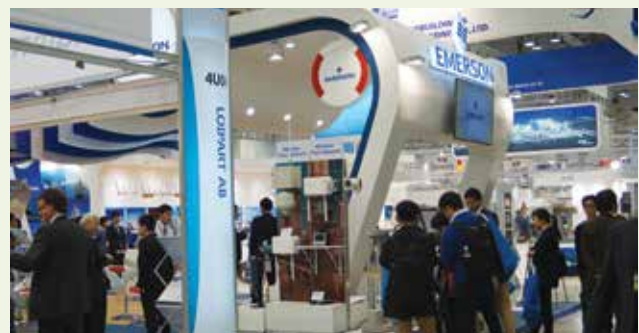


Donghwa Entec Booth

to the plate type heat exchanger.

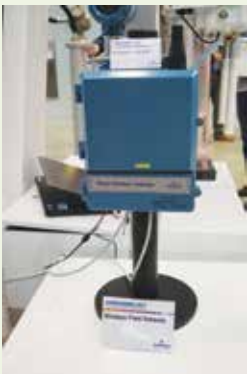
Donghwa Entec specializes in the manufacture of heat exchangers for marine application and petrochemical/power generation applications, and is supplying its products to domestic shipyards, engine makers, shipping companies, etc. Specifically, Donghwa Entec has made inroads into overseas export market based on its quality-first strategy, exporting its products to the shipyards in Japan and Southeast Asia.

In particular, Donghwa Entec has a track record of successfully supplying its high-pressure vaporizer of regasification equipment, the major equipment of LNG RV/FSRU, and low-pressure vaporizer for cargo handling of LNG carrier. Recently, Donghwa Entec is participating in the LNG PLANT project group with Korea Gas Corporation, etc., for the Braze AL Plate-fin heat exchanger, the major apparatus of Cold Box essential for LNG liquefaction plant.



Emerson Booth

**Emerson Process Management** presented the smart wireless solutions specialized for the shipbuilding and offshore



wireless plant solution

sectors in this exhibition. This solution can reduce the installation cost, compared to the wired installation technology, and increase the efficiency of functions.

Emerson's virtual wireless plant solution includes the wireless products such as switch, transmitter, temperature, etc., which are connected via Smart Wireless Gateway to enable systematic communication.

Generally, the wireless solutions can be divided into wireless plant network and wireless field network. The wireless plant network is conformant to the industrial wireless WiFi standards, and the wireless field network is conformant to 2.4GHz wireless HART standard of IEEE 802.15.A.

According to the officials from the company, Emerson's wireless field network applies the network ID, Join Key input, and AES128 security algorithm and therefore has strength in security.



General electric (GE) Booth

**General electric (GE)** presented the drilling equipment, electric propulsion system, dynamic position control system, engine, etc., for LNG carriers, drillships, FPSO, FLNG, etc. In this exhibition, GE showcased the latest diesel engine, gas turbine, automatic positioning system, etc.



Ahn Seung-beom, Global Offshore Marine Leader, GE

Ahn Seung-beom, Global Offshore Marine Leader, GE, said, "We are providing the solutions that would have an impact on the vessels and offshore facilities in

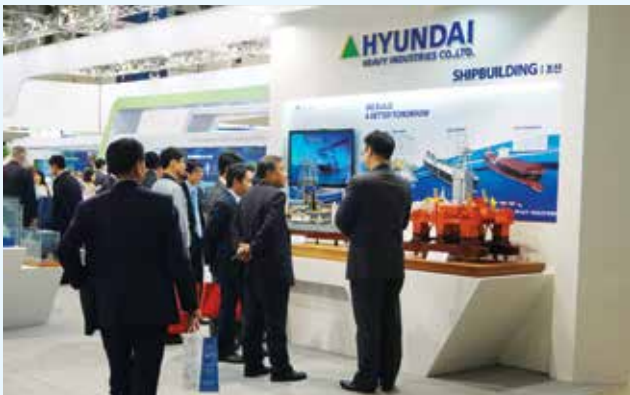
all aspects ranging from the bow to the stern of ship and from the ocean to the subsea. GE will continue the co-growth with Korean shipyards based on cooperative relationship in developing the ocean and deepwater energy."

GE presented its major products during the exhibition as follows:

- *The LM gas turbine has the advantage of output density, low emissions, fast start, and fuel flexibility, and therefore has been used in vessels for both military and civilian applications. LM gas turbine meets the emissions requirements of International Maritime Organization (IMO) and U.S. Environmental Protection Agency. GE LM2500 is one of the most popular marine gas turbines worldwide and has been used as power system in more than 400 naval warships of 33 countries, including the Navy of Korea.*
- *The state-of-art Dynamic Positioning System (DPS) has been improved in many respects to increase eco-friendly operation at sea. Importantly, it applied the new human interface machine (HIM).*
- *Visor, an information management system, enables easy identification of on-board devices, important facilities, and their positions. It allows the users both inside and outside the ship to be provided with system information, thereby improving safety and facility management at the same time.*

Ahn Seung-beom, Global Offshore Marine Leader, GE, said, "GE has the wide range of unmatched technology and know-how in offshore sector. Specifically, GE has R&D capability to meet the requirements of ship owners and shipyards and achieve integration. As Korea becomes the global shipbuilding/offshore hub, GE will solidify its cooperative relationship with shipyards in Korea."

Meanwhile, GE successfully sold the 16V 250 marine diesel engines to Hansung Enterprise and Dongwon Industries, the world-leading tuna fishing companies.



Hyundai Heavy Industries Booth

The 5 Divisions of **Hyundai Heavy Industries (HHI)** – Shipbuilding, Offshore & Engineering, Industrial Plants & Engineering, Engine & Machinery, etc., – showcased various products, including FLNG (Floating Liquefied Natural Gas), drillship, HiMSEN engine, Explosion-proof Motor, etc., FLNG (Floating Liquefied Natural Gas) currently under development by HHI drew the greatest attention. This FLNG integrated the ultra-high temperature storage cargo tank of LNG carrier and LNG plant. It separates the impurities mixed in the gas stream from gas fields, by using the plant facilities, and liquefies only the natural gas which is then stored in cargo tank before being loaded on LNG carriers.

Particularly, Turret Mooring System is the structure that did not exist in conventional FPSO, and connected to the seabed at the water depths of up to 500 to 3,000m through the mooring line and pipes. Turret is usually fitted to the bow or stern of offshore plant, and based on this point, the plant is designed to rotate 360 degrees, preventing the plant from being damaged by typhoon or high waves.

HHI has developed its own concept of optimized FLNG in cooperation with prominent overseas designers and is currently negotiating on FLNG construction with many energy developers.



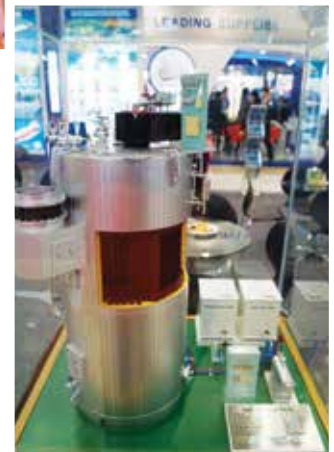
Kangrim Heavy Industries Booth

**Kangrim Heavy Industries**, which participated in KORMARINE 2013, 2013 is developing and manufacturing the IGS (Inert Gas System), IGG (Inert Gas Generators), control panels, air reservoir, including the marine boiler. It is a domestic marine equipment manufacturer which has developed products with its proprietary technology.

The marine boiler, the flagship product of Kangrim Heavy Industries, has the capacity of 12 to 55ton/hr, and has the advantage of easy operation and simple maintenance through the modularization.

Particularly, it is based on pin-tube system, improves fuel efficiency, and reduces energy consumption by more than 30% compared to the boiler of the same class. Above all, this marine boiler is highly recognized for its mechanical stability and reliability. Moreover, Kangrim Heavy Industries presented IGS which prevents fire by injecting the inert gas into oil tank, along with various marine boilers and shipbuilding/offshore equipment.

An official from Kangrim Heavy Industries said, “We have developed, produced and supplied various equipment and facilities necessary for the shipbuilding and offshore plants through the manufacturing plants in Changwon, Pohang, Changzhou of China. We are doing the best to develop and manufacture the products of high quality and reliability essential for the safety and environment of shipbuilding and offshore industries.”



Marine boiler model



KCC Booth

**KCC** is a fine chemical company specializing in the production of general construction, industrial materials, paint, silicon, etc., and is developing energy-efficient and environment-friendly products.

In KORMARINE 2013, KCC showcased the next-generation antifouling paint called 'EgisArrow' that improves fuel efficiency of ship, as well as the marine paint products such as EgisPacific, EH2352, ST1020, etc.

Egisarrow is the paint that provides excellent performance and contamination prevention function, protecting both ship and offshore structures from various marine microorganisms and contaminants in harsh marine environment. It helps reduce frictional resistance of hull effectively by blocking various contaminants that may be accumulated on the surface of vessel, and improve fuel efficiency.

KCC has carried out the coating projects for 3,000 newbuild vessels and repair projects for more than 4,000 vessels in 2012, and has been highly recognized for the stability, reliability, and workability of products based on its differentiated technical capabilities. KCC is stepping up its effort to carve out large share of overseas paint market by fully leveraging its leading technology and know-how which have been vital for dominating the domestic marine paint market.

**Kukdong Elecom** showcased the lighting, monitoring unit & power supply refrigerated containers for ships and offshore plants during the KORMARINE exhibition.

Currently, Kukdong Elecom has developed and supplied various LED products that can replace the incandescent light bulbs, fluorescent lights, halogen lamp, etc., to domestic shipyards. The main products of Kukdong Elecom include



Kukdong Elecom Booth



Searchlight

the navigation light and signal lights necessary for sailing, LED lights, LED lamps, floodlight for illuminating the deck and a wide range of area, searchlights for safe navigation and search.

Recently, there has been a massive movement to replace current onshore lighting amid the widespread distribution of energy-efficient self-ballasted lamps and LED lamps. In the shipbuilding and offshore sectors, the replacement works have been relatively delayed because the approved lighting fixtures need to be applied which are suitable for marine environment such as the vibration, impact, waterproof, corrosion, etc.

However, nearly half of newbuild vessels are fitted with LED products. Kukdong Elecom is expanding its reach in the shipbuilding and offshore markets based on its strength of high efficiency, safety, long life, etc.



Rockwell Automation Booth



ICPS Demo



Controller for process safety

**Rockwell Automation** presented many solutions that help meet the challenges of rising energy costs, ever more rigorous environmental regulations, etc., including the integrated control solutions specialized for the shipbuilding and offshore equipment and facilities. ICPS(Integrated Information, Control, Power & Safety) system, which is applied to LNG-powered vessels, can be applied to various S/W and H/W that already completed validation in onshore plant, and integrate the creation and storage of data, control, electrical system, safety controller, etc. This system reduces the costs through the integrated solution covering the upper-rank information system, minimizes the wiring inside the vessel through the network system connection, and improves the stability of system without need for separate interface.

The ICPS system integrates the PEMS(Predictive Emissions Monitoring System) based on the SW modeling of Pavilion8, PlantPAx DCS solution, PowerFlex 7000 marine drive which is the high voltage inverter applicable to pump, compressor and auxiliary system, CENTERLINE low voltage MCC (Motor Control Center) capable of motor control and protection, AADvance and Trusted, the controller for process safety, etc. In addition, Rockwell Automation presented the AADvance Euro™, which is one of the deepwater solutions for oil-field development, drilling, and excavation in subsea.



Siemens Booth

**Siemens** presented various cutting-edge automation system, including the motor electric propulsion system, in KORMARINE 2013. Particularly, Siemens showcased the integrated solutions applicable to various vessels such as pas-



Matthias Schulze Director Sales, Drive Technologies Division, Siemens Industry Sector

senger ships, special vessels, cargo, offshore vessels, submarines, surface vessels, etc.

Matthias Schulze, Director Sales, Drive Technologies Division, Siemens Industry Sector, said, "The shipbuilding and offshore sectors fall under the realm of Drive Technologies. In this exhibition, Siemens presented the specialized systems and solutions required in the shipbuilding and offshore markets."

SeaCURE, SISHIP, and SINAVY provide the shipyard and shipping companies with the solutions optimized for the fleet management, helping reduce the operating costs and increase the availability. SISHIP portfolio includes the drive solutions such as EcoProp, Cargo, Offshore, WHRS (Waste Heat Recovery System), EcoMain, etc.

- High propulsion power demands Solution 'SISHIP Drive MV': Reduced fuel consumption, less emissions
- Hybrid Drives and Waste Heat Recovery Systems 'SISHIP WHRS': Significant reduction of CO<sub>2</sub>, up to 12% reduction in fuel consumption, 11% increase of overall main engine efficiency

Matthias Schulze, Director Sales, said, "The solutions, such as SISHIP Drive MV and WHRS of Siemens, help reduce environmental contaminants and maximize energy efficiency. We applied these solutions to various vessels including the cruise ship, subsea construction vessels and others, and have many references. Specifically, we plan to focus on the areas such as special vessels like warships/submarines, and offshore vessels."



SMS Booth

**SMS** showcased Hatch Cover and Lashing Bridge, its flagship products, in KORMARINE 2013.

The hatch cover presented by SMS has 3 types: the Pontoon type hatch cover which is installed in large containership and can be loaded and unloaded by the crane on the wharf, the folding type hatch cover that is fitted to the ordinary cargo ship/bulk carrier and can open and shut down the power to the vessel, and the side rolling hatch cover installed in bulk carrier.

Lashing bridge is the structure lashing the containers securely and fitted to the large containerships with the capacity of over 5,000TEU. Particularly, the 3-stage lashing bridge can load the cargo, regardless of the weight arrangement of containers stacked on top of the hatch cover.

With no problem posed to the strength of container and support fixture, it resolved the load limit of traditional 2-stage support fixtures. Moreover, it achieved lightweight structure and cost reduction.



made in Germany

World Best **stx**

STXOS Booth



**STX Offshore & Shipbuilding (STXOS)** announced at the show site of KORMARINE 2013 being held in BEXCO, Busan, from October 22 that it obtained the world's first AIP certificate from the France-based classification society BV for the LNG bunkering shuttle developed with independent technology. AIP certification means that new order for LNG bunkering shuttle can be received through the conformity validation of basic ship design process.

The LNG bunkering shuttle of STXOS was developed for the primary purpose of supplying the fuel to large LNG-powered vessels at sea, but can serve as multi-purpose vessel supplying the heavy fuel oil (HFO), as well as LNG.

The cabin of the ship is positioned at the bow, ensuring easy visibility of mate. Equipped with the azimuth thruster and tunnel thruster, this vessel can easily adjust the direction in complex harbor and come alongside the ship or port without the berthing support vessel (tugboat), thus reducing the operating costs.

LNG prices has become stabilized with the shale gas development amid the IMO (International Maritime Organization)'s rigorous enforcement of the regulation on the exhaust gas emission from ship, and as a result, there has been a surge in the demand for LNG-powered vessels. This makes the outlook for LNG bunkering shuttle market very optimistic.

An official from STXOS said, "As we have technological advantage over competitors in the market for LNG bunkering shuttle, we will step up our effort to win new orders and dominate the market."

**Tyco Marine Services**, provides fire protection, electronic security, life safety and communications systems and services to the global marine market. With over 100 years of experience and specialised marine expertise.

Nothing is more important in the offshore plant industry than the stability and reliability of firefighting equipment essential for protecting the life and property. Tyco Marine Services presented the firefighting equipment for ship and offshore plants through its global network comprising 25 countries worldwide during the exhibition.

Tyco Marine Services put the primary focus of product promotion on firefighting equipment and facilities necessary for the marine engine section that has high risk of fire based on





Tyco Marine Services Booth

the know-how and experience that it has accumulated through many years of work. Moreover, Tyco Marine Services presented the physical/chemical fire extinguishing and fire prevention measures such as the use of water, foam, powder, gas, etc., which are suitable for ship and offshore plant. The firefighting equipment and facilities, offered by Tyco Marine Services, already received the approval of the IMO, and furthermore, proved the reliability and stability through the certification from classification societies of each country.

**Wärtsilä** focused on cementing its position as total solution provider for entire processes such as the service, parts, etc., including the ship design, engines & generating sets, gas systems, and exhaust gas cleaning.

In addition, Wärtsilä presented the dual fuel engine, its greatest strength. This engine is run on LNG and reduces Nox emissions by 80% and CO<sub>2</sub> emissions by 25% compared to existing diesel engines, and is an eco-friendly solution with almost no emissions of sulfur oxides, exhaust gas, and dust.

Previously, it was limited to 4-stroke medium-speed marine engines. However, 2-stroke low speed dual engine has recently been developed which makes it possible to incorporate the practical functions into larger vessels such as commercial vessels. Moreover, the latest Generation X engines optimized the engine and consumption of lubricant, reducing fuel consumption by 10% per day.

Sung-Bok Yoo, Managing Director, Wärtsilä Korea, said,



Wärtsilä Booth



Sung-Bok Yoo Managing Director, Wärtsilä Korea

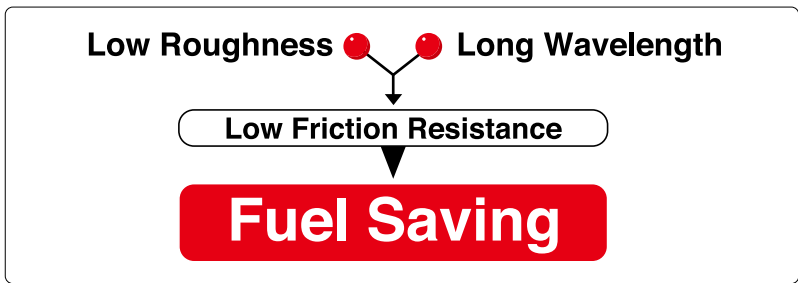
“The key issues of this year’s exhibition were the high efficiency, eco-friendliness, etc., in response to the changing environment of shipbuilding and offshore industries. Our total solutions cover the whole areas of shipbuilding and offshore sectors, such as the ship design, engine, propulsion system, environment, electrical and electronic systems, etc. We, at Wärtsilä Korea, will do our best as the partner for the advancement of Korea’s shipbuilding industry. ⚓

$$\text{FIR}(\%) = 2.62 \times \frac{Rz^2}{RSm}$$

How to calculate the fuel efficiency of your vessel by 3D analysis on the surface profile.

**FIR** Friction Increase Ratio  
Comparison with Mirror Surface.  
**THEORY**

We have established FIR theory which can estimate the Friction Resistance by measuring and evaluating roughness(Rz) and wavelength (RSm) of the paint surface, and have been carrying out the evaluation of fuel saving effect with more accuracy.



CMP Leading Edge Technology of **“Fuel Saving AF”**  
A Unique Anti-fouling “Beyond Silyl!”



**SEAFLO NEO** Series

Smooth surface roughness by long wavelength play important roles to reduce hull friction. SEAFLO NEO Series are well designed in providing those two functions and achieved low friction and thus can contribute saving fuel.

Current AF	Silicone AF (CMP BIOCLEAN)	SEAFLO NEO
Rz= 102μ RSm= 3450μ	Rz= 52μ RSm= 6491μ	Rz= 56μ RSm= 5250μ
FIR(%)=2.62×102 <sup>2</sup> ÷3450	FIR(%)=2.62×52 <sup>2</sup> ÷6491	FIR(%)=2.62×56 <sup>2</sup> ÷5250
<b>FIR 7.9%</b>	<b>FIR 1.1%</b>	<b>FIR 1.6%</b>



FIR7.9% – FIR1.6% = FIR 6.3%  
In case of 6.3% of Friction Reduction ≙ **3~5% Fuel Saving**  
(Fuel saving is depending on vessel type and speed)

# Ready, Steady, Go!



## Introducing Sensepoint XCD

XCD's unique tri-colour visual display allows the device's status to be seen at a glance - even from a distance! Using an instantly recognizable 'traffic light' system, the unit features three visual settings; steady green for normal operation, flashing yellow for a fault or warning and flashing red for an alarm.



Optimised for the detection of flammable, toxic and Oxygen hazards in potentially hazardous areas, XCD offers ease of operation and a low cost of ownership. Simple one man operation permits non intrusive configuration of the device, helping to reduce ongoing maintenance requirements.



## Honeywell Analytics - Experts in Gas Detection

### Made in Korea!



MED approval  
(MED-B-6360)

### Fixed Gas Detection

Our fixed range of gas detection products is suited to all types of applications and industries; from high functionality devices to low-cost systems ideal for the compliance market.

### Toxic Gas Detection

Our toxic gas detection systems offer unrivalled sensitivity combined with flexible functionality to support a comprehensive array of gases including exotics.

### Technical Services

From calibration work and maintenance to full end-to-end support, our technical services and additional support options provide expert assistance to ensure maximum up-time of your equipment.

# Honeywell

# HHI applies the IT to detect the error as small as 3mm

**HHI has become the world's first shipbuilder to use the latest 3D scanning technology for the offshore plant construction, increasing the quality competitiveness and reliability for customers.**

Hyundai Heavy Industries(HHI) recently announced that it successfully developed and applied the 3D smart accuracy management system to the FPSO currently being built in order to ensure more accurate measurement of errors. This system uses the 3D scanner and light wave distance measuring instrument to create the stereoscopic image of offshore structure which is automatically compared to 3D blueprint for error analysis. The 3D scanning technology builds three-dimensional images with the digital information of the shape obtained by projecting the laser on objects, and is often used for the actual survey of cultural properties. Indeed, this system played a significant role in the restoration of Sungryemun Gate.

This system, developed by HHI, shoots about 1 million laser beams per second at 3mm intervals to the offshore structure to create three-dimensional images. Through that, the overall shape of offshore structure can be measured all at once, and the results can be obtained more quickly. Particularly, this system detects the errors that remained beyond detection by conventional methods relying on the use of the light wave measuring instrument alone, and therefore ensures more precise calibration. In addition, the measurement duration is reduced by 1/5, drastically increasing the productivity.

Moreover, this system allows the operator to proactively grasp potential problems which may occur in assembly process through simulation prior to assembling the two structures, significantly improving the quality control.

In that way, HHI has applied the latest IT (information technology) to the offshore plant production in a bid to meet the rigorous quality and safety requirements of clients as the focus of offshore plant operation is shifting to deepwater, ocean, polar regions, etc.

An official from HHI said, "The 3D smart accuracy management system has drastically increased the level of product quality control, attracting favorable response from clients. We plan to apply this system to the whole processes of offshore plant production in the period ahead."

HHI has been at the forefront of the convergence between the shipbuilding/offshore industries and IT (information technology).

Particularly, HHI became the world's



**HHI's employees and client's supervisors are using the three-dimensional scanner for the measurement of FPSO under construction.**

first shipyard to unveil the smart ship in March, 2011, and established the 'Shipbuilding & Offshore IT Convergence Innovation Center' jointly with Ministry of Trade, Industry and Energy, Ulsan Metropolitan Government, shipbuilding companies, small and medium-sized IT companies, etc., in April and pushed forward the development of 'Smartship 2.0'. 



# Power for maximum system availability



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- Minimum size
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### Power specialists

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# Pilz Korea moves beyond FA into shipbuilding and offshore markets

Pilz, a leader in safety automation market, is making swift responses in shipbuilding and offshore sectors. Particularly, the safety automation solutions of Pilz are highly recognized for excellent performance in the fields of high value-added vessels or offshore plants.

Pilz with a history of more than 60 years is a global company with excellent expertise and technical capabilities in safety automation that prevents accidents and protects human life in industrial sites. Pilz Korea, which has strength in safety automation solutions, is moving beyond FA market and has embarked on full-fledged effort to tap into the rising demand for safety automation solutions from domestic shipbuilding and offshore sectors.

Lee Sung-Ho, Sales Manager, Pilz Korea, said, "Pilz has gained reputation for its technological prowess in the industrial fields that require high degree of safety. The shipbuilding and offshore sectors comprise significant proportion of our total sales. We will make utmost effort to ensure customer satisfaction with our excellent technology in shipbuilding and offshore markets, as well as FA market."

Safety is a very important issue in shipbuilding and offshore markets. The controller or control solutions are essential which can protect the lives of workers and whole system in order to ensure stable operations of ship or equipment worth hundreds of millions dollars. For that reason, Pilz Korea plans to focus on high value-added sectors, such as LNG carriers, ultra-

large containerships, offshore plants (FPSO, drillships etc), which require high degree of safety.

Pilz Korea has the competitiveness differentiated from existing competitors. Particularly, Pilz has accumulated the know-how and technology through several decades of work in shipbuilding and offshore sectors that require high degree of safety. In addition, Pilz has a wide range of safety automation solutions, such as PLC, Relays, Sensors, Control & Network systems, etc., besides the PMD product for monitoring the temperature, voltage, power, etc., to ensure stable operation of ship or offshore facilities. Stable product supply, excellent quality, and price competitiveness also place Pilz Korea in a better position to win the competition.

## Safety Automation Solution – PMD

Pilz Korea has 3 major product lines targeting the shipbuilding and offshore markets. The PMD, the electronic monitoring relay, is the optimized solution for electrical safety, such as the monitoring of voltage and active power. This solution can reduce hazardous situations for both human and machine, and furthermore, increase the service life of machine or plant through efficient production cycle. Additionally, PMDsigma,



Lee Sung-Ho Sales Manager, Pilz Korea

which monitors actual power and insulation resistance, reduces the installation and commissioning time by using the integrated display and menu-based configuration through rotary switch. PMDsigma monitors the functions such as electric current, voltage, and temperature.

- PMD s10 (True power monitoring):
  - Single-phase and 3-phase load proper active power converter
  - 2 relay output contacts (Normally energized mode, de-energized mode - changeable)
  - Analog output (current, voltage),

relay output counter

- Automatic range adjustment for input current and voltage
- Setting the values with the display and knob switch
- Status LED (Power, Overload, Underload, Output1, Output2, Fault)
- Maximum voltage and maximum current diagnosis function
- Display of load operation time

• S11M: Monitors AC/DC currents for max. current values, single-phase


- 12 measuring ranges can be selected from 0.002 to 15 A
- Reaction time can be set to up to 10 seconds
- Operates to either normally energised or normally de-energised mode
- Galvanic isolation between mea-

suring and supply voltage

- UP version: measuring inputs are not polarity-sensitive
- Supply voltage (UB): AC: 24, 42~48, 110~127, 230~240 V; DC: 24 V
- Output contacts: 1 auxiliary contact (C/O)
- Dimension (H x W x D): 87 x 22.5 x 121 mm

Lee Sung-Ho, Sales Manager, said, "Pilz is the only company that can provide consulting on the stability in FA sector. We diagnose and evaluate through the consulting in order to help customers put the optimized automation facilities in place. Currently, we are intensively targeting the sectors that require high degree of safety such as HVAC (Heating, Ventilation, and Air



Conditioning), power monitoring, boiler, ballast, and others. We are on track to expand our business reach in the market at the engineering-based system level." 

## Rolls-Royce secure a contract to supply rig equipment to SHI

Rolls-Royce has signed a contract to supply thrusters and deck machinery for two semi-submersible drilling rigs to be built at Samsung Heavy Industries (SHI) in Korea for Stena Drilling on 24 October. The value of the contract is around £22 million to Rolls-Royce.

The new drilling rigs are due for delivery in 2016 and are being built for world-wide operations, including in the rough North Sea. The contract includes options for deliveries to three additional rigs.

Rolls-Royce is a leading supplier of large thrusters and deck machinery to the offshore drilling market. So far, the company has delivered 1,200 thrusters to close to 200 rigs and drillships, and mooring systems to 25 rigs.

Anders Almestad, Rolls-Royce, President-Offshore said, "This contract confirms our solid foot print in the exploration and production market, and we are very pleased that SHI and Stena Drilling chose to place another order with us. SHI is our largest yard customer when it comes to propulsion and we value our long lasting relationship with them."

The rigs, two Moss CS60 harsh-environment semi-submersible drilling rigs, will each be equipped with six underwater mountable UUC 455 FP thrusters, eight point-mooring systems as well as control systems from Rolls-Royce.

The thrusters are part of the rigs' propulsion systems, and are used to propel the rigs to and from drill sites and accurately maintain their positioning during drilling operations. By choosing underwater mountable thrusters, downtime is significantly reduced as these are easily mounted and dismantled without drydocking the rig.



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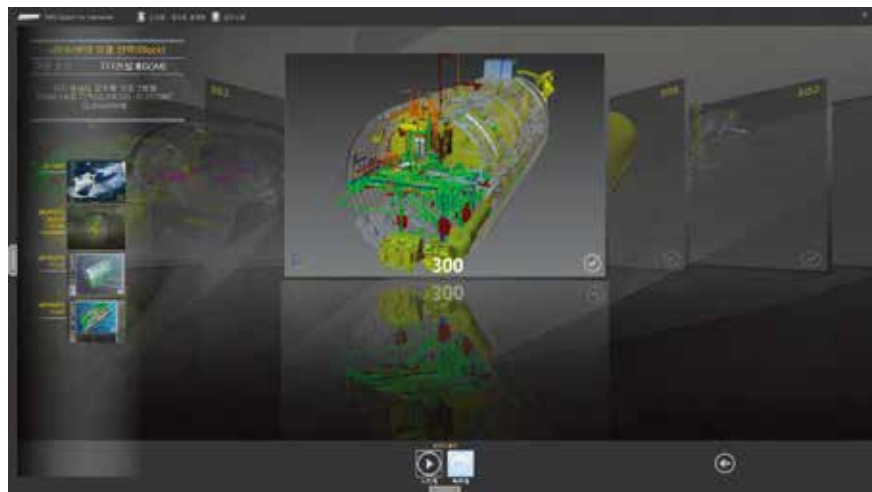
# DSME developed the world's first submarine digital mock-up system

**DSME, the first domestic shipyard that exported the submarines, has developed the world's first submarine digital mock-up (DMU) system which is currently undergoing the commissioning.**

The SI (system Integration) research group of DSME's Central Research Institute successfully developed the DMU system, the three-dimensional design model incorporating both simulation application technology and latest IT convergence technology. The construction of submarine involves the complicated design and production processes, compared to ordinary commercial vessels. Therefore, the model (physical mock up) with a scale ratio of 1/5 is made for the construction process. The cost is the problem. The production of real-size model costs approximately KRW 5 to 10 billion per unit of submarine.

This DMU system that applies the 3D digital technology is capable of modeling and provides information link between design drawing and materials processes, providing the users with the information necessary for production. Thus, DMU system reduces the cost incurred in the production of real-size model and enables the performance of various prior tests, such as the assembly and installation, through the simulation support function.

DSME anticipates that the DMU system can be used for coordinating the operations between design process and production process, shortening the period of submarine design that

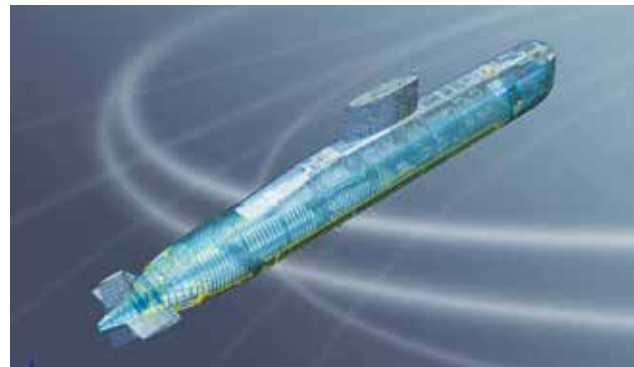


usually takes about 9 years.

DSME is applying the DMU system to the construction process of the 3 submarines ordered from Indonesia in December, 2011, and completed the pilot operation in the design process.


This DMU system attracted favorable response from the design model review process that was conducted in the presence of Indonesia's supervisors of submarine.

An official from DSME said, "DMU system can drastically reduce the real-size model production cost and significantly



Real screen of DMU system developed by DSME

help expand our competitiveness in winning the orders from the defense sector, the new growth engine."

DMU system will be fully used for the submarine construction process after the pilot operation with large multi-screen equipment at the production site for special purpose vessels. 



## 세상을 변화시키는 엔지니어

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# HSHI Launches World's First LNG Carrier Built On-ground

Hyundai Samho Heavy Industries (HSHI) successfully completed the on-land construction of the high value-added LNG carrier worth over KRW 200 billion per unit.

Hyundai Samho Heavy Industries (HSHI), a shipbuilding affiliate of Hyundai Heavy Industries, the world's biggest shipbuilder, announced on October 6 it successfully launched a 162,000 m<sup>3</sup> LNG carrier built using the on-ground shipbuilding method for the first time in the world.

The vessel, designed for delivering chilled natural gas, was ordered by Golar of Norway in February, 2012. It, measuring 289.0 m in length, 45.6 m in width, and 26.0 m in depth, is scheduled to be handed over to the owner by late July 2014 after outfitting and painting work.

After about 270 large blocks, LNG containment system, an engine, a propeller are manufactured and assembled in the on-land shipbuilding area equipped with a 1,200-tonne gantry crane, four jib cranes and a floating dock, the assembled LNG carrier is loaded out onto a floating dock by hydraulic skidding, then the LNG ship is launched out by submerging the floating dock. Striking balance of the LNG carrier, which is about 30% heavier than other type of ships, on the hydraulic skidding facility and on the floating dock is the critical point of launching.

Though this is the first LNG carrier Hyundai Samho has built using the




Aerial view of launching LNG Carrier built on-ground

on-ground method, the company has already built 50 other ships using this method since May 2008.

Since on-ground shipbuilding method allows higher productivity and cost effectiveness, facilitates efficient utilization of yard facilities and resources, and improves the safety of working conditions, Hyundai Samho Heavy Industries plans to build 10 of 12 LNG carriers in its order book using this method.

HSHI became the world's first shipyard to build the high value-added

large LNG carrier on land, although there were many shipyards that built relatively low-priced oil tankers, bulk carriers, and containerships on land thus far.

An official from HSHI said, "We are applying new engineering method to increase productivity and boost the sales and revenue. The innovation rooted in imagination and challenging spirit has been the key to overcoming the difficulties arising from the recession." 



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# Outlook on CO<sub>2</sub> Emissions of the Worldwide Containership Fleet and Possible Reduction Targets: Part I

*Germanischer Lloyd (GL)*

*Martin Köpke and Pierre C. Sames, Germanischer Lloyd SE*



Photo: Dreaamstime / Mosole



## Introduction

Climate change caused by greenhouse gas (GHG) emissions is considered as one of the biggest challenges of our time. To avoid severe consequences, the CO<sub>2</sub> concentration needs to be stabilised at about 450 ppm to limit average global warming to 2°C. The current level of CO<sub>2</sub> is approximately 390 ppm, rising 2 ppm each year. The Stern Review [1] commissioned by the UK Treasury concludes, "There is still time to avoid the worst impacts of climate change, if we take strong action now."

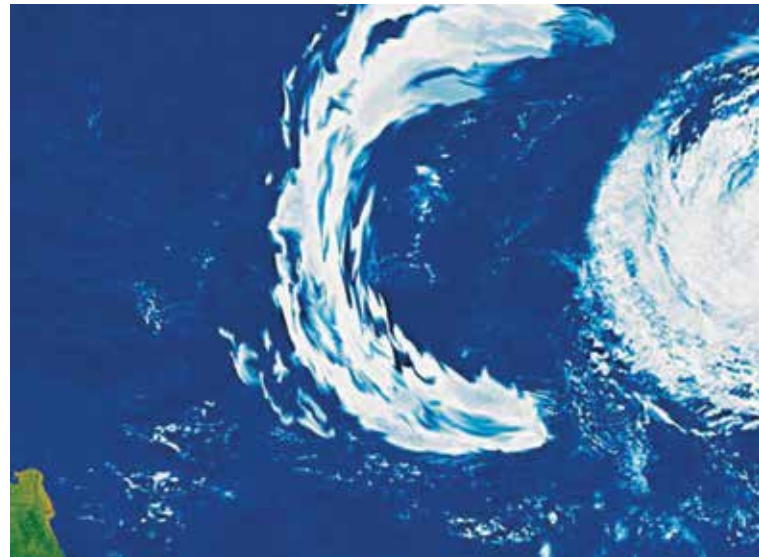
The review adds that the consequences of such an increase in global average surface temperature will still be manageable, though with strong regional variations. The fourth systematic assessment of worldwide scientific publications on climate change by the Intergovernmental Panel on Climate Change (IPCC) documents this challenge [2].

In 2003, the UNFCCC asked the IMO to initiate developments related to the reduction of GHGs from ships, and the assembly of the IMO adopted this in a resolution [3]. Early work resulted in the Operational CO<sub>2</sub> Index [4], now renamed Energy Efficiency Operational Indicator (EEOI), and updated guidelines are available [5]. The operational indicator is a voluntary tool to monitor operational transport efficiency of a ship. It can be used to complement environmental management systems such as the Ship Energy Efficiency Management Plan (SEEMP) [6], adopted by the IMO in July 2011.

Discussions at the MEPC also addressed market-based instruments (emission trading system, compensation fund with bunker surcharge and vessel efficiency rating).

However, due to the ongoing debate on the IMO's mandate to regulate CO<sub>2</sub> emissions from shipping, which is being questioned by many countries who have not signed Annex I of the Kyoto Protocol, no progress has been achieved as yet. Any decision by the IMO may face opposition, in turn delaying UNFCCC decisions on possible CO<sub>2</sub> reductions. Therefore the IMO debate has been focusing on the Energy Efficiency Design Index (EEDI) which was adopted by MEPC 62 as a mandatory newbuilding standard and will enter into force on 1. January 2013 [7].

The United Nations Framework Convention on Climate Change, Conference of Parties No. 16 (UNFCCC COP 16) was held in Cancun in December 2010. While no legally binding document was agreed on, some progress was recorded, in particular towards mitigating the financial burden for developing countries. Again shipping was identified as one possible source, but no commitments were made. Prior to COP 15, the EU had agreed on a proposal for an emission target for ship-



ping tantamount to a 20 percent reduction of 2005 emissions by 2020. In the wake of COP 15, however, this proposal is being questioned again by some EU member states. At COP 16 the EU Commission openly announced a plan to introduce a regional emission trading system for shipping in the absence of an international agreement by the end of 2011.

The present study forecasts the CO<sub>2</sub> emissions of the worldwide container fleet. First it examines energy efficiency records from existing container vessels based on the EEDI as well as recent EEOI data. The subsequent projections of future container vessel emissions account for both short-term deliveries and long-term assumptions as well as future energy efficiency improvements and their cost efficiency. Necessary future energy efficiency improvements for container vessels are discussed in the light of a comparison of future emissions with prospective emission targets.

## EEDI: Energy Efficiency History of Container Vessels

The recorded energy efficiency of container vessels can be derived from publicly available data, in particular, the HIS Fairplay (IHSF) [8] database, which currently lists 6,760 container vessels. Cancelled ships and errors were excluded from the analysis, leaving 6,440 valid datasets. Imperfect data sets were completed using regression formulae (Table 1).

Figure 1 shows the development of the container fleet in terms of vessels delivered per year and their average size in dwt. Deliveries peaked in 2008 but average vessel sizes continue to increase. Due to the economic crisis starting in late 2008, demand for container vessels dropped dramatically. However,

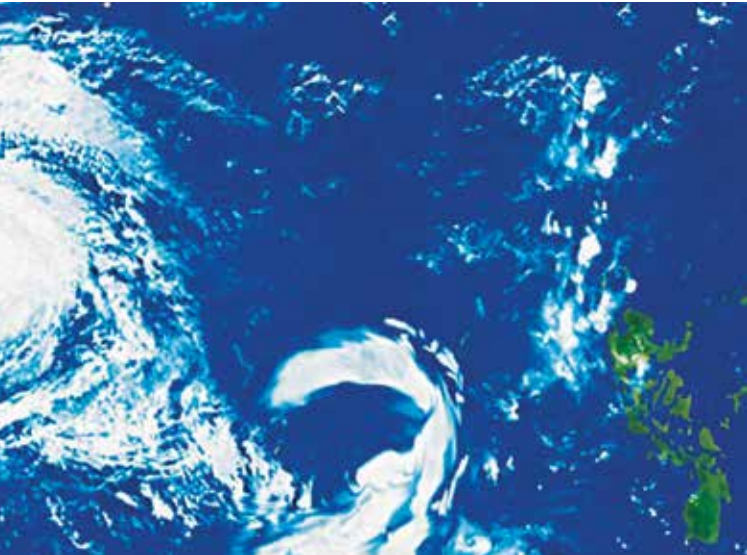


Photo: Dreamstime / Intrepix

with the global gross domestic product (GDP) recovering, demand has increased noticeably. In 2010 the container fleet grew by nearly ten percent, related to deadweight capacity, boosted in part by numerous megaboxer (>10k TEU) deliveries. For each vessel, the EEDI was computed using the formula from IMO's EEDI reference line documentation [9]. This approach assumes a constant average specific fuel consumption of 190 g/kWh for main engines, and 215 g/kWh for auxiliary engines. Auxiliary power is defined as a percentage of the main engine's power. At the MEPC 60 in July 2009, the assigned dwt for container vessels was lowered to 65 percent and a new reference line was set [10]. Note that MEPC 62 agreed to change the assigned dwt for containerships again, to 70 percent [11].

Missing parameter	Formula	R <sup>2</sup>
Speed [kn]	$3.0828 \times \text{power}^{0.1935}$	0.90
Power [kW]	$2.0305 \times \text{GT}^{0.8985}$	0.93
TEU	$0.088 \times \text{GT} - 32.696$	0.97
Deadweight [t]	$1.0316 \times \text{GT} + 3603.5$	0.98

Table 1. Approximation of Missing Parameters

IMO published a new container reference line in its report to MEPC 62, considering 70 percent deadweight. However, due to time constraints of this study, the reference line acc. to [10] is used in the following. The speed data from the database was used as reference speed, acknowledging that this may not be sufficiently accurate for the EEDI condition. (which is 75 percent maximum continuous rating (MCR) at

65 percent dwt for container vessels)

The computed average EEDI per year, weighted according to the number of vessels in each age group, is presented in Figure 2. It should be noted that the energy efficiency of container vessels has begun improving only recently. The main reason is that technological advances were transformed into higher service speeds which were readily accepted as long as fuel prices were rather low (Figure 2). The decrease of recorded EEDI from 1981 to 1986 was likely pushed by the growth in average vessel size. (Figure 1)

Thereafter, average vessel sizes decreased and stayed constant for a decade although the number of new vessels increased fivefold. As fuel prices began to increase in 2001, the economic pressure to reduce fuel costs increased. Between 1980 and 1986, the average annual EEDI of a container vessel decreased while fuel prices remained relatively high (Figure 3). The same trend could be observed during the past four years. However, this time the price increase rate and the EEDI decrease were much more pronounced, presumably because of the high transport demand in recent years and the long project planning times for new ships.

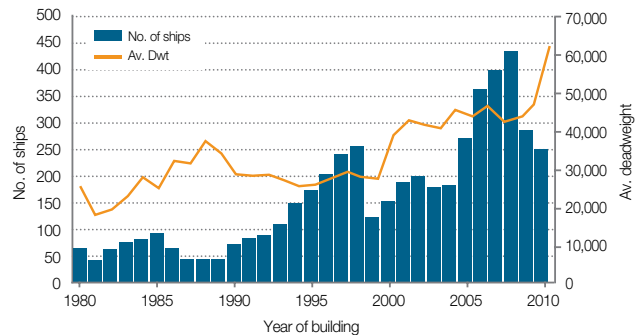


Figure 1. Evolution of container fleet size (Source: GL research, based on IHSF)

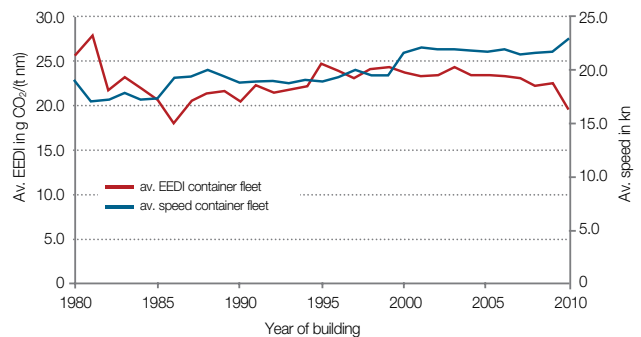


Figure 2. EEDI and speed evolution of container vessels

## Recorded Operational Energy Efficiency of Container Vessels

The operational energy efficiency is determined based on actual fuel consumption and actual transport work to reflect the way the vessel is handled and document actual CO<sub>2</sub>



emissions. Germanischer Lloyd was the first classification society to implement the EEOI and offer certification to the corresponding IMO Guideline [4]; the same applies to the most recent version [5]. GL clients can monitor their EEOI on a voluntary basis and free of charge via GL's fleet online. The data captured was analysed to document the overall status. (without disclosing any individual or ship-specific information) As Figure 4 demonstrates, the trend curve reflecting reported EEOI data shows higher values than the EEDI baseline as provided by Denmark et al. [10]. The ratio of EEOI vs. EEDI-baseline decreases from 1.8 for small dwt sizes to about 1 for large dwt. This can be explained by the actual vessel utilisation. The EEDI thus presents a maximum theoretical efficiency whereas the EEOI represents the real achieved efficiency.

## Projection of Future Emissions from Container Shipping

The model chosen for this study is based on TEU capacity,

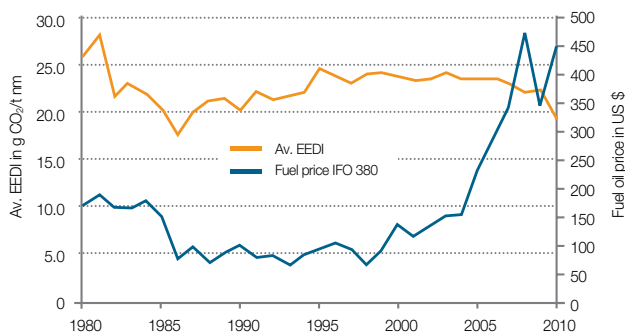


Figure 3. Development of annual average fuel prices (HFO IFO 380 in Rotterdam) and annual EEDI of container vessels

which offers the option of directly referencing container demand models in subsequent studies. This approach is similar to the one of [12]. However, the present study distinguishes seven container vessel sizes rather than six to account for the recent significant increase in container vessel sizes.

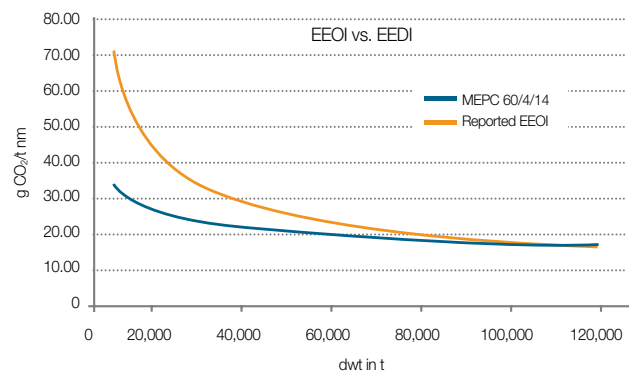


Figure 4. Trends based on the reported energy efficiency operational indicator for container vessels

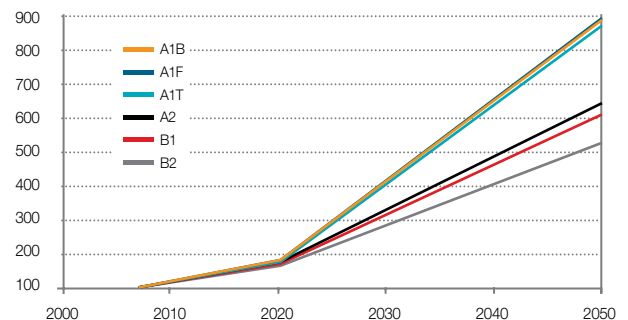


Figure 5. Transport demand for container vessels (tonne-miles index, 2007=100, from MEPC 59/INF.10)



Photo: Dreamstime / Erik De Graaf

The current model predicts CO<sub>2</sub> emissions for each calendar year based on total TEU capacity. It comprises up to 30 age groups. Each age group represents the TEU capacity active

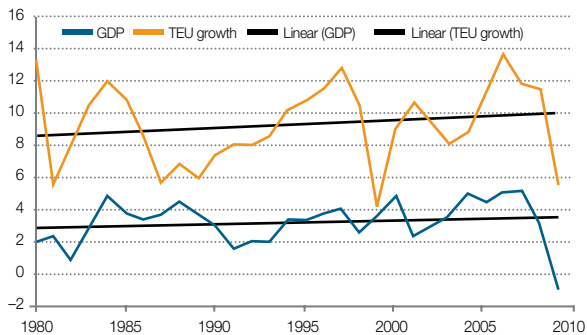


Figure 6. Growth rates of global GDP and container vessel TEU capacity

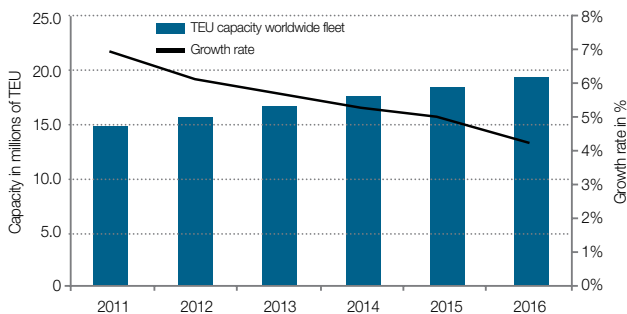


Figure 7. Container demand growth prediction Capacity in millions of TEU

in a given year. TEU capacity from recycled old tonnage is removed from each year, and newbuild capacity is added. There is a difference between the time span from 2011 to 2015, for which prospective deliveries and removals from service can be predicted fairly accurately, and the subsequent years (2016 to 2050), where assumed net fleet growth rates were used. ⚓

*continue Part 2*

### Acknowledgements & Literature

The authors would like to thank Hannes Cordsen and Hauke Glaser for their special support during the production of this paper. The opinions expressed in this study do not necessarily represent the views of GL.

- [ 1 ] Stern, N. (2007), Stern Review on the Economics of Climate Change, Cambridge University Press
- [ 2 ] IPCC, Climate Change 2007 – Synthesis Report, www.ipcc.ch
- [ 3 ] IMO, “IMO policies and practices related to the reduction of greenhouse gas emissions from ships”, Resolution A.963 (23), Annex I
- [ 4 ] IMO, “Interim guidelines for voluntary ship CO<sub>2</sub> emission indexing for use in trials”, MEPC/Circ.471, July 2005
- [ 5 ] MEPC.1/Circ. 684, “Guidelines for voluntary use of the ship energy efficiency operational indicator (EEOI)”, Aug. 2009
- [ 6 ] IMO, “Guidance for the development of a Ship Energy Efficiency Management Plan (SEEMP)”, MEPC.1/Circ. 683, Aug. 2009
- [ 7 ] IMO, “Interim Guidelines on the method of calculation of the Energy Efficiency Design Index for new ships”, MEPC.1/Circ.681, Aug. 2009
- [ 8 ] IHSF (2010), Lloyd’s Register Fairplay. Version 11/10
- [ 9 ] IMO, “Report of the Working Group on Energy Efficiency Measures for Ships”, MEPC 61/WP10, Sept. 2010
- [ 10 ] Denmark, Marshall Islands, World Shipping Council (2010): Recalculated baseline for container vessels, MEPC 60/4/14.
- [ 11 ] IMO, “Report of the Drafting Group on Amendments to Man datory instruments (Part II)”, MEPC 62/WP.11/Add.1/Rev.1, July 2011
- [ 12 ] Sames, P., Köpke, “Future required energy efficiency of container vessels”, 32nd annual Motorship Propulsions & Emissions Conference 2010, Hamburg, Germany
- [ 13 ] IMO, Second IMO GHG Study 2009, Update of the 2000 IMO GHG Study, Final report covering Phase 1 and Phase 2, MEPC 59/INF.10.
- [ 14 ] IMO, “Information to facilitate discussion on GHG emissions from ships”, MEPC 60/WP.5, March 2010
- [ 15 ] Drewry, “Container Market 2010/11 – Annual Review and Forecast – Incorporating the Container Forecaster – 3Q10”, Drewry Shipping Consultants. Oct. 2010
- [ 16 ] Institute of Marine Engineering, Science and Technology, “Marginal abatement costs and cost-effectiveness of energy efficiency measures”, MEPC 59/Inf.10
- [ 17 ] IMO, “Interim Guidelines for the Voluntary Verification of the Energy Efficiency Design Index”, MEPC.1/Circ.682, Aug.682
- [ 18 ] MPA of Singapore, Shipping Circular No. 12 of 2011, “Details of the Green Ship Programme under the Maritime Singapore Green Initiative”, Singapore, June 2011

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# Integrated ship and systems design = Efficiency

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*Rolls-Royce*



Ship and systems design is an area where Rolls-Royce continues to invest heavily in research and development, to ensure that the company's designs are the optimum for the customer's needs and can cope with real operating conditions.

A combination of CFD (computational fluid dynamics) and tank testing is used. Promising designs can then be verified by tank testing and compared with operational feedback from over 800 Rolls-Royce designed offshore and merchant vessels operating globally.

Because of its extensive product range, Rolls-Royce has the ability to integrate complex ship systems that are engineered to work efficiently together. As an integrator and a designer, it aims to get the best products together as an efficient system and design the optimum ship around them.

The design process normally starts by sitting down with ship owners to gather as much data as possible on what they want their vessels to do. Details such as operating routes, anticipated weather conditions, turnaround times in port and the type of cargo all have a significant impact on the design. A detailed picture of the operating profile is built up long before a ship gets to the drawing board.

With the introduction of new IMO emissions regulations in 2016, it is also very important to plan ahead and consider the legislative landscape and any other requirements that may be in place when the vessels enter service. The result for the customer is that the performance of a new design can be predicted early in contract negotiations, giving confidence that the actual ship will behave as calculated and the full benefits of innovation realised.

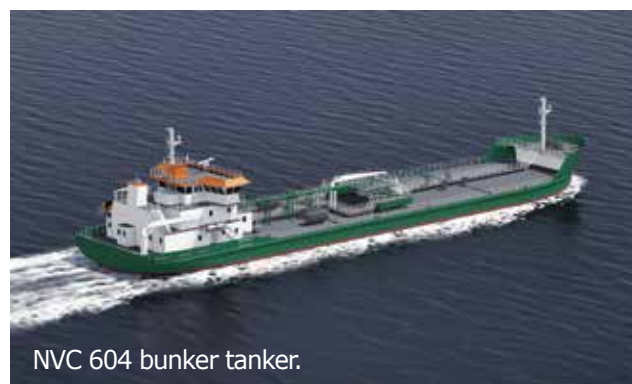
### Integrated processes

Development of a hull form with the required performance for the customer's operation goes hand in hand with structural strength and steel work calculations. Once a ship design has been agreed on with the owner, Rolls-Royce works closely with the shipyard and the owner to develop detailed specifications and working drawings.

As shipyards across the world build Rolls-Royce designed vessels, there is a three-way relationship between the yard, the ship owner and the designer. For merchant vessels, a team in Croatia specialises in producing the detailed production drawings of the ship and the installed equipment. Using powerful software, the exact order of build can be specified, as can input for the computer programmes that will cut and weld the steel.



NVC 405 general cargo vessel.



NVC 604 bunker tanker.

Over the last year, there have been a number of examples.

### NVC 405 – the first of a new generation

Last year, Rolls-Royce unveiled its new Environship concept general cargo vessel and secured its first orders from Norwegian transport group Norlines. The 112m long and 5,000dwt design combines the best available gas power and propulsion technology into an innovative hull design to provide numerous environmental benefits, including the virtual elimination of SO<sub>x</sub> and a reduction of CO<sub>2</sub> emissions by more than 40 per cent compared to similar vessels.

The hull incorporates improvements in hydrodynamics and wave piecing technology (patent pending) that enables the ship to cut through rather than ride over waves for improved performance in a seaway, enabling operators to remain on schedule without needing to burn additional fuel to make up lost time.

Powered by a single Bergen B35:40 V12 gas engine developing 3,930kW, two of the vessels are now being built at the Tsuji Heavy Industries shipyard in Jiangsu, China. The vessels will enter into service progressively from October 2013, operating along the West Coast of Norway.



NVC 401 forage carrier.



NVC 386 live fish transporter.

## NVC 604 – Bunker tankers

Three NVC 604 bunker tankers have been designed for Brazilian operator Navegação São Miguel Ltd (NSM) to build at their own yard in Niteroi, Brazil. The vessels have Rolls-Royce systems and equipment and are to be delivered by the end of 2014.

Rolls-Royce has had a fruitful cooperation with NSM for almost two years developing these vessels, which are optimised to meet very specific requirements, with a high focus on large cargo tank volume, high deadweight and good course keeping in shallow areas. The vessels will have DNV class, fly the Brazilian flag and are designed for coastal trade in Brazil. The cargo will be heavy fuel oil (HFO) and marine gas oil (MGO) to a total deadweight of about 4,350t at the design draught of 4.5m. Service speed will be approximately 10 knots. Overall length is 90.2m with a beam of 18.2m.

NSM began to provide bunkering operations in 1964 in Guanabara Bay (Rio de Janeiro) to supply the then incipient Petrobras oil giant. The company is now responsible for more than 9,000 fuel loading and supply operations to ships along the entire Brazilian coastline and the three new tankers will join the owner's fleet of about 40 specialised vessels.

## NVC 401 – Forage carrier

The gas-powered NVC 401 Forage Carrier is the latest ship design from the award-winning Rolls-Royce Environship range and incorporates a variety of features to reduce environmental impact while increasing efficiency.

Ordered by Norwegian company Eidsvaag AS, it will undertake feed supply duties to fish farms along the Norwegian coast when delivered in 2013. The 75m long vessel can carry up to 1,450t of feed pellets that are stored in 62 specially designed tanks. A demanding schedule will ensure fish are fed at the same time every week, regardless of weather conditions.


Rolls-Royce will supply all the main systems and equipment, as well as the ship design. These include a Bergen C26:33L9PG gas engine, a wave-piercing bow and a Promas propulsion system. Rolls-Royce will also supply the dynamic positioning (DP) system, which will hold the ship accurately in position during the offloading of fish feed via the unloading system at the bow.

## NVC 386 – First for live fish transport

A new generation of wellboats has been designed and developed by Rolls-Royce in close cooperation with Sølvtans, the world's largest operator transporting live fish. The first vessel is scheduled for delivery in 2013.

It will be 76m long with a beam of 16m and incorporates the latest developments in hull and systems design. An advanced diesel-electric propulsion system with hybrid shaft generator, powered by two Bergen C25:336P diesels rated at 1,440 kW, will deliver low fuel consumption and emissions. The design incorporates the latest improvements in fish welfare and fish handling. Tank capacity of 3,000m<sup>3</sup> provides a capability to safely transport up to 450t of live fish and is divided into three equal cargo holds, with sliding bulkheads and a pressure system for loading and unloading. It is fully equipped for transport in a closed system with no discharge to the sea. Control of the water flow and circulation in the cargo compartments has been a key design priority to ensure optimal conditions for the fish.

Considerable emphasis has also been placed on the living and working environment for the crew. Single cabins accommodate up to 11 people and there is a fitness centre and sauna.

The vessel is being built by the Spanish shipyard Astilleros Zamakona S.A. 





조선 & 해양 총람



# Guide

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The Offshore & Shipbuilding Guide Catalogue contains the information such as major products, location, contact details of companies including the shipyards, marine equipment manufacturers.

본 총람은 조선소 및 조선 & 해양 기자재 업체 등을 비롯한 관련 업체들의 주요 제품, 소재지, 연락처 등 각종 정보가 담겨 있습니다.

This catalogue consists of several sections based on sector(shipbuilding, offshore) and area(shipyards, equipment, shipping/port, etc) in Korean alphabetical order, providing the information of domestic/overseas shipbuilding and offshore companies at a glance.

특히 국내외 조선해양 기업들의 정보를 한눈에 파악할 수 있도록 (조선, 해양) 분야 및 (조선소, 기자재, 해운/항만 등) 영역별로 구성되어 있으며, 가나다 순서로 일목요연하게 정리되어 있습니다.

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# Fuel costs are increasing so it's imperative I get what I pay for

Emerson has performed hundreds of successful vessel-specific installations and partnered with the industry's largest marine repair company to provide installation on the biggest vessels in the world. In addition, Emerson has third party certification such as MID and MPA for custody transfer.

*Emerson Process Management Korea*

## Are you getting what you pay for?

Because fuel accounts for 50-60% of your operating costs, you must protect your profitability by scrutinizing where your dollars go. But you face serious challenges in this effort when it comes to your bunker transfer process.

It's no secret there's a lack of trust in the bunkering world. This is possible in part because heavy fuel oil is inherently complex to measure accurately. So you must conduct manual and time-consuming sounding measurements to ensure your supplier delivers the agreed upon quantity. Unfortunately, this process is prone to errors and exposes your largest operating expense to costly mistakes – both unintentional and intentional.

*Fuel costs have increased about 300% in the last five years and are projected to grow another 50% by 2015.*

*- Industry Measures, International Chamber of Shipping (<http://www.shippingandco2.org/industry Measures.htm>)*

Traditional sounding measurements don't give you the



Figure 1. Emerson's Micro Motion transmitter

accuracy or certainty you need when transacting the expense that can make or break your margins.

Fuel buyers we talk to tell us about challenges like these:

### 1. There's a general lack of trust in the industry.

Some bad actors have tarnished the industry by taking advantage of shortcomings in the bunker measurement process. Although you perform your own fuel quantity measurements, those techniques don't give you a fast, error-proof quantity transferred. But to maintain your margins, you

must tightly manage your fuel expenses.

Also, suppliers know you can't linger in port, so you're often forced to accept a bunker delivery before you're confident on the quantity transferred. Unfortunately, depending on your terms and conditions, you have very little opportunity for recourse once you leave the transaction. [1]

## 2. Heavy fuel oil is a complex material to measure.

Because heavy fuel oil is viscous, its measurement is highly dependent on variable conditions and aeration. If air is trapped in fuel you just bunkered, it may be two days before you can get an accurate reading through volume measurements. And even that varies with temperature. Sounding measurements are a woefully inadequate protection against this high-cost problem.

## 3. Measuring is an error-prone process.

The bunker process requires many crew members engaged onboard. You must have people to conduct the sounding, someone manning the manifold, the chief engineer must be present, and you must solicit the services of surveyors. It's time intensive and expensive to devote that much manpower to one event.

And you open yourself up to error and safety risks with so many human touch points.

With Emerson's Micro Motion Coriolis technology, you can more precisely measure your fuel bunker process by eliminating error-prone measurements, time-consuming conversions, and costly disputes. This reduces the need for human involvement in your bunker process to improve the accuracy and confidence in what you receive. You have the credible backing you need to establish fair and equitable dispute resolution terms and restore trust to the bunker transaction.

With a complete and certified system tailored to your marine application, you can accurately and consistently measure each bunker and have an immediate indication of the quality through the direct density measurement. By using direct mass meters and specialized software, you know immediately you're getting the amount of fuel you pay for. With the combination of less human intervention and Emerson's unmatched expertise in the field, you can accurately measure the fuel you receive and be confident in your transfer.



Figure 2. Emerson's Micro Motion 2400S Coriolis transmitter

## Confidently communicate a shortage to your supplier


With the system integrity you get by partnering with Emerson, you gain delivery process conformity without performing a set of complex manual procedures. With Emerson's air detection and alarm, you know before you leave port if there is a quantity problem.

By reducing human intervention, you minimize points of failure and the opportunity for workers to profit individually.

## Traceably measure all of your bunkers

Using traditional measurement methods, you must go through a time-consuming and complex approval process to validate any quantity issues. With complete traceability you get only with Emerson, your measurements are tied to international standards, so you and your supplier know they are accurate. By having meters linked to certification, there is no ambiguity or need to recalibrate your meters. That means you can eliminate subjectivity, reduce time spent bunkering, and get back to sea.

## Leverage experience to measure correctly

Every vessel configuration is different so you can't make any process improvements without customization. With the experience of installing direct mass measurement systems on hundreds of vessels, you have the confidence of a correct installation and a smooth, trouble-free implementation. Only with this unique understanding of environment and condition complexity can you measure your bunker with a high level of certainty. And with the support of Emerson's marine dedicated experts, you can offer your ship crews the onboard training they need to quickly and effectively use your new software. 

## References

1. Singapore Bunker Claims Procedure...Proper Usage of Arbitration Clause in Bunker Purchase Contracts, Singapore Shipping Association letter, 12 September 2011. <http://www.ssa.org.sg/library/SSA0403001/SSA%20Circular/2011/ssa137eml.pdf>

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## HHI wins USD 850 Million Order for Moss type LNG Carriers

On October 11, Hyundai Heavy Industries (HHI), the world's biggest shipbuilder, won a USD 850 million order to build four 150,000 m<sup>3</sup> Moss type LNG carriers from Malaysian oil company Petroliam Nasional Bhd (Petronas).

The contract also includes an option exercisable by the owner to order four additional same class LNG carriers. The double-hulled LNG carriers are scheduled to be delivered to the owner from the second half of 2016.

The tankers for carrying liquefied natural gas will be constructed with four independent self-supporting spherical tanks that have more reliable performance when loading and unloading cargo, and have greater resistance to sloshing forces compared to membrane tank system. These features play a crucial role in Moss type LNG carriers being the preferred choice for offshore storage work where harsh sea conditions are a significant factor.

Ka Sam-hyun, executive vice president of Hyundai Heavy's Shipbuilding Division said, "We see this order as the first of many for LNG carriers as regulations for carbon dioxide emission tighten and demand for LNG increases as an alternative energy source."

Hyundai Heavy is the only Korean shipbuilder that can build Moss type LNG carriers. The Ulsan, South-Korea based company has built 15 Moss type LNG carriers since 1994.

### 현대중공업, 말레이시아 페트로나스사로부터 LNG선 4척 8.5억 달러 수주

현대중공업이 지난 2001년 이후 12년만에 모스(MOSS)형 LNG선 수주에 성공했다. 현대중공업은 지난 9월 10일 말레이시아 국영 에너지 회사인 페트로나스(PETRONAS)사와 15만 m<sup>3</sup>급 LNG선 4척, 총 8억 5000만 달러 규모의 수주계약을 체결했다고 밝혔다. 이번 계약에는 4척의 옵션도 포함되어 있다.

이번에 수주한 LNG선은 길이 290m, 폭 48.9m, 높이 24m로 우리나라 도시가스 1일 소비량을 실어 나를 수 있는 크기이며, 2중 선체 내부에 독립된 구형의 알루미늄 탱크 4기가 탑재된다. 현대중공업은 오는 2016년 하반기부터 이들 선박을 차례로 선주사에 인도할 예정이다.

발주사인 페트로나스사는 이번 계약에서 선박의 안전성을 최우선으로 생각해 모스형 LNG선을 선호한 것으로 알려졌다.

모스형 LNG선은 구 형태의 화물창을 따로 제작해 선박에 탑재함으로써 화물창이 선박에 내재돼 있는 멤브레인(MEMBRANE)형 LNG선에 비해 가격은 비싸지만, 안전성이 뛰어나는 장점이 있다. 현대중공업은 이번 수주전에서 모스형 LNG선 15척을 포함해 총 70여척에 이르는 LNG선을 건조한 풍부한 경험과 우수한 설계능력 등을 강점으로 내세워 선주사로부터 깊은 신뢰를 이끌어 냈다. 특히 현대중공업은



Lee Jai-seong, President & CEO of Hyundai Heavy Industries (left), Tan Sri Dato' Shamsul Azhar Abbas, CEO and President of Petronas



Moss type LNG Carrier Hyundai Heavy Delivered in 2000

국내 업체 중 유일하게 모스형 LNG선과 멤브레인형 LNG선 모두를 건조할 수 있는 우수한 기술력을 확보, 선주사들의 다양한 요구를 충족시킬 수 있어 향후 LNG선 수주전에서 경쟁 우위를 가질 것으로 기대된다.

현대중공업 관계자는 "전 세계적인 이산화탄소 규제 강화와 일본 원전위기에 따른 불안감 증가로 대체에너지인 LNG의 수요가 꾸준히 증가할 것으로 예상된다"며 "LNG FPSO의 모델인 '현대 FLNG' 독자개발, 독립형 LNG 화물창 개발 등 LNG선 관련 연구개발을 꾸준히 진행해 시장 선도자로서의 입지를 확고히 해나가겠다"고 밝혔다.

# DSME Wins First Jack-Up Rig in 30 Years



Bird's eye view of the large jack-up rig ordered to DSME

DSME signed the contract on September 25th with Maersk Drilling, a Denmark based company, for one Jack-up rig. The value of this contract is approximately 530 million USD. It is scheduled to be delivered in the middle of 2016 and will provide service to the Norwegian Coast.

This state-of-art large facility ordered to DSME this time can drill up to 12km at a maximum water depth of 150m, and will be designed to carry out the drilling operation in the freezing and harsh marine environment of the North Sea where the temperature drops to 20°C below zero in winter. Due to the natural conditions of the North Sea, the quality and operation standards are very demanding.

The Jack-up rig is the drilling facility put into operation for oil field development in continental shelf area. Fixed to the steel movable legs at the seabed, the hull is raised above the surface water for drilling down for oil or gas. The Jack-up is deployed mainly in the North Sea region which is relatively less subject to the effect of tide and waves and shallow but has rough waves.

DSME won this contract based on its construction experience in drilling facilities operated in the North Sea. DSME hopes that this contract will enable it to make further inroads into the Jack-up market.

Goh Jae-ho, President of DSME, said, "I anticipate significant risk reduction in construction phase and huge synergic effects created by this contract that we signed with Maersk Drilling, the unrivalled jack-up operator carving out 55% share in the large jack-up rig market. We will

go back to the basics and work with great enthusiasm to ensure the trust of our customers."

This latest contract brings DSME's 2013 secured orders to 40 vessels and offshore platforms worth approximately USD 10 billion and moved it closer to the year's sales target.

## 대우조선해양, 30년 만에 대형 잭업리그 수주

대우조선해양은 덴마크 머스크 드릴링(Maersk Drilling)사로부터 대형 잭업리그 1기를 약 5억 3000만 달러에 수주했다고 지난 9월 25일 밝혔다. 해당 설비는 대우조선해양 거제 옥포조선소에서 건조되어 2016년 중순 발주사에 인도된 뒤 노르웨이 지역에 투입될 예정이다.

대우조선해양이 이번에 수주한 설비는 최대 수심 150m 해역에서 해저 12km까지 시추할 수 있는 최첨단 대형 설비로, 겨울철 기온이 영하 20°C까지 떨어지는 북해의 혹한과 거친 해상 조건에서 시추작업을 할 수 있도록 제작된다. 북해지역은 자연적 조건으로 인해 품질규정 및 작업품질에 관한 요구사항이 가장 까다로운 지역이다.

잭업리그는 대륙붕 지역 유전 개발에 투입되는 시추 설비로, 철제 기둥을 바다 밑으로 내려 해저면에 선체를 고정시킨 뒤 해수면에 띄워 원유나 가스를 시추한다. 파도와 조류의 영향을 상대적으로 덜 받아 수심은 알지만 파도가 거친 북해 지역에 주로 투입된다.

기존 설비들이 노후화로 인해 최근 잭업리그에 대한 수요가 늘고 있으며, 발주처가 요구하는 기술적 사양이 높아지는 추세다. 이 때문에, 대형 잭업리그는 국내 조선업체가 경쟁력을 확보할 수 있는 고부가가치 시장으로 꼽힌다.

1980년대 초 2기의 중 소형 잭업리그를 수주한 바 있는 대우조선해양은 북해용 시추설비(Semi-Rig) 프로젝트 수행을 통해 얻은 독보적인 경쟁력과 검증된 기술력을 바탕으로 대형 잭업리그 수주에 성공했다.

대우조선해양 고재호 사장은 "대형 잭업리그 시장의 55%를 점유하고 있는 독보적인 책임 운용사인 머스크 드릴링사와의 계약을 통해 건조단계에서의 리스크 최소화는 물론 큰 시너지 효과 창출을 기대한다"며, "우리는 잭업리그를 처음 짓던 시절의 초심과 열정을 갖고 제작에 임해 고객의 신뢰를 확보할 것"이라고 밝혔다.

대우조선해양은 이번 계약을 포함해 현재까지 40기, 총 100억 달러 상당의 선박 및 해양플랜트(목표 130억 달러의 약 77%)를 수주하며 순조로운 수주행진을 이어가고 있다.

## Nexans umbilicals chosen by Statoil for Gullfaks Rimfaksdalen gas project in the Norwegian North Sea

Nexans has been awarded an 8 million Euro contract by Statoil to supply the static umbilicals for the Gullfaks Rimfaksdalen project in the Norwegian North Sea. This is the fourth Statoil project in quick succession to feature the new standardized fast-track umbilical design developed by Nexans and follows the contracts awarded in 2012 for the Oseberg Delta field (North Sea), the Snøhvit gas field (Barents Sea) and the Smørbukk Sør. (Norwegian Sea)

Nexans' specialized facility in Halden, Norway will manufacture a total of 9 km of static umbilicals to be deployed at water depths of around 137 m to provide the subsea tie-back between the Rutil and Opal gas discoveries and the existing Gullfaks A platform. Statoil's new standardized umbilical design, that integrates hydraulic, data and fibre optic services, is ideally suited to this project, as it has been developed specifically by Nexans to provide a consistent and cost-efficient solution for fast-track projects, such as tie-ins to existing infrastructure, as well as other kinds of subsea oil and gas projects.

"Winning this fourth standardized umbilicals contract for Statoil confirms the success of this design in both reducing project costs and lead times, as well as increasing the repeatability of engineering, procurement and fabrication", said Krister Granlie, Vice President Hybrid Underwater Cables Division, Nexans Norway. "It is a perfect example of the fully flexible and comprehensive approach we offer for our subsea customers, with solutions ranging from standardized designs to bespoke umbilicals purpose designed for specific requirements."

Meanwhile, the Gullfaks field lies in the northern part of the Norwegian North Sea. It has been developed with three large concrete production platforms: Gullfaks A platform began production in 1986, with Gullfaks B following in 1988 and the Gullfaks C platform in 1989. Produced oil is loaded directly into shuttle tankers on the field, while associated gas is piped to the Kårstø gas treatment plant north of Stavanger and then on to continental Europe.

### 넥상스, 스타토일사와 걸팍스 림팍스다렌 가스 프로젝트에 엄빌리칼 공급

넥상스는 노르웨이 북해에 위치한 걸팍스 림팍스다렌(Gullfaks Rimfaksdalen) 가스 프로젝트에 사용 될 800만 유로 상당의 고정 엄빌리칼 공급계약을 스타토일사와 체결했다.

이번 계약은 넥상스가 개발한 표준화된 효율적인 엄빌리칼 디자인을 특징으로 하는 제품으로, 스타토일사와 연속적으로 체결한 네 번째 프로젝트이다. 그 이전 계약은 2012년에 체결한 북해의 오세베르그 델타(Oseberg Delta) 유전, 바렌트해



(Barents Sea)의 스노히비트(Snøhvit) 가스전, 노르웨이해의 스모르부크 소르(Smørbukk Sør) 프로젝트이다.

넥상스의 특화된 노르웨이 할덴 공장에서 9km의 고정 엄빌리칼을 생산할 예정이며, 이 엄빌리칼은 현재 있는 걸팍스 A 플랫폼과 루틸 및 오팔 가스 유전을 잇는 해저 타이백을 수심 137m에서 실행하게 된다. 수압, 데이터, 광통신 서비스를 통합적으로 제공하는 스타토일사의 표준화된 엄빌리칼 디자인은 모든 종류의 해저 오일 및 가스 프로젝트용으로 넥상스가 특별히 개발한 것으로 이 프로젝트에 최적화되어 있다.

넥상스 노르웨이의 하이브리드 해저 케이블 부문 부사장인 크리스터 그란리(Krister Granlie)는 "연속 4번째로 표준화된 엄빌리칼 솔루션 계약을 스타토일사와 체결하게 된 것은 프로젝트의 비용과 리드타임을 줄인 이 디자인의 성공을 확인해 줄 뿐 아니라 엔지니어링, 구매 및 생산의 반복성의 중요성이 높아짐을 시사한다. 이번 계약으로 넥상스는 고객의 요구에 따라 맞춤형 엄빌리칼 뿐 만 아니라 표준화된 제품까지 안정적으로 공급 가능하다는 점이 다시 한번 증명되었다."고 말했다.

한편 걸팍스 유전은 노르웨이 북해에 위치한다. 이 유전은 3개의 대규모 생산 플랫폼으로 개발되었다. 걸팍스 A 플랫폼은 1986년부터 생산을 시작했고, 걸팍스 B와 걸팍스 C 플랫폼은 1988년과 1989년부터 차례로 생산을 시작했다. 생산된 오일은 유전에서 직접 셔틀 탱커에 실리며, 관련 가스는 파이프 스타방거 북쪽에 있는 카르스토 가스 처리소를 거쳐 유럽 전역으로 보내진다.



## SSME secured an order for 6 units of 50,000-ton product carriers

Sungdong Shipbuilding & Marine Engineering (SSME) announced that it has entered into a contract with a U.K.-based shipping company to build 50,000-ton product carriers (including 2 optional vessels). This contract is valued at approximately USD 200 million. These vessels will measure 183m in length, 32.2m in width, 19.1m in height, and are scheduled for delivery on a staggered basis from the second half of 2015.

An official from SSME said, "We were awarded this contract, thanks in large part to our intensive investment in the development of state-of-the-art facilities and new ship model for the improvement of fuel efficiency", when he was asked about the background that led SSME to clinch the orders in a row from MR tanker market.

SSME took the top spot in the capsize bulk carrier sector in 2009 and successfully built the purse seiner for the first time nationwide. Furthermore, SSME has become the world's first shipyard to build the offshore plants, such as shuttle tankers, FSO, etc., on land.

SSME has improved its financial structure and focused on technology development since it entered into voluntary restructuring agreement with creditors in the aftermath of global financial crisis that broke out in 2010, and has built the foundation for standing on its own feet without additional funding from creditors

### 성동조선해양, 50,000 톤급 정유운반선 6척 수주

성동조선해양은 영국의 선사인 50,000 톤급 정유운반선 6척(옵션 2척 포함)의 건조계약을 체결했다고 밝혔다. 이 프로젝트의 총 수주금액은 약 2억 달러이며, 각 선박들은 길이 183m, 폭 32.2m, 깊이 19.1m로 2015년 하반기부터 차례로 인도될 예



MR-class tanker built by SSME

정이다.

성동조선해양 관계자는 연이은 MR 탱커 시장에서의 수주 성공에 대해 "연비 개선을 위한 새로운 선형 및 최신설비 개발에 집중 투자한 것이 주효했다"라고 수주 배경을 밝혔다.

성동조선해양은 지난 2009년에 케이프사이즈(Capesize)급 벌크선 분야에서 1위를 차지한 이력과 한국 최초로 참치선 망선 제작에 뛰어들어 성공을 거둔 바 있고, 셔틀탱커와 FSO 등 해양플랜트 분야에서도 세계 최초 육상건조로 두각을 나타낸 바 있다.

한편, 성동조선해양은 지난 2010년 글로벌 금융위기의 여파로 재정이 악화되면서 채권단과 자율협약을 체결한 뒤 재무구조를 개선하고 기술개발에 몰두해 이제 채권단의 추가 자금 지원 없이 자립할 수 있는 기반을 갖추고 있다.

## STX Heavy Industries inked a contract to supply diesel engines and generators for next-generation LST- II

STX Heavy Industries announced that it signed a contract worth KRW 55.4 billion with the DAPA (Defense Acquisition Program Administration) to supply the diesel engines and generators for the next-generation Landing Ship Tanks on October 22.

Under this Agreement, STX Heavy Industries will supply the main propulsion diesel engine of 5,400Kw-class and generator of 1,200Kw-class that will be fitted to the 3 units of 4,500-ton next-generation Landing Ship Tanks consecutively from 2015 to 2017. The next-generation Landing Ship Tanks are the state-of-the-art landing ship

with increased landing capability, and can carry and transport high-speed landing crafts, helicopters, landing forces, armored vehicles, tanks, etc.

Using this contract with DAPA as springboard, STX Heavy Industries is poised to advance into naval vessel sector and contribute to strengthening the national defense force.

Meanwhile, STX Heavy Industries continues to create new growth engines, like receiving the national

type approval from the Ministry of Maritime Affairs and Fisheries for the Smart Ballast, the ballast water management system (BWMS) developed independently.

An official from STX Heavy Industries said, "We will step up efforts to win new orders based on our technological prowess in core marine equipment such as marine diesel engines, generators, etc. At the same time, we will strengthen the existing business and concentrate our capabilities on creating new growth engines."

## STX중공업, 차기상륙함(LST-Ⅱ)용 디젤엔진 및 발전기 공급 계약 체결

STX중공업이 지난 10월 22일 방위사업청과 554억원 규모 차기상륙함(LST-Ⅱ)용 디젤엔진 및 발전기 공급계약을 체결했다고 밝혔다.

이번 계약으로 STX중공업은 4,500톤급 차기상륙함 후속함 3척에 탑재·운용될 5,400Kw급 주 추진용 디젤엔진과 1,200Kw급 함내 전원 공급용 발전기를 2015년부터

2017년까지 순차적으로 공급하게 된다. 차기상륙함은 고속상륙정과 헬기, 상륙군, 장갑차, 전차 등을 탑재 수송할 수 있어 한층 더 강력해진 상륙작전 능력을 자랑하는 한국 해군의 최신식 상륙함이다.

STX중공업은 이번 방위사업청과의 계약을 발판으로 해군의 함정사업에 본격 진출해 국방력 강화에 기여할 계획이다. 한편 STX중공업은 지난달 해양수산부로부터 자체 개발한 선박 평형수 처리장치(BWMS)인 스마트볼라스트(Smart Ballast)의 국가형식 승인을 획득하는 등 지속적으로 새로운 성장 엔진을 창출해 나가고 있다.

STX중공업 관계자는 "선박용 디젤엔진, 발전기 등 핵심 조선기자재 기술력을 바탕으로 추가 수주에 박차를 가할 것"이라며 "기존 사업을 강화함과 동시에 새로운 성장 엔진 창출에도 역량을 집중할 것"이라고 말했다.

## Panasia wins 26 MSC newbuildings for GloEn-Patrol™ GIII

Early October, Panasia announced that it made a contract for providing and installing its BWTS (Ballast Water Treatment System), GloEn-Patrol™ to 26 MSC (Mediterranean Shipping Company), the 2nd biggest container line, newbuildings.

This contract is based on an exclusive condition that GloEn-Patrol™ will be installed to six 18,000 TEU Containers to be fabricated by DSME and various projects such as six 9,400 TEU Containers and fourteen 8,800 TEU Containers to be constructed by 4 Chinese ship yards for 2 years from 2013.

MSC said that Panasia had installed GloEn-Patrol™ to 250 ships, providing drawings early and its products to improve efficiency of fabrication process and meet its schedule. Furthermore, dedicate Customer Care Service after the delivery helped them acquire credits from ship yards. MSC explained these are the reasons why low-electricity and high efficient GloEn-Patrol™ GIII developed by continuous study and improvement would be installed to all ships.

Also, additional contracts are expected as both parties agreed on provision to 10 ships to be fabricated by Chinese ship yards.

## MSC사의 신조 컨테이너 26척에 GloEn-Patrol™ GIII 공급계약 체결

파나시아는 10월 들어 세계 2위의 컨테이너 선사인 MSC(Mediterranean Shipping Company)에서 신규로 건조하는 선박 26척에 선박평형수 처리장치인 GloEn-Patrol™ 의 공급 및 설치 계약을 체결했다고 발표했다.



이번 계약은 한국의 대우조선해양에서 18,000 TEU 컨테이너선 6척을 비롯해 중국의 4개 조선소에서 9,400 TEU 컨테이너선 6척과 8,800 TEU 컨테이너선 14척을 건조하는 다수의 프로젝트에 2013년부터 2년에 걸쳐 파나시아의 GloEn-Patrol™이 독점적으로 설치되는 조건이다.

MSC사 관계자에 따르면, 파나시아는 그 동안 250여 척에 GloEn-Patrol™을 설치하며 선박 생산공정에 효율성을 높이기 위해 설계안의 조기확정 및 제품 공급을 선박 건조 일정에 차질이 없도록 원활히 진행했으며, 공급 후에도 수준 높은 기술 지원 서비스를 통해 조선소로부터 신뢰를 획득할 수 있었다. 양사는 중국 조선소에서 건조되는 10척의 호선에도 공급계약을 합의함으로써, 향후 추가 수주 또한 기대되고 있다.

# DSME won the orders for the largest number of drillships among domestic shipyards



DSME President Goh Jae-ho and Transocean President Steven L. Newman in the drillship contract-signing ceremony held at DSME's Okpo shipyard

Daewoo Shipbuilding and Marine Engineering (DSME) continues smooth sailing, winning orders for 3 drillships in October. DSME announced that it won orders for 3 drillships, 2 units from an Africa-based ship owner and 1 unit from the U.S.-based Transocean.

The drillships ordered from the Africa-based ship owner are worth approximately USD 1.24 billion and will be designed to ensure the best performance and safety. These drillships will be built at Okpo shipyard in Geoje island and delivered to the ship owner by late 2015. Particularly, these drillships will adopt DSME e-SMART Drillship design developed independently by DSME and can drill up to 12km at a maximum water depth of 3.6 km. These vessels will feature the design and equipment optimized for uninterrupted drilling operation in deepwater.

DSME e-SMART Drillship model will be fitted with 2 drilling towers (Dual Derrick Type) weighing 1,400 tons and 1,250 tons, respectively, to enhance the drilling capacity. One drilling tower will dig the drilling holes in seabed, and the remaining one will serve the function of assembling the drill pipes. As a result, the operation time can be reduced by more than 25%, compared to the situation where only 1 drilling tower is used.

DSME successfully clinched an order worth approximately USD 520 million from the U.S.-based Transocean for 1 drillship just in a day. This drillship is the DSME-12000 Drillship model developed independently by DSME, and measures 238m in length, 42m in width, and 19m height. This is largest drillship ever built by DSME thus far. This drillship can drill to a maximum of about 12 km in water depths of up to 3.6 km, and will be built at Okpo shipyard in Geoje island and delivered to the

ship owner by mid 2016.

This is the 12th drillship ordered from Transocean, one of the major clients of DSME, since the first shipbuilding contract in 2006. DSEM has delivered 5 drillships to Transocean since 2009 and is currently building 7 drillships for Transocean at Okpo shipyard.

## 대우조선해양, 국내 조선사 중 드릴십 최다 수주

대우조선해양은 10월 들어 3척의 드릴십을 수주하면서 드릴십 부문에서 손조로운 수주 행진을 이어가고 있다. 대우조선해양은 아프리카 지역 선주와 미국 트랜스오션(Transocean) 사로부터 각각 드릴십 2척과 1척을 수주했다고 밝혔다.

아프리카 지역 선주가 발주한 최첨단 드릴십은 약 12억 4000만 달러로, 성능과 안전성 면에서 역대 최고 사양으로 설계되며, 거제 옥포조선소에서 건조되어 2015년 말 발주사 측에 인도될 예정이다. 특히 이 드릴십은 자체 개발한 최첨단 디자인인 DSME e-SMART Drillship 모델로, 최대 수심 3.6 km의 심해에서 최대 12 km까지 시추할 수 있다. 심해에서의 원활한 시추작업을 위해 최적화된 설계와 장비가 탑재된다.

DSME e-SMART Drillship 모델에는 드릴십의 핵심 기능인 시추능력 강화를 위해 각각 1,400톤과 1,250톤인 2개의 시추타워(Dual Derrick Type)가 설치된다. 하나의 시추타워는 해저에 시추공을 파고 나머지는 시추파이프를 조립하는 역할을 수행한다. 이 경우, 시추타워가 1개일 때보다 작업시간을 25% 이상 줄일 수 있다.

대우조선해양이 불과 하루 만에 미국 트랜스오션사로부터 드릴십 1척을 약 5억 2000억 달러에 수주하는데 성공했다. 이 드릴십은 대우조선해양이 자체 개발한 DSME-12000 Drillship 모델로, 길이와 너비 그리고 폭이 각각 238m, 42m, 19m에 달한다. 이는 대우조선해양이 건조하는 드릴십 중 최대 규모다. 최대 수심 3.6 km의 심해에서 최대 약 12 km까지 시추할 수 있으며, 거제 옥포조선소에서 건조되어 2016년 중순 발주사 측에 인도될 예정이다.

트랜스오션사는 2006년 첫 계약 체결 이후 이번 계약 포함, 총 12기의 드릴십을 발주한 대우조선해양의 주요 고객사다. 대우조선해양은 2009년부터 총 5척의 드릴십을 트랜스오션 측에 인도했으며, 현재도 총 7척의 트랜스오션 측 선박을 옥포조선소에서 건조하고 있다.



# MTU Series 1163-04 Engine Chosen by Korean Coast Guard for New 5000-ton Patrol Vessel

MTU has been chosen by the Korean Coast Guard (KCG) to provide propulsion and onboard power for a new class of vessels in its ever expanding and modernizing fleet. The new 5000-ton displacement patrol vessel will be powered by four MTU 20V 1163 M94 engines in a Combined Diesel and Diesel (CODAD) propulsion configuration, with onboard power provided by four 12V 4000 M23S gensets. The first of the new class of vessels will begin service in 2016.

The newest MTU Series 1163M04 engine has upgraded features with a common rail fuel injection system, an advanced electronic engine management system and an improved combustion process to meet the present IMO 2 emission regulations. With its improved lifecycle cost, compact design and best-in-class power density and acceleration characteristics, the MTU Series 1163-04 engine sets the industry benchmark. Each of the four 20V 1163 M04 engines in the new KCG 5000-ton vessel will produce 7,400kW (9,923bhp) @ 1,300 rpm.

Alex Choe, Director of Sales at Tognum Asia said, "The KCG need diesel engines and systems that are robust, reliable and come with



competent local service support. It is for these reasons that the KCG have selected MTU engines in what will be KCG's largest and most sophisticated 5000-ton patrol vessel."



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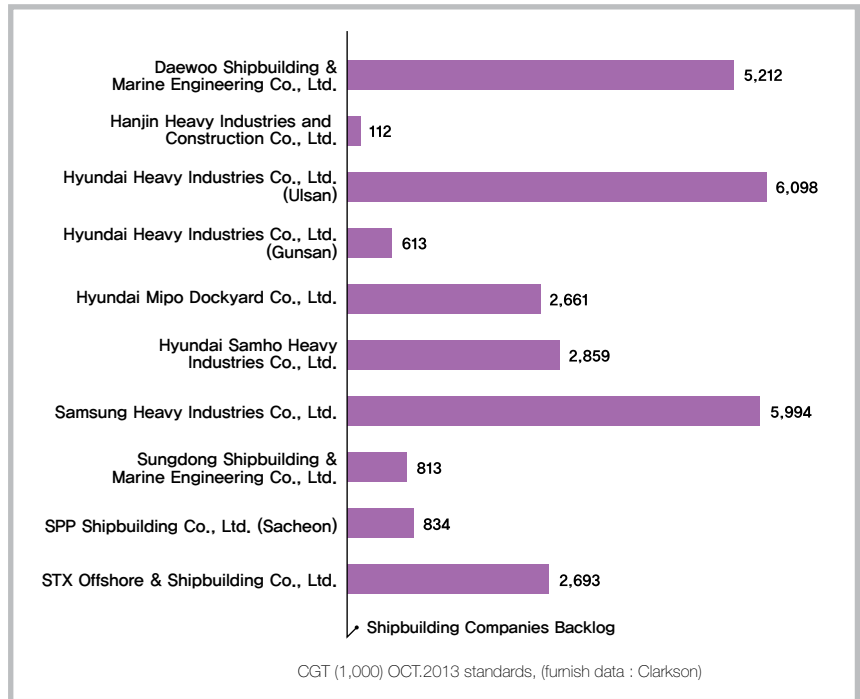
Articles about – Shipbuilding Equipments, Shipbuilding Engineering, Shipbuilding & Marine Plants, Vessel & Marine Automation, Related articles of Shipbuilding and Marine Industry

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Domestic shipyards are seeing a rise in new orders amid strong shipbuilding market worldwide. The Eco MR Tanker designed by DSEC, a subsidiary of Daewoo Shipbuilding and Marine Engineering (DSME), attracted favorable reaction from the U.S.-based ship owners for its excellent energy efficiency and eco-friendly design. In addition, Hyundai Mipo Dockyard (HMD) showed remarkable performance, exporting the eco-friendly vessel. Shipbuilding heavy weights such as Daewoo Shipbuilding & Marine Engineering (DSME), Hyundai Heavy Industries (HHI), etc., won ultra large-scale orders, and middles-sized shipyards such as Sungdong Shipbuilding & Marine Engineering (SSME) and Hanjin Heavy Industries & Construction (HHIC), etc., are adding new orders in a row to their orderbooks.



The shipbuilding industry anticipates an

upturn in new order placement of major ship owners from the second half of this year as the ship finance market recovers. Based on the type of vessels, the market is expected to witness a sharp rise in ship prices in the order of bulk carriers, containership, PCs, LNG carriers, drillship, etc.

Meanwhile, domestic export of vessels has increased continuously in the third quarter. The export of vessels in Korea has recorded growth for 3 consecutive months, rising 23.8% year-on-year to USD 3.33 billion in August. The decline in domestic export of vessels continued into May from August last year, showing a downward trend compared to the same period of previous year.

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), STX

Offshore & Shipbuilding (STXOS), and

others based on the order backlog

data.

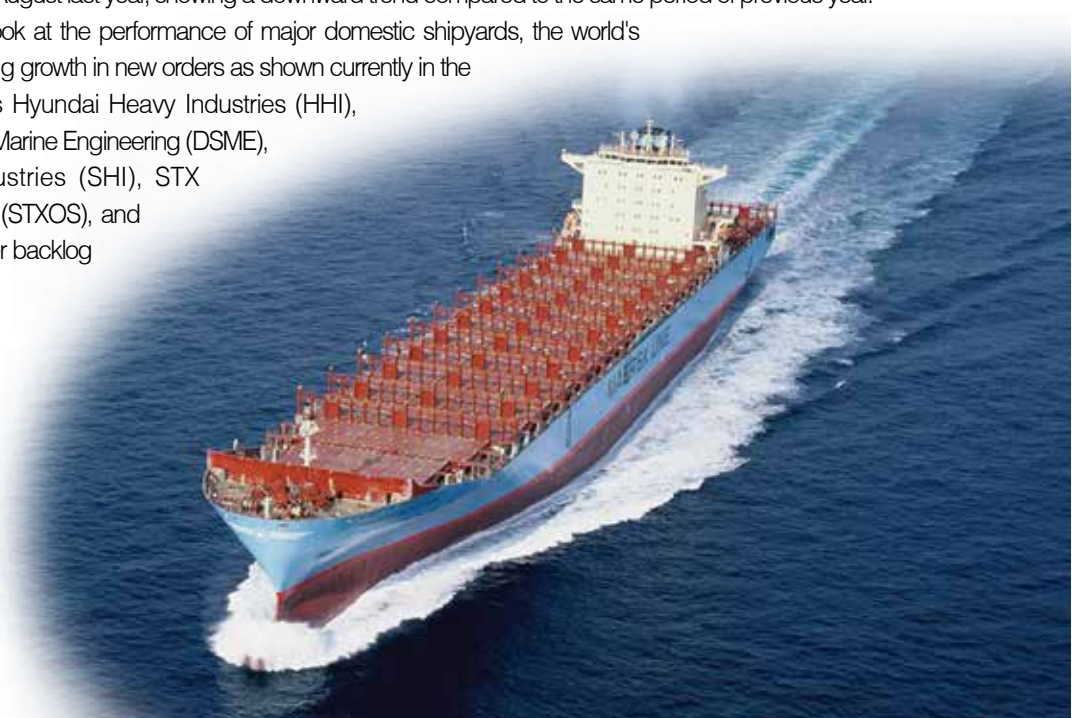


Photo: Hanjin Heavy Industries and Construction Co., Ltd.



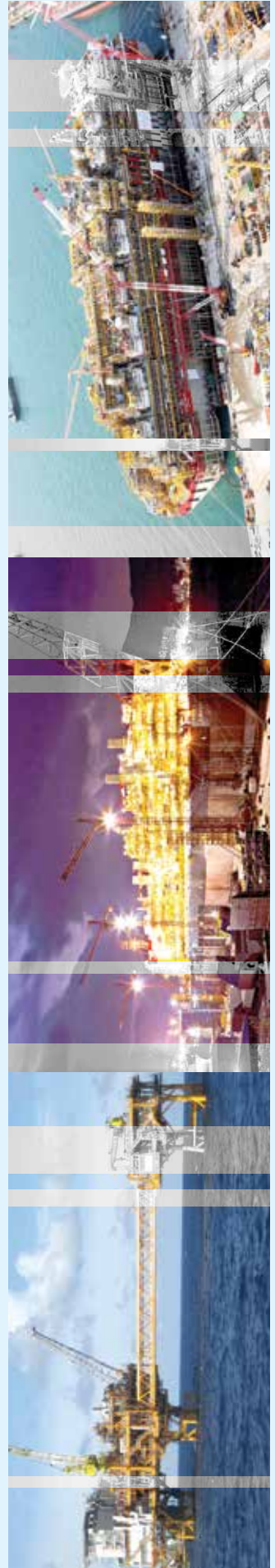
# Offshore Plant Orders

## Offshore plant orders awarded to domestic shipyards in 2011-2013

Data	Type	Number of vessel	Amount	Ship owner	Delivery	Shipyards
Jan	Drillship	1 vessel	KRW 590 billion	Diamond Offshore Drilling Limited, U.S.A	Mid 2013	Hyundai Heavy Industries
	Offshore Plant	-	USD 900 million	RasGas, Qatar	Late 2013	Hyundai Heavy Industries
Feb	Drillship	2 vessels	KRW 1 trillion	Noble Drilling, U.S.A	On a staggered basis until Sep 2013	Hyundai Heavy Industries
	Deepwater drillship	1 vessel	-	Atwood Oceanics, U.S.A	Second half of 2013	Daewoo Shipbuilding & Marine Engineering
	Offshore facility carrier	1 vessel	KRW 265 billion	Dockwise, Netherlands	October 2012	Hyundai Heavy Industries
	FPSO for the North Sea	1 vessel	USD 1.2 billion	BP (British Petroleum), U.K	Early 2015	Hyundai Heavy Industries
	Platform Supply Vessel	1 vessel	-	-	2012	STX OSV
	Fisheries Research Vessel	1 vessel	EUR 35 million	Ministry of Fisheries and Marine Resources, Republic of Namibia	Early 2012	STX Finland
Mar	Offshore Platform (North Sea Drilling & Production platform, Quarters & Utilities platform)	1 unit each	USD 600 million	BP (British Petroleum), U.K	Late 2014	Hyundai Heavy Industries
	Deepwater drillship	2 vessels	KRW 1.2 trillion	Aker Drilling, Norway	Second half of 2013	Daewoo Shipbuilding & Marine Engineering
	Drillship	2 vessels	USD 1.1 billion	Ship owner, U.S.A	-	Samsung Heavy Industries
	Platform Supply Vessel	1 vessel	-	Norsea Group AS, Norway	June 2012	STX OSV
Apr	Platform Supply Vessel	1 vessel	-	-	2012	STX OSV
	Drillship	1 vessel	-	Fred Olsen Energy, Norway	August 2013	Hyundai Heavy Industries
	Drillship	2 vessels	USD 1.12 billion	Maersk, Denmark	-	Samsung Heavy Industries
	Drillship	1 vessel	USD 680 million	Ocean Rig, Greece	October 2013	Samsung Heavy Industries
May	Shuttle Tanker	2 vessels	USD 200 million	European Navigation, Greece	2013	STX Offshore & Shipbuilding
	Drillship	2 vessels	USD 1.12 billion	Rowan, U.S.A	Second half of 2013	Hyundai Heavy Industries
	Deepwater drillship	1 vessel	-	Vantage Drilling, U.S.A	Late May, 2013	Daewoo Shipbuilding & Marine Engineering
	Offshore Platform (Top side)	-	USD 414 million	Statoil, Norway	-	Samsung Heavy Industries
Jun	FPSO	1 vessel	USD 636 million	Teekay Petrojarl, Norway	Mid 2013	Samsung Heavy Industries
	Platform Supply Vessel	2 vessels	KRW 120 billion	Farstad Shipping, Norway	First half of 2013	STX OSV
	FSO	1 unit	-	PTSC, Vietnam	Early 2013	Sungdong Shipbuilding & Marine Engineering
	LNG-FPSO	1 unit	USD 3,026 billion	Royal Dutch Shell, U.S.A	2016	Samsung Heavy Industries
Jul	Platform Supply Vessel	2 vessels	KRW 150 billion	Island Offshore, Norway	First quarter, third quarter of 2013	STX OSV
	LNG-FSRU	2 units	USD 500 million	Høegh LNG, Norway	Second half of 2013, first half of 2014	Hyundai Heavy Industries
	Multifunctional Deep Water Anchor Handling, Offshore Service Vessels	2 vessels	KRW 240 billion	Farstad Shipping, Norway	From the second quarter of 2013	STX OSV
	Drillship	1 vessel	USD 680 million	Ocean Rig, Greece	November 2013	Samsung Heavy Industries
Aug	Drillship	2 vessels	USD 1,1225 billion	Maersk, Denmark	July 2014	Samsung Heavy Industries
	LNG-FSRU	1 vessel	USD 280 million	Accelerate 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 half of 2014	Daewoo Shipbuilding & Marine Engineering
	Well Intervention Vessel	2 vessels	USD 420 million	Eide Marine Services AS, Norway	2013	STX Finland
Oct	Drillship	1 vessel	KRW 600 billion	Noble Drilling, U.S.A	Second half of 2014	Hyundai Heavy Industries
	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
Nov	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	Daewoo Shipbuilding & Marine Engineering
Dec	Pipe Laying Support Vessel	2 units	USD 500 million	Odebrecht, Brazil	August of 2014	Daewoo Shipbuilding & Marine Engineering
	Offshore facilities (Gas platform and various facilities)	-	USD 900 million	Major multinational oil companies	2nd half of 2014	Hyundai Heavy Industries
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
		Semi-submersible Drilling Rig	2 units	USD 1.1 billion	Songa Offshore, Norway	Mid 2015			Daewoo Shipbuilding & Marine Engineering
	May	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	-	Petrolim 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	-	Excellerate, U.S.A	Between early 2015~2017			Daewoo Shipbuilding & Marine Engineering
		Drillship	1 vessel	USD 620 million	Rowan, U.S.A	First half of 2015			Hyundai Heavy Industries
	Sep	Drillship	1 vessel	USD 623 million	-	-			Samsung Heavy Industries
		Drillship	4 vessels	USD 2.06 billion	Transocean, U.S.A	One-by-one from mid 2015			Daewoo Shipbuilding & Marine Engineering
	Oct	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
		Gas Production Platform (topside)	1 unit	USD 1.1 billion	Statoil, Norway	Mar 2016			Hyundai Heavy Industries
	Jan	LNG-FSRU	1 vessel	-	BW Maritime, Singapore	2015			Samsung Heavy Industries
		Floating Production Unit (FPU)	1 unit	USD 1.3 billion	Total, France	First half of 2016			Hyundai Heavy Industries
	Mar	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
		Ultra-deepwater Drillship	1 unit	USD 515 million	Ensco, United Kingdom	Third quarter of 2015			Samsung Heavy Industries
	Jun	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
		Ultra-deepwater Drillship	2 units	USD 600 million	Seadrill, Norway	Second half of 2015			Samsung Heavy Industries
	Jul	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	Transocean, U.S.A	Second half of 2015			Daewoo Shipbuilding & Marine Engineering
		Drillship	1 vessel	USD 520 million	-	The middle of 2016			Daewoo Shipbuilding & Marine Engineering

\*Note : Based on the press release and public announcements of each shipyards, internal estimation of Monthly KORSHIP (estimation until Oct 15, 2013)

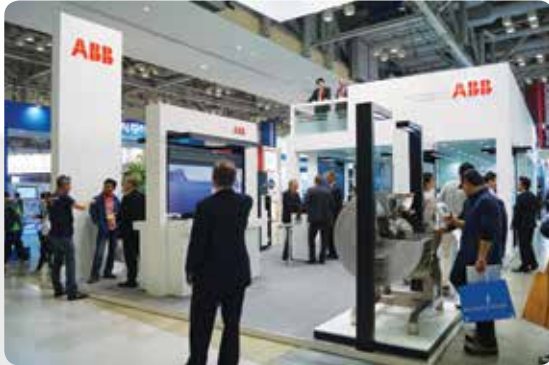


# KORMARINE 2013 ended in great success

'KORMARINE 2013', the festival for shipbuilding and offshore industries, ended in great success. This year's event attracted a large number of exhibitors from marine equipment and plant sectors, reflecting the strong growth of offshore industry.

KORMARINE 2013 was the largest in history, attracting about 1200 exhibitors with 1850 booths from the fields of shipbuilding, marine equipment, ocean exploration,

offshore plant, etc. Among domestic exhibitors are included Hyundai Heavy Industries (HHI), Daewoo Shipbuilding & Marine Engineering (DSME), STX, NK, Staco, Pan-Asia, etc. Overseas exhibitors included ABB, Bosch, GE, ALFA LAVAL, which are related to major shipyards and affiliates in offshore plant, shipbuilding, marine equipment sectors. ⚓



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| 1 | 2 |
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1. ABB
  2. BIP Industries
  3. Alfa Laval
  4. Bosch Rexroth





Busan Marine Equipment Association



Chugoku Marine Paints



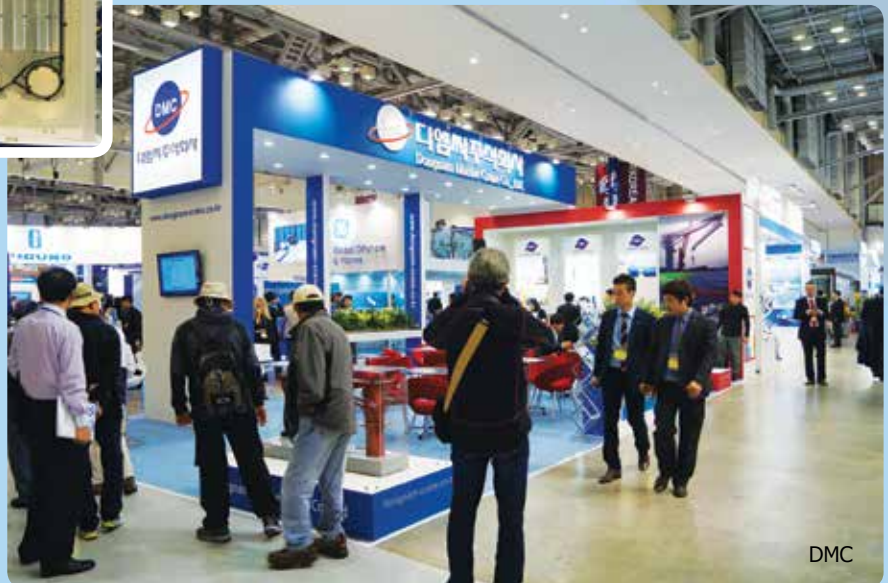
Daewoo Shipbuilding & Marine Engineering



Denmark Pavilion



DHP Engineering



DMC



Donghwa Entec



Endress+Hauser



Filtr



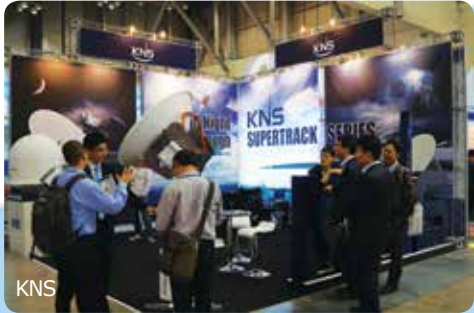
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| 1 | 2 |
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1. Fluke
  2. Hanil-Fuji (Korea)
  3. Hanla IMS
  4. Hyundai Heavy Industries



Jotun



JS Cable



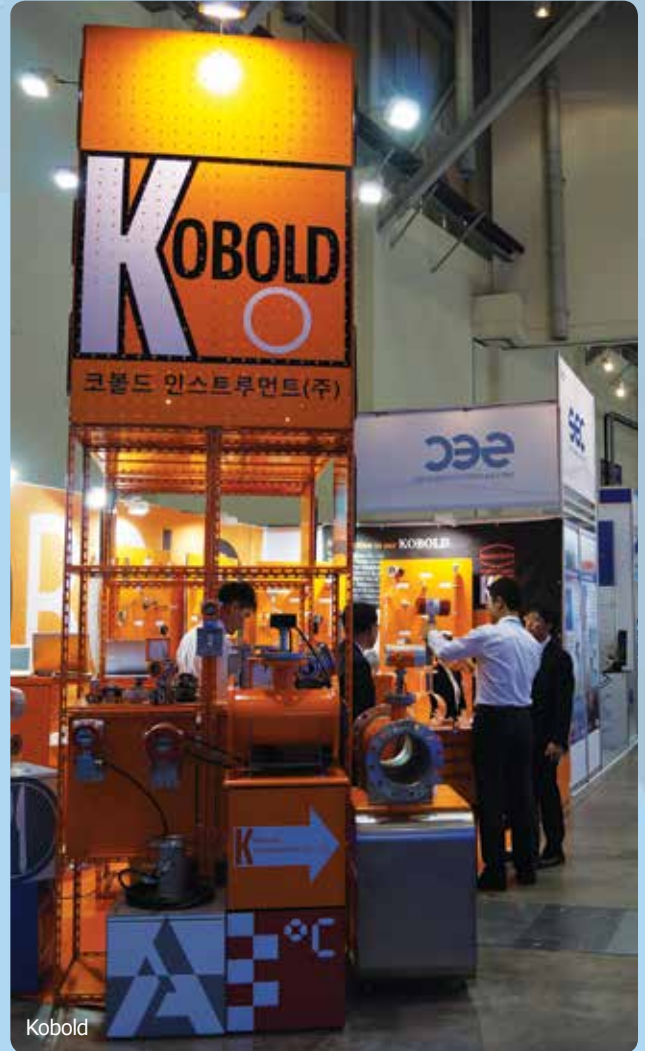
KNS



KTE



Neotec



Kobold



Nexans



Panasonic



Pepperl+Fuchs

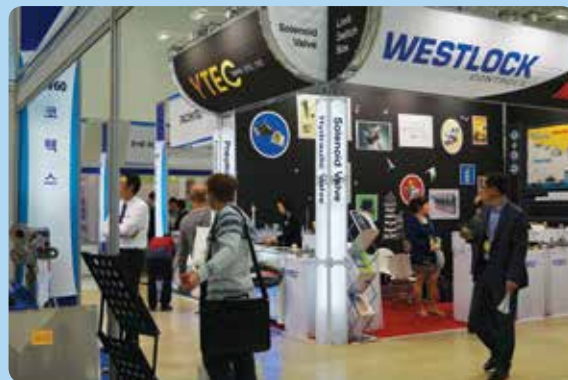
1. Phoenix Contact
2. Rockwell Automation
3. Rolls-Royce
4. Samyung ENC
5. Singapore Pavilion

1	2
3	5





- 1. TMC
- 2. Vacon
- 3. YTEC



# Improved surface technologies for large hydraulic cylinders

*Bosch Rexroth Korea Ltd.*

Large hydraulic cylinders are used in many offshore applications, like riser tensioning, heave compensation, skidding, deck mating and jacking. The piston rod surface of these engineer-to-order products is one of the most essential parts of the hydraulic installation. The right combination of surface technology, seal concept and hydraulic medium define the



eventual uptime and Total Cost of Ownership. Therefore, it has been the main driver for innovation over many decades; Bosch Rexroth being one of the pioneers and trend setters offering various in-house solutions for every industry and application.

With Enduroq as new brand name for all of in-house surface technologies, Rexroth introduces an integrated concept for selecting, engineering and producing the best surface technology in any industry or application. As part of this concept, Rexroth introduces Enduroq 3200, a dual layer, Ultimet based high-duty surface technology. This technology is especially developed for offshore splash zones. (e.g. direct riser tensioners)

With more than 50 years of experience and service data feedback from the largest installed cylinder base in the world, combined with an extensive research program and the newest production technologies, Rexroth sets new engineering and production standards for surface technologies in large hydraulic cylinders.

Enduroq 3200 is an extension of the already existing in-house technologies for piston rods of large hydraulic cylinders. These solutions include the existing Enduroq 3000, a single layer Ultimet based surface technology, and Enduroq 2000 and Enduroq 2200, both based on the proven HVOF technologies.

-TEL: +82-31-270-4200  
-<http://www.boschrexroth.co.kr>

New  
Product

# Auto-Strainer for Ballast Water Treatment System

*Korea Filter Co., Ltd.*

## Highly Efficient BWTS Filter

Korea Filter has developed a candle-type seawater auto-strainer for ballast water treatment systems. It is available in a wide range of capacities from 100 tons to 1,600 tons.

Maintaining a constant pressure difference of 2-3 bar, the filter removes more than 95% of 50-micron particulates as well as zooplankton. In addition to the size range, the auto-strainer can be operated in various modes - timed, continuous operation and manual control.

Furthermore, the pump can be installed on the upstream side of the system for a pressure unit with separate backwashing. This filter offers reliable operation, high efficiency and ease of maintenance.



## Standard Material

- Fluid: Sea Water
- Element type: Candle Type
- Filtering Size: 50 Micron
- Capacity: 100 ton ~ 1600 ton

## Special Feature

- More than 95% of 50 micron or remove zooplankton
- Maintain a certain pressure difference of 2 ~ 3bar driving
- Strainer made of various sizes (100 ton ~ 1600 ton)
- Various operating method (operation by foreclosure, by time operation, continuous operation)
- PUMP can be installed on the upstream side (pressure unit with a separate backwashing)

-TEL: +82-51-928-5015  
-http://www.korea-filter.co.kr

# Laser Scanner Focus3D

*FARO Singapore Pte Ltd. (South Korea)*



FARO Technologies, the world's most trusted source for 3D measurement, imaging and realization technology, announced it has released the new FARO Laser Scanner Focus3D X 330. Building on the success of the FARO Laser Scanner Focus3D, the new Focus3D X 330 surpasses previous models in functionality and performance. With a range almost three times greater than previous models, the Focus3D X 330 can scan objects up to 330 meters away and in direct sunlight. With its integrated GPS receiver, the laser scanner is able to correlate individual scans in post-processing making it ideal for surveying based applications.

In addition, the Focus3D X 330 measurement accuracy has been increased and noise has been reduced, providing precise three dimensional models in a photo-realistic style. These advances in performance did not come at the expense of safety as the Focus3D X 330 includes a Class 1 "eye safe" laser.

With its increased range and scan accuracy, the Focus3D X 330 considerably reduces the effort involved in measuring and post-processing. The 3D scan data can easily be imported into all commonly used software solutions for accident reconstruction, architecture, civil engineering, construction, forensics, industrial manufacturing and land surveying. Distance dimensions, area and volume calculations, analysis and inspection tasks and documentation can thus be carried out quickly, precisely and reliably.

-TEL: +82-51-662-3410  
-http://www.faroasia.com

New  
Product



# New Salinometers & Lifebuoy Lights

*Daniamant Electronics*



BNWAS BW-800 main unit and parts



L170 Lights

## Salinometer SL8005 & SL8040

Daniamant has recently released their latest products within the Salinometer range of products: Salinometer SL8005 & SL8040. The SL8005 will replace the old Salinometers SL6000 and SL6005. The new Salinometer SL8005 is used on Freshwater Generators, Boilers, Reversed Osmosis Fresh Water Systems (RO) and other systems where salinity has to be supervised.

The new salinometer SL8040 is used on Ballast Water Treatment Systems to monitor the salinity in the Ballast Water Tanks. The Ballast Water Treatment System helps to prevent, minimize and ultimately eliminate the transfer of organisms and pathogens via vessel ballast discharge.

Both Salinometers are fitted with a new type of electrode (sensor); a 5-wire auto-referenced electrode with built in temperature-compensation and are type approved by DNV.

## BNWAS BW-800 Wheel mark approved

One of the core products from Daniamant is the BNWAS BW-800 system. The system is developed to monitor bridge

activity and detect operator disability which could lead to accidents. BNWAS BW-800 is Wheel mark approved. The Wheel mark certificates along with all type approvals are available for download on [www.unielec.dk](http://www.unielec.dk). The popular BNWAS system has been delivered to more than 3.500 vessels worldwide.

## Launch of new L170 series

Daniamant are delighted to announce the release of their latest range of Lifebuoy Lights. This new range is available in two styles, aimed at both the Commercial Market and the Leisure Market. Buying the lights you get many advanced features at a very competitive price. Also L170 Commercial Light is the SOLAS/MED approved L170 and it is available in yellow. Being SOLAS and MED approved, it is immediately aimed at the majority of World markets.

-TEL: +45-3286-0525  
-http://www.daniamant.com

# BMEA (Busan Marine Equipment Association)

## Member List

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### BUSAN INDUSTRY CO.

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 Main Products : Powder Coating  
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### BUSUNG PLANT CO., LTD.

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 Homepage Add. :  
 Main Products : Cargo Reducer Piece  
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### CEPHAS PIPELINES CO., LTD.

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### DAEHEUNG IND. CO., LTD.

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 Main Products : Forged Flanges, Nozzel & Forged Neck, Forged Items for ship  
 TEL : +82-51-831-6635

### AQ TECK CO., LTD.

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 Homepage Add. :  
 Main Products : Flower Meter, Viscometer, Control Valve  
 TEL : +82-51-831-3720

### DAEHWA TECHNICAL CO., LTD.

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 Homepage Add. :  
 Main Products : Shot & Blast, Painting, Painting's Manufacture  
 TEL : +82-55-329-5705

### DAEJUNG SPECIAL STEEL CO., LTD.

Head Office : Gangseo-gu Busan  
 Homepage Add. :  
 Main Products : Winch, Shaft, Gear Clutch  
 TEL : +82-51-831-1133

### DAEKYUNG CO., LTD.

Head Office : Saha-gu Busan  
 Homepage Add. : [www.dkhoist.com](http://www.dkhoist.com)  
 Main Products : Chain Block, Lever Block Trolley  
 TEL : +82-51-264-6611

### DAERIM MACHINERY CO., LTD.

Head Office : Gangseo-gu Busan  
 Homepage Add. : [www.dae-rim.kr](http://www.dae-rim.kr)  
 Main Products : Head, Air Receiver Tank, Pressure Vessel, Reactor  
 TEL : +82-51-831-1456

### DAESAN ENGINEERING CO., LTD.

Head Office : Gangseo-gu Busan  
 Homepage Add. : [www.daesan-eng.com](http://www.daesan-eng.com)  
 Main Products : E/R Package unit, Pipe Group Unit  
 TEL : +82-51-831-0090

### DAE SEONG MARINE TEC CO., LTD.

Head Office : Gangseo-gu Busan  
 Homepage Add. : [www.ds-frp.com/](http://www.ds-frp.com/)  
 Main Products : Pipe Insulation System, FRP Weather Door  
 TEL : +82-51-832-2071

### DAESUNG IND CO.

Head Office : Gangseo-gu Busan  
 Homepage Add. :  
 Main Products : VENT SYS, OIL TANK, Out Fitting  
 TEL : +82-51-831-7427

### DAE WON HEAVY INDUSTRIES CO., LTD.

Head Office : Gangseo-gu Busan  
 Homepage Add. : [www.daewonindustry.co.kr/](http://www.daewonindustry.co.kr/)  
 Main Products : Deck Machinery, Deck Equipments, OffShore  
 TEL : +82-51-831-5215

### DAEWON METAL IND. CO., LTD.

Head Office : Gangseo-gu Busan  
 Homepage Add. : [www.galvanizing.co.kr/](http://www.galvanizing.co.kr/)  
 Main Products : Hot Dip Galvanizing, Pipe for Shipbuilding  
 TEL : +82-51-831-2541

### DAEYANG ELECTRIC CO., LTD.

Head Office : Saha-gu Busan  
 Homepage Add. : [www.daeyang.co.kr](http://www.daeyang.co.kr)  
 Main Products : Precision Instrument  
 TEL : +82-51-200-5331

### DAEYANG INSTRUMENT CO., LTD.

Head Office : Saha-gu Busan  
 Homepage Add. : [www.daeyang.co.kr](http://www.daeyang.co.kr)  
 Main Products : Precision Instrument  
 TEL : +82-51-200-5331

### DAEYANG SP CO., LTD.

Head Office : Yangsan Gyeongsangnam-do  
 Homepage Add. :  
 Main Products : Welding machine  
 TEL : +82-55-388-3800

### DA HEUNG ENG. CO., LTD.

Head Office : Sasang-gu Busan  
 Homepage Add. :  
 Main Products : Marine valves  
 TEL : +82-51-311-1882

### DAOM METAL.

Head Office : Sasang-gu Busan  
 Homepage Add. :  
 Main Products : Sus plate, Flange, Pipe sleeve  
 TEL : +82-51-315-1347

### DEAIL MACHINERY.

Head Office : Gangseo-gu Busan  
 Homepage Add. :  
 Main Products : Piston Rod, Cross headpin, Propeller Shaft  
 TEL : +82-51-832-1119

### DECKWIN CO., LTD.

Head Office : Youngdo-gu Busan  
 Homepage Add. : [www.deckwin.com](http://www.deckwin.com)  
 Main Products : Winch  
 TEL : +82-51-413-1193

### DH-M CO., LTD.

Head Office : Seo-gu Incheon  
 Homepage Add. : [www.dhm.co.kr](http://www.dhm.co.kr)  
 Main Products : High Pressure Blower, High Pressure Washer  
 TEL : +82-32-527-5782

**DHP ENGINEERING CO., LTD.**

Head Office : Dongnae-gu Busan  
Homepage Add. : www.dhpeng.com  
Main Products : Plate Type heat Exchanger, Disk & Shell type heat Exchanger  
TEL : +82-51-556-4200

**DINES CO., LTD.**

Head Office : Gangseo-gu Busan  
Homepage Add. :  
Main Products : Provision Crane, Tilting Radar Post  
TEL : +82-51-971-0972

**DK INDUSTRIAL CO., LTD.**

Head Office : Saha-gu Busan  
Homepage Add. : www.dk-ind.com/  
Main Products : Silencer, Fire Damper, Lashing Bridge, Rudder  
TEL : +82-51-832-1436

**DK TECH CORPORATION CO., LTD.**

Head Office : Kimhae Gyeongsangnam-do  
Homepage Add. : www.dklok.com  
Main Products : Instrument TuBe Fitting, Instrument Valve  
TEL : +82-55-338-0114

**DNP CO., LTD.**

Head Office : Gangseo-gu Busan  
Homepage Add. : www.dnpco.kr  
Main Products : Fire & Gas Damper, Galley Equipment, AL, Steel Furniture  
TEL : +82-51-831-4551

**DOLIM PRECISION.**

Head Office : Gangseo-gu Busan  
Homepage Add. :  
Main Products : Cross Head Pin, Main Journal, Crank Shaft  
TEL : +82-51-831-8861

**DONG-A VALVE IND.**

Head Office : Gangseo-gu Busan  
Homepage Add. :  
Main Products : Marine Offshore valve, Strainer  
TEL : +82-51-831-1500

**DONGBANG SHIP MACHINERY CO., LTD.**

Head Office : Jinhae Gyeongsangnam-do  
Homepage Add. : www.dongbangsm.co.kr  
Main Products : General Steel Piping, Framo & Hydro Piping, Module Unit  
TEL : +82-55-545-0882

**DONGHAE INTEC CO., LTD.**

Head Office : Gangseo-gu Busan  
Homepage Add. : www.dhintec.co.kr  
Main Products : Sleeve, Scupper, Suction Bell Mouth  
TEL : +82-51-831-2565

**DONG HUN ENTERPRISE CO.**

Head Office : Sasang-gu Busan  
Homepage Add. :  
Main Products : Ball Valve  
TEL : +82-51-314-2610

**DONGHWA ENTEC CO., LTD.**

Head Office : Gangseo-gu Busan  
Homepage Add. : www.dh.co.kr  
Main Products : E/R Heater & Cooler, Copt, Condenser, Plate Heat Exchanger  
TEL : +82-51-970-1000

**DONGHWA M&E CO., LTD.**

Head Office : Gangseo-gu, Busan  
Homepage Add. : www.donghwame.com  
Main Products : Heat Exchanger  
TEL : +82-51-971-3455

**DONGHWA PNEUTEC CO., LTD.**

Head Office : Gangseo-gu Busan  
Homepage Add. :  
Main Products : Air Compressor, Cylinder, Cylinder, Head, Piston  
TEL : +82-51-974-4800

**DONGIL SHIPYARD CO., LTD.**

Head Office : Saha-gu Busan  
Homepage Add. : www.dongilshipyard.co.kr

Main Products : Rescue Boat Davit & Winch, Assembly, Line Hauler  
TEL : +82-51-200-1211

**DONGKYUNG INDUSTRY CO., LTD.**

Head Office : Gangseo-gu Busan  
Homepage Add. : www.dki21.co.kr  
Main Products : Reducer, Gear  
TEL : +82-51-832-1602

**DONG NAM ENGINEERING CO., LTD.**

Head Office : Saha-gu Busan  
Homepage Add. : www.dongnam-eng.com  
Main Products : Electric Control Panel  
TEL : +82-51-204-3984

**DONGNAM PRECISION IND. CO., LTD.**

Head Office : Gangseo-gu Busan  
Homepage Add. :  
Main Products : Multi Core Tube, Sus Cable Tray & Cover, LNG Line Out Fitting  
TEL : +82-51-831-3500

**DONG SUNG HIGHTECH.**

Head Office : Gangseo-gu Busan  
Homepage Add. : www.dshitech.com  
Main Products : Shutter Grill, P-Chamber, Diffuser, Frie Damper, Volume Damper  
TEL : +82-51-831-9561

**DONGYANG G.T.S.**

Head Office : Gangseo-gu Busan  
Homepage Add. :  
Main Products : Compressed Centellen Board, Metal Inserting Gasket  
TEL : +82-51-831-6505

**DONGYANG HYDTEC CO., LTD.**

Head Office : Gangseo-gu Busan  
Homepage Add. : www.dongyang-hyd.com  
Main Products : Rudder & propeller Truck, Block lifter, Gripper Jack System  
TEL : +82-51-831-6185

**DONGYANG METAL CO., LTD.**

Head Office : Sasang-gu Busan  
Homepage Add. : www.dy-metal.co.kr  
Main Products : Swing bolt a' ssy, Fittings  
TEL : +82-51-814-5157

**DONGYOUNG ELECTRIC CO., LTD.**

Head Office : Gangseo-gu Busan  
Homepage Add. : www.dyelectric.com  
Main Products : Main Switchboard, Emergency Switchboard  
TEL : +82-51-261-9800

**DSB ENGINEERING CO., LTD.**

Head Office : Youngdo-gu Busan  
Homepage Add. : www.dseng.com  
Main Products : Totally Enclosed, Lifeboat, Herged Qrarity Davit  
TEL : +82-51-412-5937

**DSE BEARING CO., LTD.**

Head Office : Gangseo-gu Busan  
Homepage Add. : www.dsebearing.com  
Main Products : Metal Bearing  
TEL : +82-51-831-2046

**DSK CO., LTD.**

Head Office : Youngdo-gu Busan  
Homepage Add. : www.dskworld.com  
Main Products : Piston Crown  
TEL : +82-51-417-7800

**DUYOUNG INDUSTRIAL MACHINES CO., LTD.**

Head Office : Gangseo-gu Busan  
Homepage Add. :  
Main Products : Plate-Baffle  
TEL : +82-51-831-2477

**EM SYSTEC CO., LTD.**

Head Office : Sasang-gu Busan  
Homepage Add. : www.emsystec.com  
Main Products : Marine Switch Board, Control Console  
TEL : +82-51-302-8761

**FRIEND CO., LTD.**

Head Office : Gangseo-gu Busan  
Homepage Add. : www.thefriend.co.kr  
Main Products : Marine Cable Tray, Mud Box, Strainer  
TEL : +82-51-831-9456

**GEO MAEK SHOT&PAINT CO.,LTD.**

Head Office : Saha-gu Busan  
Homepage Add. :  
Main Products : Deck Machinery Part, Hose Handling Crane  
TEL : +82-51-264-3315

**GEORIM ENGINEERING CO., LTD.**

Head Office : Gangseo-gu Busan  
Homepage Add. : www.kangrim.com  
Main Products : Marine Indutrial Boiler, Exhaust Gas Boiler  
TEL : +82-51-831-2929

**GISUNG ENGINEERING CO., LTD.**

Head Office : Gangseo-gu Busan  
Homepage Add. :  
Main Products : Air Reserovir, Heat Exchanger  
TEL : +82-51-831-4475

**G. M. TEC CO., LTD.**

Head Office : Gangseo-gu Busan  
Homepage Add. : www.igmtec.com  
Main Products : Duct Equip't Seat Support  
TEL : +82-51-831-5851

**G.S HIGH-TECHER CO., LTD.**

Head Office : Gangseo-gu Busan  
Homepage Add. : www.gshightecher.koreasme.com  
Main Products : Air Vent Head, Pipe Coupling  
TEL : +82-51-832-0456

**G&S PRECISION IND CO., LTD.**

Head Office : Gangseo-gu Busan  
Homepage Add. :  
Main Products : Cable Tray, Vent, Hull Outfittings  
TEL : +82-51-831-0849

**HAE DONG METAL CO., LTD.**

Head Office : Gangseo-gu Busan  
Homepage Add. : www.hdanode.com  
Main Products : Zinc Anode, Al Anode  
TEL : +82-51-831-3751

**HAE DUK RUDDER & R.STOCK CO., LTD.**

Head Office : Gangseo-gu Busan  
Homepage Add. : www.rudders.co.kr  
Main Products : Rudder & R.Stock, Rudder Horn, Rudder Carrier  
TEL : +82-51-831-0101

**HAE SUNG INDUSTRIAL.**

Head Office : Saha-gu Busan  
Homepage Add. : www.hsjs.co.kr/  
Main Products : Cable Tray, Cable Way Fitting, Cable Coaming  
TEL : +82-51-264-8103

**HAEWON INDUSTRIES CO.**

Head Office : Gangseo-gu Busan  
Homepage Add. :  
Main Products : P/Crown, P/Skirt  
TEL : +82-51-831-4600

**HAEWON IND. CO., LTD.**

Head Office : Sasang-gu Busan  
Homepage Add. : www.haewon.net  
Main Products : Copper, Copper-Nickel, Monel Fitting & Flanges  
TEL : +82-51-312-2161

**HAEYANG FAMILY CO., LTD.**

Head Office : Gangseo-gu Busan  
Homepage Add. :  
Main Products : F.P Propeller, C.P Propeller, Propeller Shaft  
TEL : +82-51-831-3550

**HAEYANG METAL CO., LTD.**

Head Office : Gangseo-gu Busan  
Homepage Add. :  
Main Products : F.P Propeller, C.P Propeller, Propeller Shaft  
TEL : +82-51-831-4591

**HAEYANG PROPELLER CO., LTD.**

Head Office : Gangseo-gu Busan  
 Homepage Add. :  
 Main Products : Marine Propeller  
 TEL : +82-51-831-4599

**HANCHANG TRANS CO., LTD.**

Head Office : Gangseo-gu Busan  
 Homepage Add. : www.hctr.co.kr  
 Main Products : Pole Mounted Transformer, Pad Mounted Transformer  
 TEL : +82-51-831-3470

**HANJULEVEL.**

Head Office : Sasang-gu Busan  
 Homepage Add. : www.hanjulevel.co.kr  
 Main Products : Level instrument Etc, Vapour Emission Control Sys.  
 TEL : +82-51-303-0537

**HANLA IMS CO., LTD.**

Head Office : Gangseo-gu Busan  
 Homepage Add. : www.hanlalevel.co.kr  
 Main Products : Cargo Tank Monitoring Sys. Tank Remote Sounding Sys.  
 TEL : +82-51-601-3019

**HANLA IND CO., LTD.**

Head Office : Saha-gu Busan  
 Homepage Add. :  
 Main Products : Oil Filter unit, Gas Blower  
 TEL : +82-51-264-2201

**HANMAUM KI-GONG CO., LTD.**

Head Office : Gangseo-gu Busan  
 Homepage Add. : www.hankg.co.kr  
 Main Products : Air Cooler Housing, Oil Cooler Housing  
 TEL : +82-51-831-5211

**HEARTMAN CO., LTD.**

Head Office : Saha-gu Busan  
 Homepage Add. : www.heartman.co.kr  
 Main Products : Nozzle Tip, Plunger Ass'y, Fuel Injection V/V  
 TEL : +82-51-262-8869

**H.M.E.**

Head Office : Kijang-kun Busan  
 Homepage Add. : www.hyomyungeng.com  
 Main Products : Battery Charger, Light Signal Column  
 TEL : +82-51-709-9000

**HOSEUNG ENTERPRISE CO., LTD.**

Head Office : Gangseo-gu Busan  
 Homepage Add. : www.hoseung.koreasme.com  
 Main Products : Tand Package Unit, Pump Package Unit, Cooler Package Unit  
 TEL : +82-51-831-2233

**HWAJIN ENTERPRISE CO., LTD.**

Head Office : Gangseo-gu Busan  
 Homepage Add. : www.hwa-jin.com  
 Main Products : Control Box, Gauge Board System  
 TEL : +82-512-831-9447

**HWAJIN PF CO., LTD.**

Head Office : Saha-gu Busan  
 Homepage Add. : www.hwajinpf.com  
 Main Products : Butt-Welding Pipe, Fittings Carbon Steel  
 TEL : +82-51-204-3001

**HWA SHIN PRECISION CO., LTD.**

Head Office : Gangseo-gu Busan  
 Homepage Add. :  
 Main Products : Life Boat Winch  
 TEL : +82-51-831-9839

**HYOSUNG STEEL TECHNOLOGIES CO., LTD.**

Head Office : Gangseo-gu Busan  
 Homepage Add. :  
 Main Products : Steel plate cutting, Hy Auto or Manual  
 TEL : +82-51-831-5093

**HYUNDAI HYCRAULIC CO., LTD.**

Head Office : Gangseo-gu Busan  
 Homepage Add. : www.hhmc.co.kr

Main Products : TURNING ROLLER, BLOCK LIFT  
 TEL : +82-51-831-8611

**HYUNDAI ZINC METAL CO., LTD.**

Head Office : Saha-gu Busan  
 Homepage Add. : www.hdz.co.kr  
 Main Products : Sacrificial Anode, Hot Dip Galvanizing, Ship Manufacture  
 TEL : +82-51-266-4788

**HYUNJIN MATERIALS CO., LTD.**

Head Office : Gangseo-gu Busan  
 Homepage Add. : www.hjmco.co.kr  
 Main Products : Cross Head, Connecting Rod, Piston Rod  
 TEL : +82-51-602-7700

**ILDO MACHINE ELECT CO., LTD.**

Head Office : Saha-gu Busan  
 Homepage Add. :  
 Main Products : Heavy Electric Parts  
 TEL : +82-51-266-6066

**IL - SUNG INDUSTRY CO.**

Head Office : Sasang-gu Busan  
 Homepage Add. :  
 Main Products : Silencer, Water Air Filter, Air Intet Trunk  
 TEL : +82-51-312-4056

**IN SUNG INDUSTRY CO.**

Head Office : Saha-gu Busan  
 Homepage Add. :  
 Main Products : Profile, Steel Coalming Insulation  
 TEL : +82-51-293-7550

**JAESEUNG ENGINEERING CO., LTD.**

Head Office : Gangseo-gu Busan  
 Homepage Add. :  
 Main Products : Steel Pipe Spool, Sus Pipe Spool, CuNi Pipe Spool  
 TEL : +82-51-831-8838

**JEILSANKI CO.**

Head Office : Gangseo-gu Busan  
 Homepage Add. :  
 Main Products :  
 TEL : +82-51-831-5398

**JEONG-AM SAFETY GLASS CO., LTD.**

Head Office : Gangseo-gu Busan  
 Homepage Add. : www.jeong-am.co.kr  
 Main Products : Tempered Glass, Laminated Glass  
 TEL : +82-51-831-6161

**JEONG HWA ACCOMMODATION SYSTEM CO., LTD.**

Head Office : Gangseo-gu Busan  
 Homepage Add. : www.jeonghwa21.com  
 Main Products : Wooden Furniture  
 TEL : +82-51-974-8000

**JEONG WOO COUPLING CO., LTD.**

Head Office : Kimhae Gyeongsangnam-do  
 Homepage Add. : www.jwcojoint.co.kr  
 Main Products : Pipe Coupling, Pipe Repair Clamp  
 TEL : +82-55-339-7666

**JIN GU ENGINEERING.**

Head Office : Kimhae Gyeongsangnam-do  
 Homepage Add. :  
 Main Products : Rudder Stock, Stern Tube, Stern Roller, Winch  
 TEL : +82-55-343-3414

**JIN IL BEND CO., LTD.**

Head Office : Gangseo-gu Busan  
 Homepage Add. :  
 Main Products :  
 TEL : +82-51-832-1919

**JINKWANG ELECTRIC CO., LTD.**

Head Office : Gangseo-gu Busan  
 Homepage Add. :  
 Main Products : Pull Card Switch, Belt Sway Switch, Belt Speed Switch  
 TEL : +82-51-831-2571

**JINYOUNG METAL CO., LTD.**

Head Office : Sasang-gu Busan  
 Homepage Add. : www.jymct.co.kr  
 Main Products : Multi Core Tube, Welded Stainless, Steel Tube  
 TEL : +82-51-313-4001

**JMC HYDRAULICS.**

Head Office : Saha-gu Busan  
 Homepage Add. :  
 Main Products : Hydraulic Motor For Marine, Hydraulic Control Valve  
 TEL : +82-51-204-4046

**JNC HI-TECHNOLOGIES.**

Head Office : Gangseo-gu Busan  
 Homepage Add. : www.jnchitec.com  
 Main Products : Junction Box, Elect panel bard, Tel Booth  
 TEL : +82-51-974-9500

**JOKWANG I.L.I CO., LTD.**

Head Office : Gangseo-gu Busan  
 Homepage Add. :  
 Main Products :  
 TEL : +82-51-602-0200

**JONGHAP POLESTAR ENGINEERING CO., LTD.**

Head Office : Youngdo-gu Busan  
 Homepage Add. :  
 Main Products : Diesel Engine Piston, Cylinder, Valve  
 TEL : +82-51-403-5514

**JUNG GONG IND. CO., LTD.**

Head Office : Saha-gu Busan  
 Homepage Add. : www.jung-gong.com  
 Main Products : Ordinary Window Side, Scuttle, Heated Window  
 TEL : +82-51-261-2911

**JUNG - WOO MACHINERY CO., LTD.**

Head Office : Gangseo-gu Busan  
 Homepage Add. :  
 Main Products : Carrier Housing, Split Bearing, Stock, Up, Lower Sleeve  
 TEL : +82-51-831-5394

**KANG BACK INDUSTRY CO., LTD.**

Head Office : Gangseo-gu Busan  
 Homepage Add. :  
 Main Products : Electric Control Box, Valve & Similar , Equipment  
 TEL : +82-51-831-9025

**KANGIL CO., LTD.**

Head Office : Gangseo-gu Busan  
 Homepage Add. :  
 Main Products : Pressure Vessel, Deaerator, Heat Exchanger  
 TEL : +82-51-972-5672

**KANGRIM HEAVY INDUSTRIES CO., LTD.**

Head Office : Changwon Gyeongsangnam-do  
 Homepage Add. : www.kangrim.com/  
 Main Products : Marine Indutrial Boiler, Exhaust Gas Boiler  
 TEL : +82-55-269-7701

**K.C. LTD.**

Head Office : Gangseo-gu Busan  
 Homepage Add. : www.iccp-mgms.com  
 Main Products : M.G.P.S, I,C,C,P, System Fe Ion, Generator  
 TEL : +82-51-831-7720

**KEO HUNG MACHINERY.**

Head Office : Gangseo-gu Busan  
 Homepage Add. :  
 Main Products : Deck Crane, Provision Crane, Hose Handling Crane  
 TEL : +82-51-831-6296

**KEYSUNG METAL CO., LTD.**

Head Office : Gangseo-gu Busan  
 Homepage Add. : www.keysungmetal.com  
 Main Products : Valve(Cryogenic, Ball), Strainer  
 TEL : +82-51-831-3391

**KOC ELECTRIC CO., LTD.**

Head Office : Gangseo-gu Busan  
 Homepage Add. :  
 Main Products : Cast Resin Transformer, Dry Resin Transformer  
 TEL : +82-51-832-0550

**KOREA HYDRAULIC CO.**

Head Office : Gangseo-gu Busan  
 Homepage Add. : [www.enpos21.com](http://www.enpos21.com)  
 Main Products : Electric Motor Pump, Hand Pump, Single/Double Acting Ram  
 TEL : +82-51-832-1100

**KOREA PHE CO., LTD.**

Head Office : Gangseo-gu Busan  
 Homepage Add. : [www.kphe.co.kr](http://www.kphe.co.kr)  
 Main Products : Plate Heat Exchanger, Tank Cleaning Heater  
 TEL : +82-51-261-2664

**KOREA STEEL SHAPES CO., LTD.**

Head Office : Sasang-gu Busan  
 Homepage Add. : [www.ekosco.com](http://www.ekosco.com)  
 Main Products : Flat Bars, Equal Angles, Unequal Angles  
 TEL : +82-51-323-2611

**KOREA TRADING & INDUSTRIES CO., LTD.**

Head Office : Saha-gu Busan  
 Homepage Add. : [www.kticopper.co.kr](http://www.kticopper.co.kr)  
 Main Products : Copper alloy coil, Plate  
 TEL : +82-51-293-4423

**KORINOX CO., LTD.**

Head Office : Gangseo-gu Busan  
 Homepage Add. : [www.korinox21.com](http://www.korinox21.com)  
 Main Products : Cold Mill Stainless, Steel Coil  
 TEL : +82-51-832-0031

**KORVAL CO., LTD.**

Head Office : Saha-gu Busan  
 Homepage Add. : [www.korval.co.kr](http://www.korval.co.kr)  
 Main Products : Crank Case Relief Valve, Main Starting Valve, Rotary Valve  
 TEL : +82-51-790-9700

**KSP CO., LTD.**

Head Office : Gangseo-gu Busan  
 Homepage Add. :  
 Main Products : Ship Engine Valve Spindle, Flange, Ring Gear  
 TEL : +82-51-831-6274

**KSV**

Head Office : Youngdo-gu Busan  
 Homepage Add. : [www.ksv-valve.co.kr](http://www.ksv-valve.co.kr)  
 Main Products : Valve Spindle, Seat-Ring for marine Engine  
 TEL : +82-51-415-4466

**KTE CO., LTD.**

Head Office : Gangseo-gu Busan  
 Homepage Add. : [www.kte.co.kr](http://www.kte.co.kr)  
 Main Products : Electrical Equipment (Switchboard & Console)  
 TEL : +82-51-265-0255

**KUKDONG ELECOM CO., LTD.**

Head Office : Saha-gu Busan  
 Homepage Add. : [www.kukdongelecom.com](http://www.kukdongelecom.com)  
 Main Products : Navigation/Signal LT, EX-Plision Proof LT, Fluorescent LT  
 TEL : +82-51-266-0050

**KUKDONG INDUSTRIAL ENGINEERING.**

Head Office : Sasang-gu Busan  
 Homepage Add. : [www.kdie.co.kr](http://www.kdie.co.kr)  
 Main Products : Exhaust Gas Pipe With Insulation, Fuel Injection Pipe and Bloc  
 TEL : +82-51-303-6900

**KUKJE METAL CO., LTD.**

Head Office : Gangseo-gu Busan  
 Homepage Add. : [www.kjmetal.co.kr](http://www.kjmetal.co.kr)  
 Main Products : Manhole Cover, Portable Tank, EXH. Gas Pipe  
 TEL : +82-51-831-1541

**KUM HAW PRECISION CO.**

Head Office : Gangseo-gu Busan  
 Homepage Add. :  
 Main Products : Coupling Flange, Bellows Flange  
 TEL : +82-51-831-5685

**KUMKANG ENGINEERING.**

Head Office : Gangseo-gu Busan  
 Homepage Add. :

Main Products : Hand Rail, Storm Rail, Platform, Inc. Ladder  
 TEL : +82-51-831-0091

**KUMKANG PRECISION.**

Head Office : Saha-gu Busan  
 Homepage Add. : [www.kkmarine.co.kr](http://www.kkmarine.co.kr)  
 Main Products : Engine Parts, (Air Reservoir) & Valve  
 TEL : +82-51-262-4893

**KWANGIL CORP.**

Head Office : Sasang-gu Busan  
 Homepage Add. : [www.k-i.co.kr](http://www.k-i.co.kr)  
 Main Products : Stainless Steel, HR Coil  
 TEL : +82-51-324-0006

**KWANG JIN E.N.G CO., LTD.**

Head Office : Gangseo-gu Busan  
 Homepage Add. :  
 Main Products : Pipe Piece, Pipe Spool  
 TEL : +82-51-831-1435

**KWANG JIN IND. CO., LTD.**

Head Office : Gangseo-gu Busan  
 Homepage Add. :  
 Main Products : Part of Heat Exchanger  
 TEL : +82-51-831-4131

**KWANG JIN TECH.**

Head Office : Gangseo-gu Busan  
 Homepage Add. :  
 Main Products : Non Asbestos, Teflon, Rubber  
 TEL : +82-51-973-5566

**KWANG LIM MARINE TECH. CO.,LTD.**

Head Office : Sasang-gu Busan  
 Homepage Add. :  
 Main Products : Window Box, (STEEL, AL, SUS) Vent Hole  
 TEL : +82-51-313-0055

**KWANG SAN CO., LTD.**

Head Office : Gangseo-gu Busan  
 Homepage Add. : [www.kwangsan.com](http://www.kwangsan.com)  
 Main Products : Heating Coil unit, Expansion joint  
 TEL : +82-51-974-6301

**KWANGWOON CO.,LTD.**

Head Office : Youngdo-gu Busan  
 Homepage Add. : [www.kwang-woon.com](http://www.kwang-woon.com)  
 Main Products : Square Window, Side Scuttle, Door, Hatch, Window Wiper  
 TEL : +82-51-414-9494

**KYEONG SIN FIBER CO., LTD.**

Head Office : Gangseo-gu Busan  
 Homepage Add. : [www.ksfiber.co.kr](http://www.ksfiber.co.kr)  
 Main Products : Rudder Bearing Bush, Insulation  
 TEL : +82-51-831-0268

**KYOUNGWON BENDING CO.**

Head Office : Kimhae Gyeongsangnam-do  
 Homepage Add. : [www.bending4u.com](http://www.bending4u.com)  
 Main Products : Hwase Pipe, Chain, Locker  
 TEL : +82-55-313-1277

**KYUNGIL METAL CO., LTD.**

Head Office : Gangseo-gu Busan  
 Homepage Add. :  
 Main Products : Marine Equipment Plating, Head Rest Pipe Plating  
 TEL : +82-51-831-1677

**KYUNGSUNG INDUSTRY CO., LTD.**

Head Office : Gangseo-gu Busan  
 Homepage Add. : [www.e-clamp.com](http://www.e-clamp.com)  
 Main Products : Svs Corner & Anchor, Strip, Clamp  
 TEL : +82-51-831-4960

**LHE CO., LTD.**

Head Office : Kimhae Gyeongsangnam-do  
 Homepage Add. : [www.lhe.co.kr](http://www.lhe.co.kr)  
 Main Products : Heat Exchanger  
 TEL : +82-55-340-0624

**MANZU INDUSTRY CO., LTD.**

Head Office : Gangseo-gu Busan

Homepage Add. :  
 Main Products : Phosphate Coat, Pipe & Structure Painting, Special Painting  
 TEL : +82-51-832-0944

**MARINE RADIO CO., LTD.**

Head Office : Youngdo-gu Busan  
 Homepage Add. : [www.mrckorea.co.kr](http://www.mrckorea.co.kr)  
 Main Products : Public Addresser Sys, Common Aerial Sys.  
 TEL : +82-51-414-7891

**MARINE TECHNICAL ENGINEERING CO., LTD.**

Head Office : Sasang-gu Busan  
 Homepage Add. :  
 Main Products : Oily Water Separator, Bilge Alarm, Air Dryer  
 TEL : +82-51-831-1118

**MARSEN CO., LTD.**

Head Office : Gangseo-gu Busan  
 Homepage Add. : [www.marsen.com/](http://www.marsen.com/)  
 Main Products : Cargo Tank Monitoring System, Tank High/Overfill Alarm System  
 TEL : +82-51-831-2108

**MAX TECH.**

Head Office : Kimhae Gyeongsangnam-do  
 Homepage Add. : [www.maxtech21c.com](http://www.maxtech21c.com)  
 Main Products : Engine, Shock Absorper, Gasket  
 TEL : +82-55-327-9652

**MCM CO., LTD.**

Head Office : Gangseo-gu Busan  
 Homepage Add. : [www.mcm21.co.kr](http://www.mcm21.co.kr)  
 Main Products : Valve, Junction Box, Switch Cover  
 TEL : +82-51-832-0505

**MI JIN PRECISION.**

Head Office : Sasang-gu Busan  
 Homepage Add. :  
 Main Products : Valve, Tube, Vend, Pipe for ship  
 TEL : +82-51-315-3143

**MIJOO INDUSTRY CO., LTD.**

Head Office : Gangseo-gu Busan  
 Homepage Add. :  
 Main Products :  
 TEL : +82-51-831-1588

**MIRAE ENGINEERING CO., LTD.**

Head Office : Gangseo-gu Busan  
 Homepage Add. : [www.miraeship.co.kr](http://www.miraeship.co.kr)  
 Main Products : Hull Block, Steel Outfitting, Pipe Spool/Unit  
 TEL : +82-51-790-5800

**MJ TSR CO., LTD.**

Head Office : Gangseo-gu Busan  
 Homepage Add. : [www.mjtsr.com](http://www.mjtsr.com)  
 Main Products : Rubber Sheets & Hats, All Types of Parts for Shipbuilding & Industries  
 TEL : +82-51-832-0002

**MODERN INTECH CO., LTD.**

Head Office : Sasang-gu Busan  
 Homepage Add. :  
 Main Products : Curtain, Carpet, Upholstery, Mattress for Marine  
 TEL : +82-51-325-0260

**M.T.H CONTROL VALVES CO., LTD.**

Head Office : Gangseo-gu Busan  
 Homepage Add. :  
 Main Products :  
 TEL : 82-51-974-8831

**MYTEC CO., LTD.**

Head Office : Gangseo-gu Busan  
 Homepage Add. : [www.imytec.com](http://www.imytec.com)  
 Main Products : Heat Exchanger, Pressure Vessel  
 TEL : +82-51-831-7474

**NAMSUNG SHIPBUILDING CO., LTD.**

Head Office : Saha-gu Busan  
 Homepage Add. :  
 Main Products : Rescue Boat Davit & Winch, Assembly, Line Hauler  
 TEL : +82-51-200-1277

**NAMYANG METAL.**

Head Office : Gangseo-gu Busan  
 Homepage Add. :  
 Main Products : Stair Way Body, Bulk Head Hnlon, Galley Hood  
 TEL : +82-51-832-1721

**NARA CORPORATION CO., LTD.**

Head Office : Saha-gu Busan  
 Homepage Add. :  
 Main Products :  
 TEL : +82-51-790-7505

**NAVUTEC.**

Head Office : Kijang-kun Busan  
 Homepage Add. : www.navutec.com  
 Main Products : Fire fighting & Safety, equipment for marine & Offshore  
 TEL : +82-51-728-5055

**NEW-OHSEUNG CO., LTD.**

Head Office : Saha-gu Busan  
 Homepage Add. :  
 Main Products : Manifold, Spool piece, Chain compressor  
 TEL : +82-51-266-5724

**NK CO., LTD.**

Head Office : Saha-gu Busan  
 Homepage Add. :  
 Main Products : Ballast Water Treatment System, Co2 System  
 TEL : +82-51-204-2211

**NOKSAN FLANGE CO., LTD.**

Head Office : Gangseo-gu Busan  
 Homepage Add. :  
 Main Products : Flange for ship  
 TEL : +82-51-831-7956

**OBOK ELECTRIC CO., LTD.**

Head Office : Gangseo-gu Busan  
 Homepage Add. :  
 Main Products : Transformer  
 TEL : +82-51-832-1751

**OK KWANG ENG CO., LTD.**

Head Office : Gangseo-gu Busan  
 Homepage Add. : www.okv.co.kr  
 Main Products : Marine valves, Strainers  
 TEL : +82-51-326-7741

**OK KWANG METAL CO., LTD.**

Head Office : Gangseo-gu Busan  
 Homepage Add. : www.okkwang.com  
 Main Products : Std Flange, Tube Sheet, Forging Material  
 TEL : +82-51-831-9885

**ORIENTAL PRECISION & ENGINEERING CO., LTD.**

Head Office : Gangseo-gu Busan  
 Homepage Add. : www.opco.co.kr  
 Main Products : Deck house, Engine room Casing, Life Boat  
 TEL : +82-51-202-0101

**ORIENTAL PRECISION MACHINERY CO., LTD.**

Head Office : Gangseo-gu Busan  
 Homepage Add. : www.opco.co.kr  
 Main Products : Crane Component  
 TEL : +82-51-831-0202

**O.S.C.G CO., LTD.**

Head Office : Sasang-gu Busan  
 Homepage Add. : www.oscg.net  
 Main Products : Cable grand, Junction box  
 TEL : +82-51-305-3910

**PACO HITEC CO., LTD.**

Head Office : Saha-gu Busan  
 Homepage Add. : www.pacohitec.com  
 Main Products : Hydraulic hose, Fitting  
 TEL : +82-51-266-6994

**PAL MI METAL IND CO., LTD.**

Head Office : Jinhae Gyeongsangnam-do  
 Homepage Add. :  
 Main Products : Valve, Yoke, Fork, Knuckle, Carrier  
 TEL : +82-55-552-3840

**PANASIA CO., LTD.**

Head Office : Gangseo-gu Busan  
 Homepage Add. : www.worldpanasia.com  
 Main Products : Hi-level Alarm Sys. Tank level Gauge  
 TEL : +82-51-831-1010

**PI PLUS CO., LTD.**

Head Office : Gangseo-gu Busan  
 Homepage Add. : www.pharmaidsolutions.com  
 Main Products : Rudder stock, Pintle, Intermediate Shaft  
 TEL : +82-51-831-9338

**POONG JIN METAL CO., LTD.**

Head Office : Gangseo-gu Busan  
 Homepage Add. :  
 Main Products : Emergency Shut-Off Valve, Veneral Bronze Casting Valve  
 TEL : +82-51-831-8510

**PSM CO., LTD.**

Head Office : Gangseo-gu Busan  
 Homepage Add. : www.psmnc.co.kr  
 Main Products : Ring Flange, Shaft, Nozzle  
 TEL : +82-51-970-3000

**SAEJIN INTECH CO., LTD.**

Head Office : Kimhae Gyeongsangnam-do  
 Homepage Add. : www.saejinintech.com  
 Main Products : Emergency Towing, Arrangement, Universal Swivel Fairlead  
 TEL : +82-55-328-1458

**SAMBOO METAL CO., LTD.**

Head Office : Gangseo-gu Busan  
 Homepage Add. : www.samboometal.com  
 Main Products : Wheel, Shaft, Hyd-Net, Hyd Coupling Bolt, Flange  
 TEL : +82-51-831-1478

**SAMGONG CO., LTD.**

Head Office : Gangseo-gu Busan  
 Homepage Add. : www.sam-gong.co.kr  
 Main Products : Oil Purifiers, Ship' Accommodation, Ladders  
 TEL : +82-51-200-3040

**SAMJOO ENG. CO., LTD.**

Head Office : Saha-gu Busan  
 Homepage Add. : www.sam-joo.co.kr  
 Main Products : Catering Furniture, Galley Hood, Laundry Equipment  
 TEL : +82-51-264-6677

**SAMJUNG MACHINERY.**

Head Office : Gangseo-gu Busan  
 Homepage Add. :  
 Main Products : Piston Rod, Cross Head, Inter Shaft  
 TEL : +82-51-832-0190

**SAM KWANG HI-TEC CO., LTD.**

Head Office : Gangseo-gu Busan  
 Homepage Add. :  
 Main Products : Rectangle Windows  
 TEL : +82-51-832-0177

**SAMSUNG NONFERROUS METAL CO., LTD.**

Head Office : Kimhae Gyeongsangnam-do  
 Homepage Add. : www.metalsamsung.co.kr  
 Main Products : Bushing, Liner, Sleeve, Pintle Bush  
 TEL : +82-55-329-1067

**SAMYANG METAL IND. CO., LTD.**

Head Office : Saha-gu Busan  
 Homepage Add. : www.cuniship.com  
 Main Products : W-NT 90/10 Flange, Elbow, Tee  
 TEL : +82-51-266-6655

**SAMYOUNG FITTING.**

Head Office : Gangseo-gu Busan  
 Homepage Add. :  
 Main Products : Elbow, Tee, Coupling  
 TEL : +82-51-832-0211

**SDK CO., LTD.**

Head Office : Gangseo-gu Busan  
 Homepage Add. :

Main Products : Winch, Hatch  
 TEL : +82-51-832-1882

**SEAPLUS CO., LTD.**

Head Office : Gangseo-gu Busan  
 Homepage Add. : www.sea-plus.co.kr  
 Main Products : Low Pressure CO2, Fire Extinguishing Sys  
 TEL : +82-51-831-0119

**SEBO METAL CO., LTD.**

Head Office : Gangseo-gu Busan  
 Homepage Add. : www.sebometal.co.kr  
 Main Products : Pump Tower for LNG, Vent Mast  
 TEL : +82-51-970-0200

**SEBO TECH CO., LTD.**

Head Office : Gangseo-gu Busan  
 Homepage Add. :  
 Main Products : Windwall, Heat Shield, Manual Hatch  
 TEL : +82-51-831-4171

**SEIL SERES CO., LTD.**

Head Office : Gangseo-gu Busan  
 Homepage Add. : www.seilseres.com  
 Main Products : VRC system, ODME  
 TEL : +82-51-831-1858

**SEJIN BOLT CO., LTD.**

Head Office : Gangseo-gu Busan  
 Homepage Add. :  
 Main Products : Bolt, Nut & Be, Double Nut, Chard Nut, Hinge Bog  
 TEL : +82-51-831-9832

**SEUNG JIN E.N.G.**

Head Office : Gangseo-gu Busan  
 Homepage Add. :  
 Main Products : Pipe Spool (Steel)  
 TEL : +82-51-831-9050

**SEUN STEEL CO., LTD.**

Head Office : Jin-gu Busan  
 Homepage Add. : www.seunsteel.co.kr  
 Main Products : CR, HGL, CGL, EGL  
 TEL : +82-51-639-3200

**SEWOONG PRECISION MACHINERY CO., LTD.**

Head Office : Gangseo-gu Busan  
 Homepage Add. :  
 Main Products :  
 TEL : +82-51-831-0595

**SEYANG HIGH-TECH**

Head Office : Gangseo-gu Busan  
 Homepage Add. :  
 Main Products : Water & Oil Strainer, Condensate Chlorination Tank  
 TEL : +82-51-831-9125

**SHILLA E&T CO., LTD.**

Head Office : Gangseo-gu Busan  
 Homepage Add. :  
 Main Products : Spot Cooler, Heat Exchanger, Pressure Yeses  
 TEL : +82-51-831-7705

**SHINDONG DIGITECH CO., LTD.**

Head Office : Dong-gu Busan  
 Homepage Add. : www.shindong.com  
 Main Products : Navigation Communication, Satellite Communication  
 TEL : +82-51-461-5000

**SHINHWA INTERIOR & TECHNOLOGY CO., LTD.**

Head Office : Saha-gu Busan  
 Homepage Add. :  
 Main Products : Marine Furniture  
 TEL : +82-51-441-1294

**SHINKWANG ACE ELECTRIC CO., LTD.**

Head Office : Kimhae Gyeongsangnam-do  
 Homepage Add. : www.skace.com  
 Main Products : Cable Tray, Accessories  
 TEL : +82-55-332-3315

**SHINMYUNG INDUSTRIAL CO., LTD.**

Head Office : Gangseo-gu Busan

Homepage Add. :  
Main Products : Cable Tray Joint, Hanger  
TEL : +82-51-831-5061

#### **SHIN SHIN HEAVY INDUSTRIES CO., LTD.**

Head Office : Gangseo-gu Busan  
Homepage Add. :  
Main Products : Deck Machinery, Hydraulic system, Surface Treatment  
TEL : +82-51-832-0734

#### **SHIN SHIN MACHINERY CO., LTD.**

Head Office : Kijang-kun Busan  
Homepage Add. : www.sspump.com  
Main Products : Centrifugal Pumps, Gear Pumps, Screw Pumps  
TEL : +82-51-727-5300

#### **SHINWOO METAL CO., LTD.**

Head Office : Gangseo-gu Busan  
Homepage Add. : www.shinwoometal.net  
Main Products : Flange, Forging  
TEL : +82-51-831-2830

#### **SHIN YOUNG AIR CLUTCH.**

Head Office : Gangseo-gu Busan  
Homepage Add. : www.airclutch.co.kr  
Main Products : SY-CB Type, SY-VC Type, SY-E Type  
TEL : +82-51-831-7072

#### **SILLA METAL CO., LTD.**

Head Office : Gangseo-gu Busan  
Homepage Add. : www.sillametal.com  
Main Products : PROPELLER(F.P.P), C.PPROPELLER Blade & Hub  
TEL : +82-51-831-5991

#### **SIN HUENG FLANGE CO., LTD.**

Head Office : Gangseo-gu Busan  
Homepage Add. :  
Main Products : Flange for ship  
TEL : +82-51-831-6167

#### **SINWEOL GRATING CO., LTD.**

Head Office : Sasang-gu Busan  
Homepage Add. : www.steelgrating.net  
Main Products : Steel Grating for Ship  
TEL : +82-51-323-7000

#### **SMS CO., LTD.**

head office : Saha Gu Busan  
homepage add : www.sms-marinesystem.com  
main products : hatch-pontoon type, folding type, side rolling type, etc. lashing equipment-2/3tier  
TEL : +82 51-290-1000

#### **SM POWER TEC CO., LTD.**

Head Office : Gangseo-gu Busan  
Homepage Add. : www.smpo.co.kr  
Main Products : Vacuum Pump for Shipping Bldc, AC,DC Motor & Generator  
TEL : +82-51-973-0267

#### **SNP CO., LTD.**

Head Office : Saha-gu Busan  
Homepage Add. :  
Main Products : Galley Equipment, Cold Chamber, Catering Furniture  
TEL : +82-51-261-7711

#### **STACO CO., LTD.**

Head Office : Gangseo-gu Busan  
Homepage Add. : www.staco.co.kr  
Main Products : Wall Panel, Ceiling Panel, Unit Toilet, Marin Door  
TEL : +82-51-831-7000

#### **STA-JH CO., LTD.**

Head Office : Gangseo-gu Busan  
Homepage Add. :  
Main Products : Welding Fittings (Butt Welding)  
TEL : +82-51-831-1274

#### **STASB CO., LTD.**

Head Office : Jinhae Gyeongsangnam-do  
Homepage Add. :

Main Products : Marine Furniture, Door  
TEL : +82-55-544-8070

#### **STAUFF KOREA LTD.**

Head Office : Saha-gu Busan  
Homepage Add. : www.stauff.co.kr  
Main Products : Hyd' System & Engineering, Hyd' Clamp & Test  
TEL : +82-51-266-6666

#### **STBEND CO., LTD.**

Head Office : Gangseo-gu Busan  
Homepage Add. : www.stbend.co.kr  
Main Products : SUS Pipe Fitting, SUS Bend  
TEL : +82-51-831-5131

#### **STEEL KOREA CO., LTD.**

Head Office : Jinhae Gyeongsangnam-do  
Homepage Add. :  
Main Products :  
TEL : +82-55-541-2212

#### **SUHHEUNG ENGINEERING CO., LTD.**

Head Office : Gangseo-gu Busan  
Homepage Add. : www.shge.co.kr  
Main Products : Steel Grating  
TEL : +82-51-831-1811

#### **SUNBO IND CO., LTD.**

Head Office : Saha-gu Busan  
Homepage Add. : www.sunboind.co.kr  
Main Products : Tank Top Unit, Engine Room unit, Sater Strainer Silenser  
TEL : +82-51-261-3454

#### **SUNG CHANG CO., LTD.**

Head Office : Gangseo-gu Busan  
Homepage Add. :  
Main Products : Non-Asbestos Gasket, Spiral Wound Gasket, P.T.F.E Gasket  
TEL : +82-51-316-6300

#### **SEOUNG HYUP MACHINERY.**

Head Office : Sasang-gu Busan  
Homepage Add. :  
Main Products : White Metal, Piston Lo  
TEL : +82-51-303-4112

#### **SUNG IL CO., LTD.(SIM)**

Head Office : Gangseo-gu Busan  
Homepage Add. : www.sungilsim.com  
Main Products : Pipe Spool Pre-Fabrication, Induction Pipe Bending  
TEL : 82-51-831-8800

#### **SUNG KWANG M/C.**

Head Office : Gangseo-gu Busan  
Homepage Add. :  
Main Products : Oil Press, Pipe Vending, Pipe Fitting Unit  
TEL : +82-51-831-0620

#### **SUNGWON ELECTRIC CO.**

Head Office : Gangseo-gu Busan  
Homepage Add. :  
Main Products : Cable Tray, Starter, Panel, Cable Way  
TEL : +82-51-831-9230

#### **SUNG WON ENTERPRISE CO., LTD.**

Head Office : Gangseo-gu Busan  
Homepage Add. : www.sungwonent.co.kr  
Main Products : V-Flow Swing Check, Valves, Manifold Unit  
TEL : +82-51-831-2140

#### **SUNIL INSTRUMENT CO., LTD.**

Head Office : Gangseo-gu Busan  
Homepage Add. : www.suniltech.co.kr  
Main Products : Tank Level System, Viscosity System  
TEL : +82-51-831-1994

#### **SUN KWANG P.S.P INC. CO., LTD.**

Head Office : Gangseo-gu Busan  
Homepage Add. :  
Main Products : Cargo Line, Ballast Line, Engine Room, I.G Line  
TEL : +82-51-831-3777

#### **S&W CO., LTD.**

Head Office : Saha-gu Busan  
Homepage Add. : www.snwcorp.com  
Main Products : Com Shaft, Valve, Seat, Piston Pin, Bolt, Nut  
TEL : +82-51-205-7411

#### **TAE HWA INDUSTRY CO.,LTD (THI)**

Head Office : Seocho-gu Seoul  
Homepage Add. : www.thi.co.kr  
Main Products : Reciprocating & Screw, Compressor Unit, Brine/ Water Chiller Unit  
TEL : +82-2-598-1126

#### **TAEHWA KALPA SEAL.**

Head Office : Gangseo-gu Busan  
Homepage Add. : www.taehta1.com  
Main Products : TH3000, TH3000W  
TEL : +82-51-831-9944

#### **TAE KWANG INDUSTRIES.**

Head Office : Gangseo-gu Busan  
Homepage Add. : www.tkic.co.kr  
Main Products : Boiler, Oil Cooler / Heater, Shell & Tube Heat Exchanger  
TEL : +82-51-831-1801

#### **TAESHIN G & W CO., LTD.**

Head Office : Gangseo-gu Busan  
Homepage Add. : www.taeshin.co.kr  
Main Products : Co2 / Mag, Mig Arc Welding, Machine, Air Gouging  
TEL : +82-51-831-1100

#### **TAESUNG MACHINERY CO., LTD.**

Head Office : Gangseo-gu Busan  
Homepage Add. : www.taesungmc.co.kr  
Main Products : Manufacture of Structures, for Shipbuilding(LNG,LPG) and plant  
TEL : +82-51-971-4006

#### **TAEWON CO., LTD.**

Head Office : Gangseo-gu Busan  
Homepage Add. : www.twubc.kr  
Main Products : Flange, Strainer, Pressure  
TEL : +82-51-831-0310

#### **TAEWOONG CO., LTD.**

Head Office : Gangseo-gu Busan  
Homepage Add. : www.taewoong.com  
Main Products : Piston Rod/ Crown/ Head, Cross Head Pin  
TEL : +82-51-329-5000

#### **TAEWOONG TECH CO., LTD.**

Head Office : Gangseo-gu Busan  
Homepage Add. :  
Main Products : Main Shaft, Connecting Rod, Inter Shaft, Propeller Shaft  
TEL : +82-51-831-6685

#### **TANKTECH CO., LTD.**

Head Office : Gangseo-gu Busan  
Homepage Add. : www.tanktech.co.kr  
Main Products : High velocity valve  
TEL : +82-51-979-1600

#### **TK CORPORATION CO., LTD.**

Head Office : Gangseo-gu Busan  
Homepage Add. : www.tkbcnd.co.kr  
Main Products : Fittings (Elbow, Tee, Reducer, Cap)  
TEL : +82-51-970-6600

#### **TMC CO., LTD.**

Head Office : Kimhae Gyeongsangnam-do  
Homepage Add. : www.besttmc.com  
Main Products : Membrane Sheets, Heavy Steel Corner, Anchor Strip  
TEL : +82-55-340-3000

#### **TYCO MARINE SERVICES KOREA CO., LTD.**

Head Office : Sasang-gu Busan  
Homepage Add. : www.dbefire.com  
Main Products : Fire Fighting System & Equipment  
TEL : +82-51-633-9100

**U-YOUNG PRECISION IND. CO., LTD.**

Head Office : Kimhae Gyeongsangnam-do  
 Homepage Add. : u-nex.com/  
 Main Products : Elec/Hyd. Windless, Elec/Hyd, Winch, Steering Gear  
 TEL : +82-55-326-9691

**U-YOUNG & TECH.**

Head Office : Kimhae Gyeongsangnam-do  
 Homepage Add. : u-nex.com/  
 Main Products : Elec/Hyd. Windless, Elec/Hyd, Winch, Steering Gear  
 TEL : +82-55-326-9691

**WON KWANG VALVE CO., LTD.**

Head Office : Gangseo-gu Busan  
 Homepage Add. : www.wonkwangvalve.com  
 Main Products : Marine Globe Valve, Marine Angle Valve, Marine Gate Valve  
 TEL : +82-51-831-9932

**WOONG CHEON OUTFITTING CO., LTD.**

Head Office : Jinhae Gyeongsangnam-do  
 Homepage Add. :  
 Main Products : Ship Component Parts, Painting, Deck Machinery  
 TEL : +82-55-545-2432

**WOOSUNG FLOWTEC CO.**

Head Office : Gangseo-gu Busan  
 Homepage Add. :  
 Main Products : Simplex Oil Strainer, Can Water Filter  
 TEL : +82-51-831-1531

**WOORYANG B&P IND CO., LTD.**

Head Office : Gangseo-gu Busan  
 Homepage Add. : www.wooryangshot.com  
 Main Products : Deck Outside Monting Item, Engine Room Mounting Item  
 TEL : +82-51-831-5000

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Gastech 2014 컨퍼런스 & 전시회

# Gastech 2014 공식 지정 매체 '월간 KORSHIP'

— 2014년 3월 KINTEX 개최

Gastech은 영국 DMG사 주관으로 18개월 주기로 개최되는 국제 가스 전시회입니다.

'Gastech 2014'는 한국가스공사 주최로 일산 킨텍스(KINTEX)에서 2014년 3월 24일부터 27일까지 4일간 개최됩니다. 세계 각국의 에너지 분야 장관 및 차관급 VIP, 글로벌 에너지 기업 및 관계자 등 약 40,000명 이상이 참관할 예정입니다.

월간 KORSHIP은 'Gastech 2014'의 공식 매체로서 행사기간 동안 귀사의 홍보 및 마케팅에 도움을 드리고자 합니다.

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Gastech 2014와 관련해 잡지 광고 및 기사 게재, 그리고 카달로그 모음집에 관심 있는 업체는 문의 바랍니다.

\* Gastech 전시회의 참가업체 및 자세한 정보는 해당 홈페이지([www.gastechkorea.com](http://www.gastechkorea.com))에서 얻을 수 있으니 참고 바랍니다.

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