



Tech Flower Co., Ltd.

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www.techflower.co.kr

**World Best Company
in Marine, Offshore & Naval**



**Marine
Offshore & Naval**



Tech Flower Co., Ltd.



Tech Flower Introduction & History

TECH FLOWER supplies reliable offshore and marine cranes, offshore structures and navy equipment to our wise customers.

OFFSHORE CRANE

Tech Flower offers a range of offshore cranes specially designed according to the customer requirements in order to prevent all the risks and be suitable for use in a variety of offshore vessels, drill ships, FPSO, FSO and rigs.

We have developed high quality and performance offshore cranes to meet the demand of the challenging tasks required for offshore environment.



OFFSHORE HEAVY STRUCTURE

Tech Flower entered the offshore structure market successfully with our newly-developed products such as Wind wall, Moon pool damping device, Drive pipe support platform and Sea-fastening system for drill ships and rigs. High level of quality with reasonable cost was realized by continuous investment on Research and Development for several years and it has attracted not only current customers but also potential customers finally.



MARINE CRANE

Tech Flower has many years of experience on marine crane market with world famous shipyards and ship owners. We have developed a wide range of marine cranes for use in various vessels according to the customer requirements, quality and safety. Easy installation and operation of a crane as well as availability of spare parts and worldwide service network is guaranteed.



NAVY & COAST GUARD

Tech Flower had been designated as a defense industry company officially in 2005 and acquired the Defense Quality Management System in 2007. Our main products are helicopter traversing system with landing grid and hangar door, retractable sliding padeye, bow/stern ramp, and special rescue boat davit meeting specific demands for navy and coast guard vessels.

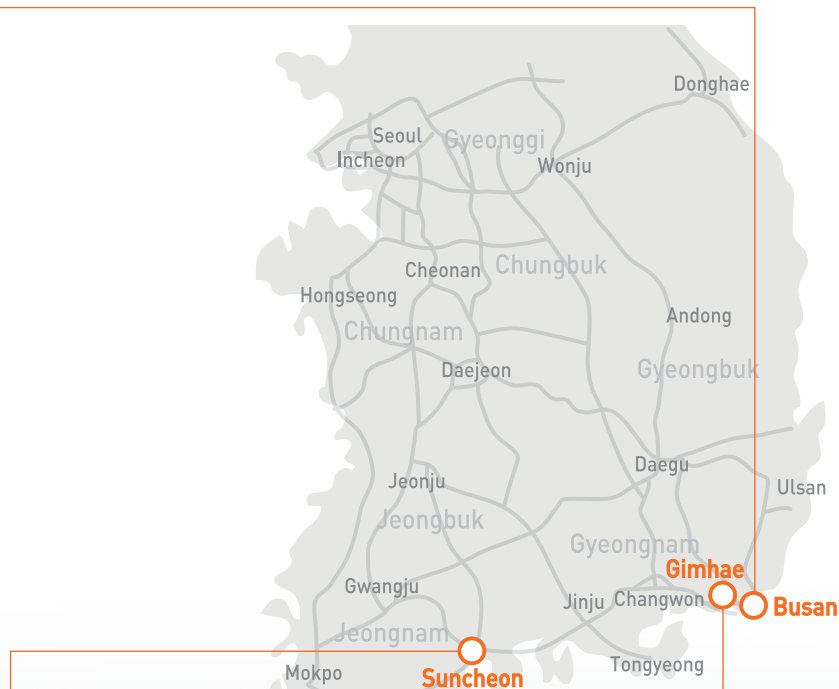


Offshore & Marine
& Naval

- 2015 ○ Company name changed to Tech Flower Co., Ltd.
- 2013 ○ Enlarged Suncheon factory
- 2012 ○ Started Offshore Heavy Structure and Device business with DSME / SHI (Moon Pool Damping & Guide Array, Wind Wall, Texas Skidding System, etc.)
- 2009 ○ Steel Flower acquired Haeon's 100% share
50T AHC Knuckle Boom Offshore Crane for SOV
Acquired API 2C, API Q1, ISO/TS 29001 by API
68T Lattice Boom Crane delivered to Singapore
20T/25T Gantry Typed Deck Crane for Dredger
- 2007 ○ Acquired the Defense Quality Management System (KDS 0050-9000 : 2000) by Defense Agency for Technology and Quality
- 2006 ○ Acquired OHSAS 18001:2007 and ISO 14001:2004 by DNV
- 2005 ○ Acquired ISO 9001 by DNV
- 2004 ○ Technical License with LIEBHERR Jib & Pedestal of Deck Crane for Container
- 2003 ○ Development for Navy and Coast Guard
→ Heli-Traversing System / Retractable Sliding Pad Eye / Heli-Landing Grid
All kinds of marine cranes for Container, Oil & Chemical Tanker & Bulk Carrier
Established as Haeon Machinery Ind. Co., Ltd.

Tech Flower Location

Head Office and R & D Center



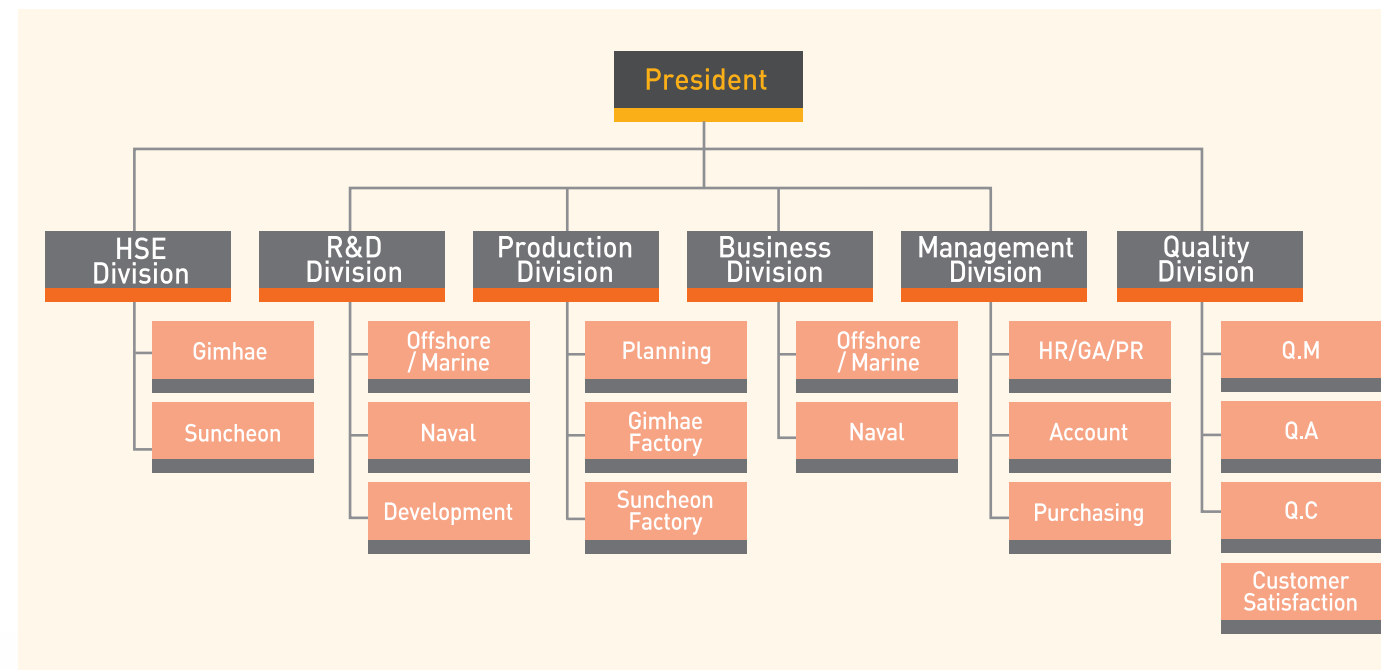
Suncheon Factory and Office



Gimhae Factory and Office

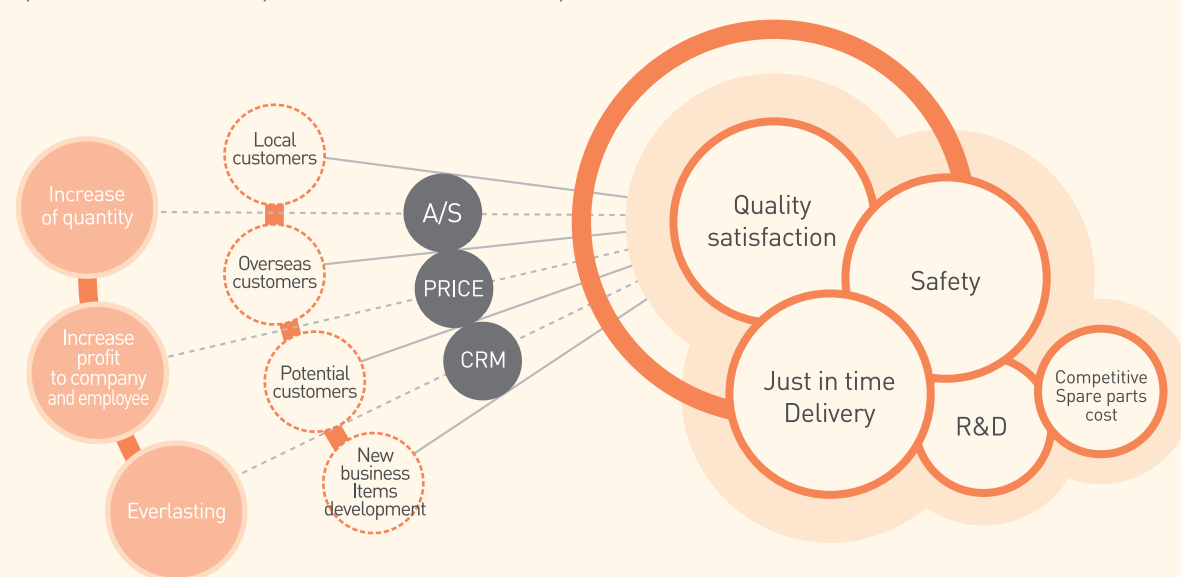


Tech Flower Organization



Tech Flower Vision & Strategy

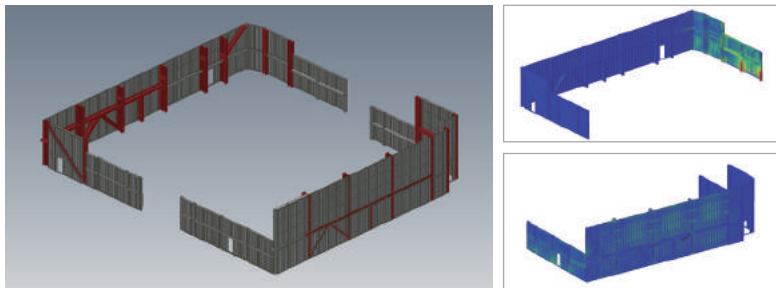
Tech Flower shall create Win-Win management with customers



Tech Flower Offshore Heavy Structure

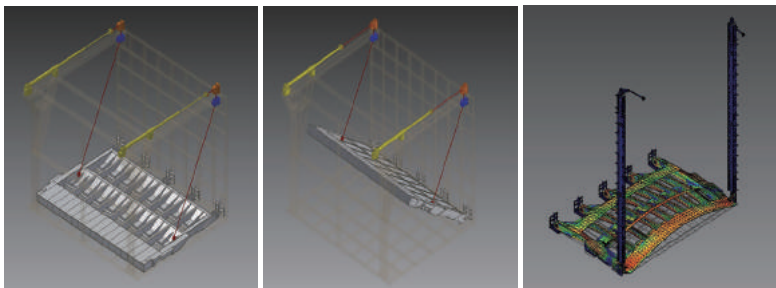


Windwall



Technical Specification	
Type	Welding / Bolting Installation
Material	ASTM-A572, Gr. 50
Customer	TRANSOCEAN, VANTAGE, SEADRILL, SONANGOL

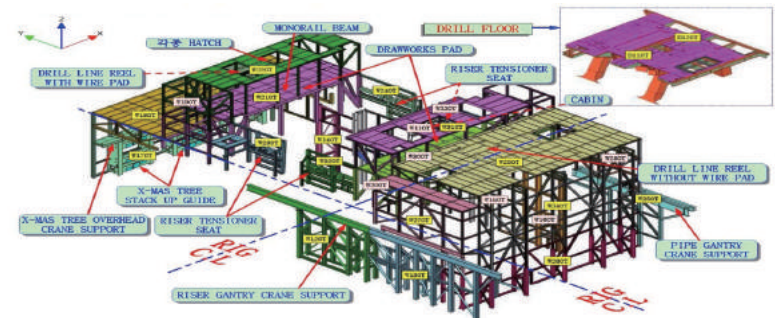
Moon Pool Damping Device



Technical Specification	
Type	Guide Array Type
Locking System	Remote Hydraulic Cylinder Operating Type
Customer	SEADRILL, TRANSOCEAN



Windwall



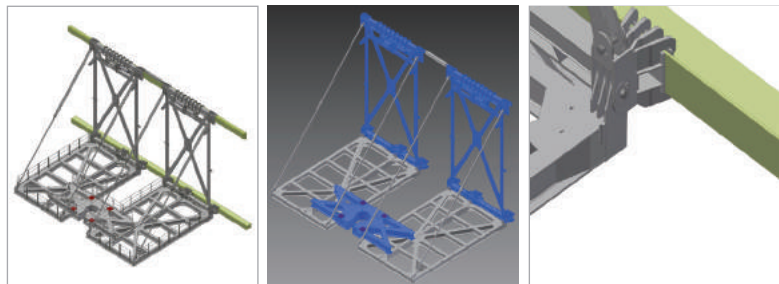
Technical Specification	
Type	Bolting Type
Material	Stainless steel(Cladding), Steel plate(Structure)
Customer	STENA



▶ AHC (Active Heave Compensation) Knuckle Crane

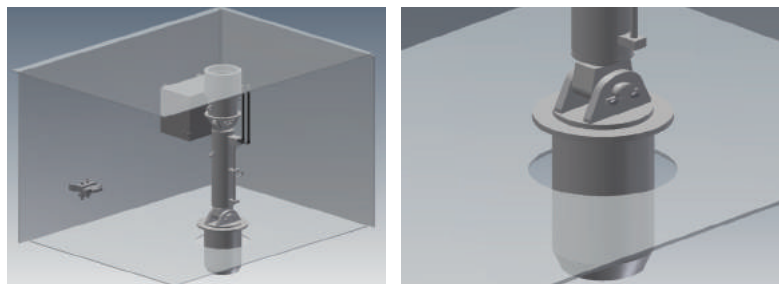


○ Drive Pipe Support Platform



Technical Specification	
Type	Cylinder Skidding Type
Material	NV-D36, E36 / HEB 360, 450
Customer	Maersk Drilling Holdings

○ Sea-Fastening System



Technical Specification	
Type	Hydraulic Cylinder Type
Material	34CrNiMo6 or Equivalent
Customer	Maersk Drilling Holdings

No	Technical Specification		
1	Crane Type		AHC Knuckle Boom Cylinder Luffing Type
2	Crane Capacity		30 Ton ~ 165 Ton
3	Hoisting Speed	Full Load	0 ~ 20 M/MIN
		No Load	0 ~ 40 M/MIN
4	Lifting Height		1,000 ~ 3,000 M
5	Working Radius	Min.	4M ~ 7M
		Max.	20M ~ 42M
6	Slewing Speed		0.5 ~ 0.8rpm
7	Luffing	Time	According to maker standard
		Angle	
8	Wave Height		±4M
	Max. Heave Stroke		±3M ~ ±4M
9	Class		ABS, BV, DNV, LR(C/W API-2C)
10	Vessel Type		SUBSEA OPERATIONS VESSEL(SOV)




Lattice Boom Crane



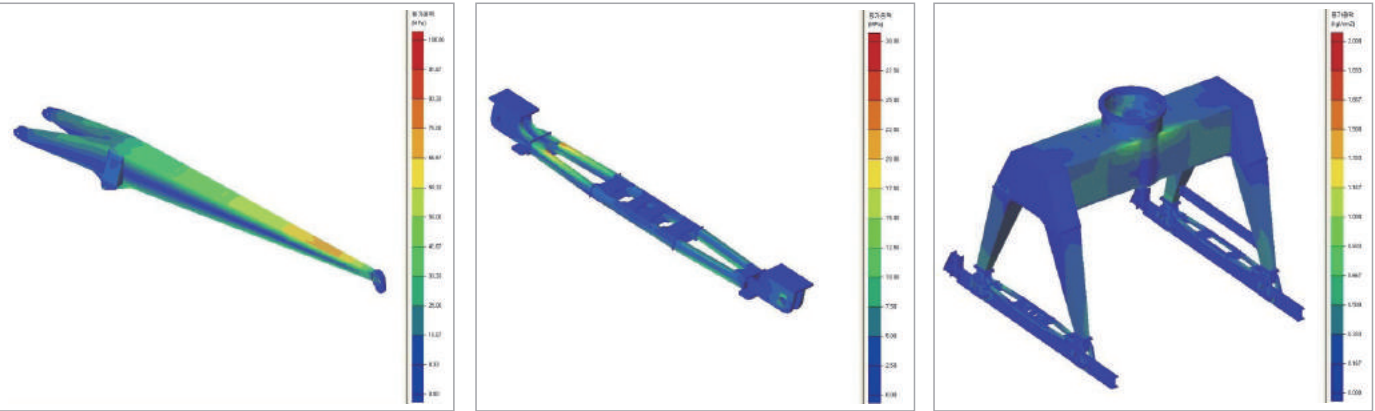
No	Technical Specification		
1	Crane Type		Lattice Boom, Wire Luffing Type
2	Crane Capacity	Main Hoist	10 Ton ~ 120 Ton
		Aux. Hoist	5 Ton ~ 10 Ton
3	Hoisting Speed	Main Hoist	Full Load 0 ~ 20 M/MIN
			No Load 0 ~ 40 M/MIN
		Aux. Hoist	0 ~ 40 M/MIN
4	Working Radius	Main. Hoist	Min. 5 M ~ 10 M / Max. 20 M ~ 50 M
		Aux. Hoist	Min. 6 M ~ 12 M / Max. 22 M ~ 52 M
5	Slewing Speed		0.5 ~ 1.0 rpm
6	Luffing	Time	According to maker standard
		Angle	
7	Class		ABS, BV, DNV, LR(C/W API-2C)
8	Vessel Type		PLATFORM, FLOATING DOCK, BARGE, RIG, FPSO, etc.

Gantry Deck Crane



Customer	CCCC Guangzhou Dredging
Vessel	Trailing Suction Hopper Dredger
Class	CCS
Q'ty	6 Sets

No	Technical Specification		
1	Crane Type		Fixed Boom, Cylinder Luffing-Gantry Type
2	Crane Capacity		10 Ton ~ 40 Ton
3	Hoisting Speed	Full Load	0 ~ 10 M/MIN
		No Load	0 ~ 20 M/MIN
4	Working Radius	Min.	4M ~ 8M
		Max.	20M ~ 28M
5	Slewing Speed		0.5 ~1.0rpm
6	Luffing	Time	According to maker standard
		Angle	
7	Travelling Speed		0 ~ 10m/min
8	Rail	Length	According to customer order
		Distance	



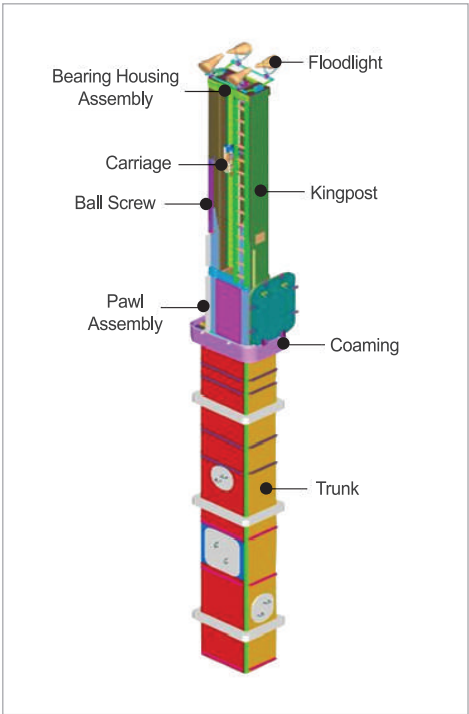
Stress of jib Stress of frame Stress of gantry part



Retractable Sliding Padeye



Technical Specification	
Type	Retractable Sliding Type
Height	According to maker standard
Width	
Transfer Load	According to customer order
Transfer Speed	12 m/min
Transfer Stroke	According to customer order

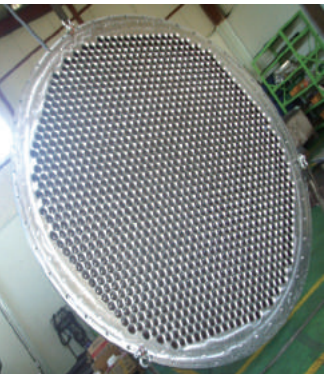


Helicopter Traversing System



Technical Specification		
Type	Flushed Double Curved Rail with Carriage	
	3 Winch 5 Wires	
Kind of Helicopter	Super Lynx, MH-60, MH-60R, AW-159	
Traversing Speed	1.8 ~ 18 M/Min	
	1.8 ~ 24 M/Min	
Emergency Traversing Speed	0.2 ~ 1.2 M/Min	
Special specification	Shock	MIL-S-901D, Grade B, Class I / II
	Noise	MIL-STD-740-1/2, Grade D, Type II / III
	Vibration	MIL-STD-167-1A/2, Type I / II

Helicopter Landing Grid



Technical Specification		
Type	STANAG 1276 Edition 1 Amendment 8	
Outer Diameter	2,750 mm	
Maximum Reaction Force	17,000 kg	
Maximum Tension Force	6,500 kg	
Material	Grid Top Plate	Stainless Steel, High Tensile
	Grid Support Ass'y	High Tensile Steel

Helicopter Hangar Door



Technical Specification	
Type	Roller Curtain
Size	Width 6.45M x Height 5.7M
Opening Size	Width 4.9M x Height 4.5M
Tightness	Splash Tight
Opening & Closing Time (Bu Electric Motor)	Abt. 45 Sec
Emergency Opening & Closing Time(By Manual)	Abt. 16 Min
Electric Motor	2.2 KW
Weight	2,300 Kg

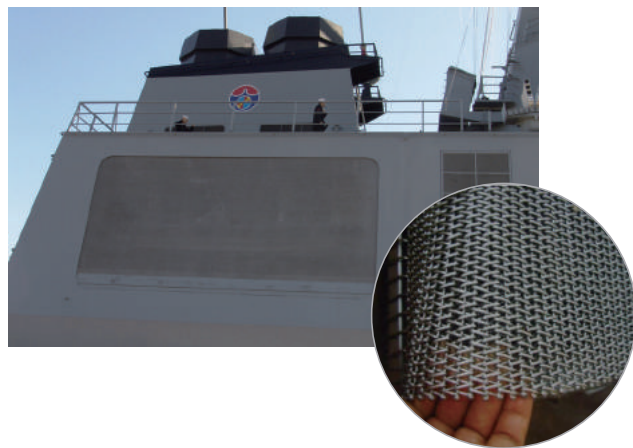
Tech Flower
Naval Equipment

Rigid Inflatable Boat Davit



Technical Specification	
SWL	2.722 Ton
Working Radius	4.9 M
Hoisting Speed	Max. 29 M/Min
Light Tension Speed (Empty Hook)	Min. 152 M/Min
Slewing Angle	120°
Slewing Speed	Max. 1.0 RPM
Electric Motor	45 KW
Emergency Operation	by Accumulator(2EA)
Self Weight	4,700 KG

RCS Screen



Technical Specification	
Size	8,000mm(W) x 4,000mm(H) ±5%
Operation Type	Electric motor driven (Locking system : Air driven)
Electric power	Main AC440V, 3Phase, 60Hz Control AC220V, 3Phase, 60Hz
Electric Motor	7.5kw x 4P x 440V x 60Hz
Weight	5,000kg
Mesh Type	7.5kw x 4P x 440V x 60Hz

Submarine Hatch Cover



Technical Specification	
Type	Outward-domed with insert coaming
	Inward-domed
Operation	Manual operated
Dimension	Ø700
Weight	300kg

Bow / Stern Ramp



Technical Specification	
Type	Hydraulic Actuator Operated Type
Available Weight of Ramp	52 Ton
Bow Ramp Size	Width 8.23M x Length 2.397M
Stern Ramp Size	Width 4.55M x Length 2.397M
Closing Speed	20 Sec
Opening Speed	High Speed 10 Sec. By Gravity
	Low Speed 10 Sec. By Gravity
Ramp Material	Aluminum
Weight	4,500 KG



Water Tight SUS Door



Technical Specification	
Material	Stainless Steel
Height	1676 mm
Width	660 mm
Water Tight Pressure	0.35 Kg/cm²
Air Tight Pressure	0.14 Kg/cm²
Gasket	Fire Retardant
	Emi Shield
Weight	Abt. 250 Kg

○ Special Rescue Boat Davit



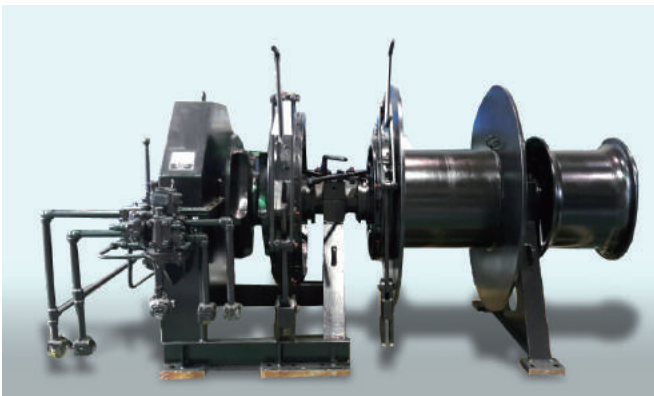
Technical Specification	
SWL	3.5 Ton
Overall Height	6.5 M
Width	2.0 M
Depth	3.96 M
Hoisting Speed	Max. 35 M/Min
Light Tension Speed (Empty Hook)	Max. 35 M/Min
Luffing Angle	72°
Luffing Speed	Average. 30 Sec
Electric Motor	48.1 KW
Emergency Engine	14.3 KW
Self Weight	5,000 KG

○ Multi Grip Davit & Crane



Technical Specification	
Type	Telescopic Boom
SWL	3.0 Ton ~ 5.0 Ton
Working Radius	7.45 M
Hoisting Speed	Max. 35 M/Min
Light Tension Speed (Empty Hook)	Max. 110 M/Min
Boat Turning Device	65° rotatable limited by hydraulic
Boat Turning Speed	Abt. 0 – 1.0 RPM

○ Windlass



Technical Specification			
Type	Hydraulic Operated Type		
	Chain Drum	Hawser Drum	Warping Drum
Winding Load	10.5 Ton	5 Ton	5 Ton
Winding Speed	0~12 m/min	0~15 m/min	0~15 m/min
Drum Capacity	Ø46 Gr3	Ø50 x 200M	Ø50
Brake Capacity	77 Ton	31 Ton	-
Total Weight	Abt. 4.6Ton		

➤ Hose Handling Crane



Technical Specification		
Crane Type		Electro-Hydraulic Driven, Cylinder Luffing Type
Crane Capacity		4 Ton ~ 25 Ton
Hoisting Speed	Full Load	0 ~ 10m / min
	No Load	0 ~ 20m / min
Working Radius	Min.	2 M ~ 6 M
	Max.	3 M ~ 25 M
Slewing	Speed	0.5 ~ 1.0 rpm
Luffing	Time	According to maker standard
	Angle	

➤ Provision Crane



Technical Specification		
Crane Type		Electro-Hydraulic Driven, Cylinder Luffing Type
Crane Capacity		2 Ton ~ 20 Ton
Hoisting Speed (at average)		0 ~ 10m / min
Working Radius	Min.	1.5 M ~ 4 M
	Max.	8 M ~ 15 M
Slewing	Speed	0 ~ 0.5 rpm



Technical Specification		
Crane Type		Electric Driven, Wire Rope Luffing Type
Crane Capacity		2 Ton ~ 20 Ton
Hoisting Speed (at average)		0 ~ 10m / min
Working Radius	Min.	2 M ~ 5 M
	Max.	6 M ~ 15 M
Slewing	Speed	0 ~ 0.5 rpm

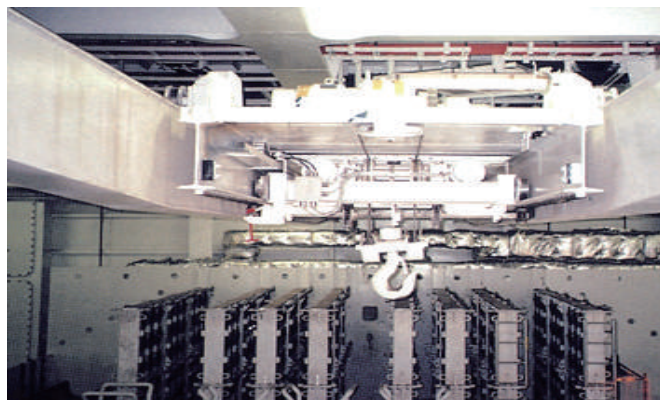
Tech Flower Developed Products

Monorail Crane



Technical Specification	
Crane Type	Electric Motor Driven, Sliding Two Hoist and Two Hook Type
Crane Capacity	2 Ton ~ 13Ton
Hoisting Speed	0 ~ 15m / min
Working Travelling Out reach	5 m from max. ship's breadth
Travelling Speed	0 ~ 15m / min
Travelling Length	According to maker standard

Engine Room Crane



Technical Specification		
Crane Type		Electric Driven
Crane Capacity		1 Ton ~ 13 Ton
Hoisting Speed	Low	0 ~ 2 m / min
	High	0 ~ 5 m / min
Speed	Travelling	0 ~ 5 m / min
	Traversing	0 ~ 3 m / min
Travelling Length		According to customer order
Span		

Knuckle Crane



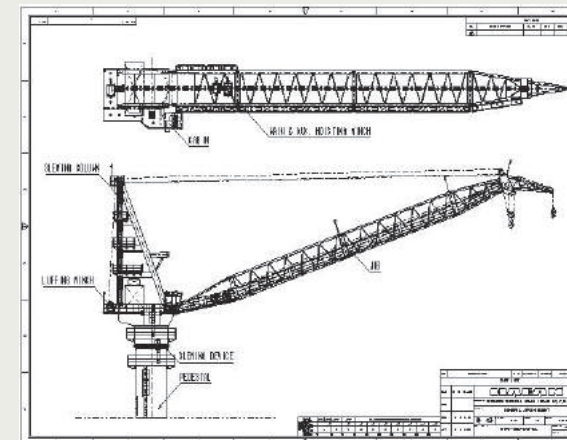
Telescopic Crane



Knuckle-Telescopic Crane

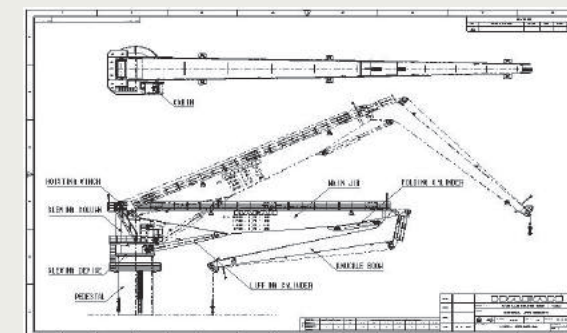


Lattice Boom Crane for Drillship



Article		Specification
Cane Type		Lattice Boom(Wire Luffing Type)
Crane Capacity	Main Hoist	100T x 15m / 30T x 46m
	Aux. Hoist	15T x 51m / 5T x 51m(for Man-riding)
Hoisting Speed	Main Hoist	0~10m/min at 100Ton / 0~20m/min at no load
	Aux. Hoist	0~60m/min at 15ton / 0~100m/min at no load
Working Radius	Main Hoist	Min. 9m ~ Max. 46m
	Aux. Hoist	Min. 11m ~ Max. 51m
Slewing Speed		0 ~ 0.7 rpm
Luffing	Angle	0° ~ 83°
	Time	180 sec.(Between 15° and 83°)

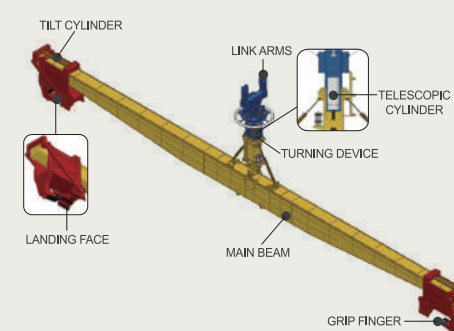
Knuckle Boom Crane for Drillship



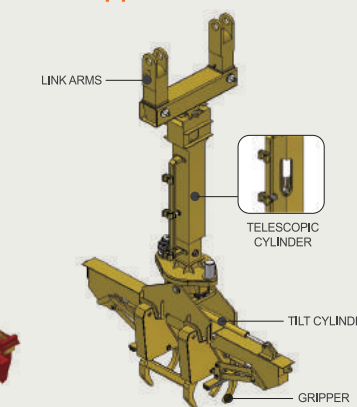
Article		Specification
Cane Type		Knuckle Boom(Cylinder Luffing Type)
Crane Capacity		100T x 14m / 17T x 45m
Hoisting Speed		0~10m/min at 100Ton / 0~20m/min at no load
Working Radius		Min. 8.5m ~ Max. 45m
Slewing Speed		Slewing Speed
Luffing	Cane Type	0° ~ 80°
	Cane Type	125 sec. (Between 0° and 80°)

Yoke

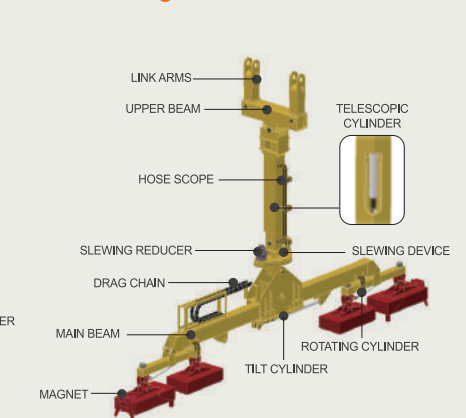
→ Riser Yoke



→ Gripper Yoke

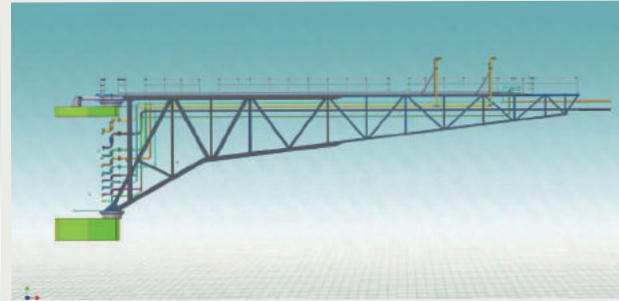
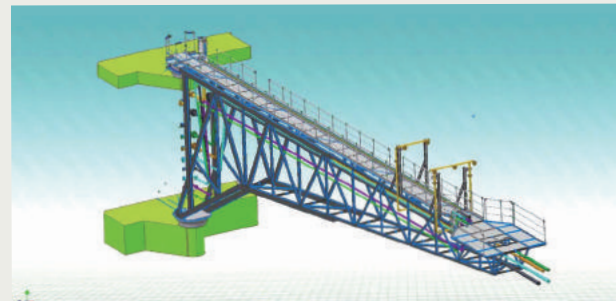


→ Magnet Yoke

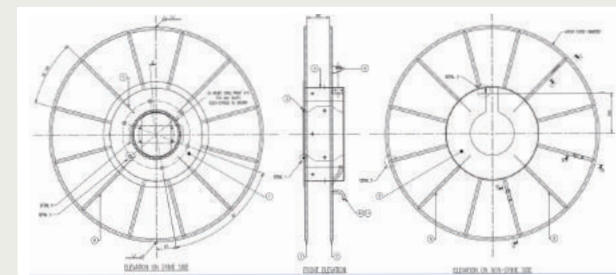


Tech Flower Developing Products

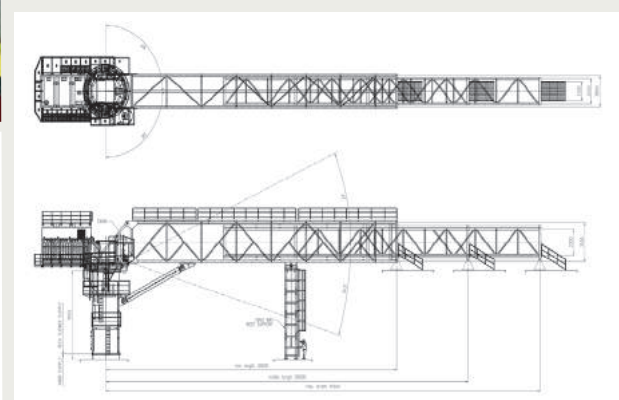
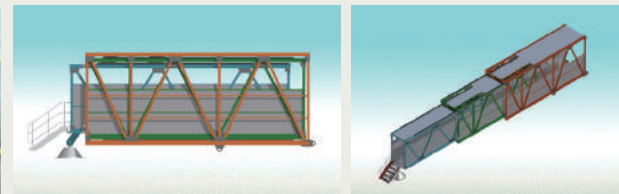
▶ Burner Boom



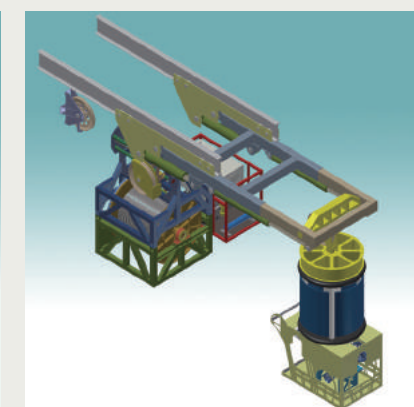
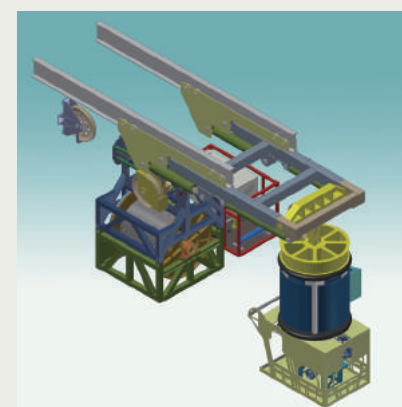
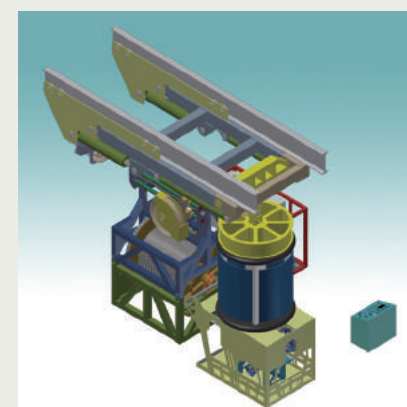
▶ Bunker Station



▶ Telescopic Gangway



▶ ROV LARS



Tech Flower Research & Development / Certificate

R&D Dep't of Tech Flower Co., Ltd. was established in 2004 for the purpose of creating new products and developing Tech Flower's technology about the marine and offshore cranes, offshore structures and special equipment for Navy and Coast Guard.

We have made great efforts in ceaseless development with detailed research activities setting a pivot of study in a particular project of special ships such as KDX-III project as well as marine and offshore markets.

As a result of our effort for several years, our newly-developed products such as Active Heave Compensation Crane, Offshore Lattice Boom Crane, Wind wall, Moon pool damping device, Drive pipe support platform and Sea-fastening system for offshore vessels have received a good reputation by world famous customers.

In addition, Helicopter traversing system with landing grid and hangar door, Retractable sliding pad eye, Bow/Stern ramp were developed and supplied to Korea Navy and Korea Coast Guard successfully under their delicate inspection criteria.

We are going to continue developing our technology in order to satisfy customer's requirement and create brand new products for the future.

Developed/Developing Products

Offshore Plant

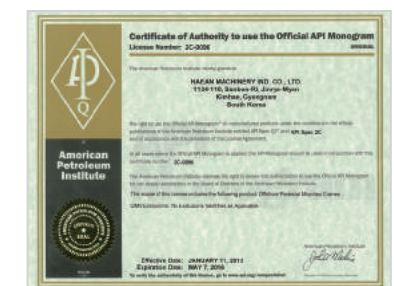
- Wind Wall
- Blast Wall
- Heat Shield
- Turret & Pull in Lifting Arm

Offshore Equipment with System

- 165T AHC Crane
- 100T Knuckle Boom Crane for Yoke Handling
- Riser, Gripper, Magnet Yoke
- 100T Lattice Boom Crane
- Special Winch
- A-Frame
- Bunker Station
- Telescopic Gangway
- Material Handling Equipment
- Moon Pool Damping Device
- Drive Pipe Support Platform
- Sea-Fastening System

Navy and Coast Guard

- Bridging System
- Huge Bow/Stern Ramp and Door
- RAS/FAS System
- Mast Winch System
- LARS System for DSRV

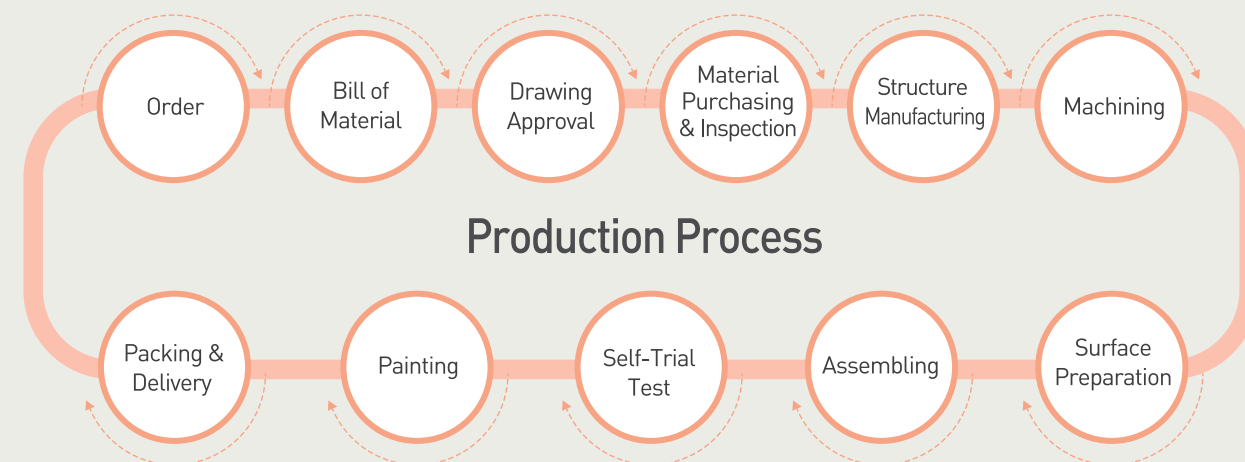


Tech Flower Reference List & Production Process

Reference List

Type	Equipment		Year													Remark
			2004 ~2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total		
1	Marine Equipments	Hose Handling Crane	13	12	36	69	42	11	8	6	3	18	28	246	4T - 20T	
2		Provision Crane	42	43	60	68	67	52	47	77	29	20	32	537	2T - 10T	
3		Engine Room Crane	30	46	42	110	50	22	32	38	46	29	34	479	1T – 12T	
4		Monorail Crane	10	8	13	10	13	2	-	9	13	10	66	154	2T – 12.5T	
5		Knuckle & Telescopic Boom Crane	17	5	6	10	5	6	1	20	12	3	3	88	2T - 30T	
6		Deck Crane	12	37	2	32	48	8	55	39	11	7	5	256	Inc. OEM from LWN	
7		Davit	95	40	57	112	8	22	-	37	18	14	26	429	MAX. 85 Persons	
8		Deck Machinery (Windlass-mooring winch)	62	62	28	5	10	19	1	4	12	18	29	250	2T - 60T	
	Sub-Total		281	253	244	416	243	142	144	230	144	119	223	2439		
9	Offshore Crane		1	1	-	5	7	4	2	8	14	4	3	49	5T - 68T	
10	Offshore Structure & Device		-	-	-	-	-	-	-	-	-	11	18	29	Moon Pool Damping Device/Windwall, etc.	
11	Barge Crane		1	-	-	-	5	2	2	2	1	1	2	16	10T - 60T	
12	Marine Equipments For Defense		68	23	33	18	30	98	41	50	43	35	55	494	Republic Of Korea Navy/ Korea Coast Guard	
13	Plant		-	-	-	-	-	9	9	8	2	-	-	28	Overhead Crane, Conveyor	
TOTAL			351	277	277	439	285	255	198	298	204	170	301	3055		

* LWN : Liebherr-Werk Nenzing GmbH / Austria



Tech Flower Global Service Network

