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Dimension(W x L x H)	M	1.5x 2.6 x 1.9	2.1 x 4.4 x 2.1	2.1 x 4.7 x 2.2	2.2 x 5.2 x 2.1	2.3 x 5.8 x 2.6	4.4 x 8.0 x 4.3	6.5 x 13 x 7.0
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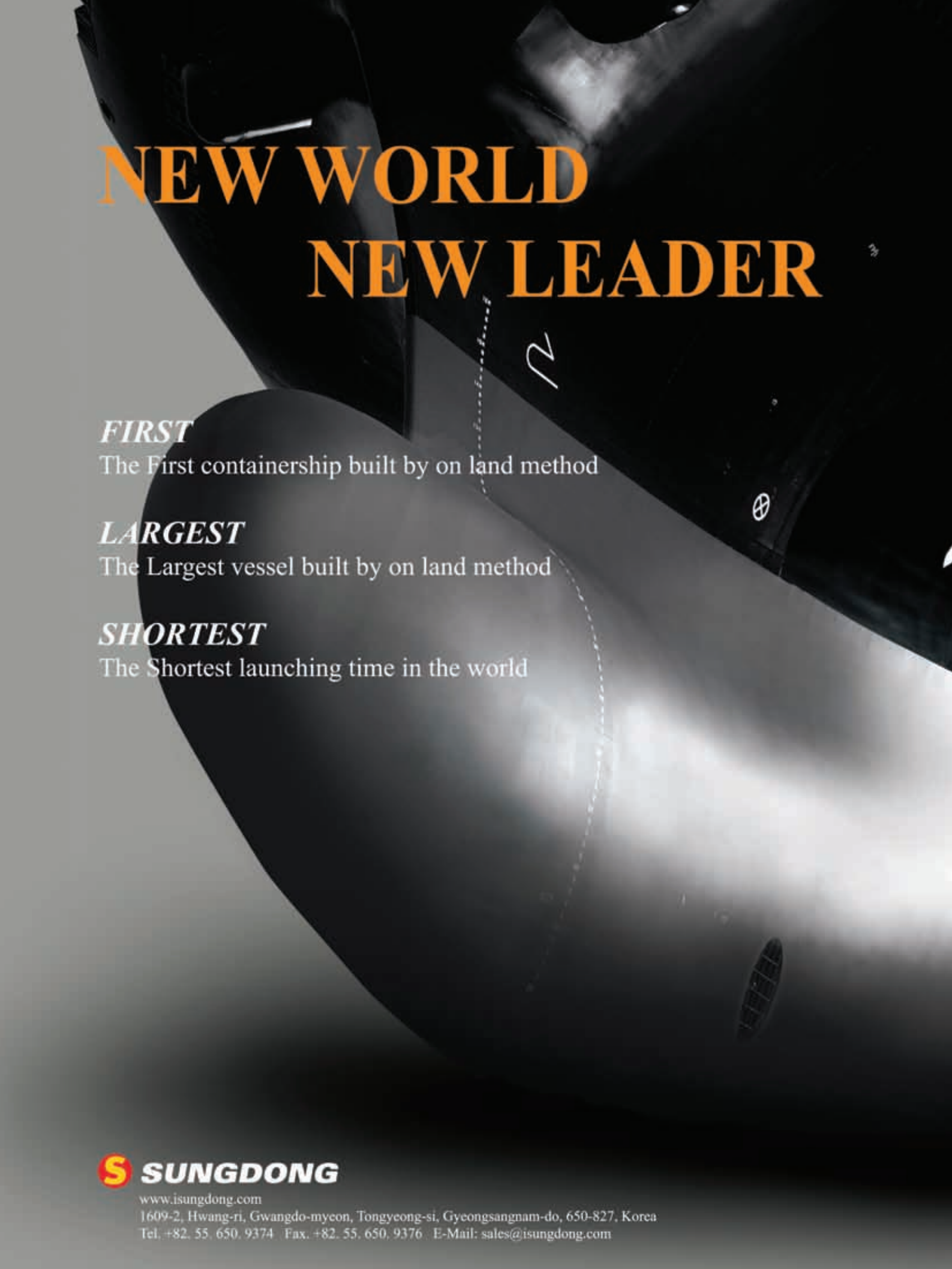

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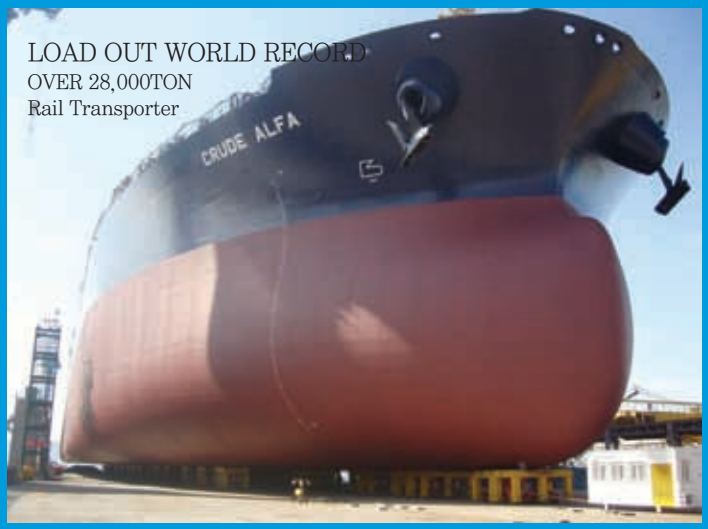

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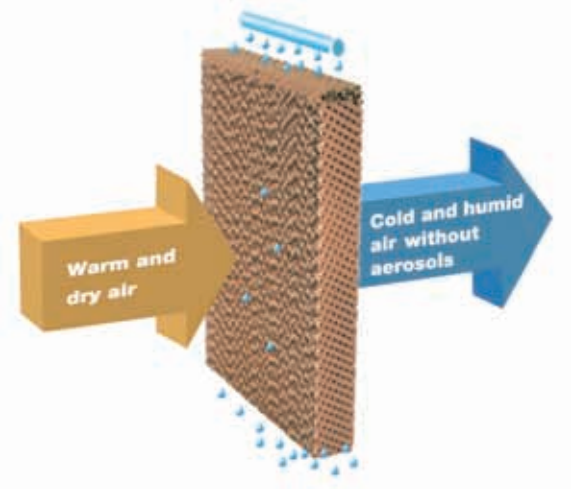
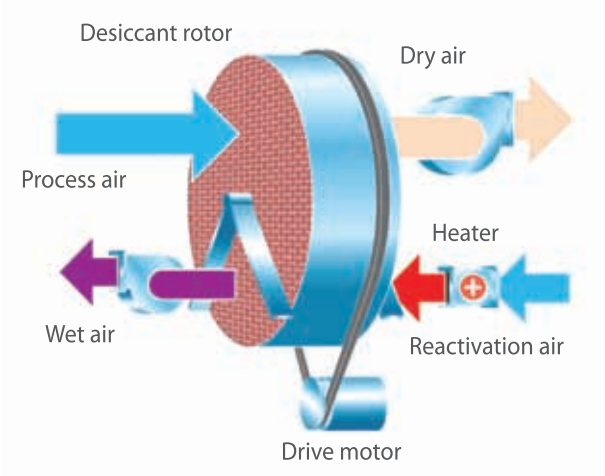


The principle of evaporative humidification and cooling



The principle of desiccant dehumidification

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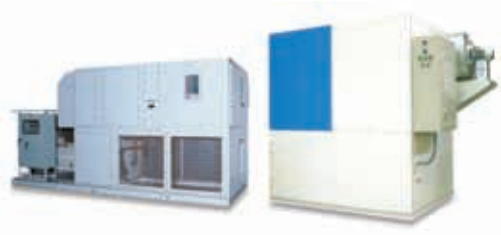

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Hyundai Heavy Industries delivered its second hybrid patrol vessel

Hyundai Heavy Industries (HHI) delivered its second hybrid patrol vessel to Korea Coast Guard

On July 23, HHI held the naming ceremony and launching ceremony on the dock of special ship at its Ulsan headquarters for a 3,000-ton class patrol vessel named 'Taepyungyang 10'.

The launching ceremony held on that day was attended by about 70 officials, including Oh Byung-wook, President of HHI, Lee Gil-beom, Commissioner of Korea Coast Guard, who congratulated the successful construction of the vessel.

The vessel is 112.7 meters in length and 14.2 meters in width with a maximum speed of 28 knots (approximately 51km/h). Mounted with two 10,000 h.p. diesel engines and one 750kW electric motor, the vessel can be powered by the electric motor alone when sailing at low speed. Specifically, this eco-friendly vessel which uses two different engines improved the fuel efficiency and reduced vibration and noise remarkably.

'Taepyungyang 10', a 3,000-ton patrol vessel built by HHI

Moreover, this vessel is equipped with two high speed single boat capable of sailing at a speed of 40 knots and fire-fighting equipment capable of spraying 20 tons of water per minute. It can be used for marine and coast patrol, and rescue and salvage operations even in bad weather.

JUNJIN CSM released its first 60-ton truck crane

JUNJIN CSM held a ceremony on July 30 to celebrate the release of its first new 60-ton truck crane (model name : JK600T) at the Asan headquarters in Chungnam, a province in the west of South Korea. During the ceremony, the key of luck was offered to customers purchasing its first 60-ton truck, hoping business prosperity of customers and steady introduction of its 60-ton truck crane to the market.

The 60-ton truck of JUNJIN CSM, which was released this time, was designed with the domestic technology for the first time nationwide. It completed the validation of performance through the rough terrain driving and lifting ability test, and has been highly recognized for its potentials even by the national defense industry, as well as customers of crane, through customer demonstrations which were performed several times.

JUNJIN CSM held a ceremony to celebrate the release of its first new 60-ton truck crane at its headquarters on July 30.

Meanwhile, the axial load has become a matter that should be considered the most important in the Korean market since the advance notice of legislation, a revision (draft) of Enforcement Decree of the Road Act, stipulating the imposition of penalty, instead of fine, on progressive basis against any violation of the regulation pursuant to heavy vehicles. However, this truck crane of JUNJIN CSM is noticeable for resolving such problems by applying five axis.

JUNJIN CSM completed the development of 30-ton crane prototype to build the movable crane lineup and is currently validating its performance.

The company plans to complete the development of crawler crane prototype within this year.

Taihan Electric Wire sold its equity in TMC for KRW 46 billion

Taihan Electric Wire announced through public notification on July 29 that it entered into an Agreement to sold its entire equity in TMC among its investment assets.

Taihan Electric Wire which has 39.22% (2.2 million shares) equity in TMC signed the Agreement on July 29 to sell its entire equity to president Song Moo-hyun, the largest shareholder of TMC, for KRW 46 billion.

Taihan Electric Wire acquired 39.22% of equity in TMC in May 2005 by investing KRW 9.9 billion. TMC, a producer of ship cables and optical cables, is headquarted at Ipjang-myeon (subcounty), Cheonan City, Chungnam, a province in the west of South Korea.

A source from Taihan Electric Wire said, "Our financial restructuring and business restructuring have gained momentum with the establishment of Restructuring Committee in June. This sale of equity in TMC is the first positive outcome, and we will make efforts to strengthen the financial healthiness steadily."

STX Group makes a full-fledged foray into the shipbuilding market of Russia

STX Group laid the cornerstone for advancing into the shipbuilding and marine market of Russia.

STX signed on July 26 a memorandum of understanding (MOU) with Russia's state-owned USC (United Shipbuilding Corporation) to support the relocation of shipyard and jointly establish technology center to develop ships for the Arctic area.

USC is a state-owned company, established in 2007 by former President Putin, with 100% of the shares of which being owned by the government. It is committed to the development of policies for the modernization of Russia's shipbuilding industry, integration by region, and investment, etc.

Kim Dae-yoo (right), President of STX, and Roman Trotsenko (left), President of USC, met with each other in Moscow on July 26 and signed the MOU.

Under the MOU, STX will not only help USC's Admiralty Shipyard move into new shipyard by supporting the shipyard design, providing construction support/workforce training, and transferring shipyard operation know-how, and but also jointly establish Arctic Shipbuilding Technology Center in the STX Finland's shipyard in Helsinki.

A source from STX said, "The STX Europe's Shipyard in Finland was selected as th partner of USC for its geographic proximity to the western part of Russia and its expertise and know-how related to the Arctic development."

This MOU will give STX the prior negotiating rights to the business related to the shipbuilding and the modernization of shipyards in the western part of Russia through STX Europe, and pave the way for STX to advance into the Russian shipbuilding market.

Kim Dae-yoo, President of STX, said, "In Russia, there will be many projects to develop the western region and polar region, and I anticipate that this MOU will lead to the creation of many business opportunities not only for the modernization of shipyards but also for the resource exploitation and transportation in the polar region."

Korean Register of Shipping was nominated Cooperating Organization for Standards Development by the Korean Agency for Technology and Standard

Korean Register of Shipping was named Cooperating Organization for Standards Development (COSD) by the Korean Agency for Technology and Standard on July 21 in the field of shipbuilding and maritime technology.

As a result, Korean Register of Shipping will develop and manage the national industrial standard over the upcoming

three years in relation to ▲shipbuilding and maritime technology (ISO/TC8), ▲life-saving facilities and fire-fighting (ISO/TC8/SC1), ▲marine environment protection (ISO/TC8/SC2), ▲ship design (ISO/TC8/SC8), ▲complex and coastal transportation and inland navigation (ISO/TC8/SC11), ▲marine energy (IEC /TC114), and electric facilities of floating and fixed offshore structures (IEC/TC18) for a total of 300 KS types.

Korean Register of Shipping, which will perform the duties relating to the development and management of national standard in the corresponding field, plans to spearhead the efforts to expand the standardization capabilities of domestic shipbuilding and marine industry by laying the foundation for the standardization of domestic shipbuilding and marine industry, proceeding with the project to improve the technology for standardization, supporting the standardization in the private-sector, and fostering experts in the field of standardization.

Furthermore, it plans to play a leading role to promote the advancement of marine industry by embracing the opinion of marine industry in developing international standard, cope with the development of related standard in the international marine organization, achieve the international standard based on domestic technology early than any others.

A source from Korean Register of Shipping, remarked, "Nominated as the Cooperating Organization for Standards Development this time, Korean Register of Shipping will be responding swiftly to the need for the development of standard and market demand by working closely with the government, and shipbuilding and marine industry, which will make it easier to put the level of national standard on par with that of advanced countries in order to beef up the competitiveness in the global market."

Cooperating Organization for Standards Development (COSD) refers to the private-sector organization committed to the development and management of national standard such as the survey of demand for the development of standard commissioned by the government, review of technology, embracement of opinion, generation of standard, etc, as well as the administrative processing such as the review and notification of national standard which the government supervises.

Hyundai Wia exported the world's largest goliath crane

Hyundai Wia announced that it recently built and exported goliath crane capable of lifting up to 3,000-ton load, the world's first.

Hyundai Wia completed the installation of two 1,500-ton goliath cranes in Estaleiro Atlantico Sul (EAS) in Brazil, the largest shipyard in Latin America. That is the world's most powerful goliath crane, able to lift up to 3,000 ton when one operator maneuvers and operates two goliath cranes at the same time via the state-of-art wireless electronic control system. 3,000 ton is equivalent to the total weight of about 2,200 Hyundai Motor Sonata cars.

The goliath crane built by Hyundai Wia this time is 164 meters wide and 110 meters

Goliath crane, the world's largest, installed by Hyundai Wia at Estaleiro Atlantico Sul Shipyard of Brazil

high, which is larger than two soccer fields combined, and priced at $68.64 million (approximately KRW 80 billion), and the ocean freight to the shipyard in Brazil costs as much as about KRW 10 billion.

Specifically, the wireless electronic control system simplifies work process and reduces the cost of maintenance and repair remarkably, which was adopted in stead of the wired cable connections for simultaneous operation.

Currently, government has provided support at the policy level to stimulate the shipbuilding market growth in the heavy industry sector of Latin American countries, including Brazil. The industry considers that the export this time laid the groundwork for massive inflow of order for Hyundai Wia.

Ministry of Land, Transport and Maritime Affairs named organizations that would support the cultivation of ship finance professionals

The Ministry of Land, Transport and Maritime Affairs nominated the organization that would carry out the project aiming to foster ship finance professionals in an endeavor to cultivate highly specialized ship finance experts equipped with up-to-date knowledge of shipping and financing techniques and international interpersonal network. This consortium is composed of the selected three organizations, that is Korea Maritime University, Korea Banking Institute, Korea Maritime Research Institute, which will be committed to the cultivation of experts in the global ship finance. Three organizations applied for the consortium consolidating their strength because ship finance requires expertise in various fields, encompassing the law and accounting, on the basis of maritime and financing fields.

Shipping industry is a capital-intensive industry involving high-priced vessels, and the capital supply environment is affected very much by economic ups-and-downs. In Korea, there has been a growing need to expand the capability of ship finance in the private sector because companies purchase vessels at high price during the economic boom to seek maximization of their immediate profits while they sell low price vessels during the economic doldrums to cope with the liquidity crisis.

So far, the government has pushed ahead vigorously with the cultivation of professional manpower in an endeavor to strengthen the capability of financing at the policy level such as the restructuring ship fund which aims to help shipping industry wriggle out of the crisis, expand the ability to prevent the recurrence of crisis, improve the ability to cope with crisis, and respond effectively to the market restructuring.

To foster ship finance professionals, KRW 1.6 billion will be invested over the four years for those working in the maritime and financial sectors. KRW 100 million will be invested in the domestic retraining courses (for 10 people) in 2010, the first year of the project. From 2011 to 2013, KRW 500 million will be invested every year to support the domestic retraining courses (for 20 people) and the short-term/long-term overseas training courses for 10 people annually.

Meanwhile, the government said that domestic and overseas training courses would not only help expand the expertise, stimulate the formation of interpersonal network among those working in the maritime and financial sector, increase the number of domestic ship finance professionals, which will help domestic maritime industry gain ground and grow further in the global ship finance and charter market.

Hyundai Mipo Dockyard has moved in full swing with the construction of asphalt carrier

Hyundai Mipo Dockyard (HMD) announced that it moved into full gear to build asphalt carrier, a high value-added special ship, while making steady progress in the diversification of ship types recently in a bid to strengthen competitiveness.

HMD held a steel-cutting ceremony on August 13 at the Seongak 1B factory for its first 6,000-ton asphalt carrier ordered from Vroon of the Netherlands.

The no. 2300 vessel which began to be built in full swing from that day is the first one among four 6050-dwt asphalt carriers ordered from Vroon in December last year.

The block assembly is set to begin on the Dock no. 3 from late October. This vessel will measure 110 meters in length, 18.2 meters in width, and 9.8 meters in height,

Asphalt carrier of Hyundai Mipo Dockyard

and can carry various loads such as asphalt, cortar, heavy oil, diesel oil, and others, and consist of two independent tanks. In addition, this vessel is equipped with thermal oil boiler, etc, which keeps the asphalt from being dried and maintains the temperature inside the tank up to 230°C while sailing.

Samsung Heavy Industries completed the construction of wind power generator facility

Samsung Heavy Industries (SHI) completed the construction of its wind power generator facility with an annual production capacity of 500MW, and held the completion ceremony on August 19 with the attendance of President Roh In-sik and about 200 employees. Built inside Hannae Shipbuilding Specialized Industrial Complex of Rural Areas, Yeoncho-myeon (subcounty), Geoje City, which faces Geoje Shipyard of SHI over the 2km wide sea, this facility is capable of producing more than two hundred 2.5mW-class wind power generators per annum.

This facility measuring 15,000m^2 is built on approximately 32,000m^2 land and, and consists of assembly factory, mechanical processing and painting factory, material warehouse, etc, and is equipped with 40 types of machines, including wind power generator's main shaft assembly equipment.

Specifically, this factory has applied the 'flow production system' for the first time nationwide and maximized the production efficiency by installing dedicated equipment for each production process to increase the efficiency of automation. Flow production system refers to the method in which workers handle the production process with prepared parts and tools at the assigned position while the wind power generator being assembled passes consecutively from operation to operation until completed according to the production process like the assembly line of automobile factory.

So far, wind power generator factories built in Korea have adopted the arrangement production system in which products are gathered at one place and workers carry the parts and equipment when assembling.

The completion ceremony held on August 19 for the wind power generator facility with an annual production capacity of 500mW

Ministry of Land, Transport and Maritime Affairs approved the restructuring shipping fund for purchasing one additional newly built bulk carrier

Ministry of Land, Transport and Maritime Affairs approved on August 12 'Camco Global 25th Ship Investment Company', a shipping fund for restructuring. The government approved 18 restructuring fund (KRW 580 billion) according to the first measure (April 2009) to overcome the shipping industry crisis and granted additional approval of 6 restructuring fund (KRW 180 billion) after the second measure (November 2009) focusing on the improvement in the fund operation structure was taken (March 2010, June 2010)

This fund is a restructuring shipping fund for purchasing newly built bulk carriers which Korea Line Corporation ordered to STX Dalian. Its structure, such as the specification of ship (57,000DWT), fund size (KRW 39.1 billion), financing (senior financing for DVB - 40%, subordinated financing for Camco - 60%), charter contract (Sale & Leaseback, BBCHP at four-year maturity), etc, is identical to that of Camco Global which was approved on June 30.

The shipping market has been rebounding in overall sense from the beginning of 2010, but the bulk market condition has shown unstability such as the short-term jump and nosedive.

The government has considered that such a trend arose from the unexpected change in the demand, such as the sharp decline in the demand for imported Chinese iron ore, pressure on the supply due to the backlog of new shipbuilding order, and

external factors stemming from the uncertainty over world economy, despite the rebounding global volumes.
In addition, the government said that shipbuilders would need to make constant efforts to improve business management to prevent the recurrence of crisis, and the restructuring fund was playing a supportive role.
Also, it called for shipbuilders to fully take advantage of this restructuring fund approved recently because 100% financing is provided, without the need for bearing own expense, to shipping companies which take over newly built vessels as a result of the improvement in the fund operation policy, stressing that this fund significantly helpful will be useful for shipping companies that plan efficient restructuring.
The ship management works, etc, pursuant to the restructuring fund will be contracted out to Camco Shipping Operation.

Midas IT will hold a forum to announce new Midas NFX

Midas IT, a domestic developer of structural analysis software, will held a forum at Seoul Construction Hall on October 1 to launch 'Midas NFX', a multi-discipline integrated optimal design solution for mechanical sector.
In this forum, Midas IT plans to provide an opportunity for ordinary designers to carry out various structural, thermal, fluid analysis - which are required for the product design - and effectively perform the optimal design, the ultimate purpose, as part of effort to ratchet up the competitiveness of product and facilitate the improvement of design productivity.
Besides, the company will offer various events for direct experience with Midas NFX solution which requires brief and intuitive work environment and simple learning for practical application.

Rockwell Automation acquired TüV safety certification for emergency stop switch

Rockwell Automation recently acquired TüV certification for the B10d functional safety rating on Allen-Bradley emergency-stop switch product range.
This safety certification allows users to take the certified safety product data and include the data of these products in calculating the safety level of entire safety control system. This will help not only increase worker safety because designers have far greater insight into when components, like emergency stop switch, will have to be replaced, but also ensure the reliability of safety control system.
Emergency stop switch is a very important safety component for automation system, and used to stop the motion to prevent injury of workers or damage to machinery. For example, in the case of an emergency that can culminate into a hazardous situation, the operator can press the emergency stop switch to stop the equipment and preclude the risk to the worker or the system.
The B10d rating further cements the market leadership of Allen-Bradley push button product category, which has been highly recognized in the industry for ingress protection sealing technology, low voltage switching capability and superb reliability.
With a number of companies self-certifying for this safety rating, Allen-Bradley emergency stop switch was finally approved through strict evaluation and validation carried out by TüV Rheinland. TüV Rheinland is a leading international service group providing certification service for the safety, product quality, systems, and services.
Kim Sang-soo, Director in overall charge of Drive & Component Marketing at Rockwell Automation, said, "Earning the certification form internationally recognized standard organization, Rockwell Automation will keep maintain top position as global leader in the sector of equipment and process safety." He stressed, saying "We have been helping our customers protect workers, improve the performance of equipment, and ultimately increase the productivity by elevating overall functional safety of automation system."

Allen-Bradley emergency stop switch

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(Korea International Shipbuilding and Marine Exhibition)

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Marine Tech Korea 2010 will be open with great eclat at Changwon Exhibition Convention Center, Gyeongsangnam-do, which is the hub of LNG carrier and offshore plant construction technology, and Monthly Korship will keep you updated with the latest news swiftly during the show as the official media of Marine Tech Korea 2010 and we appreciate your cooperation in advance.

Marine Tech Korea 2010 will run from October 20 to October 23 at Changwon Exhibition Convention Center (CECO).
Our daily news will have a circulation of 6,000 every day during the show.

Contact Monthly Korship or K. Fairs for inquiries or suggestions for the daily news article related to Marine Tech Korea 2010 or advertisement in the print edition. (Deadline Date : September 20th, 2010)

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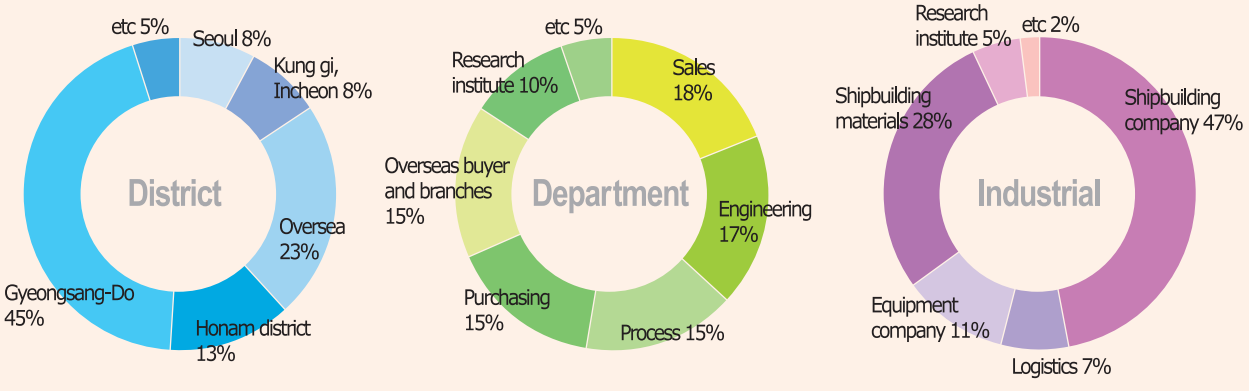

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Brazil, an attractive market

Current status and prospect of Brazilian shipbuilding market

In the 1970s and 1980s, Brazil's shipbuilding industry was highly advanced to an extent that it was the world's second largest (based on the shipbuilding volume), but the lack of investment in the aftermath of economic depression in the 1980s and 1990s led to the industry's decline.
As Petrobras, the state-run oil company of Brazil, placed more orders in 2001 onwards and the local content ratio in domestic shipbuilding increased under the leadership of Lula government in 2003, Brazil's shipbuilding industry has begun to achieve steady growth and finally become the world's sixth largest in terms of the current shipbuilding volumes. Specifically, Brazil's shipbuilding industry is very likely to accomplish fast growth as the Brazilian government requires the deepwater drillship ordered from Brazil to be built in Brazil.

According to the Brazilian Development Bank (BNDES), the state-owned development bank of Brazil, new shipbuilding orders and new investment of Brazilian shipyards are valued at 55 billion Brazilian Real (approximately $31.4 billion).

Brazil has emerged to become world's sixth largest shipbuilding nation

As of the end of 2009, a total of 195 vessels have been either under construction or scheduled to be built, which include 128 oil tankers, 38 support vessels, 13 platforms, 7 bulk carriers, 5 container ships, 4 fishing boats, and others. In consideration of that, Brazil has emerged to become the world's six largest shipbuilding nation behind China, South Korea, Japan, EU, and India in terms of quantity of ships under construction.

The employment of Brazil's shipbuilding industry provides a clue to the growth rate of Brazil's shipbuilding industry. The total employment of Brazil's shipbuilding industry increased

Table 1. Employment of Brazil's shipbuilding industry

(Unit : person)

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Employment	1,910	3,976	6,493	7,465	12,651	14,442	19,600	39,000	40,277	45,470

Source : SINAVAL

Table 2. Shipbuilding in major countries

(Unit : vessels)

Country	China	Korea	Japan	Europe	India	Brazil	U.S.A	Singapore	Argentina	Mexico
Shipbuilding volumes	3,746	2,418	1,589	1,178	250	195	123	97	8	4

Source : SINAVAL

Table 3. Quantity of ship under construction or scheduled for construction in Brazil

(Unit : vessels)

	Oil tanker	support vessel	Platform	Bulk carrier	Container ship	Fishing boat
Quantity of constructed ships	128	38	13	7	5	4

Source : SINAVAL

as much as 24 times over the last decade to 45,000 in 2009 from 1,910 in 2000. Brazil's shipbuilding industry is expected to increase the employment along with the construction of five new shipyards amid the deepwater oil field exploitation, and each shipyard is said to be planning to increase employment to 3,500.

Construction of new shipyard

Brazil was the second largest shipbuilding country behind Japan in 1970s, but the financial crisis in 1980s led to the industry's decline. However, Brazil's shipbuilding industry began to be revitalized since 2000.

Unlike China which made tremendous investment in the raw material carriers over the recent five years, Brazil's shipyards are expected to focus on the construction of offshore drillships for deepwater oil exploitation.

In fact, Brazilian government is planning to build 146 crude oil production/transportation vessels, valued $58 billion in total by 2014, and 23 new oil storage vessels which cost as much as $180 million per unit. Furthermore, Petrobras, the state-run oil company of Brazil, is planning to lease 40 deepwater semi-submersible platforms and drillships by 2017 with a funding of approximately $4 billion. That is consistent with the fact that Brazil has been interested in Korea and Singapore which have unrivalled competitiveness in the crude oil drillship sector.

As Brazil moves to exploit deepwater oil fields, overseas shipbuilders such as STX (Korea), Jurong (Singapore), as well as Sinergy Group (Eisa Shipyard and Maua Shipyard), have already decided to build new shipyards or moved ahead with the expansion of their existing shipyards.

In addition, Samsung Heavy Industries (SHI) of Korea acquired a stake in the Atlantico Sul Shipyard, the most modernized Brazilian shipyard, as part of effort to expand its operation into the shipbuilding market of Brazil.

Currently, there are 28 medium-sized and large shipyards shipyards in Brazil. Most of 26 large shipyards are located in Rio de Janeiro, such as Estaleiro Ilha Shipyard, Maua Shipyard. Promar Shipyard, Brasfels, and others. Estaleiro Itajai Shipyard is located in State of Santa Catarina, and Wilson, Sons Shipyard is located in State of Sao Paulo. Rio Negro Shipyard is located in state of Amazonas.

The total area of those ship is 470 million m^2 with the annual steel processing capacity of 5.7 million tons.

Most of 26 large shipyards are equipped with large-scale production facilities and excellent production technologies, and capable of building crude oil probe vessels, oil tankers, coastal vessels, and others.

Estaleiro Itajai Shipyard is capable of building LNG carriers for carrying liquefied natural gas, and Wilson Sons Shipyard is equipped with a large-scale offshore service vessel construction facilities.

Table 4. Status of major shipyards in Brazil

	Location of shipyard (State)	Processing of Steel	Area (1 million m²)	Dry Dock	Carrier	Dock
Eisa	RJ	52	450	0	2	3
BrasFels	RJ	50	410	1	3	2
Rio Nave	RJ	48	150	0	2	4
Enavi-Renave	RJ	40	200	4	-	1
Maua	RJ	36	334	1	1	4
STX Brasil	RJ	15	120	1	1	1
Alianca	RJ	10	61	0	1	2
Superpesa	RJ	10	96	0	1	1
SRD	RJ	10	85	1	1	2
Cassinu	RJ	6	30	2	-	1
Sao Miguel	RJ	5	21	0	1	2
UTC	RJ	ND	112	0	0	2
Setal	RJ	ND	ND	0	0	1
CBD	RJ	ND	ND	1	0	1
Sermetal	RJ	ND	ND	1	0	1
Maclaren Oil	RJ	6	30	0	0	1
Total (RJ)		**288**	**1,799**	**12**	**13**	**29**
Wilson, Sons	SP	10	22	1	1	1
Total (South East)		**298**	**1,821**	**13**	**14**	**30**
Navship	SC	15	175	0	1	2
Detroit	SC	10	90	0	1	1
TWB	SC	10	78	0	1	1
Itajai	SC	12	177	1	1	1
Total		**47**	**520**	**1**	**4**	**5**
Rio Grande	RS	30	100	1	1	1
Quip	RS	0	70	0	0	1
Total		**30**	**170**	**1**	**1**	**2**
Total (South)		**77**	**690**	**2**	**5**	**7**
Atlantico Sul	PE	160	1,500	1	2	2
Inace	CE	15	180	1	0	2
Total (North East)		**175**	**1,680**	**2**	**2**	**4**
Rio Maguari	PA	6	120	2	0	0
Total (North)		**12**	**120**	**2**	**0**	**1**
Grand Total		**562**	**4,311**	**19**	**21**	**42**

Table 5. Status of new shipyards in Brazil

(Unit : R$ 1 million)

Status of new shipyards	Location (State)	Invested amount
Estaleiro Paraguacu	BA	1,468
Estaleiro Bahia S/A	BA	815
Total	-	**2,283**
Alusa	PE	350
STX (Suape)	PE	640
Construcap (Suape)	PE	200
Schahin-Tome (Suape)	PE	300
MPG Shipyards (Suape)	PE	905
Total	-	**2,395**
WTorre (nova planta fase 2)	RS	243
Wilson, Sons (Rio Grande)	RS	233
Quip (Rio Grande)	RS	ND
Total	-	**476**
Sao miguel (Sao Goncalo)	RJ	46
Aliabca (Sai Goncalo)	RJ	35.6
Total	-	**81.6**
OSX	SC	1,700
Juroug	ES	500
Wilson, Sons	SP	70
Promer Ceara	CE	132
EISA Alagoas	AL	1,100
Grand Total	-	**8,737.6**

According to SINAVAL, the Brazilian Union of Shipbuilding, Ship Repair and Offshore Industries, the shipbuilding industry in the North East region of Brazil has emerged as new magnet for investment. 9 products out of a total of 17 investment projects scheduled to be carried out by 2013 in the field of

shipbuilding will be undertaken in the North East region. The investment for the 17 projects is valued 7.6 Brazilian Real in total, among which 80% equivalent to 6.1 billion Brazilian Real is expected to be invested in the projects that will be carried out in the North East. The incentive of State governments, low land cost, and other advantages, have led the State of Pernambuco or the State of Rio Grande do Sul in the South to become attractive alternative for shipbuilding projects.

Table 6. Investment in Brazil's shipbuilding industry (2010-2013)

Total investment	R$ 7.6 billion
Investment in the North East region	R$ 6.1 billion
Number of new shipyards	17
Number of new shipyards in the North East region	9

Ariovaldo Rocha, Chairman of SINAVAL, remarked, "There was neither a shipbuilder nor a company specializing in the oil field exploitation in the North East region until last year when Atlantico Sul Shipyard opened in Suape, the State of Pernambuco. However, the North East region has attracted the attention of shipbuilding companies since the construction of Atlantico Sul Shipyard was completed."

However, the increased attention of shipbuilders to the North East region does not mean any reduction of investment in Rio de Janeiro where the shipbuilding industrial complex has been formed since long before. The shipbuilding complex in Rio de Janeiro is expected to expand next year, and roughly 1 to 2 billion Brazilian Real will be invested. This investment includes the project of Petrobras moving to resume the operation of Ishibras Shipyard which is not currently operational and the project of EBX which changed its previous plan and decided to build a shipyard in Porto de Asu, Rio de Janeiro, after failing to obtain the approval of the Santa Catarina State Government for the construction.

Deepwater oil field exploitation speeds up the growth

Petrobras announced its plan to purchase large-scale probe/drilling equipments, including 28 drillships, for gigantic deepwater oil field discovered recently, which will further stimulate the growth of Brazil's shipbuilding industry.

Drillship is a high-priced equipment with cost per unit reach-

Table 7. Status of the bidding for the drillship construction project

Company/consortium	Description
Andrade Gutierrez	One of the most prominent construction companies in Brazil
Engevix	Currently plans to acquire Rio Grande shipyard
Jurong	A Singapore company
Eisa	Currently building a shipyard in the State of Alagoas
Keppel Fells	A Singapore company
Atlantico Sul	It is a shipyard currently under construction jointly carried out by Camargo Correa, Queiroz Galvao, Samsung, etc. The new shipyard will be equipped with large-scale shipbuilding facilities capable of building drillships.
STX	Currently building a new shipyard in the State of Ceara jointly with a local Brazilian company
Consortium 1	Composed of Alusa and Galvao Engenharia
Consortium 2	Composed of Odebrecht (Daewoo Shipbuilding and Marine Engineering (DSME) has a 10% stake.), OAS, and UTC Engenharia

ing roughly $800 million to $1 billion. 28 drillships cost between $22 to $28 billion which is more than half of the budget of Petrobras for this year. Specifically, the bidding for the drillship construction project will be based on the invitation of prominent shipbuilders selected by Petrobras, and a total of 9 companies, including Andrade Gutierrez, STX, EISA, Jurong, Atlantico Sul, are said to be participating in the bidding.

Besides, Brazil's shipbuilding industry is ready to seize a new opportunities as new ship owners placed shipbuilding orders with Brazilian shipbuilders at the end of last year. Venezuela's state-owned oil company PDSVA placed an order for ten oil tankers, and Brazilian mining giant Vale held an open bidding for the construction of four large-scale vessels carrying iron ore.

Marine equipment manufacturers suffer from a lack of global competitiveness

The increasing shipbuilding order turned out to be accompanied by the surge in the demand for marine equipment.

Brazil which had a heavy reliance on imported marine equipment increased the mandatory local content ratio in shipbuilding and has taken a series of measures to vitalize local shipbuilding industry, which raises the prospect for increase in the marine equipments containing materials produced locally.

Currently, various marine equipments can be produced in Brazil, such as air cylinder, residential equipments ventilation fan device, drinking water and sewage treatment equipment, etc), diesel engine generator, alternating power generator, compressor, pump, and many others, but the products manufactured locally were found to have less price competitiveness compared to imported ones.

Presently, Brazil has about 200 marine equipment companies, and most of them were established during the heyday in 1970s and 1980s when the Brazil's shipbuilding industry flourished. They could survive to date because they shifted the focus of their business to steel making, food processing, agriculture, bio-energy, etc, in 1990s when Brazil's shipbuilding industry was sluggish.

At the moment, Brazil's marine equipment companies are encountering many difficulties for lack of government's incentives, and products manufactured locally have been less competitive than imported products including Chinese ones, despite excellent quality.

In fact, BNDES Bank, the major financial supporter of Brazil's shipbuilding industry, pointed out that the lack of effective distribution channel for marine equipment and credit guarantee problem are the greatest stumbling block to the growth of Brazil's shipbuilding industry. BNDES Bank indicated that the financial support and capital investment are required for a series of sectors such as bearing, boiler, compressor, diesel gas engine, crane, valve, engineer service, construction and assembly.

Also, it advocated the local production as top priority for the growth of Brazil's shipbuilding industry, specifically the products not manufactured in Brazil such as motors for large ship, gas turbine, measuring instrument, and others.

BNDES Bank suggested that lack of local content production, specifically the core parts, was the most serious hindrance to the growth of Brazil's shipbuilding industry. The back plate for ship is the only products that are mass produced in Brazil, and Usiminas is the only manufacturer of the back plate. The greatest complaint in Brazil's shipbuilding industry is concerned with the excessively high price of the back plate which Usiminas produces, and for that reason, Transpetro, the transportation subsidiary of Petrobras, is importing the back plate for ship from China, Korea, Ukraine, and other countries.

Promotion of domestic shipbuilding industry at the policy level

Currently, Brazil is proceeding with the policy to promote shipbuilding and marine equipment industry at the national level. Brazilian government is operating the Marine Merchant Fund (FMM) to reinvigorate the shipbuilding industry. This fund can used for the construction, improvement, and repair of various ships. A total of 553 Brazilian Real was found to have been provided from FMM in 2006, among which 76.2% was used to support the construction of ship. The remaining 23.8% went to the navigation and related projects.

In 2007, a total of 891 million Brazilian Real was found to have been used for projects related to shipbuilding. FMM is provided only to domestic shipbuilders of Brazil for the construction and repair of ship, and up to 90% of total project cost can be financed from FFM.

In addition, Brazil's government has pushed ahead with PROMEF, a program to modernize oil tankers and equipments, to exploit deepwater oil fields since 2004.

In the first PROMEF, a bidding was held in 2005 for a total of 26 2.7 million DWT) vessels, and Atlantico Sul Shipyard, Estaleiro Ilha-Eisa Shipyard, Maua Shipyard signed contract with Transpetro to build 23 vessels 1.3 million DWT). The mandatory requirement of over 65% local content in shipbuilding have to be met by shipbuilders under PROMEF.

The second PROMEF was announced in May 2008, and the bidding was held for a total of 23 vessels necessary for the oil field exploitation. Also, the mandatory requirement of over 70% local content in shipbuilding have to be met by shipbuilders under PROMEF, and the primary focus has been given to the exploitation of very large oil field, Tupi, discovered in Santos Bay in 2007.

Brazilian ship order status and future plans

Table 1. Demand to supplied by National shipbuilding industry (Total)

	Demand*	Qty
Confirmed demand	Ships	78
	Supply boats-Prorefam	146
	Drillships	40
	Other Ships	59
Expected future demand	Ships, FPSO, oil rigs and supply boats	182

Table 2. Demand to be supplied by National shipbuilding industry (Ship)

Demand	Qty	% LC
PROMEF I	23	65
PROMEF II	26	70
EBN (Brazilian shipowners)	19	ND
Other Orders	10	ND
Total	78	-

Table 3. Demand to be supplied by National shipbuilding industry (Supply boats - Prorefam)

Demand	Qty	% LC
Prorefam 1st lot	24	60
Prorefam other lots	122	60
Total	146	60

Table 4. Demand to be supplied by National shipbuilding industry Vessel

Demand	% LC	Qty	Type	Shipyard
PROMEF I	65	10	Suezmax	EAS
		5	Aframax	EAS
		4	Panamax	EISA
		4	Clear products 45K	Maua
PROMEF II	70	4	Suezmax DP	EAS
		3	Aframax DP	EAS
		3	Clear products 45K	
		3	Clear products 30K	
		2	Dark products	
		2	LPG 400	Promar PE
		2	LPG 12000	Promar PE
		3	Bunker	Superpesa
		4	LPG 7000	Promar PE
EBN (Brazilian shipowners)	ND	3	Crude and DPP 45-50K	Global
		3	Clear products 45-50K	
		2	Petroleum and DPP 30-35K	Panocean
		2	Clear products 30-35K	Panocean
		6	Bunker	3 Delima/ 3 S. Miguel
		3	LPG 4500	Elcano
Pre-salt (Petrobras / Engevix)	ND	8	FPSO	
Noroil /EAS	ND	2	VLCC	
Total	-	78		

**Comfirmed demand*

Table 5. Demand to be supplied by National shipbuilding industry supply boats (Prorefam)

Demand - first lot*

Ship type	Qty	Shipower	Shipyard
PSV 3000	2	CBO	Alianca
PSV 3000	4	Saveiros	Wilson, Sons
PSV 3000	1	Superpesa	Superpesa
PSV 4500	2	Saveiros	Wilson, Sons
PSV 4500	1	Otto Candies	SRD Offshore
AHTS 18000	4	Barm Offshore	Navship
AHTS 18000	2	Norskan	STX
AHTS 18000	1	Noroil	STX
AHTS 21000	2	Barm Offshore	Navship
TUG 15000	2	CBO	Alianca
ORSV 750-10	2	Sao Miguel	Sao Miguel
ORSV 750-10	1	Astromaritima	EISA
Total	24		

Expected demand for 146 new vessels at the end of the program, with 60% of local content.

Table 6. Demand to be supplied by National shipbuilding industry (Drillships)

Demand	Qty	% LC
1st - delivery	12	0
Other lots- delivery 2013-2017	28	-
Total	40	-

**14 ships ans 14 semi-submersible -operation by Brazilian companies*

Table 7. Demand to be supplied by National shipbuilding industry (Platform(Petrobras))

Demand	Qty	% LC
P-55 (hull-EAS)	1	-
P-55 (process plant -QUIP)	-	-
P-56, P-61 (BrasFels)	2	-
P-57 (BrasFels)	1	-
P-62 (Jurong)	1	-
P-63 (QUIP)	1	-
Paltform (Odebrecht -Bahia)	2	-
FPSO (hull- Engevix)	8	-
Total	16	-

Table 8. Demand to be supplied by National shipbuilding industry (Other Ship)

Demand	Qty	% LC
Tanker-PDVSA	10	-
Ships for port support	18	-
Ships for inland navigation	27	-
Containers vessels	4	-
Total	59	-

Table 9. Demand to be supplied by National shipbuilding industry (Expected future demand)

Demand*	Qty	% LC
Pre-salt	-	-
PROMEF	60	-
Prorefam	122	-
Total	182	-

**Expected demand*

Table 10. Demand to be supplied by National shipbuilding industry expected future demand

Demand	%LC	Qty	Type
Pre-salt	-	-	FPSO
	-	-	Shuttle tankers
	-	-	OSVs
	-	-	Oil rigs
*PROMEF III	-	20	Tankers
*PROMEF IV	-	20	Tankers
*PROMEF V	-	20	Tankers
Prorefam III -2nd lot	-	22	OSVs
Prorefam III -3rd lot	-	20	OSVs
Prorefam III -4th lot	-	20	OSVs
Prorefam III -5th lot	-	20	OSVs
Prorefam III -6th lot	-	20	OSVs
Prorefam III -7th lot	-	20	OSVs
Total	-	182	

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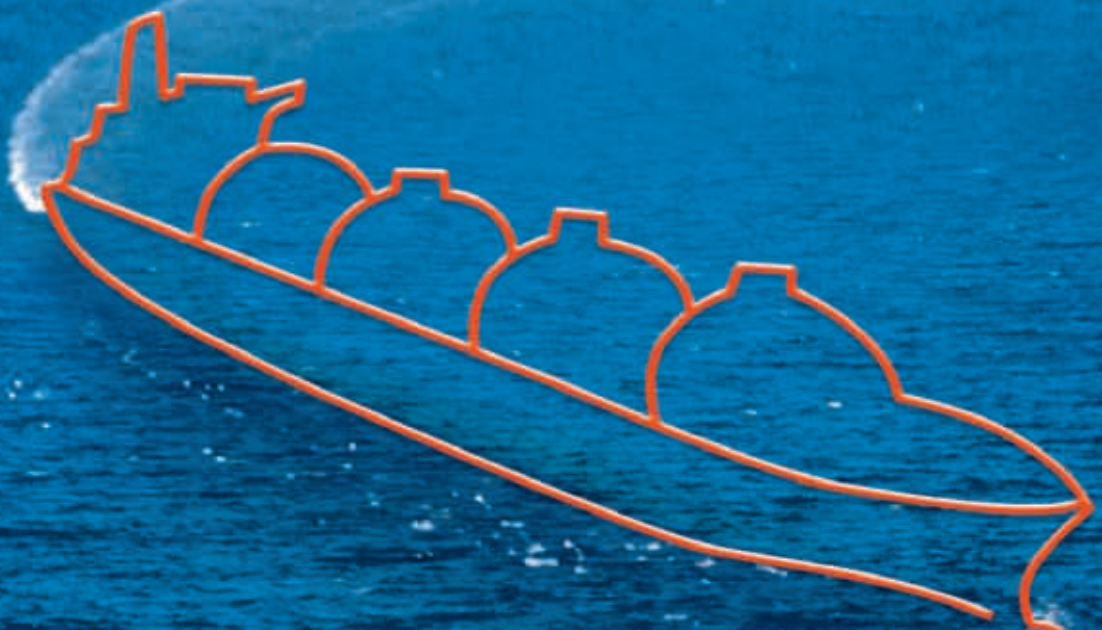

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Design core technology for offshore plant industry has been secured

Doh Deog-hee, Professor of the Division of Mechanical & Information Engineering at the Korea Maritime University

Doh Deog-hee, Professor of the Division of Mechanical & Information Engineering at the Korea Maritime University, has achieved the feat of developing the 'non-contact measurement and analysis technique for flow-structure interactive motions', first ever around the globe.
This technology is considered to be a breakthrough innovative technology for securing the design core technology in the field of offshore plant as well as enabling the localization of equipments and materials of offshore plants which had a heavy reliance on imports so far.

Profile
02. 1995 - 08.1995: Researcher at Pohang University of Science & Technology(State-of-Art Flow Engineering Research Center)
09. 1995 - Current: Professor of Korea Maritime University
04. 2001 - Current: Journal of Visualization, Managing Editor
02. 2005 - Current: Director of Korean Society Of Visualization
02. 2006 - Current: Director in Charge of Flow Engineering at the Korean Society of Mechanical Engineers
02. 2007 - Current: Editor of Korean Fluid Machinery Association

Major Fields of Research
- Flow Visualization/ 3D&4D Flow Visualization Analyses / Virtual Engineering
- Fluid Engineering / Complex Turbulence / Refrigerator Air Flow Analyses
- Ship Machinery and Machine System Integrations

Q : Please elaborate on the background and process of 'non-contact measurement and analysis technique for flow-structure interactive motions' which was developed this time. How many periods and how much cost did it take to develop this technology?

A : Korea is relatively weak in technologies related to the offshore plant although the country retains a highly excellent technology to an extent that it has captured approximately 75% of share of offshore plants and production facilities in the global market. Specifically, Korea has a reliance on import for over roughly 90% of materials and equipments related to offshore plants, and it is imperative to localize related materials and equipments.
Approximately KRW 15 trillion or more are generated annually in sales from offshore plant industry in Korea, but the nation has a total dependance on import for high-priced materials and equipments which erodes the real sales by more than a half.
Such a problem is attributed to the strong tendency of major oil companies, which place the new building orders for offshore plants, to adhere to the products of prominent overseas material/equipment companies for reasons of reliability and stability. That is profoundly related to the reliability of Korea's core source technology, which implies that Korea's technology has yet to provide a reassurance of reliability.
The inadequate core design technology for a certain

area will complicate the design of other parts because offshore plant is a system.

So, core technologies must be secured for all parts. In particular, the design technology for the riser - which corresponds to the pipes for transferring the exploited deepwater resources to the ship - cannot avoid being linked to the entire system of offshore plant.

The 'non-contact measurement and analysis technique for flow-structure interactive motions' represents the technology for analyzing the kinetic performance of this riser and can be applied essentially to the design of riser. The background which led to the development of this technology is associated with that kind of importance.

It took about a year and cost approximately KRW 200 million to develop this technology. In practical sense, it took more than a year, considering that the technology itself embodies an integration of a variety of technologies ranging from the electric and electronic engineering, through the optical and mechanics, to the control technology.

Like that, this technology, a convergence of a vast array of technologies, cannot be emulated or imitated easily by other countries.

Q : What challenges did you encounter in the development and research?

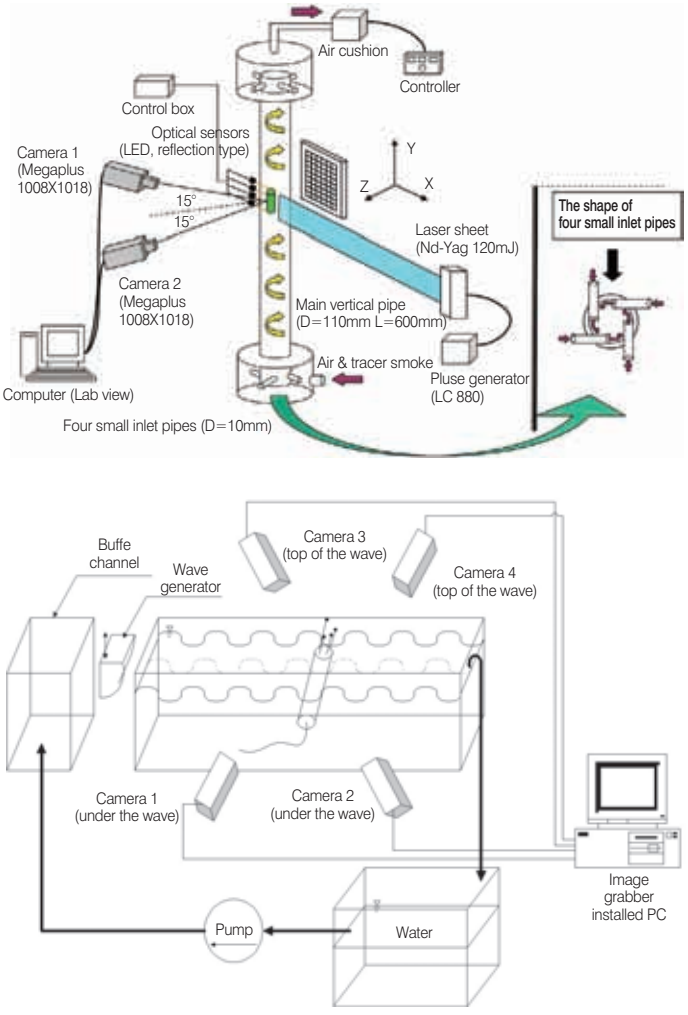
A : Failures were repeated over and over again until the integration of the measuring system was successfully accomplished because technologies of various fields had to be converged.

Specifically, the hardest challenge came from the application of state-of-art software technologies to the data processing technology until the results of the experiment with a complete system, which was carried out day and night, were analyzed and utilized from the engineering perspective.

Besides, repeating the experiments several times was one of major challenges because no experiment of this kind had been ever conducted before.

Q : What do you think is the trend and prospect of the 'non-contact measurement and analysis technique for flow-structure interactive motions' both at home and abroad?

A : The technology for the simultaneous measurement of flow has been nonexistent so far, although the technology for measuring the motion of structures has already been commercialized. Presently, our laboratory's technology for 3D measurement of flow motion can be said to be the world's best. In recognition of this technology, we were selected by the Ministry of Education, Science and Technology and have been developing 'the high precision measurement & analysis technology for the analysis on the hydroelasticity of high value-added ship's offshore motion parts' since June 2008 as part of researcher development laboratory project (formerly known as National Research Laboratory project (NRL)).



Equipments for the experiment of 'non-contact measurement and analysis technique for flow-structure interactive motions'

Q : What can be said to be the core technology and characteristics of the 'non-contact measurement and analysis technique for flow-structure interactive motions' which was developed this time?

A : This technology combines the optical sensor system and three-dimensional digital image processing based motion measurement system, capable of measuring both 3D motion of structures and 3D flow motions surrounding the structures.

Among others, this technology is capable of 3D measurement and analysis of the kinetic motion of structures and flow surrounding the structures even during the free motion of such structures.

It is characterized by the non-contact measurement ability, considering that many (more than two cameras) cameras are used to measure the structures and flow.

Q : What meaning does the development of 'non-contact measurement and analysis technique for flow-structure interactive motions' have and what is the expected spill-over effect of it?

A : As I explained before, this technology enables the simultaneous measurement of the motion of long offshore structures, such as deepwater riser, and the complex motion of the flow in the surrounding area, and therefore, may be useful for analyzing the kinetic motion analysis of riser which is considered to be important for the design of offshore plant. That will have a direct or indirect impact on the acquisition of design source technology in the offshore plant industry of Korea.

Q : What is the inadequacy of this technology or aspect requiring an improvement, if any, for the upcoming period?

A : The current technology has been completed at the laboratory level for reasons of budget constraints. However, the experiment must become larger as much as possible to accomplish the analogy because offshore plant is a gigantic structure. Though we have perfect software of the measurement system, the hardware needs an improvement if the experiment becomes large.

Q : As far as I know, you were awarded the prize of technology from the Japanese Society for Multiphase Flow of Japan in relation to the outcomes of research. What is your impression of winning the prize and what can be said to be the meaning of the prize?

A : The research activities of the Japanese Society for Multiphase Flow, a research institute with nearly 4-decade history, cover vast area encompassing the mechanical engineering, aerospace engineering, chemical engineering, resource environment, medicine, biology, and many others, and this organization has researched the complex flow. I am very pleased to be awarded the prize such an organization, and I will not become complacent with that but speed up the development of tidal power plant system suitable for the coastal area of Korea which will incorporate the related technologies currently under development in my lab.

Q : What have been your major accomplishments of research and what are your research plans for the upcoming period?

A : So far, I have focused on developing the technology for 3D or 4D measurement and analysis of overall flow phenomenon in the engineering field which applies the digital image processing technology. I plan to consolidate this technology with the cutting-edge optical technology or ubiquitous-based technology and further develop it into a technology that can be incorporated into the critical phenomenon, etc, which has remained a challenge in the field of measurement and analysis.

BMEA held a conference on July 29 with the visiting delegates of Transpetro of Brazil in relation to the plan for shipbuilding orders and a session on technological cooperation.

Korea is ready to enter Brazilian market

Transpetro of Brazil discussed with Korean marine equipment manufacturers on the technological cooperation

Delegates of Transpetro, the logistics and energy subsidiary of Petrobras, Brazil's state run oil company, visited Korea in July to identify Korean marin equipment manufacturers with excellent technology necessary to advance into the Brazilian market and help vitalize Brazil's marine equipment market. Transpetro held a conference, organized by Busan Marine Equipment Association, to discuss the plan for large-scale shipbuilding orders and technological cooperation.

Busan Marine Equipment Association (BMEA) announced that it successfully completed the conference held on July 29 with the visiting top-officials of Brazil's Transpetro to discuss the plan for large-scale shipbuilding orders and technological cooperation.

Brazil has pushed ahead with PROMEF, a program to modernize its oil tankers and equipment, since 2004, and announced a program to promote shipbuilding industry in an endeavor to stimulate the development of shipbuilding and marine equipment industry at the national level. Specifically, Transpetro plans to build 146 crude oil production/transportation vessels, valued at $58 billion in total, by 2014, and construct 23 oil storage vessels which cost $180 million per unit.

In the afternoon on that day, Korean marine equipment manufacturers had a in-depth discussion about the entry into Brazilian market, technical collaboration, and others.

Delegates of Transpetro, composed of Sergio Machado, CEO of Transpetro, Arnaldo S. Arcadier, the manager of PROMEF, and others.

Brazil has emerged to become a very attractive market for Korean marine equipment manufacturers as Petrobras, the holding company of Transpetro, is planning to lease 40 deepwater semi-submersible platforms and drillships by 2017 with an investment of $4 billion.

In addition, the local contents rule - which require the manufactured goods must include over 65 to 70% of materials locally produced - is very likely to create opportunity for Korean marine equipment manufacturer to make an entry into the Brazilian market by means of technological partnership, given that Brazil's marine equipment currently contain only about 20% of material locally produced.

Transpetro is the logistics and energy subsidiary of Petrobras, Brazil's state run oil company, and has handled the Fleet Modernization and Expansion Program (PROMEF), the plan for large-scale shipbuilding orders, which aims to revitalize Brazil's shipbuilding industry.

The main purpose of the visit was to identify prospective Korean marine equipment manufacturers

The conference was held to identify Korean marine equipment manufacturers with excellent technology necessary to expand into the Brazil's market by means of joint venture with local Brazilian companies or direct investment, or license contract, etc, in an attempt to promote Brazil's marine equipment market. Specifically, the conference was attended by Sergio Machado, CEO of Transpetro, Arnaldo S. Arcadier, the manager of PROMEF, Ana Paula S. Costa, the Public Relations Manager, and others.

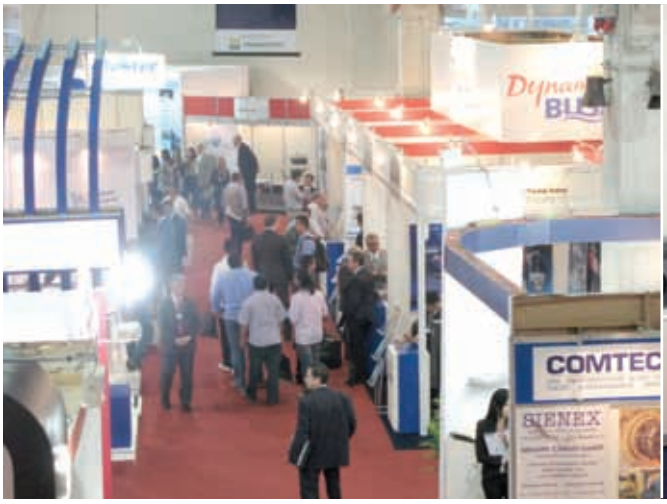
The conference which opened in the morning on July 29 was attended by about 150 people, including delegates from 70 companies such as Korean marine equipment manufacturers, related organizations, and media organizations.

Sergio Machado, the CEO of Transpetro explained on the technological cooperation among the marine equipment manufacturers of Brazil and Korea and the mandatory rule requiring the manufactured goods must contain over 65 to 70% of materials locally produced, as well as Brazil's plan for new shipbuilding orders. In the afternoon, a session was held on the technological cooperation among companies.

About 40 Korean equipment manufacturers with the intention of making an entry into the Brazilian market had a group discussion with the visiting delegates of Transpetro.

Also, Transpetro discussed further individually with each of 15 Korean equipment manufacturers with which it desired to have a meeting. The discussions focused on the entry into the Brazilian market, technological cooperation, vendor registration, and introduction of companies. In particular, Transpetro showed a great interest in cargo pumps, ballast pumps, ballast valves, propulsion equipments, and Dynamic Positioning System (DPS).

Korean marine equipment manufacturers which attended this conference opined that the hard push for entry into the Brazilian market in the wake of the local contents rule would complicate their efforts to make inroads into the market and



BMEA set up a joint pavilion and participated in Naval Shore 2010 that opened on July 11 in Brazil.

A total of 13 Korea marine equipment manufacturers participated in Naval Shore 2010 and launched aggressive marketing activities targeting Brazilian shipbuilding market.

expand the market although they saw Brazil an attractive market. In other words, they, confronted with the constraints on the initial investment, hope that they can begin with the simple export and enter the Brazilian market preliminarily by entering into license contract with local partner and then make an full-fledged entry into the local market by setting up joint venture.

Transpetro has not revealed concrete measures for support or any plan to push forward, but provide information to Korean companies in relation to technological cooperation, inquired Korean companies about their intention to make an entry into Brazilian local market, and expressed their hope that they would be provided with the detailed plans (company introduction, desired field, method for entering the local market) from Korean companies with intention to make inroads into Brazilian market. Besides, Transpetro showed an interest in the possibility that Korean marine equipment companies would participate in the projects such as the construction of marine hotel, as well as merchant ship and offshore plant sector.

Technological cooperation with Brazilian companies

BMEA, the organizer of the conference, remarked, "This conference was instrumental very much in grasping the market trend of Brazilian market, the intention of domestic companies to make entry into local Brazilian market and their requirements. We will help pave the way for Korean companies to make an entry into the market first through simple export in trade with the Federation of Industries of the State of Rio de Janeiro (FIRJAN), Macae City, Transpetro, etc, which will be followed by the license agreement and establishment of joint venture with local companies, and push forward with the long range technological collaboration."

BMEA aims to lay the cornerstone for Korean marine equipment manufacturers to make inroads into the Brazilian market so as to diversify their markets and advance into the offshore plant market and increase local content ratio of domestic marine equipments which currently stand at below 20%.

13 domestic companies participated in the Naval Shore

BMEA dispatched a group to open up the marine equipment market of Brazil in December 2009 and set up a joint pavilion in Naval Shore 2010 which ran for three days from the 11th to the 13th of July at Sul America Convention Center.

Naval Shore, an annual show which has been held since 2004, specializes in the shipbuilding and marine equipments of Brazil and showcases the shipbuilding materials/equipments, shipyard facilities, ship navigation devices, marine equipment, marine technologies and many others. This year, Naval Shore attracted a total of 194 companies, including 13 domestic marine equipment manufacturers.

During Naval Shore 2010, the aforesaid participating dis-

BMEA attended the investment conference and session.

BMEA led the meeting on the technological cooperation among related organizations of Brazil, local shipbuilding and marine equipment manufacturers and consulting companies.

• Participating companies

Among the companies that participated in the Naval Shore 2001 are included DNP Co., Ltd, Taeshin Gas & Welding Co., Ltd, Haedong Metal Co., Ltd,TK Co., Ltd, S&W Co., Ltd, PANASIA Co., Ltd, Bermyoung Valve Co., Ltd, DSB Engineering Co., Ltd, Sunbo Industries Co., Ltd, Shinheung ENG Co., Ltd, Taewon IND. Co., Ltd, Duckwonent Co., Ltd, Saemah Co., Ltd.

cussed the deals worth a total of approximately $34 million and the deals, valued at roughly $21 million, with high chance of being signed in the upcoming period, which reaffirms the potential of Brazilian market that has emerged as new market in the shipbuilding and offshore plant sector recently.

During the visit to Brazil, Busan Marine Equipment Association had a meeting with the FIRJAN, Suape Global (the investment attraction bureau of Penambuco State), the Office of Economic Development of Macae City, and officials of Transpetro to help domestic marine equipment manufacturers secure a foothold in the Brazilian market, sent official letter in relation to the current demand in the local shipbuilding and marine equipment market and technological cooperation with Busan Marine Equipment Association, and discussed the execution of MOU.

Also, Busan Marine Equipment Association had a meeting with the managers of Jaragua and Great Lakes Dredge & Dock (the large shipbuilding and marine equipment companies of Brazil), Lonsal Trading and RonicInternational (the shipbuilding and marine equipment trade consulting companies of Brazil) to gain an insight into the technological cooperation (partnership between Korean companies and Brazilian companies) - centerpiece issue for the entry into the Brazilian market - and the demand of local Brazilian companies, and broaden the understanding of the current condition of Brazilian shipyards, new shipyard construction plans, demand of Brazil's marine equipment companies, and others.

Moreover, BMEA attended the conference and session, organized by KOTRA, on the investment in Brazilian market, which were instrumental a lot in learning more about the marine equipment listing project of the National Organization of the Petroleum Industry (ONIP) of Brazil, order volume and equipments of Brazilian Union of Shipbuilding, Ship Repair and Offshore Industries (SINAVAL), and the incentive for the investment in the Rio de Janeiro region.

Hwang Soon-chul (left), President of JS Cable, and Sun Chao Yue (right), President of Jiangsu Zhongkai Cable, are shaking hands after signing the joint venture Agreement.

Target the Chinese Market

JS Cable sets up joint venture with a Chinese rubber cable company

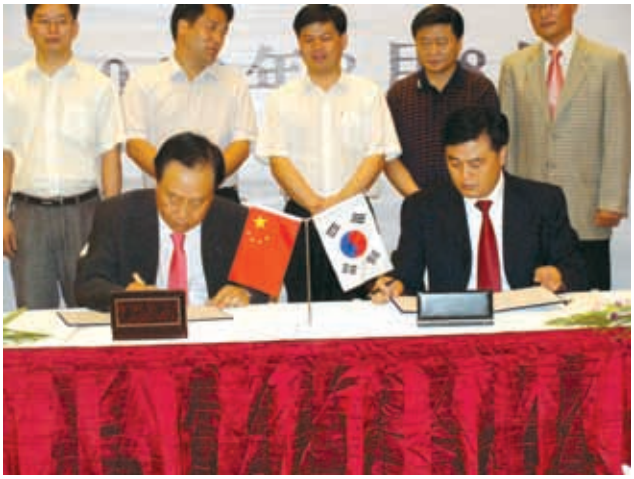
Recently, JS Cable entered into joint venture Agreement with Jiangsu Zhongkai Cable to make a full-fledged foray into the specialty cable market of China. So far, the entry into the Chinese market has been complicated by the tendency of favoring domestic companies over foreign ones, though China is the world's largest single market and high growth market in the field of specialty cable. However, the establishment of joint venture this time will lay the cornerstone for JS Cable to overcome the high barrier to the entry into the Chinese market and achieve sustainable growth.

JS Cable is making a full-fledged foray into the Chinese market. JS Cable entered into an Agreement on August 8 to establish joint venture with Jiangsu Zhongkai Cable a Chinese manufacturer specializing in rubber cables. The registered capital of joint venture is RMB 136 million (approximately KRW 24.5 billion), among which JS Cable will contribute 75.5% in the form of property other than money and Jiangsu Zhongkai Cable contribute 24.5% in the form of property in kind.

JS Cable has made preparations to make inroads into the Chinese market as the first step toward global business management in an endeavor to become a global standard company in the field of specialty cables, aiming to achieve KRW 1 trillion in sales by 2015. JS Cable partnered with Jiangsu Zhongkai Cable to best leverage the synergy of five factors such as sales capability, production capacity, potentials for expansion, financial risk, possibility of control over the management.

As a result of this joint venture, JS Cable will be able to use the existing factory and facilities of Jiangsu Zhongkai Cable and bring in the President of Jiangsu Zhongkai Cable as Sales Director of joint venture so as to absorb the existing customers of mining cables. Three years later, JS Cable will have the right to exercise the call option to take over the remaining equity in Jiangsu Zhongkai Cable, which means that JS Cable will gain 100% control over the joint venture.

JS Cable speeds up its advancement into the



JS Cable and Jiangsu Zhongkai Cable entered into joint venture Agreement at the Howard Johnson Hotel in Yixing-shi, Jiangsu-sheng, China, on August 8.

Chinese market

JS Cable is confronted with the limited size and growth potential of domestic market for various types of cables used in shipbuilding, offshore, wind power, mine, etc, its primary area of business. Meanwhile, China is the world's largest single market and high growth market in the field of specialty cables, a country with the world's second largest shipbuilding market, world's second largest wind power generation market, world's second largest mining output, and world's largest port container traffic. However, the entry into the Chinese market based on export model has become somewhat complicated by the tendency of favoring domestic companies over foreign companies, high tariffs on imported goods, delay in VAT refund, etc. For those reasons, localization was considered a priority.

Hwang Soon-chul, President of JS Cable, said, "I hope that we can best leverage the synergy from the marine cable sales ability and ship cable customer base of Jiangsu Zhongkai Cable, specialty cable technology and brand value of JS cable, so that our joint venture can gain foothold fast and grow in China."

The joint venture Agreement between JS Cable and Jiangsu Zhongkai Cable not only lays the cornerstone to overcome the high barrier to the entry into the Chinese market and achieve constant growth but also take advantage of synergy with LS Cable and broaden the product and regional coverage by securing a production/sales base in the East China and focusing on the specialty wire business.

Agreement pursuant to joint venture establishment

A future leader in the specialty cable market

The new joint venture plans to focus on the production of cables used in ship and wind power generation, mining cables, and portable cables, expand product coverage steadily, and diversity portfolio.

Hwang Soon-chul, President of JS Cable, said, "We will strengthen the price competitiveness of ship cable business through thorough localization to tighten our grip in the Chinese market. For the cables used in wind power generation, we will reinforce our technological leadership on the basis of our product technology prowess which led us to be recognized as the sole Asian vendor of Vestas and win the five-year long range contract. For the mining cables and portable cables, we will transfer our proprietary technology to expand our coverage based on high quality products."

He added, "We plan to complete the additional investment in the production and environmental facilities by this year and stabilize the organization so as to evolve into the leader in the specialty cable market, aiming to achieve over KRW100 billion mainly from our flagship products in the shortest period of time."

Jiangsu Zhongkai Cable, the joint venture partner of JS Cable, has specialized in the production of rubber cables since its establishment 2006 with a mining cable factory and a power cable factory built on 51,355m^2 land inside economic development zone in Yixing-shi, Jiangsu-sheng, and has developed into as a medium enterprise with an annual sales of RMB 200 million (approximately KRW 30 billion). Recently, it acquired MA safety certification essential for the stable expansion of mining cables, and has proceeded with sales activities targeting the mining and engineering companies as major customers in Anhui, Shanxi, and Inner Mongolia.

Essence of R&D Business Management

Establishment of STX Technology Center

STX Group established STX Technology Center that will play a pivotal role in the R&D business management and held a completion ceremony on July 22. With the establishment of STX Technology Center this time, STX will speed up quality control activities to accomplish global standard technical business management.

STX Group will embark on the efforts to strengthen the quality control of shipbuilding machinery along with the establishment of STX Technology Center which will serve as the backbone of the R&D business management.

STX held a completion ceremony on July 22 at Jungang-dong (subdistrict), Changwon City, which was attended by Gang Duk-soo (STX Group Chairman), Kim Doo-gwan (governor of Gyeongsang Province), Park Wan-soo (mayor of Changwon City), and other major officials.

STX Technology Center of STX Group located in Changwon City, Gyeongnam

Gang Duk-soo, STX Group Chairman, who attended the ceremony, said, "STX Technology Center will lay the cornerstone for STX to open the door to a new era for Changwon as STX has become the most prominent company in Changwon City where many production facilities are located."

STX Technology Center, with 21 floors above the ground level and 8 basement floors, can accommodate 1,500 workers, and houses R&D and sales departments of major affiliates such as STX Offshore and Shipbuilding, STX Engine, STX Heavy Industries, STX Metal, STX Solar, etc.

Besides, STX Technology Center will comprehensively manage R&D departments which have been operated by the affiliates in the field of shipbuilding machinery division, such as the shipbuilding offshore research center of STX Offshore and Shipbuilding, engine research center of STX Engine, electronic and telecommunication research center, technology research center of STX Heavy Industries, research center of STX Metal, etc, and will orchestrate overall R&D strategies.

The establishment of STX Technology Center this time laid the groundwork for STX to proceed with medium to long-range R&D projects, rather than the short-term performance. In addition, it will lead to the maximization of synergic effect in the R&D sector through the introduction of various knowledge resource management system which have been retained by each affiliate so far and the promotion of communication among affiliates.

A source from STX remarked, "Quality control has been considered essential for sustainable growth since Toyota's quality problems began recently. With the completion of STX Technology Center this time, we will push ourselves harder for quality control activities to accomplish the global standard technical business management."

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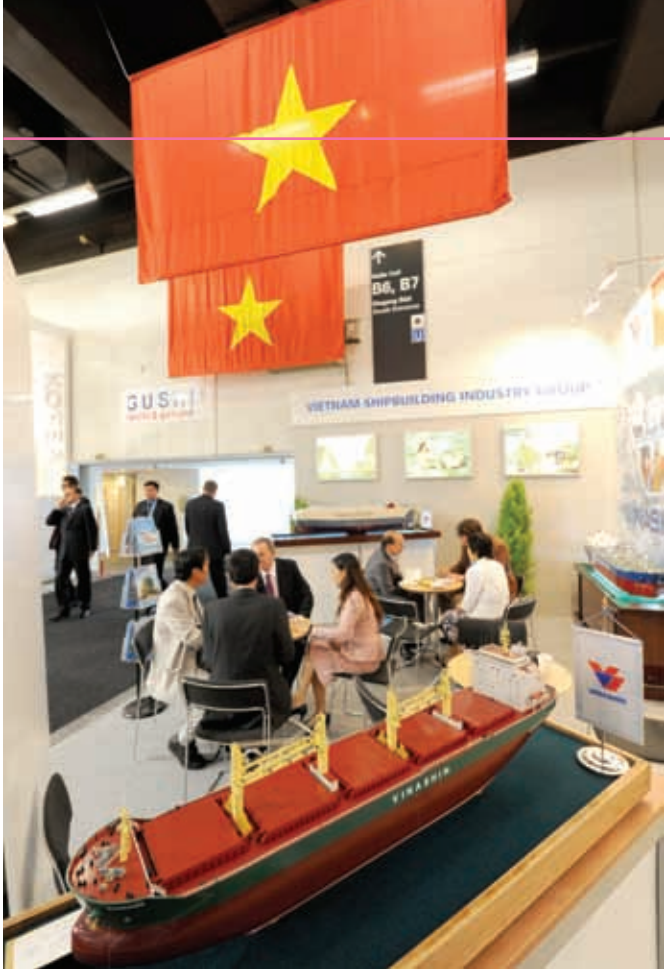


China slightly outpaced Korea which has been the world's largest shipbuilding nation since 2000 in terms of new shipbuilding orders, shipbuilding volumes, and order backlog, and grabbed the world's leading position in the first half of this year.
According to the data released recently by the Research Center of Daewoo Securities, China overtook Korea on the back of the bulk carrier market which has been strong since 2009 and the shipping finance of Chinese government. However, it predicted that Korea will regain its top spot in the global shipbuilding with the recovery in the tanker and container carrier market in the second half of this year.

Who will emerge as winner in the second half this year, Korea or China?

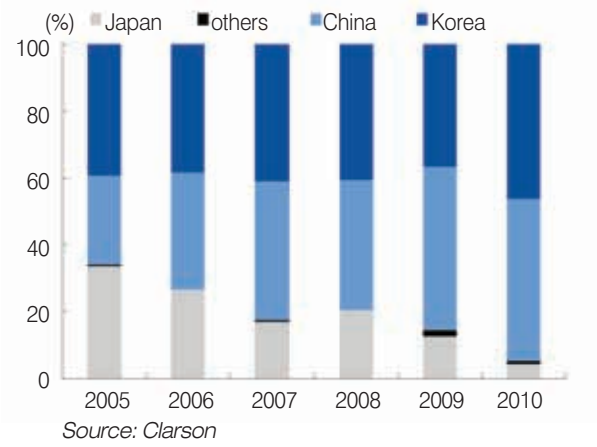
The Research Center of Daewoo Securities analyzed that the recent emergence of China as the world's largest shipbuilding country was only temporary and attributed largely to the bulk carrier market which has been strong since 2009 and the shipping finance of Chinese government.

Seong Gi-jong, a researcher at the Research Center of Daewoo Securities, speculated that Korean shipbuilders would be back on top as the world's biggest shipbuilding nation, regaining the crown from China as the shipbuilding industry is rebounding.
Going forward, Korea's dominance should strengthen, as: First, non-bulk carrier sectors such as tankers, containerships, and gas carriers are expected to improve - Korean shipbuilders will increase their market shares in these sectors; second, European ship finance houses will resume lending money to ship buyers; third, Chinese government support will decline; and fourth, quality rather than price will become a distinguishing factor as environmental policies promote efficient and environmentally-friendly ships.

Korea and China have become the two giants in world's shipbuilding industry

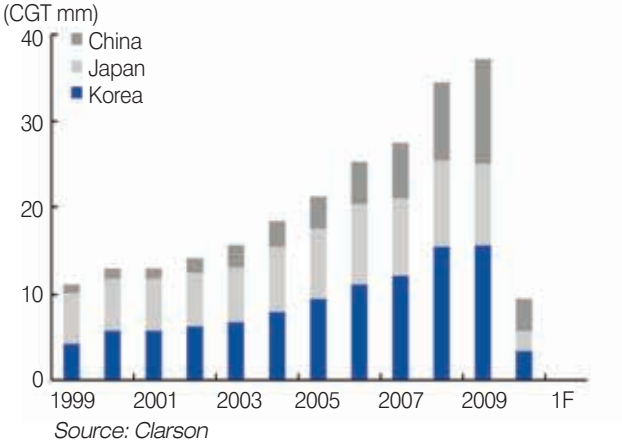
Global shipbuilding market has been dominated by Korea, Japan, and China since the early-2000s. Prior to the financial crisis, Korea was able to maintain its market leadership in terms of new orders since taking over Japan in 2000, thanks to cost competitiveness and customized engineering skills. China has quickly expanded its market share since 2005, on the back of low labor costs and strong demand from local ship operators. After the financial crisis, China took over Korea for the first time, helped by strong government support. Chinese government-sponsored shippers placed ship orders backed by government funding in 2009. In addition, Chinese banks offered ship financing at low interest rates for ship buyers. As the global ship financing market contracts, an increasing number of shippers moved to China from Korea to take advantage of easy funding. Ship speculators sought opportunities to buy ships at low prices and placed orders last year in expectation of capital gains.

Amid tough competition between China and Korea, Japanese yards are losing ground in the merchant ship market. Mitsubishi Heavy Industries recently announced that it would no longer build merchant ships at its 100-year-old Kobe yard once it completes the last merchant ship in its order book by 2012. Instead, the company will focus on submarines. It seems that Japanese yards believe their cost competitiveness is deteriorating against Korean and Chinese competitors. As such, we believe other Japanese ship-



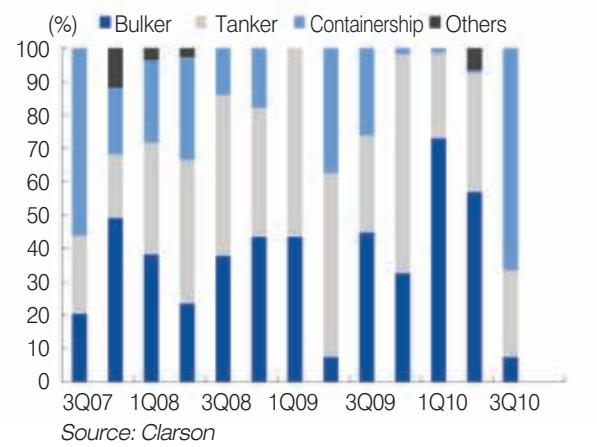
Source: Clarson

Fig.1 Market share trend of Korea, China and Japan



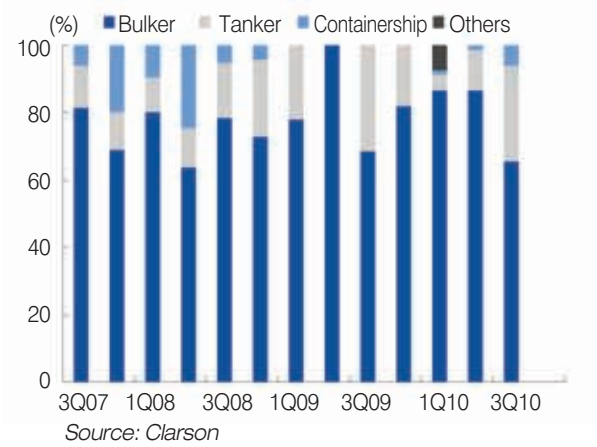
Source: Clarson

Fig.2 Delivery trend of Korea, China and Japan



Source: Clarson

Fig.3 Korean new orders by ship type



Source: Clarson

Fig.4 Chinese new orders by ship type

builders should follow suit.

The recovery of tankers and container ship market has a positive impact on Korean shipbuilders

Going forward, we expect Korea and China will compete fiercely for market leadership. We believe market dominance will be determined by market development in terms of market mix.

In the past, new orders were generated from various ship types, including bulk carriers, tankers and containerships. Therefore, Korean yards, which have a competitive edge across all ship types, outpaced Chinese competitors. Since the financial crisis, however, the tanker and containership markets have been extremely quiet because of slow end-market demand and overcapacity issues. Only the bulk carrier market has been robust thanks to stable demand for iron ore and coal from China.

China focuses on the bulk carrier market. In the bulk carrier market, it is difficult to distinguish between Korea and China in terms of quality and delivery. Since the financial crisis, China has dominated the global shipbuilding market because the bulk carrier sector has led the market (2009 and 2010). China is expected to outperform Korea and Japan with the current order book backlog for bulk carriers at Chinese shipyards totaling about 137 million DTW which is higher than Japan's 77 million DWT and Korea's 54 million DWT combined.

Going forward, however, Korean yards will likely receive more orders than Chinese peers as the tanker and containership markets should. In fact, Samsung Heavy Industries (SHI) recently won orders for ten 8,000TEU large containers and nine oil tankers in a single deal from Evergreen of Taiwan, and Daewoo Shipbuilding & Marine Engineering (DSME) signed contract to build ten 84,000TEU large containers for world's prominent container shipping company and two 10,700TEU containers ships for NOL of Singapore, which brightens the market outlook.

The effect of Chinese government's support is expected to dwindle

The Chinese government has been providing the domestic industry with direct support through government-sponsored shipping companies. Approximately 50% of the buyers that placed orders with Chinese yards in 2010 were domestic companies. Chinese shipyards were able to enjoy stable order flow thanks to government spending.

In addition, the Chinese government is providing indirect support. The government is offering cheap and easy financing to encourage shippers to place orders with Chinese shipbuilders. As a result, Chinese shipbuilders enjoyed massive new building orders in second half of 2009 and first half of 2010. According to Marine Money, a niche ship finance mag-

azine, the global shipping loan portfolio contracted to $333bn as of June 2010 from $381bn in 2009. During this same period, Chinese banks increased lending.

Since the shipbuilding market is recovering, Chinese government support will be less effective going forward. Therefore, Korea's market share will expand in line with more European buyers and the resumption of ship financing.

Noticeable growth of private-sector shipyards in China's shipbuilding industry

The most noticeable development is the new leap of China's private-sector shipbuilders which recently received orders for Capesize or Panamax although they had focused on the handy size-handymax small-to-medium sized ships.

Recently, Sinopacific Shipbuilding Group signed a contract for a total of 62 ships (valued at $1 billion in total) with Bourbon of France, and New Century Shipbuilding entered into a contract with a Greek ship owner to build a total of 4 very large crude carrier (VLCC) valued at $380 million.

According to a related statistical data, China's private-sector shipbuilders clinched 60% of total shipbuilding orders awarded to China, and received orders for a variety of ships such as specialized vessels, port working ship, maritime process vessel, and others, unlike the past.

Bolstered by the expansion of overall shipbuilding sector of China, China's private-sector shipbuilders have accomplished fast growth. Various funds, not subject to the control of past system, have led to the improved technology, strengthened competitiveness, increased value-added, and others. Previously, private-sector shipbuilders received orders only for low value-added three types of ships with the state-owned companies winning a majority of shipbuilding orders.

However, private-sector shipbuilders have become stronger to compete with state-owned companies. Sinopacific Shipbuilding Group has become capable of building high value-added LPG carriers and asphalt carriers as a result of its focus on technological development. Furthermore, private-sector shipbuilders are able to build liquefied natural gas (LNG) carriers, the crown jewel of shipbuilding industry.

So far, it is indicated in the shipbuilding industry that there are only a limited number of private-sector shipyards which can be recognized for excellence in the international market, but Korean shipbuilders need to keep a close watch on those private-sector shipyards.

Performance of China's shipbuilding industry in the first half of 2010

According to the Clarkson data released recently, China overtook Korea in terms of new shipbuilding orders, ship building volumes, and order backlog in the first half of 2010. The followings show the major performance of China's shipbuilding industry in the first half of 2010 based on statistical data.

Major types of ships for export

According to the recent data of KOTRA, bulk carrier export accounted for over 50% of China's total ship export in the first half of this year, and the growth rate of bulk carriers ranging from 150,000 to 300,000 ton has stood at 325.86%, the highest in all shipbuilding sectors, compared to the corresponding period of last year.

In addition, the container ship below 6,000TEU, crude oil carriers over 300,000 ton, and RO/RO below 20,000 ton, and other vessels, recorded a growth rate of over 40% compared to the same period of last year.

Ship type	Amount ($ 1 million)	Ratio (%)	Growth Rate (%)
Bulk carrier below150,000 ton	725,995	37.50	185.33
Bulk carrier from 150,000 to 300,000 ton	249,135	12.87	325.86
Container carrier below 6,000TEU	241,811	12.49	44.54
Refined product carrier from 150,000 to 300,000 ton	138,371	7.15	39.27
Product oil carrier below 100,000 ton	102,786	5.31	-39.79
Multi-purpose carrier	86,098	4.45	-5.04
Other ships(Light ship, fire-fighting vessels, crane vessels, etc)	48,711	2.52	15.35
Semi-finished ship, including the ship segment	43,273	2.24	12.43
Tow vessel	40,487	2.09	1.58
Crude oil carrier below 150,000 ton	36,598	1.89	-57.61
Crude oil carrier over 300,000 ton	34,220	1.77	50.82
Other liquid cargo carriers	32,785	1.69	30.65
RO/RO below 20,000 ton	28,366	1.47	87.43
Product carrier 100,000 to 300,000 ton	23,848	1.23	-43.49
Other non-maneuver vessels and passenger combination ship	23,269	1.20	-30.12
Total	1,936,026	100	47.62

Source : China's Ship Magazine

Major countries for export

In the first half of 2010, major countries for China's shipbuilding industry were Hong Kong, Singapore, Liberia, etc, and China's export increased remarkably to Turkey, Panama, and others.

Country/Region	Amount ($ 1 million)	Ratio (%)	Growth Rate (%)
China, Hong Kong	417,627	21.57	114.12
Singapore	234,422	12.11	-11.92
Liberia	172,294	8.90	279.27
Germany	170,066	8.78	103.76
Panama	164,407	8.49	392.93
Greece	88,721	4.58	130.37
Marshall Islands	80,315	4.15	49.93
Italy	74,140	3.83	162.45
Malta	62,097	3.21	-13.07
Korea	56,709	2.93	14.61
Antigua and Barbuda	39,076	2.02	116.27
UK	38,674	2.00	0.66
Netherlands	37,668	1.95	-47.05
Japan	32,792	1.69	-1.94
Cyprus	31,759	1.64	-40.94
Norway	27,053	1.40	-14.73
Bahamas	27,018	1.40	68.83
France	26,814	1.39	46.90
Malaysia	22,484	1.16	-20.34
Turkey	22,156	1.14	819.75

Source : China's Ship Magazine

Location of major shipyards of China

In 2010, China's major shipyards were found to be located in regions such as Zhejiang-sheng, Jiangsu-sheng, Shanghai, Liaoning-sheng, etc.

Region	Amount ($ 1 million)	Ratio (%)	Growth Rate (%)
Zhejiang-sheng	409,772	21.17	126.71
Jiangsu-sheng	401,106	20.72	42.27
Shanghai	327,309	16.91	4.30
Liaoning-sheng	188,849	9.75	23.55
Guangdong-sheng	142,685	7.37	86.63
Beijing	135,285	6.99	47.82
Hebei-sheng	120,158	6.21	94.31
Fujian-sheng	72,179	3.73	21.69
Shandong-sheng	57,472	2.97	9.49
Shanxi-sheng	27,806	1.44	164.35

Source : Ship Segment Association of China Chamber of Commerce for Import and Export of Machinery and Electric Products

Major imported products

In 2010, the import of dissembly ship and other floating structures accounted for 42.6% of China's total import. The import of product carrier below 100,000 ton jumped by 5464.18% from last year, the largest increase.

Ship type	Amount ($ 1 million)	Ratio (%)	Growth Rate (%)
Dissembly ship, other floating structures	44,304	42.64	42.84
Bulk carrier below 150,000 ton	18,079	17.40	-27.23
Dredger	10,699	10.30	1581.71
Container ship below 6,000TEU	6,129	5.90	1512.92
Product carrier below 100,000 ton	5,463	5.26	5464.18
Other ships (Light ship, fire-fighting vessels, crane vessels, etc)	3,273	3.15	-51.40
Ships carrying the meat, such as fishing boat and factory ship, etc	2,954	2.84	348.78
Entertainment and sports ship, rowing boat, small ship	2,916	2.81	270.90
Floating/submersible boring, production platform	2,905	2.80	-
Tow vessel	2,138	2.06	-17.28
Total	103,901	100	41.27

Source : Ship Segment Association of China Chamber of Commerce for Import and Export of Machinery and Electric Products

World's major shipbuilding countries and regions

In the first half of 2010, China was ranked at the top worldwide based on two indexes, that is the quantity of finished ship and shipbuilding orders retained. The country took the second place behind Korea based on the index of new shipbuilding orders taken.

(unit: 10 million DWT)

Country/ Region	Quantity of finished ship		Shipbuilding orders taken		Shipbuilding orders retained	
	Tonnage	Global M/S	Tonnage	Global M/S	Tonnage	Global M/S
China	27.5	39.6%	18.5	40.0%	193.0	38.8%
Korea	22.1	31.8%	20.3	43.8%	168.6	33.9%
Japan	16.2	23.3%	1.5	3.2%	91.9	18.5%
Europe	2.0	2.9%	0.1	0.2%	9.1	1.8%
Others	1.6	2.4%	5.9	12.8%	34.8	7.0%
Total	69.4	100%	46.3	100%	497.4	100%

Source : Clarkson

Why 16,000TEU?

Lee Sok-je, analyst of Mirae Asset Securities remarked, citing a shipbuilding industry research paper released recently, that the Maersk's plan to build world's largest container ship would help increase new shipbuilding orders that had been declining somewhat so far and strengthen the bargaining power of large domestic shipbuilders over the price in negotiations with ship owners. Here, we take an overview of the major details of the research that analyzed the background of Maersk's plan to build world's largest container ship and the effect of that plan on the global shipbuilding market.

Maersk, the world's largest container liner, is reported to be considering 16,000TEU container ship orders, the largest size ever ordered. Demand for new container ships is resuming.

Maersk's 16,000TEU container ship order implies that competition to reduce CO_2 emissions has begun in earnest. We forecast a faster-than-expected recovery in containership orders and competition by shipping lines for slots in Korean yards. Maintain Overweight on the sector.

Competition to reduce CO_2 has begun in earnest

Maersk, the world's largest container liner, is reported to be considering 16,000TEU container ship orders. These will be the largest container ships ever built. Previously, the largest size was 14,000TEU, with typical sizes ranging from 10,000 to 13,000TEU. The new vessels, if ordered, will be priced at $140-150m per vessel.

The real intention of Maersk in ordering 16,000TEU container ships is to secure a superior position to its peers in the "upcoming regulation of CO_2 emissions". 16,000TEU container ships will use similar-sized engines to those installed in 12,000-13,000TEU container ships. The 16,000TEU container ship will have a slower top-speed than smaller-sized ones, but will consume much less fuel per TEU (refer to Fig.1).

Furthermore, the projected price for 16,000TEU container ships will be less than the peak price of 12,000TEU container ships contracted in mid-2008,

Fig.1 Containership comparison by size

Avg. size (TEU)	13,136	11,623	8,394	6,547
Max speed (knot)	24.4	24.7	24.9	25.1
Daily fuel consumption (ton)	260.2	255.0	254.3	215.7
Daily fuel consumption per TEU (kcal)	19.80	21.94	30.29	32.95
Draft (meter)	15.4	15.4	14.5	13.9
beam (meter)	49.7	46.3	43.5	40.5
length (meter)	365.9	359.7	334.5	298.8
# of sample	123	26	106	95

Source: Company data, Mirae Asset Research

at $160-170m. The price of 16,000TEU containerships is estimated at $140-150m.

Greenhouse Gas Control (GHG Control) will levy carbon-related taxes or incentives based on CO_2 emissions per ton-mile. By running bigger vessels, ship operators can realize significant savings on CO_2 emissions-per-ton of cargo. We expect regulations on new ships to start from 2013 and on shipping operations from 2014, or soon thereafter. Considering the lifespan of new ships can be up to 30 years, from now on ship operators will have to consider CO_2 emissions. As the industry leader, Maersk is setting the standard for the rest of the industry to follow.

The move of Maersk should ring alarm bells at other shipping companies. Maximum speed is no longer a key issue as "slow-steaming" has begun to dominate the market. Competitors should seriously consider their long-term competitiveness in view of the steps Maersk is taking to secure larger and more fuel-efficient vessels., Although Maersk's new vessels will be slower, they are 20-30% more fuel efficient. If new ship contracts are dominated by a small number of players, others may see a serious decline in their market shares.

Toward a full revival of container ship orders

In our recent report, we forecast a decent recovery in container ship orders, but given Maersk's recent moves, the recovery will be faster than we expected. The start of 16,000TEU container ship orders implies a weakening of the competitiveness of existing container ships and increasing competition for bigger vessels.

As noted in our recent report, there could be a supply shortage in container ships from at the latest. We believe the potential supply shortage prompted Evergreen to sign new contracts after a pause of one year. The current order book-versus-fleet ratio fell below 30%, the lowest since 2004, and the global delivery schedule is now spread evenly over the next 2.5 years. In 2014, the expansion of the Panama Canal will be completed, and the canal will be able to accommodate container ships of up to 12,000TEU. Demand for container ships bound for

China-US routes will be up by 15%, solely due to canal expansion. Conversely, the US railroad industry will be severely hurt.

Competition for quality shipbuilding slots

We expect competition among shipping companies to secure qualified shipbuilding slots to heat up. Fuel efficiency is highly correlated with the overall quality of shipbuilding skills, good design skills, and the skills required to install energy saving devices. There are only a small number of shipyards that can meet all these requirements.

Korean yards, after adjusting their delivery schedules for container ships over the past 1-2 years, have filled newly-generated empty slots with bulk carriers and tankers. Thus, there is no room left for early-delivery slots until mid-2012. Korean yards are now negotiating orders to be delivered in 2H12 or 2013. In our view, Maersk's move will trigger heated competition among the major shipping companies.

Perfect balance is back, maintain Overweight

The revival of containership orders further implies balanced ship demand, which will maximize the profitability of new orders for shipyards. Top shipbuilders cannot build just one type of vessel; a proper mix of ship types is required in order to maximize the utilization and profitability of their facilities. We reiterate our Overweight rating on the sector.

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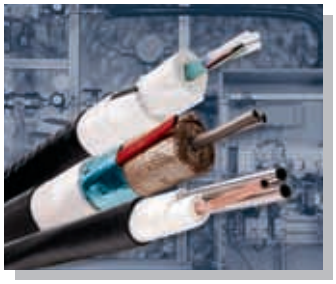

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Mooring Line

Parker Scan Subsea
Parker Cabett Subsea
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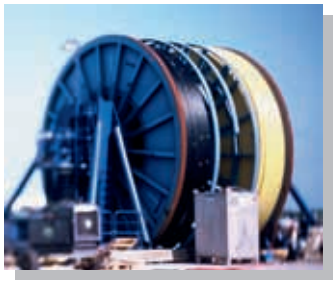

Quick
Coupling

The **Parker Fluid Connectors Group** manufactures and markets the widest range of hydraulic tube and hose fittings as well as related accessories. There are also high-quality instruments for measuring pressure, temperature and flow. Make the most of this broad product offering of millions of proven components. Furthermore, for product reliability and safety, Parker offers you many advantages when it comes to assembly, purchasing and logistics.

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Monthly Korship, Korea's only shipbuilding magazine in English, serves as the window to the world's shipbuilding industry building a bright future on the horizon at sea.

Monthly Korship provides an up-close look at the products of companies.
It is a precious source of information, offering in-depth features related to shipbuilding orders, strength and special advantages of new products, and updates of products that companies are rolling out.

Technology - It provides detailed overview of the expertise, know-how and products of companies, touting the technological competitiveness of shipbuilding equipment and material companies.

Application - It provides explanations on the function, strengths, weakness of products based on their application to ships.

Reliability starts with precision shaft alignment

Laser precision alignment of PRUFTECHNIK Alignment Systems extends machine availability as the Mean Time Between Failure (MTBF) increases. It protects assets and increases product quality, because vibration is reduced to very low levels. So it would expected reduce operating cost.

Daeah Co., Ltd.

Rotating machinery is susceptible to misalignment. Machines that are well aligned at the commissioning stage and thereafter regularly maintained, will in the long term reduce both plant operating and maintenance costs.

Extend machine availability and efficiency

Rotating machinery is susceptible to misalignment. Machines that are well aligned at the commissioning stage and thereafter regularly maintained, will in the long term reduce both plant operating and maintenance costs.

Laser precision alignment extends machine availability as the Mean Time Between Failure (MTBF) increases. It protects assets and increases product quality, as vibration is reduced to very low levels.

When misaligned, the loading of the shafts dramatically increases due to the reaction forces created within the coupling.

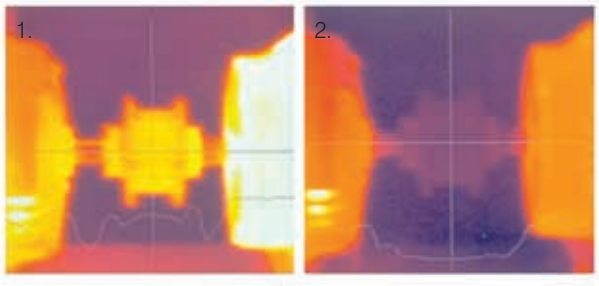
Precision alignment guarantees:

-Reduced energy consumption

-Reduction in bearing, seal, shaft and coupling failure

-Reduced bearing and coupling temperatures
-Reduced vibration
-No breaking (or cracking) of shafts
-Secure foundation bolts

Accurate shaft alignment contributes in more than one way towards great savings and a cleaner environment.



1. Out of tolerance: In this case, the flexible coupling element heats up. The machine develops elevated temperatures, particularly around the bearing housings.

2. Within Tolerance: Precision alignment drastically reduces factors that may cause machinery breakdown.

Fig.1 The effect of increased coupling loading due to misalignment can readily be shown using infrared thermography.

Benefits of precision alignment

• **Reduced energy consumption:** Significant power savings can be made through accurate alignment. Precise alignment eliminates reaction forces and reduces energy consumption by up to 10%.

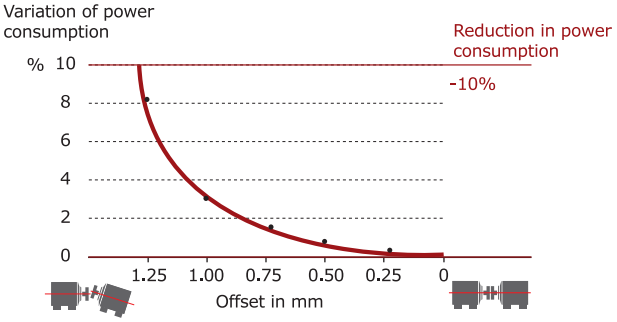


Fig.2 Effects on power consumption

• **Reduced repair incidences:** Mechanical seal repairs decline by up to 65% when precision alignment is carried out on a regular basis.

The rate of repairs declines by up to 30% when precision laser alignment becomes an integral part of the pump repair schedule. Maintenance costs are also reduced through lower parts expense and inventory levels.

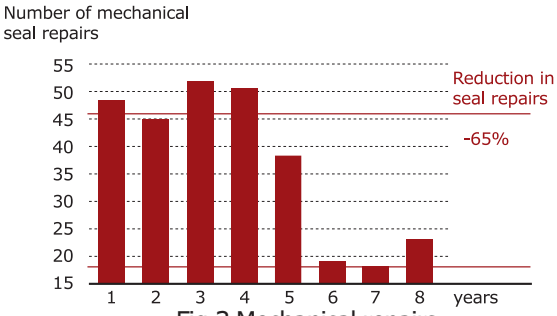
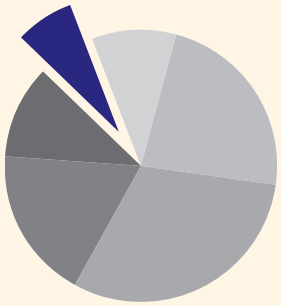


Fig.3 Mechanical repairs

Align machines to specified tolerance move

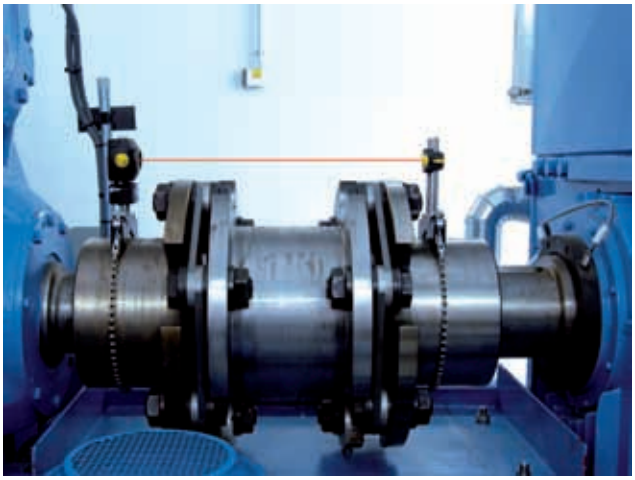
A survey conducted by one of the world's leading rotating equipment service organizations shows that less than 10% of the 160 machines randomly chosen for measurement were found to be aligned within acceptable limits.



Only 7% the measured machines fall within the acceptable alignment tolerance

Offset (mm)	Machines measured (%)	
0.00 - 0.05	7%	acceptable alignment
0.06 - 0.10	10%	
0.11 - 0.20	23%	
0.21 - 0.50	31%	out of tolerance
0.51 - 1.00	18%	
>1.00	11%	

**The above tolerances are for equipment running at 3,000 rpm.*



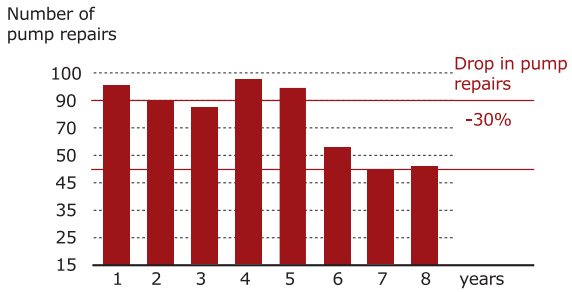


Fig.4 Pump repairs

- **Longer machine life:** The smaller the offset misalignment, the higher the expected bearing life cycle.

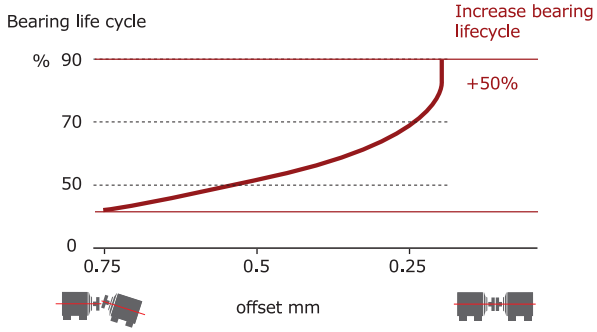


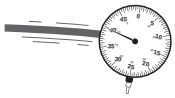
Fig.5 Relation between offset and bearing life cycle

Traditional shaft alignment methods

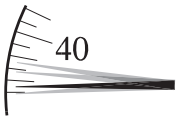
Conventional measurement methods possess a low resolution for the adjustment of modern machinery. The straightedge/feeler gauge methods depend on the limited resolution of the human eye. The resulting resolution of 1/10mm is for most machinery inadequate.

Dial indicators normally have a resolution of 1/100mm, but calculations tend to be complicated, requiring highly experienced users, and jobs take longer to accomplish. These methods are prone to human influences when reading dial indicator values or computing the alignment condition.

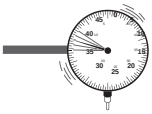
How accurate are dial indicator readings?



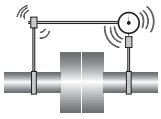
- **Sagging indicator brackets:** Sag should always be measured before actual alignment readings are taken irrespective of how solid the bracket appears.



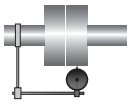
- **Low resolution:** Up to 0.005mm rounding error may occur with each reading - which easily results in an error of up to 0.04mm in the calculated results.



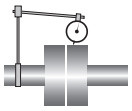
- **Sticking/jumping dial hands:** Sometimes the indicator must be tapped in order for the needle to settle on its final value.

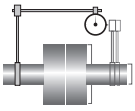


- **Play in mechanical linkages:** Slight amounts of looseness may not be noticed, yet produce large errors in results.



- **Reading errors:** Human errors occur all too often when dials must be read under cramped, poorly-lit conditions and severe time constraints.





- **Tilted dial indicator:** The indicator may not be mounted perpendicular to the measurement surface so that part of the displacement reading is lost.
- **Axial shaft play:** This can affect face readings taken to measure angularity unless two axially mounted indicators are used.

Advantages of laser shaft alignment

Straightforward alignment procedure

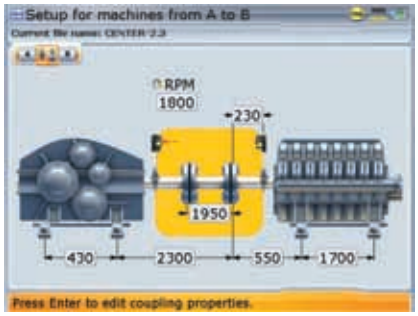
• Dimensions

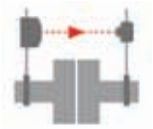
-Systems are user-friendly and intuitive

-Quick set-up of the fully assembled ready-to-use sag-free brackets

-Follow the simple on-screen guidance to enter required machine data.

-Bracket variety for any shaft or coupling





Unibeam

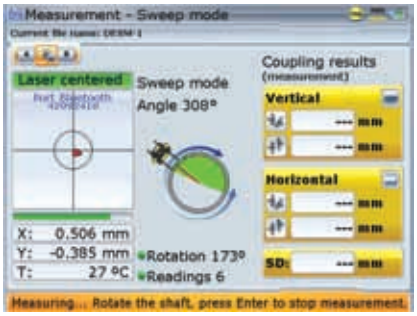
• Measure

-Error-free and accurate measurement with a resolution of 1 micron (0.00004°±)

-No human reading errors and bracket sag influences

-Quick on-screen laser beam adjustment

-Take readings at any desired position



Sweep mode

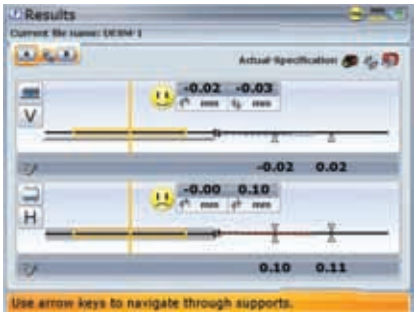
• Results

-Instant display of the coupling & feet values in both horizontal and vertical directions

-Evaluation of the alignment condition according to coupling tolerance

-Repeatability of results

-Reports generated directly from instrument, in conformity with ISO 9001 requirements



TolChek

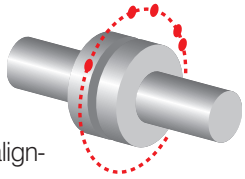
ALIGNMENT CENTER - The software for professionals

ALIGNMENT CENTER is a state-of-the-art PC software database platform for all PRUFTECHNIK Alignment instruments and applications. It is the perfect solution for preparing, analyzing, organizing and archiving measurements. Measurement related data is also saved and the measurement history can also be followed and organized under hierarchies. The software generates professional color reports that include photos, company information and logo.

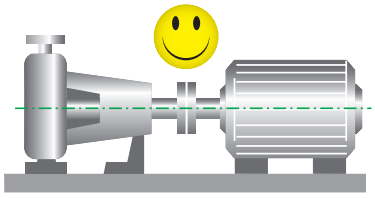
Benefits of PRUFTECHNIK laser alignment systems

The unique measurement principle offered by PRUFTECHNIK laser alignment systems allows the machine feet corrections to be monitored during live adjustment. The machine graphics show the direction and the correction value of feet to be moved. A smiley face appears as soon as the alignment condition falls within the set coupling tolerances. PERMABLOC precut shims from PRUFTECHNIK are the quality shims for fast and accurate alignment correction.

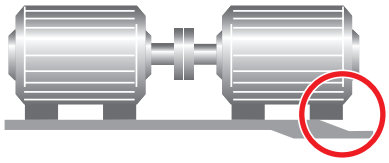
- **Continuous sweep mode:** Measurement data is automatically and continuously collected from any start position as the shafts are rotated capturing a large number of measurement points to accurately determine the alignment condition.



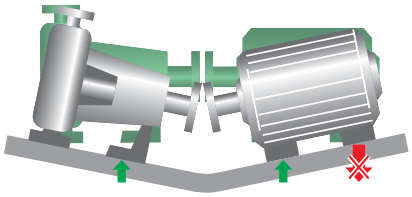
- **Tolerances (TolChek):** Avoid unnecessary moves by automatically evaluating alignment condition with respect to tolerances using the "smiley" which is also active during live machine correction.



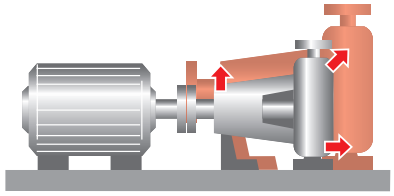
- **Soft foot:** For good alignment, soft foot must be eliminated. The machine feet should rest properly on the foundation. Soft foot is measured, corrected and documented.



- **Base-bound or bolt-bound:** Problems arising from base-bound or bolt-bound feet are resolved by redefining fixed/movable feet.



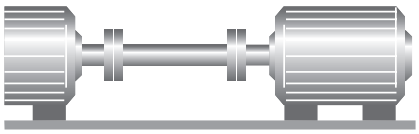
- **Thermal growth and Target specifications:** The specifications can be input to take into account the expected positional change of the machine during operation.



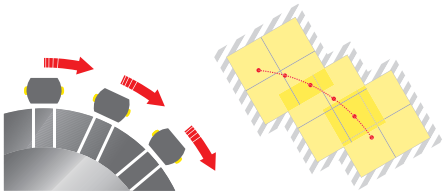
| Company | PRUFTECHNIK Alignment Systems GmbH

PRUFTECHNIK Alignment Systems, the inventor of laser shaft alignment, has more than 25 years of experience in developing, manufacturing and applying laser-based alignment measurement systems.
We offer a full range of shaft alignment products. These modular systems can be customized to include advanced functions to meet user needs. They are also available in intrinsically safe versions for use in hazardous areas. Our measurement systems are used in many alignment applications of rotating machinery in most industries.

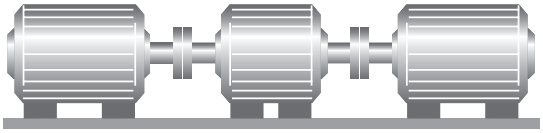
- **Choose coupling type:** Short flex, single plane, cardan or spacer couplings can be selected to apply the correct tolerance and display criteria for your machines.



- **InfiniRange:** The measurement range of the detector can be infinitely extended to accommodate gross misalignment. This is ideal to perform and document initial rough alignment and easily handle long spans across spacer shafts.



- **Machine train alignment:** Measure and display the entire alignment condition of machine train; allowing the user to make the optimal machine adjustment.



Applications

PRUFTECHNIK Alignment measurement systems are utilised in a wide range of industrial applications including alignment of rotating machinery, bores, turbines and rolls, monitoring of machine position changes, measurement of machine tools, surface flatness and straightness. Meanwhile, PRUFTECHNIK hi-tech instruments are used in top industrial organizations worldwide. Industrial sectors covered include: power, oil, gas, mining, petrochemical, cement, water treatment and sewage, marine and shipping, pulp and paper, chemical and pharmaceuticals, food processing, steel, production and processing, and within OEMs.

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Mass appeal

Recently, Buffalo Marine Service announced how the use of precision metering technology could help to manage expectations and eliminate disputes.

Emerson Process Management Korea Ltd.

Recently, Buffalo Marine Service's M/V San Joaquin pushing the T/B Buffalo 401K pumped 1,500 metric tonnes (mt) 500 centistoke (cst) bunker fuel to the M/V Maersk Wyoming. To the casual observer, there was nothing extraordinary about this particular bunker job; however, upon closer inspection, both vessels were monitoring the mass flow of bunkers via mass flow Coriolis meters. After seven hours of pumping, the Captain of the M/V San Joaquin printed out a fuel ticket for the 1514.39mt that had been pumped by the T/B Buffalo 401K. Meanwhile, the M/V Maersk Wyoming's Chief Engineer compared the meter ticket against the reading on his vessel's mass flow meter and acknowledged that he had received 1,515mt - a 0.05% difference.

The transparent nature of this operation reinforced the value of the recently-installed mass flow meter and FuelTrax system aboard the T/B Buffalo 401K. The real time temperature and density readings recorded by FuelTrax validated that the volume was not inadvertently boosted by entrained air. More importantly, the measurement of the fuel in mass ensured that the bunker fuel's characteristics - such as density - did not create an unreliable or questionable volume. This 'certainty of measurement' allayed any concerns over the barge owner 'skimming' fuel for its own benefit or the supplier providing a lesser quality of product.

Mass flow meters in conjunction with FuelTrax are by no means a panacea. Yet, the employment of such a system has already substantially reduced delivery disputes and shortage claims. In essence, it clearly represents Buffalo Marine's commitment to employing proven technology for the benefit of its customer base.

Over the last two decades, Buffalo Marine has recognised that it is imperative to accurately measure and document bunker deliveries. Thus, before the advent of reliable and robust mechanical measurement devices, bunker crews were constantly reminded to properly gauge tanks, re-gauge and re-gauge yet again so that there was no doubt as to the amount of bunker fuel aboard the tank barge. Despite this fastidious approach to documenting the number of barrels on hand or the amount of barrels transferred from the bunker barge, it was not uncommon for personnel to question the accuracy of the gauge readings or even demand to personally gauge the bunker barge tanks. In other instances, gauge readings taken by the crews aboard the vessels in receipt of bunkers were even wary of their own readings due to the possibility of significant air entrainment during the course of the loading.

As Buffalo Marine's President and CEO Pat Studdert recalled: "We knew there had to be a better way to convince our customers that what was ordered, was delivered." That sentiment drove Studdert to evaluate the metering capabilities of Buffalo Marine's blending tank barge - the Buffalo Star. This particular barge, equipped with a kinematic static mixture, was designed to provide precision blended fuel products from a combination of its IFO 380 centistoke (cst), cutter stock and marine gas oil tanks. The brains of the blending operation consisted of Emerson's Micro Motion Coriolis meter and e-blend control system.

Studdert recounted: "Given the success of the mass flow meter system aboard the Buffalo Star, it stood to reason that a similar system could be installed on our newer bunker barges." Yet, the infrastructure costs and regulatory requirements associated with non-self propelled tank barges led Buffalo Marine to consider mechanical meters.

"The relatively complex nature of the Buffalo Star's piping systems and mandate that the power and control systems associated with the meters must be self-contained and intrinsically safe were a bit daunting," commented Studdert. Eventually, in order to avoid extensive shipyard refitting and design modifications to accommodate a control booth and separate power source, mechanical meters (i.e., positive displacement) were placed on all new construction bunker barges in 1997. The meters also required a robust air eliminator system and were temperature compensated to enhance the system's accuracy.

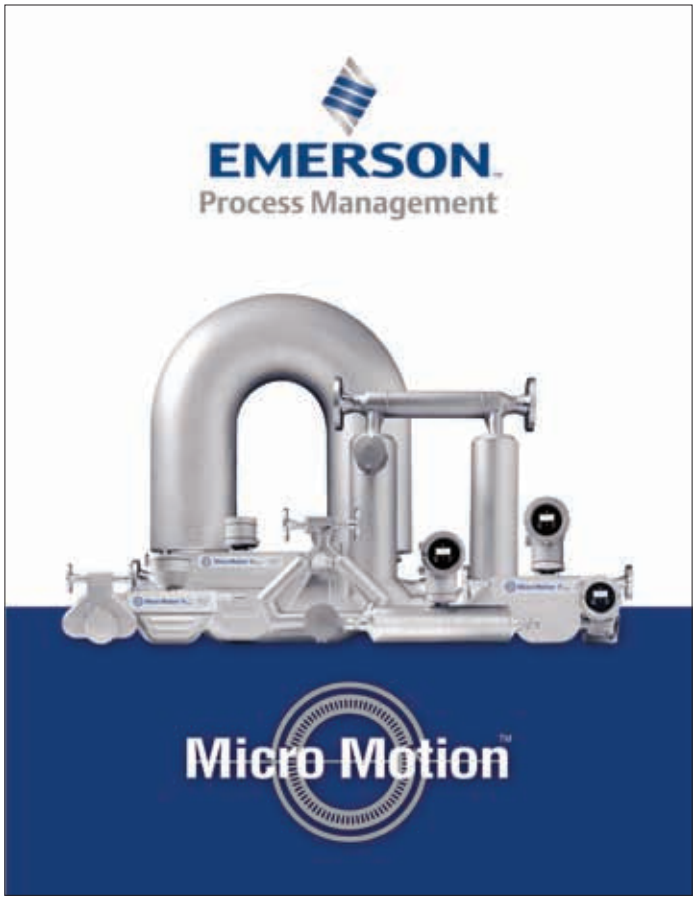
Like any new system that is subjected to the rigours of the maritime environment, the strainers, air eliminators and actual meter required routine maintenance. This was of utmost importance with respect to the calibration of the metering system since hard landings or any other 'shocks' suffered by the tank barge could easily knock the tumblers out of alignment. As Studdert noted: "The additional maintenance measures and calibration schedule was well worth it. Our bunker crews possessed a tool that produced a meter ticket that documented what had been delivered to the ship." More importantly, the relatively simple nature of the system made it easy for the personnel aboard the vessel receiving bunkers to grasp how the meter operated and recognise that it was nearly impossible for air entrainment to artificially boost the barrels delivered. This went a long way in allaying any concerns over short deliveries.

Buffalo Marine Service quickly reaped the benefit from this investment as short-delivery claims ceased to exist when bunkers were delivered from a metered barge. However, Studdert was not quite convinced that the mechanical meters were an optimal solution. After all, the Buffalo Star's mass flow meters continued to perform in a flawless fashion without large demands in maintenance and routine calibration. His instincts proved to be correct when a team comprised of Emerson and Nautical Control Systems approached Buffalo Marine about the prospect of installing a mass flow meter on a bunker barge.

What caught Studdert's eye was the fact that the computer monitoring system was installed in the pushboat's wheelhouse. Thus, there was no need for a separate control room and accompanying power supply on the tank barge. This reduced the amount of additional equipment on the bunker barge and permitted wheelhouse personnel to monitor the mass flow of bunkers as if they were located on the bunker barge with the tankerman. The key to the system was the umbilical cord that connected the FuelTrax meter on the barge to an independent port on the pushboat. The cord, in turn, provided power from the pushboat's generator to the meter. All of this was synched up to a FuelTrax control system which included a separate interactive computer screen for the benefit of personnel monitoring the evolution from the wheelhouse.

Studdert knew he had a 'winner' of a system when the Captains informed him that the mass volume data depicted on the FuelTrax wheelhouse monitor permitted them to better gauge the bunker discharge process. "Previous concerns

over the tankermen properly using the mechanical meter on the tank barge were eliminated. Additionally, bunker tankermen had greater confidence that the digital readings depicted by the FuelTrax system were more precise and less vulnerable to inaccuracies that were related to mechanical meters." In short, tankermen soon realised that their verification gaugings at the end of the bunker job were always in line with the data from the mass flow meter. Consequently, when personnel from the ship that had just received bunkers were presented with a mass flow meter printout from wheelhouse personnel, it was quickly understood that the meter had taken into account the properties of the fuel delivered (i.e. temperature, density). Therefore, the accuracy of the data was sacrosanct. As one veteran Buffalo Marine Captain put it: "Mass is mass is mass. Unless you change the laws of physics, the amount recorded by the Coriolis meter is what we pumped to the customer!"



Buffalo Marine personnel were also quite impressed with FuelTrax' Bunker Trax menu. During any portion of the bunker transfer process, pushboat personnel, dispatchers at the main office or any authorised person equipped with a laptop and internet connection could log into the system and access the particulars of any given bunker job. The impact of this data was profound as it enabled personnel to monitor pumping performance, temperature trend lines and density consistency throughout the course of the bunkering evolution.

Studdert recalled a recent bunker job where the ship's Chief Engineer was convinced that it was impossible for the barge to have pumped at a nearly 500mt/ hour rate.

"Our Captain patiently explained to him that the rate was consistent with the pump's rating," recounted Studdert. "The Chief Engineer countered that the fuel temperature was too low for that as he was convinced that the fuel was no more than 110°F." At this juncture, the Captain pulled up the temperature graph as well as the bunker density chart to drive home to the Chief Engineer that the entire process was transparent and our pumps performed as advertised.

"Once the Chief was presented with this data, he studied it carefully, asked if all of the tow's jobs were this thoroughly documented and then proceeded to sign the bunker delivery receipt without any further comment."

This type of experience certainly validates Buffalo Marine's commitment to install mass flow meters and the FuelTrax system on its fleet of bunker barges.

"Perhaps our biggest problem is that the demand for FuelTrax-equipped bunker tows exceeds our supply," commented Studdert. "However, we have stressed to our customer base and regional suppliers that while the bunker barges with mechanical meters lack the FuelTrax data history, these meters still provide accurate delivery information."

As he continues to outfit his fleet of pushboats with FuelTrax systems, Studdert is convinced of the importance of bunker delivery transparency and believes that mass flow meters represent the future of the bunker business.

"All too often, the bad habits and shenanigans that are perpetrated by a few are imparted to the bunker community as a whole - regardless of the port," said Studdert. "If I can convince our most sceptical customers that they are in possession of every barrel they ordered with a FuelTrax printout from a Coriolis meter, then I save time, money and, most importantly, positively bolster our profession's reputation."

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Making the heart of ship beating

Testo Korea announced that H Shipping accomplished satisfactory results from its use of 'testo 881', an infrared camera, after having sought a way of high precision maintenance of facilities crucial for the movement of ship without disrupting the navigation.

Testo Korea Ltd.

Recently, medium-sized companies is adding fresh impetus and new momentum to their plans for operating on the European and American routes in a bid to win the competition against large global shipping companies. Amid this trend of industry, H Shipping has mapped out and proceed with plans to organize various fleets within a decade and provide the services that link South East Asia, India, and Mid East from the Far East.

Emerging from the worst crisis along with the recovery of shipping market that began from the end of last year, H Shipping aims to ensure efficient ship management because its car carriers have become old despite more steady performance compared to that of container carriers.

H Shipping has decided to use 'testo 881', an Infrared Camera of Testo Korea, as it was seeking a way to ensure high precision maintenance of facilities essential for the movement of ship while causing no disruption to the navigation.

testo 875

Infrared camera optimized for the maintenance of large ship's facility

Testo Korea, the domestic distributor of Germany-based Testo's infrared camera, temperature, wind velocity, humidity, pressure, combustion gas system, transmitter, etc, has recently unveiled 'testo 875' and 'testo 881', upgraded versions of infrared cameras.

Both models of thermal imagers ensure precise analyses of maintenance/repair condition of all facilities and energy efficiency. Highly accurate, they can detect even the slightest difference in temperature, helping prevent accidents and ensuring effective maintenance.

Furthermore, the exchangeable lens allow adaptation to the different sizes of and distances from measurement objects. The 32°C standard lens shows a large image section and therefore ensures a quick overview, while the 9°C telephoto lens offers the option of detecting more details at greater distance.

testo 881

The built-in digital camera stores a thermography and a real image at the same time or several infrared images can be analyzed simultaneously and documented in the measurement report. TwinPix function shows real image and thermography superimposed and merged, enabling the effective analysis of measurement point.

The one-hand operation with automatic focus and joystick ensures convenient operation, and the soft case with shoulder strap allows the user to move freely when the measurement stops. Special germanium lens protective filter, easy to be attached to the lens, is permeable to infrared radiation and offers optimum protection of the lens from dust and scratching.

testo 875, upgraded to provide greater precision, features temperature sensitivity of less than 0.08°C and offers a quick overview of dew condensation point within the thermal image by analyzing the ambient temperature, humidity in air, indoor dew point, etc, through specialized software, as well as the smallest temperature difference. In addition, the temperature recognition of important area ensures the constant monitoring and discovery of abnormalities, which is useful for closely examining, evaluating, and documenting related details via the computer.

With a thermal resolution of less than 0.05°, the testo 881 provides high resolution images that can detect even the smallest temperature differences. Besides, it indicates the possible area of dew condensation in the thermal image if ambient temperature, humidity in air, indoor dew point, etc, are entered manually, and includes powerful LED lighting to provide illumination for the built-in digital camera.

The isotherm function shows the temperature of important area with color images. The headset with a speech/recording function enables the storage and documentation of measurement images and voice information.

If high temperature filter is attached to the camera lens, the measuring range can be extended up to 550°C and the maximum/minimum values of image can be checked immediately on the spot.

Immediate location of hazardous area of electric facilities

Using testo infrared camera, H Shipping checked complex facilities inside ship and immediately located hazardous area of electric facilities. In addition, it could prevent the power leakage caused by old parts and analyze the thermal maintenance system of boiler systematically.

A source from H Shipping said, "I heard that Testo's infrared camera was selected recently by the Ministry of National Defense for closely examining military-related facilities with great precision. I am convinced that the cutting-edge technology recognized by the military will enable high-precision inspection of facilities which are the heart of our ships." He added, "We selected the products of Testo with great confidence because it is the only company among domestic instrument companies which provides two-year free after-sales-services following the purchase, and we are very happy with the results."

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New Order - It is a clean roundup of news on orders placed with shipyards. New shipbuilding orders are reported in detail, along with photos capturing the moment of shipbuilders and clients signing contracts and summary illustrations of order backlog.

Major Performance Gallery - It provides detailed overview on the specification of products with photos.

New product - It provides updates on new products.

DSME clinched an order for ten large container ships

Daewoo Shipbuilding & Marine Engineering (DSME) announced that it was recently awarded an order for ten 8,400TEU large container ships from world's prominent container shipping company. The deal is valued at a total of approximately KRW 1 trillion and 200 billion.

The vessels are 332 meters in length and 42.8 meters in width, and has the capacity of 8,400 containers, operating at a maximum speed of 23 knots (42.6km/h). They will be built at the Okpo Shipyard in Geoje, Gyeongnam, and delivered to the ship owner by the first quarter of 2014.

DSME has secured orders for a total of ten container ships from this company so far, and has successfully delivered six of them.

The state-of-art technology of DSME has laid the cornerstone for the relationship of trust with the ship owner, leading the company to win this shipbuilding contract.

Meanwhile, the ship owner is said to have placed the order with DSME while it was looking to build a long range business relationship with a shipbuilder in an attempt to reorganize its fleet with an added emphasis on large container vessels as the container freight index has recently set a record high since November 2008.

DSME President & CEO Nam Sang-tae remarked, "This mega contract for container ships will tighten our grip not only on the very large oil tanker market but also the container ship market. We will achieve our $10 billion target this year by proceeding vigorously with our strategies to win orders for high value-added vessels such as very large oil tankers, very large container ships, offshore facilities, and others."

DSME has accomplished a half of its annual target as this contract brings the total number of orders for vessels and offshore facilities to 47 which are valued at $4.9 billion in total.

Trial operation of the same type of vessel ordered to DSME this time

DSME won a contract to build KRW 310 billion worth of luxury ferry

Daewoo Shipbuilding & Marine Engineering (DSME) held a signing ceremony after winning an order for one large night car ferry, a luxury ferry, from Compagnie Tunisienne de Navigation (COTUNAV), Tunisia's state-run shipping line, on July 26.

The ferry will be 210 meters in length and 30 meters in width, the largest among all ferries currently operational around the globe. The contract is valued at about KRW 310 billion and the ferry is scheduled for delivery in the first half of 2012.

Powered by 57,600kW engine, this vessel has a capacity of 3,200 passengers, 285 crews and 1,060 cars with a speed of 27.5 knots (about 51km/h). Among the cruise ship style passenger facilities are included the shopping center, childrens' play area, restaurants, swimming pools, night clubs and internet cafes, etc, in the passengers' convenience area measuring about 11,000m^2 on three decks.

COTUNAV which ordered this vessel is a state-owned shipping line established in 1995, providing regular passenger ferry connections in France and Italy, etc. It plans to put this ferry into the regular route linking Tunisia and France during the peak season and use the ferry during the off season as cruise ship sailing at sea.

Meanwhile, the signing ceremony, held on the 50th anniversary of the nation's proclamation of the republic (on July 25, local time), was attended by Ali Khalifa, president of COTUNAV, the ship owner, and major officials from the political and financial circles of

Tunisia, who showed great interest in this contract which Tunisian government has supported at a national level.
Ali Khalifa, president of COTUNAV, said, "I believe that DSME will build world's best quality vessel under this contract which the government has driven forward at the national level and meet the expectation of Tunisian people."
This contract brings the total number of orders for passenger ships awarded to DSME to 10, and DSME has successfully delivered 7 of them so far, the best performance in the passenger ship sector among domestic companies.
Specifically, this contract is meaningful very much in that DSME - which was solely qualified to bid among domestic companies for its unrivalled experience with the construction of ferry - won the competition against prominent European shipyards specializing in passenger ship and was awarded the order in recognition of its overall ability to build passenger ship, such as the shipbuilding technology, financing ability, interior design ability, and others.
Making inroads into the North African market for the first time beyond the current passenger ship market in Greece or Italy, DSME is praised for expanding the market for Korean passenger ship further.
Meanwhile, DSME President & CEO Nam Sang-tae remarked, "We will make a full-fledged inroad into the cruise market, using our know-how and experience in the passenger ship market."

DSME President & CEO Nam Sang-tae (right) and COTUNAV President Ali Khalifa (left) are shaking hands after exchanging the ferry construction contract on July 26 in Tunisia.

JUNJIN CSM was awarded KRW 10 billion contract from Korean Electric Power Corporation

JUNJIN CSM announced that it won the bid to build electric work vehicles for Korean Electric Power Corporation (KEPCO) on July 30. Under the contract, JUNJIIN CSM will build a total of 102 insulated aerial working platform trucks.

Insulated aerial working platform trucks

The contract is valued at approximately KRW 10 billion.
The bids on the performance standard and price of product were offered separately this time, and JUNJIN CSM passed the product performance test in June and had the winning bid on the price. As a result, the company will regain its reputation as the supplier of KEPCO after losing it to foreign suppliers.
Lee Jae-hwan, President of JUNJIN CSM, said, "This contract represents the recognition of the excellence of our products in terms of quality, performance, and price competitiveness, proven in the open bidding held by KEPCO". He added, "It will have a considerable marketing effect on the reliability of company and improvement of brand image in domestic and overseas market."

DSME received orders for three onshore/offshore facilities

Recently, Daewoo Shipbuilding & Marine Engineering (DSME) was finally awarded one contract to build one FPSO (Floating Production, Storage & Offloading Unit) from a major oil company operating the oil field in the West Africa, and another order for one offshore plant facility and one onshore plant module from a U.S. oil company.

The contracts are valued at a total of approximately $2.15 billion, and DSME plans to deliver them to ship owners by 2013.

The FPSO will be 305 meters in length, 61 meters in width, 110,000 tons in weight, a mega facility both in terms of value (approximately KRW 2 trillion and 100 billion) and size. It is capable of producing up to 160,000 barrels of crude oil and 6.5 million cubic meters of natural gas every day, and storing up to 1.8 million barrels of crude oil.

This FPSO is a turn-key basis project which will be delivered to the owner in a state ready to be used. DSME will build both hull and topside of this facility, carrying out the entire processes - which encompass the designing, purchasing, producing, installing, and commissioning - through its proprietary technology.

This FPSO will be operated in the oil field zone at a depth of 1,200 meters located 140 km off Angola's west coast.

DSME President & CEO Nam Sang-tae said, "This contract is a splendid accomplishment, which makes our unrivaled technological prowess in the offshore facility construction known again around the world. We will do our utmost to maintain our top position in the high value-added facilities such as FPSO, semi-submersible rig, and others, and exceed our annual target of $10 billion in new orders."

STX Offshore & Shipbuilding won the this year's first drillship order

STX Offshore & Shipbuilding was recently awarded a contract worth $250 million to build a drillship for Noble Drilling Holding, a U.S. drilling company.

This drillship is the first to be ordered this year across the globe, and will cost $550 million for construction.

This vessel will be 189 meters in length, 32.2 meters in width, with a speed of about 11 knots, capable of carrying 180 persons and drilling in depths up to 12,000 meters. It will be built at STX Dalian Shipbuilding Complex and delivered in 2012.

Specifically, Compact Drillship design, developed jointly by STX Offshore & Shipbuilding and European ship designer, will be applied to this drillship. Compact Drillship, a small type of drillship with drilling capacity comparable to that of conventional larger one, is designed to enable the drilling in regions with bad weathers like the North Sea. Above all, the greatest strength of this vessel resides in easy navigation and reduction of maintenance/repair cost including fuel cost, a low carbon emission eco-friendly vessel.

The U.S. based Noble Drilling Holding which placed the order with STX Offshore & Shipbuilding this time is the second largest specialist in the drilling industry, possessing 69 drilling units. Recently, Noble Drilling Holding acquired Frontier, a drilling company, expanding its sphere of influence in the market even further.

STX won orders for drillship and FSU (Floating Storage Unit) consecutively after

Allen Al Hay (left), President of Noble Drilling Holding, and Jeong Yeong-hwan (right), Vice President of STX Offshore & Shipbuilding, are shaking hands after signing the contract in Rotterdam, Netherlands.

it secured the order worth $200 million for pipe laying vessel in 2007. This time also, it successfully clinched orders, cementing its top position as the leader in the offshore plant market only four years after it advanced into this sector.

Only two orders were awarded for drill ship worldwide in 2009 as major oil companies were refraining from placing any new building orders in the aftermath of global economic slump, a sharp contrast to the booming years of 2007 and 2008 when a total of 12 drillships and 19 drillships were ordered, respectively, amid high oil prices.

This contract for drillship, the first one awarded to STX this year, is all the more meaningful for being a tangible achievement in overcoming the sluggish drillship market conditions in the wake of the oil spill in the Gulf of Mexico.

A source from STX Offshore & Shipbuilding said, "Wining this contract for offshore plant, we proved our competitiveness in the high value-added ship market in a short period of time, and we will lay the groundwork to become the leader in the offshore plant market through constant R&D and aggressive sales activities as we anticipate more orders in the sector of offshore plant such as drillship and others."

Having received orders for sixty five vessels valued at $5.05 billion this year alone, including recent drillship order, the shipbuilding sector of STX Group is spurring its sales activities.

STX Europe was awarded a contract to construct two AHTS vessels

STX Europe announced that it clinched orders for two Anchor Handling Tug Supply (AHTS) vessels from Brazil's NorSkan Offshore on August 11 (local time).

AHTS vessels are vessels which tow drilling rigs to the precise location at sea and anchor them up.

The vessels which STX Europe will build is 93 meters in length, 22 meters in width, and will be built at Promar Shipyard, STX Europe's shipbuilding yard in Brazil, and is scheduled for delivery in 2012 and 2013, respectively. Specifically, this vessel will adopt a new design developed by STX Europe, which enables stable drilling even in deep sea waters.

NorSkan Offshore, a Brazilian subsidiary of Norway's DOF - an offshore plant service provider - plans to charter four AHTS vessels to Brazil's Petrobras, which are the two vessels ordered this time and two vessels under construction at Promar Shipyard.

Last year, STX Europe received the order for eight vessels in the offshore and specialized vessel sector amid the declining demand for new ships in the wake of the financial crisis that gripped the global economy.

This year, STX Europe secured orders for a total of 23 vessels in the offshore and specialized vessel sector alone, including the AHTS vessels ordered this time. In the cruise sector, STX Europe successfully won the orders for two large cruise ships this year alone, proceeding steadily with the efforts to obtain orders as the global shipbuilding market is rebounding.

Roy Reite, President of STX's Offshore and Specialized Vessel sector, remarked, "Leveraging the geographical advantage of shipyards in Brazil, we have won upwards of 40 orders in Brazil's offshore plant support vessel market alone. We plan to strengthen R&D activities, such as the development of new ship design, to speed up our advancement into new markets like Latin America, Asia, and other regions, using our production facilities in Brazil and Vietnam as the springboard."

Anchor Handling Tug Supply Vessel

DSME signed a contract to build two 10,700TEU large container ships

Daewoo Shipbuilding & Marine Engineering (DSME) announced that it was recently awarded a contract to build two 10,700TEU large container ships for Neptune Orient Lines of Singapore. The deal is valued at approximately $230 million.

The vessels ordered this time will be 347 meters in length, 45.2 meters in width, and have the carrying capacity of 10,700 containers, sailing at a maximum speed of 24.8 knots.

They will be built at Okpo Shipyard, Geoje, Gyeongnam, and delivered to the ship owner by the fourth quarter of 2012.

DSME was awarded orders worth approximately $1 billion to build ten 8,400TEU container ships from NOL in July. This recent contract brings the total number of container ships ordered from NOL to 22, and DSME successfully delivered six of them so far. Winning this contract, DSME has become the strategic partner of NOL.

NOL has the fleet composed of about 140 vessels, and 80% of them are small-to-medium sized container ships below 6,000TEU. NOL is currently reorganizing its fleet with more focus on large container ships, which raises the prospect of additional shipbuilding orders.

DSME President & CEO Nam Sang-tae said, "We will maintain our competitive advantage in the container ship market by developing new technologies such as the fuel-saving technology which helps ensure economically efficient operation of ship owner."

DSME President & CEO Nam Sang-tae (right) and NOL Chairman Cheng Wei Keung (left) are shaking hands after signing the contract.

Nexans signed a turn key contract for ultra high voltage submarine power link between Nea Makri and Polypotamos

Nexans signed £64 million turnkey contract for Greece's Public Power Corporation (PPC), the biggest electric power company in Greece.

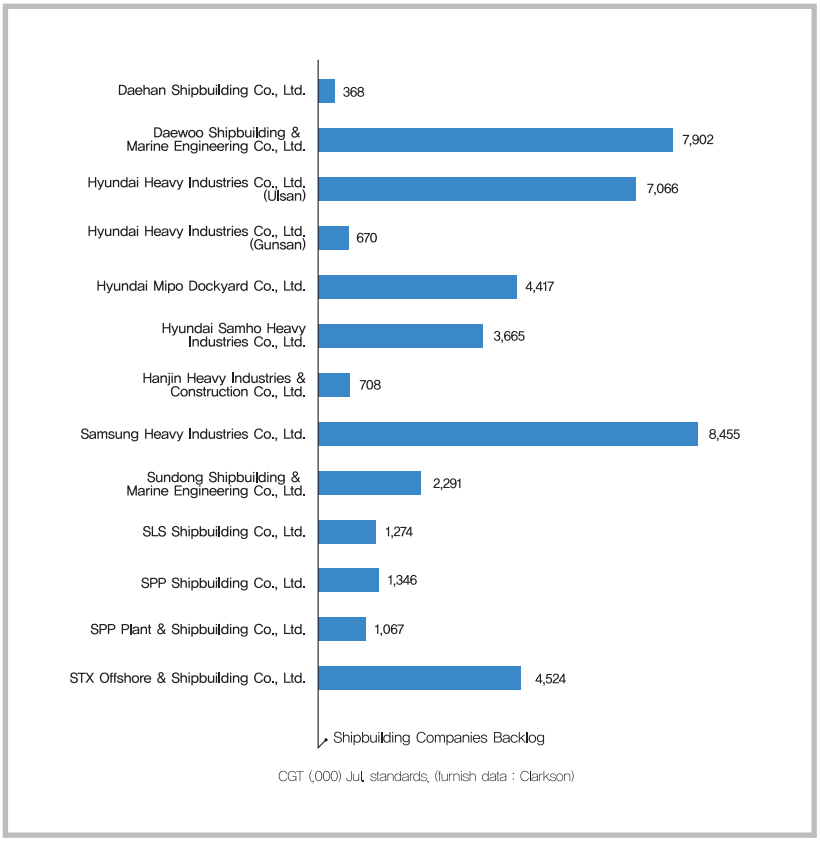
This contract includes the design, manufacturing, and installation of ultra high voltage AC power link between Attika on the mainland and Evia, the second largest island in Greece. About 400mW Wind power project will be developed in Evia, which will transmit the generated power directly to the transmission grid of Greece's Public Power Corporation. The 150 kV power link will link the Nea Makri substation on the coast of Attika and the Polypotamos substation on Evia.

Nexans will manufacture, supply and install 21km-long three submarine cable circuits that will traverse the Gulf of Evia in waters reaching a maximum depth of 85 meters. Also, Nexans will supply the 2.7km-long underground power cables that link each end of the submarine cables, along with related accessories.

Yvon Raak, Chief Corporate Officer of Nexans in charge of Europe Area, said, "This contract strengthens our position even further as the reliable partner of customers in the construction of ultra high voltage submarine interconnection projects that essentially require the continued supply of wind power as part of global energy mix. The factors driving the success of this contract were our extensive experience with many similar projects and our ability to provide a vast array of services from the design, through the manufacturing and installation, to the commissioning of submarine cables and underground cables."

Korean shipbuilders which were hit hard by the steepest fall in ship-building orders last year have received orders worth a total of 4.62 million CGT and $9.1 billion in the first half of 2010, up 450% and 116%, respectively, from the same period of previous year as the global economy is rebounding slowly.

The outlook of shipbuilding market for the second half of this year has become even brighter with domestic shipbuilders clinching shipbuilding orders consecutively as the ship-building market is expected to be in better shape buoyed by the vibrant shipping market conditions while major shipbuilders are placing more orders recently.



According to the statistics of Clarkson, shipyards in Korea have enjoyed influx of large volume of orders and been placed high in the global ranking. In consideration of that, let's have an up-close look at the backlog of major Korean shipbuilders such as Hyundai Heavy Industries, Daewoo Shipbuilding & Marine Engineering, Samsung Heavy Industries, STX Offshore & Shipbuilding.

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Sekwang Heavy Industries Co.

Established in 1939, Sekwang Heavy Industries acquired Cheung-gu Marine Industry, a company with six decade history, in 1990 and was renamed to Cheung-gu Shipbuilding Industry Co.,Ltd. Later, it was renamed to INP Heavy Industries Co.,Ltd in 1999 and Sekwang Heavy Industries Co. in 2007.

Currently, Sekwang Heavy Industries is focusing on the production of ETH/LPG gas carriers, a specialized vessel, stainless chemical product carrier, Anchor Handling Tug Supply (AHTS) vessel, and others.

Specifically, the company has been awarded contracts for various offshore support vessels and highly sophisticated gas (ethylene) carriers from prominent overseas ship owners and successfully built and delivered them since 1990s, which has led the company to build reputation in the global market for its technological prowess.

Here, we take an overview of major ships and production of Sekwang Heavy Industries which have made constant R&D efforts and strived to acquire state-of-art equipments in an attempt to respond effectively to the changing needs of shipbuilding market and evolve into the world's best medium-sized shipbuilding company.

No. H1147~52 8,000cbm Ethylene Carrier under construction (ship owner: Lauritzen Kosan A/S of Denmark)

No. H1147~52 8,000cbm ethylene carrier under construction in the No.1 Slipway of the No. 1 Yard (ship owner: Lauritzen Kosan A/S of Denmark)

No. H1147 to 52 8,000cbm ethylene carrier TGE gas tank being loaded (ship owner: Lauritzen Kosan A/S of Denmark)

Launching of No. H1139~40 11,300DWT stainless steel chemical tanker under construction in the No.2 Slipway of the No. 1 Yard (ship owner: Crystal Pool Ltd. of Finland)

No. H1139~40 11,300DWT stainless steel chemical tanker manifold (ship owner: Crystal Pool Ltd. of Finland)

250-ton floating crane in the No. 1 Factory

CNC steel cutting machine in the No. 2 factory (No. 2 Yard), a block factory owned by Sekwang Heavy Industries located in Onsan Industrial Complex (currently outsourced)

H1111 18,200DWT bulk carrier engine being installed (ship owner: VOSCO, Vietnam Ocean Shipping Joint Stock Company)

Launching of No. H1160~63 20,000DWT chemical tanker (ship owner:Sekwang Shipping Co., Ltd. of Korea)

No. H1157~59 10,000cbm ethylene carrier under construction (ship owner: Kowa Kaiun Co., Ltd., Saito Shipping Co., Ltd. and Tamba Kisen Co., Ltd. of Japan)

Sekwang M-Tec, an affiliate of Sekwang Group,
a block factory located at Samcheon, Gangwon Province

View of the No. 1 and No. 2 factory in the headquarters (main shipyard) of Sekwang Heavy Industries

Trial operation of IH93/94 3,650DWT chemical tankers (ship owner: Sea Tankers of Norway)

Sea Trial of No. H1147~52 8,000cbm ethylene carrier (ship owner: Lauritzen Kosan A/S of Denmark)

Trial operation of No. H1139~40 11,300DWT stainless steel chemical tanker (ship owner: Crystal Pool Ltd. of Finland)

Anchoring of No. H1133~36 8,500DWT stainless steel chemical tanker (ship owner: Schoeller Holdings Ltd. of Germany)

Sea Trial of No. H1137/38 BP80ton AHTS
(ship owner: Tidewater Marine L.L.C of U.S.A)

Sea Trial of No. H1155/56 13,000DWT chemical tanker
(ship owner: Hisafuku Kisen K.K. of Japan)

Sea Trial of No. 1157~59 10,000cbm ethylene carrier (ship owner: Kowa Kaiun Co., Ltd., Saito Shipping Co., Ltd. and Tamba Kisen Co., Ltd. of Japan)

New Product

UDT electronic table truck capable of automatic transport

Cretec Chegim Co., Ltd

Cretec Chegim, one of the largest domestic tool distributors, launched 'UD-109', a brand new UDT electronic table truck, is attracting the most favorable reaction from users mesmerized, specifically, by its ability to transport 400k load automatically. The company was recently renamed to Cretec Chegim from Chegim Tech Tool.

Unlike other commercially available products that had to be operated manually or semi-automatically, this new model enables loading, unloading, and transport electronically.

UDT electronic table truck

As a result, accident and physical fatigue of workers can be reduced and efficiency in work can be increased remarkably.

The model has the following specification:

- *Size of Table: 1,000 x 600mm*
- *Height of Table: Min. 460mm- Max. 900mm*
- *Total Weight: 180kg*
- *Driving Motor: 400W*
- *Lifting Motor: 370W*
- *Battery: 12V x 2, 33Ah*

Specifically, the battery can last 3 to 4 hours if recharged for 4 to 6 hours.

A source from Cretec Chegim, said, "This new product is suitable very much for workplace that requires a lot of manpower for warehouse management or product transport. The demand for this brand new product has increased fast in various logistics centers or production/assembly lines of factory."

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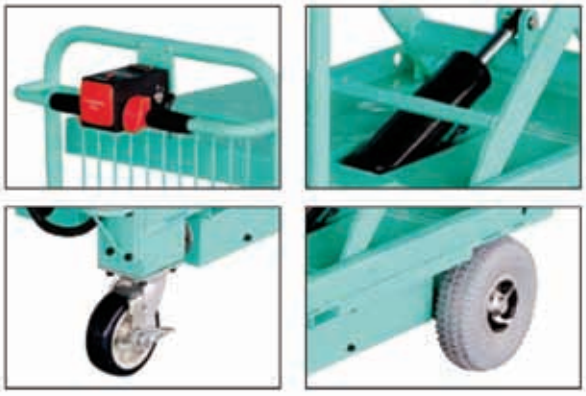

Measuring kit for ECA preparation

DNV

DNV provides various services to enable ship owners and those in maritime industry to cope with ECAs more systematically through the Survival kit.

Emission Control Areas (ECAs) have already been established in the Baltic Sea and the North Sea, and will be enforced along the North American coastlines. Other areas, such as the Mediterranean Sea, are expected to follow in the near future. The fuel sulfur content of any ship in an ECA after 2015 cannot exceed 0.1% or the exhaust gas must be purified to an equivalent level. And after 2016 NOx emissions from newbuilds must be reduced by approx. 75%. Compliance will become a ticket to trade in ECAs.

DNV advised operators to start preparing now to turn the upcoming 2015 and 2016 legislation into business benefits. Access to DNV's repository of maritime expertise and a range of services is included in the survival kit. By following a process phase scheme, ship owners will be well prepared for the forthcoming ECA requirements.

The process phrase scheme: Opportunity and risk identification, Strategy and planning, Implementation and Validation and documentation.

Meanwhile, DNV recently launched service that extends periods between bottom surveys in dry dock for eligible ships to 7.5 year, provided that the consecutive in-water bottom surveys are conducted with satisfactory results during the intervening period.

Eligibility of vessels will be decided on a case-by-case basis, however, as a general rule passenger vessels and ships subject to Enhanced Survey Programme (ESP) will not be accepted for the scheme due to SOLAS regulations and IMO Res.A.744 (18). Also no vessel over 15 years of age can participate in the programme.

In order to be accepted for the scheme, following conditions must be met:

-As the inspection outside of the ship's bottom is a part of statutory requirements, acceptance from the Flag administration must be obtained

-The ship must be provided with a high quality underwater coating designed to last for the extended period

-The ship must comply with the in-water survey provisions in accordance with DNV Rules for BIS notation

-The ship must have a shafting arrangement fulfilling the requirement for tailshaft monitoring

-A good coating condition (both external and within the ballast tanks) must be maintained

-A regular maintenance and replacement of cathodic protection anodes must made

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Homepage Add. :
Main Products : Compresed 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 Outffittings
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.heawon.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 Emision 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 plute 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.jwcjoint.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. CO., LTD.
Head Office : Gangseo-gu Busan
Homepage Add. : www.iccp-mgps.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
Main Products : Electtric 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
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
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
Main Products : Copper alloy coil, Plate
TEL : +82-51-293-4423

KORINOX CO., LTD.
Head Office : Gangseo-gu Busan
Homepage Add. : 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
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
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
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
Main Products : Naviagtion/Signal LT, EX-Plosion Proof LT, Fluorescent LT
TEL : +82-51-266-0050

KUKDONG INDUSTRIAL ENGINEERING.
Head Office : Sasang-gu Busan
Homepage Add. : 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
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
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
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
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
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
Main Products : Rudder Bearing Bush, Insulation
TEL : +82-51-831-0268

KYOUNGWON BENDING CO.
Head Office : Kimhae Gyeongsangnam-do
Homepage Add. : 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
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
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
Main Products : Public Addressor 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 Seperator, Bilge Alarm, Air Dryer
TEL : +82-51-831-1118

MARSEN CO., LTD.
Head Office : Gangseo-gu Busan
Homepage Add. : 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
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
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
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
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

MT.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
Main Products : Heat Exchanger, Pressure Vassel
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.psminc.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
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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

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Head Office : Gangseo-gu Busan
Homepage Add. :
Main Products : Rectangle Windows
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Homepage Add. : www.metalsamsung.co.kr
Main Products : Bushing, Liner, Sleeve, Pintle Bush
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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.
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Homepage Add. :
Main Products : Winch, Hatch
TEL : +82-51-832-1882

SEAPLUS CO., LTD.
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Homepage Add. : www.sea-plus.co.kr
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SEBO METAL CO., LTD.
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Homepage Add. : www.sebometal.co.kr
Main Products : Pump Tower for LNG, Vent Mast
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SEBO TECH CO., LTD.
Head Office : Gangseo-gu Busan
Homepage Add. :
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Main Products : VRC system, ODME
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SEUN STEEL CO., LTD.
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Homepage Add. : www.seunsteel.co.kr
Main Products : CR, HGL, CGL, EGL
TEL : +82-51-639-3200

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Homepage Add. :
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Homepage Add. : www.skace.com
Main Products : Cable Tray, Accessories

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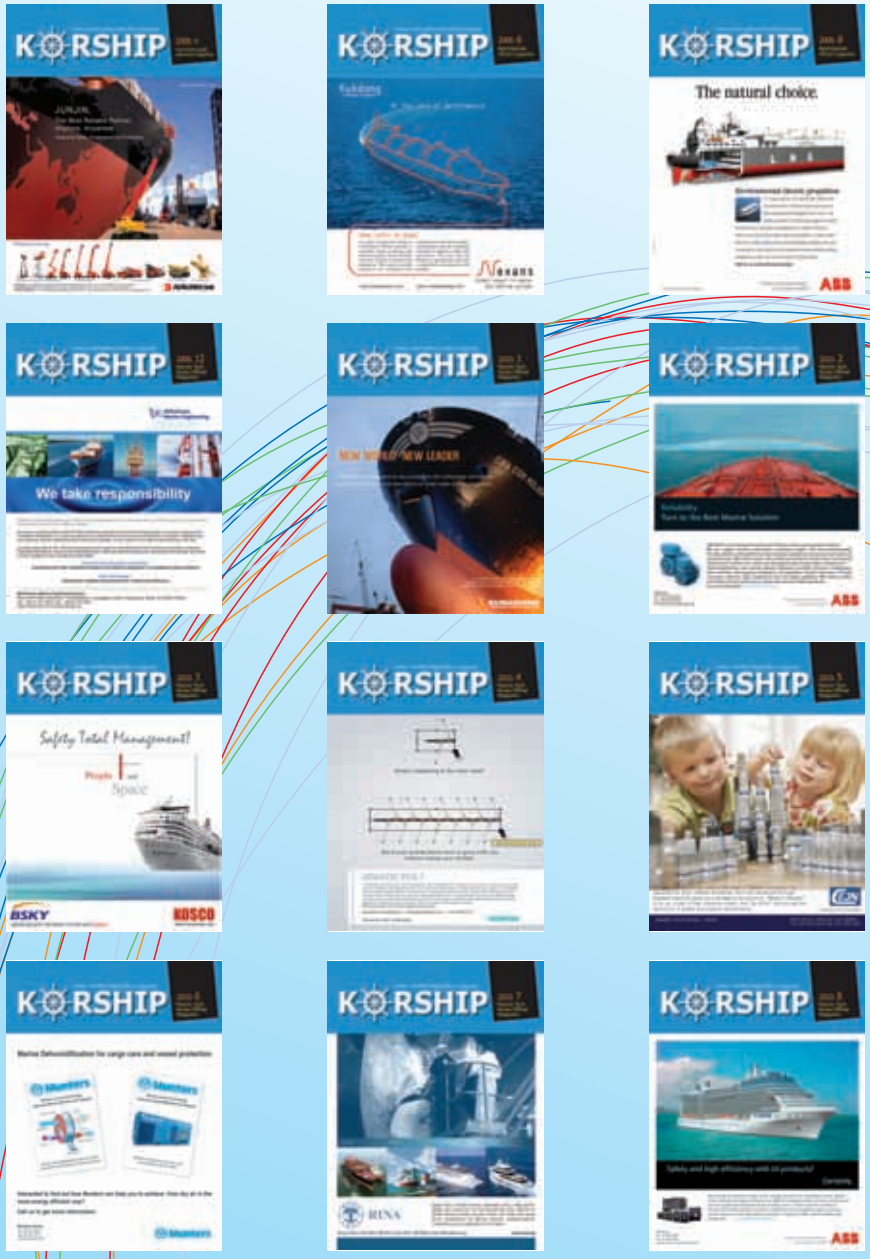

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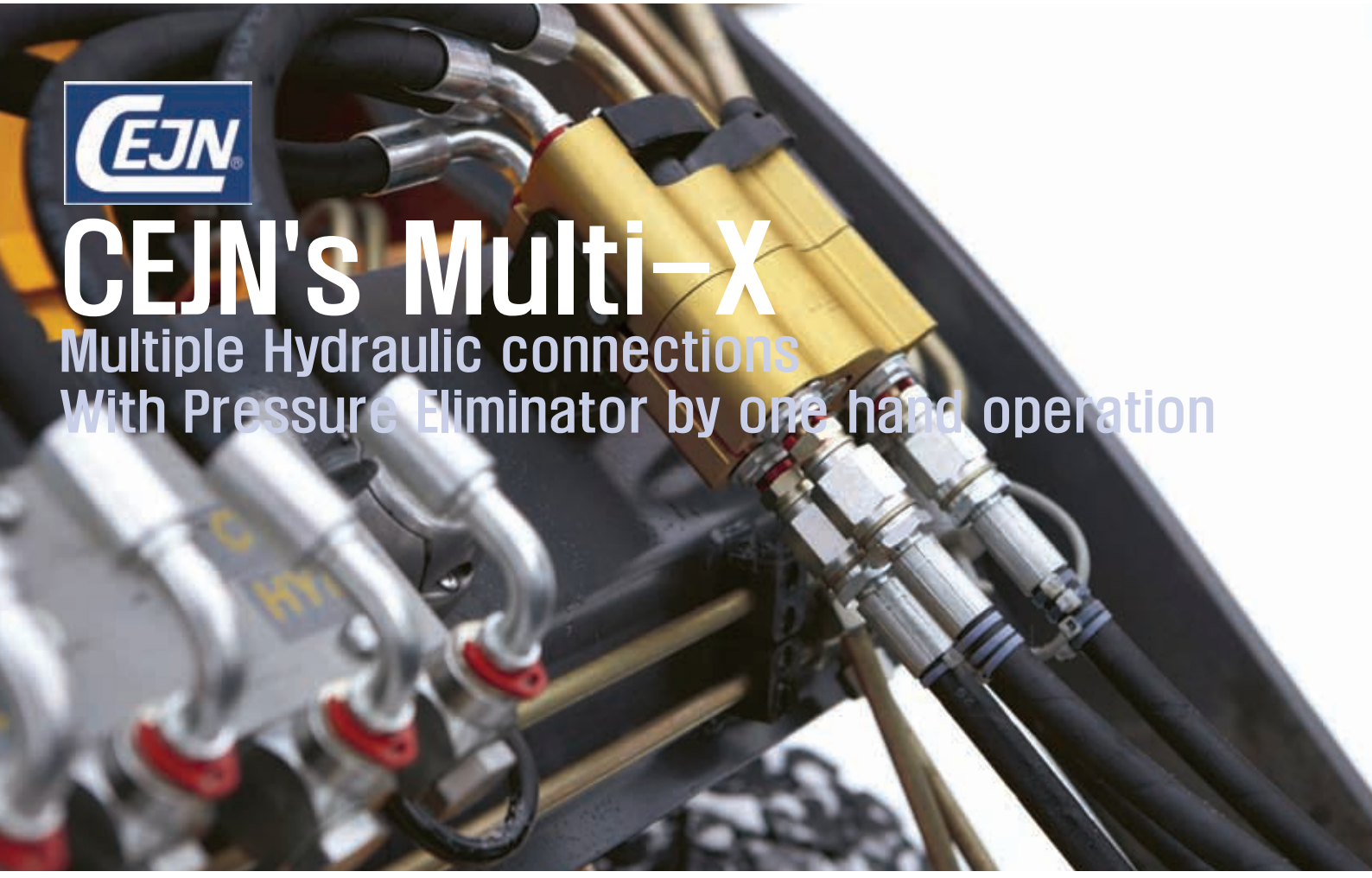

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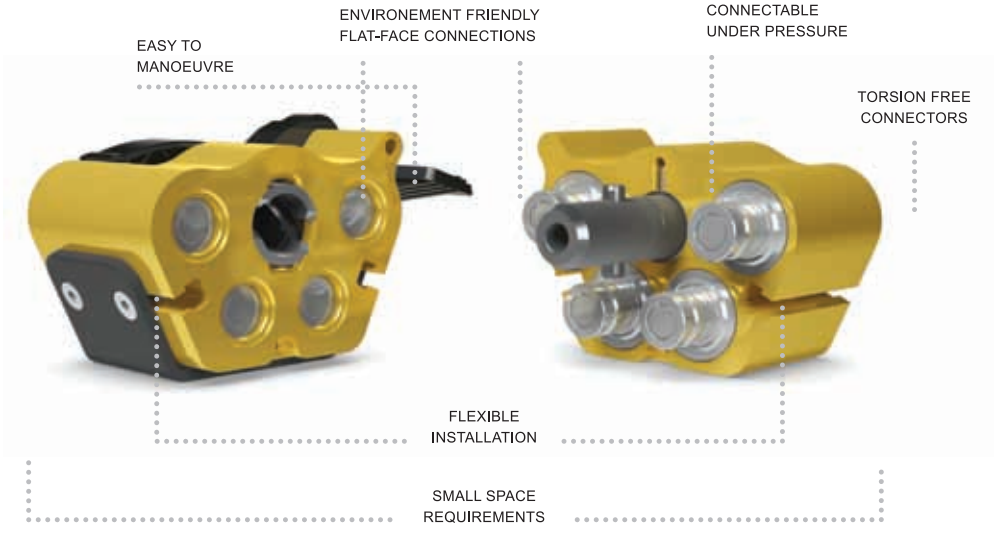

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