



**BOILER ENGINEERING &  
MANUFACTURING**  
Pressure parts

***DOOSAN***

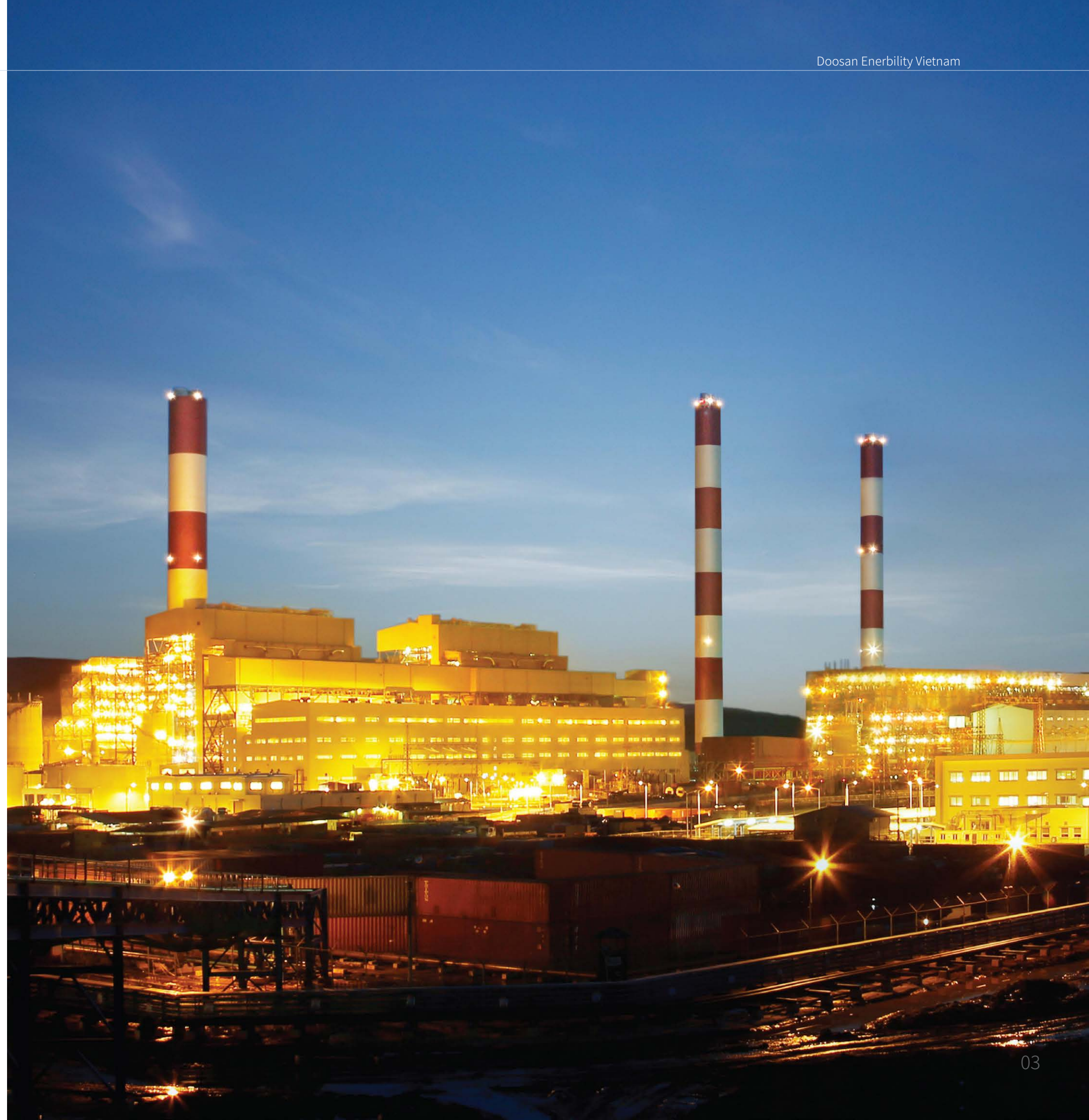
**Doosan Enerbility Vietnam**



# PRESSURE PARTS

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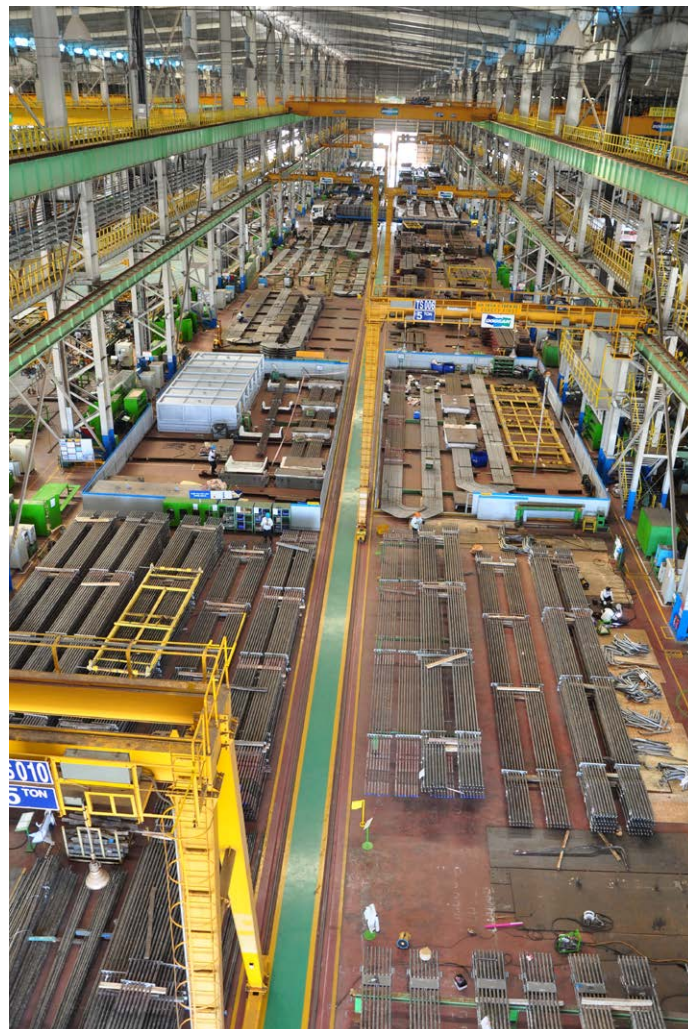
# BOILER LEADER

## Turning night into day worldwide

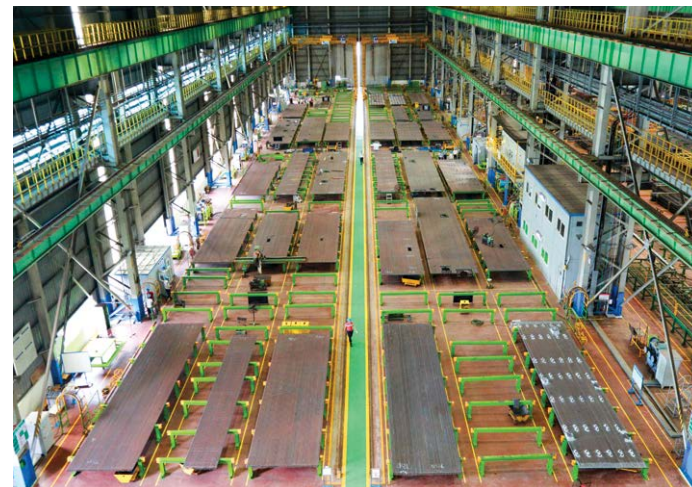
- A boiler is considered the heart of a thermal power plant and Doosan Vina's Boiler shop has manufactured boilers with total generating capacity of well over 10,000 MW. For perspective that is equal to nearly half of Vietnam's total power capacity and if all were installed in Vietnam nearly 15 million additional households could be served. Our "Made in Vietnam" boilers are currently producing electricity and fueling development in Brazil, Egypt, Thailand, Saudi Arabia, India and Vietnam.

- With advanced technology, modern production facilities as well as the most qualified technicians, Doosan Vina is a global supplier that offers products of the highest quality at competitive prices. And with our own dedicated deep-sea port, we can provide cost effective delivery anywhere in the world.

- **Main Product:** Pressure Part and Non-Pressure Part
- **Square Meters of the Boiler Shop:** 92,136m<sup>2</sup>
- **Typical Customer:** Power plant developers worldwide



Doosan Vina's Coil manufacturing area in the Boiler Shop



Some of the massive interior fabrication areas



Some of the massive interior fabrication areas

## Boiler pressure parts main components

- A Boiler's pressure parts are where thermal energy is converted to steam that is then used to drive a turbine and generate electricity. These heat absorbing parts are subject to extreme pressure and are considered the most important parts of a Boiler. They are critical to the safe and efficient operation of a boiler and include Economizers, Super Heaters, Re-heaters, Drums, Panel Walls and Valves & Fittings.

- Doosan has manufactured a wide range of Pressure Parts for Boilers including the drum-type, the once-through boiler and the large-scale high temperature, high pressure supercritical boilers that are used in power plants around the world. Our expertise & experience are unparalleled and we are a leader in the manufacture of boiler pressure parts.



Tata Power's Mundra UMPP is a coal-fired thermal power project with a combined power output of 4,000 MW by Doosan



Module assembly of an Economizer for the Mong Duong II Project



Economizer Inlet Header in fabrication





A Boiler worker grinds a Primary Reheater Inlet Header for the Vinh Tan 4 Thermal Power Plant Project



Welder welds a Butt-Joint Pipe to Pipe for a Platen Super Heater Outlet Manifold with Visualization of the AMP's displayed on an electronic board



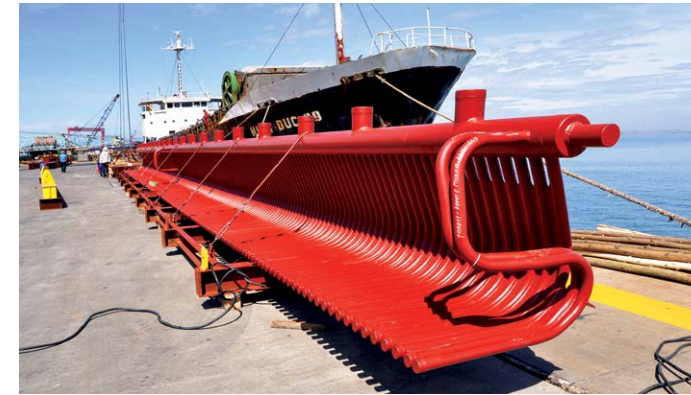
Primary Super Heater Outlet Header in fabrication



Packing Primary Super Heater Inlet Header



Header ready for shipment



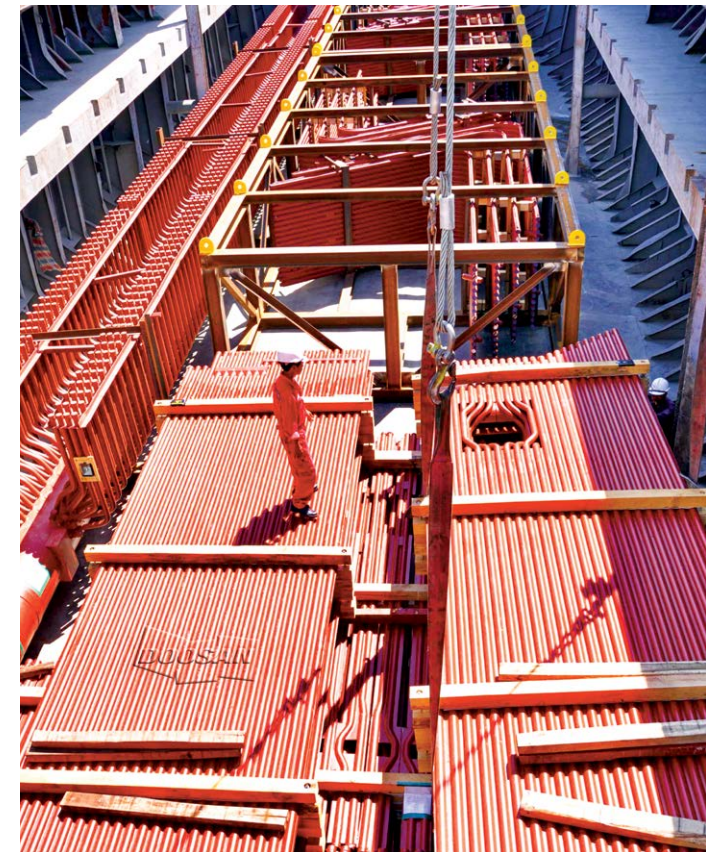
Furnace Roof Panel ready for shipment



Vertical Wall Panel Packed for shipment



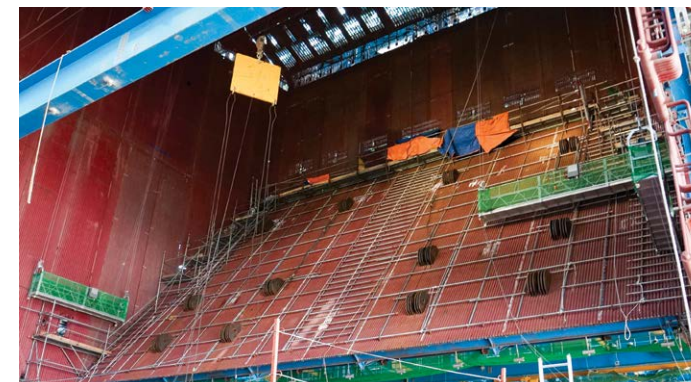
Coil Platen Super Heater ready for shipment



Shipment of a Spiral Wall Panel, a Rear Arch Wall Panel and a Header



Erection of Platen Super Heater and Final Super Heater at the Mong Duong II Power Plant



Erection of Spiral Hopper Panel Wall at the Mong Duong II Power Plant



Erection of Spiral Hopper Discharge Wall Panel and Furnace Inlet Header at the Site of the Mong Duong II Power Plant





A birdseye view of Doosan Vina's Quang Ngai complex

Doosan Vina provides integrated solutions and is a manufacturer that offers end-to-end design engineering and fabrication solutions to customers worldwide. Our large enclosed indoor shops assure customers of quality products that are warrantied and serviced on site by our technicians under strict quality assurance and EHS management systems.



**QA Management System**

- ISO 9001:2015
- ISO 3834-2
- EN 1090
- ASME
- + U, U2, S, PP

**EHS Management System**

- ISO 14001:2015
- ISO 45001:2018



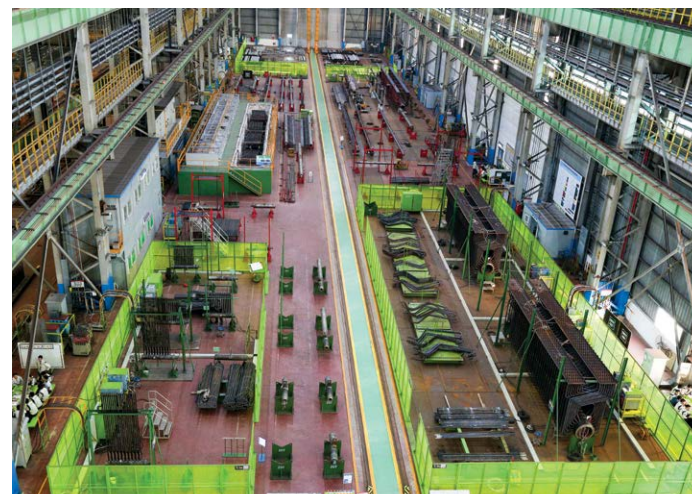
In addition to modern facilities and technology that are controlled by some of the most qualified technicians in the world today, Doosan Vina strictly applies Quality Management Systems with a commitment to our “Zero Defect” Policy.

We execute quality control through all phases of the manufacturing process and maintain a stringent regime of quality, safety and on time delivery for every project.

Pre- Manufacturing



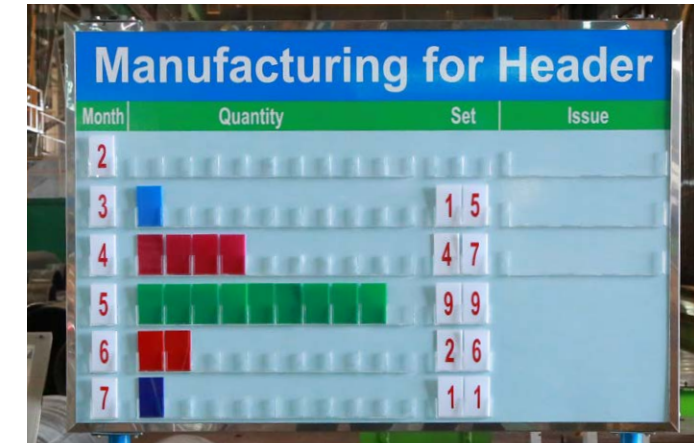
Uniform color coded material management



Colored coded raw materials

Classified working area

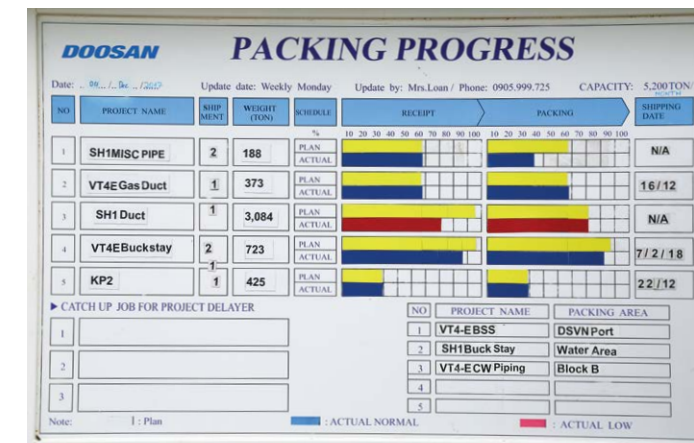
In Manufacturing



Weekly progress and manufacturing control system



Project Process map



A packing schedule for post manufacture



Type of Material	Remain (Ton)	Last Month (Ton)		Plan This Month (Ton)		Remarks
		Received	Issued	Received	Issued	
Tube	2,905	1,671	570	315	493	Include Round bar
Pipe	456	341	197	152	132	
Steel Plate	163	327	99	111	115	Carbon Steel Stainless Steel Checkered plate H-beam Angle Channel
Shape Plate						
Shape Beam	6	3	5	4	2	
<b>Total</b>	<b>3,530</b>	<b>2,342</b>	<b>871</b>	<b>582</b>	<b>742</b>	





### A vertical integrated solution provider

	Integrated Solution	Not capable of providing an integrated solution	
Work Scope	Doosan Vina	Competitor A	Competitor B
Engineering	✓	✗	✓
Procurement	✓	✓	✓
Fabrication	✓	✓	✗
Erection (Modularization)	✓	✗	✗
Trouble Shooting	✓	✗	✓

### Engineering

- Doosan Vina has its own engineering & design capabilities for boiler and equipment like pressure part, steel structure, non-pressure part, combustion equipment, etc.
- Especially, Doosan Vina provides the total solution for industrial boiler including basic engineering & design, project management, manufacturing, supplying, modularization, technical supervision, etc.

### Procurement

- Doosan Vina has the ability to procure raw materials and Compete Vendor Items through our own Procurement System and Supply Chain.
- Since Doosan Vina has our own dedicated port, it has significant advantages in importing and importing raw materials and products.

### Fabrication

- Doosan Vina is specialized in fabricating of boiler-related pressure parts / steel / non-pressure parts, and has excellent facilities and a well-organized production / quality management system.
- Annual production capacity of boiler parts (about 3.3GW / Year) and steel / non-pressure parts (40,000 tons / year)

### Erection (Modularization)

- Doosan Vina has an exclusive area for Assemble (Approx. 80,000m2) and has sufficient Bearing Capacity of Soil for large module Erection.
- It is optimized for modularization by manufacturing process of One Flow leading to factory, assembly site and dedicated port in our factory.

### Trouble Shooting

- Doosan Vina has its own Trouble Shooting ability for the products manufactured by Doosan Vina based on many years of plenty experiences / design know-how.
- In addition, engineers who has lots of experiences can provide immediate customer support in case of problems in the field.

# FEATURES

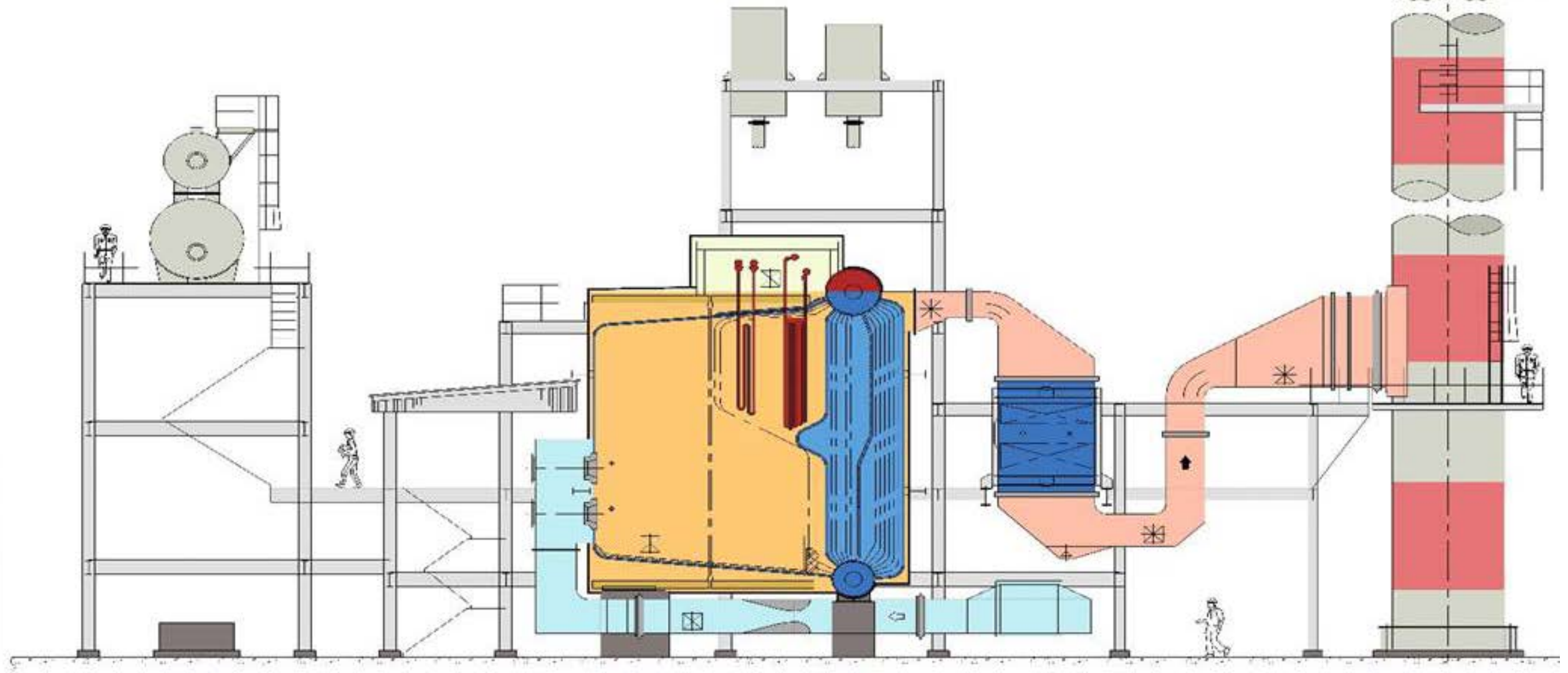
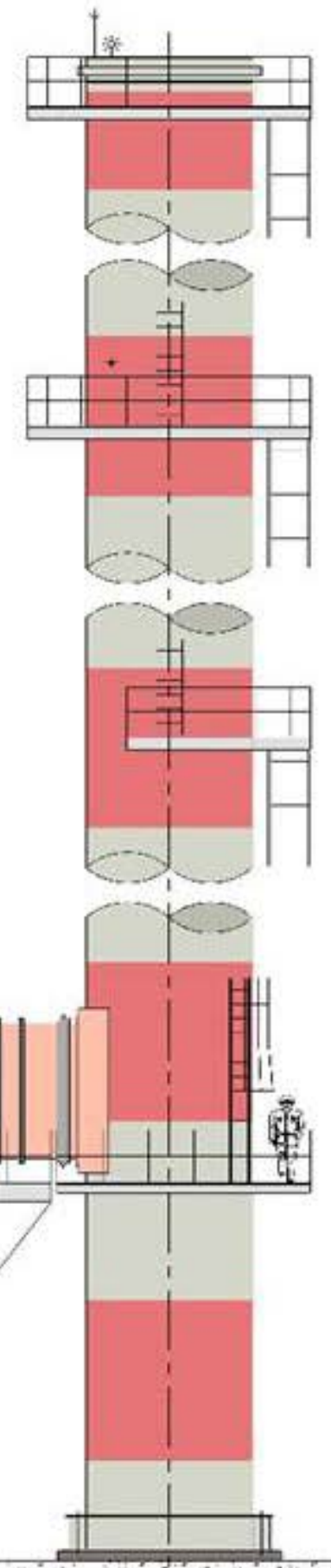
- Doosan Vina provides high-quality and high-reliability industrial boiler package total services through engineering to manufacturing by leveraging its boiler OEM technology along with extensive experiences and references from around the world.

- Our Industrial Package boiler solutions offer reasonable prices, fast delivery and trustworthy after-sales services.

- We have industrial boiler models of the "DS" type and "Bi-Drum" type, which are proven and reliable standardized models that are designed to burn the various Oil & Gas efficiently.

- Based on our extensive and successful experience in a lot of boilers, we can provide industrial boiler package solutions for process steam required by various industries with the best engineering, high quality and reasonable price of Doosan Vina.

Key Parameters			
Description	Unit	DS Type Shop Assembled	Bi-Drum Type Field Assembled
Capacity	t/h	20 ~ 270	50 ~ 450
Design Pressure	barg	~ 110	~ 120
Steam Temperature	0°	~ 510	~ 530
Fuel & Firing		Liquid and/or Gas Wall Firing	



"Bi-Drum" type Industrial Boiler Typical Side Elevation View



# GLOBAL CHAMPION IN POWER BOILER

Doosan Vina is truly proud of our products. We have many years of experience in the fabrication of core components for power plants utilizing the latest technology, cutting-edge equipment and skilled manpower that put their reputation in every boiler part we make.



EDP Boiler 360MW X 4 Units	
Period	05.Jan.2009~27.Jun.2010
Client	MABE LTDA (Mairie Eng'g / Alusa / BC Projecos / Efacec)
Location	Pecem & Itaquí, Brazil
Boiler Type	Sub-Critical Drum Boiler



Marafiq 275MW x 2Units	
Period	11.MAY.2010~02.NOV.2010
Client	Marafiq Company
Location	Yanbu Al Sinaiyah ,Saudi Arabia
Boiler Type	Sub-Critical Drum Boiler



Raipur Boiler 685MW X 2Units	
Period	18.Jun.2010~30.Dec.2011
Client	GMR Energy (India IPP Developer)
Location	Raipur District, Chhattisgarh State, India
Boiler Type	Once-through Boiler



Ain Sokhna 650MW x 2Units	
Period	25.Mar.2011~15.Mar.2012
Client	East Delta Electricity Power Production Company (EDEPC)
Location	Ain Sokhna, East Cairo, Egypt.
Boiler Type	Once-through Boiler



Mong Duong II 600MW X 2Units	
Period	15.Dec.2011 ~ 05.Dec.2012
Client	AES-VCM MONG DUONG POWER CO., LTD
Location	Quang Ninh, Vietnam
Boiler Type	Once-through Boiler



Kudgi 800MW X 2Units	
Period	01.Jan.2013 ~ 30.Mar.2014
Client	NTPC Limited
Location	Karnataka, India
Boiler Type	Super-Critical coal-fired Boiler



EDP Boiler 360MW X 4 Units	
Period	15.Jan.2014 ~ 30.Aug.2014
Client	
Location	Chhattisgarh, India
Boiler Type	Once-through Boiler



Vinh Tan IV 600MW x 2 Units	
Period	Mar.2014 ~ Jun.2018
Client	POWER GENERATION CORPORATION 3
Location	Binh Thuan, Vietnam
Boiler Type	Super-Critical Once Through, Two Pass



Song Hau I 600MW x 2 Units	
Period	May.2015 ~Aug.2019
Client	Vietnam Oil and Gas Group (PetroVietnam-PVN)
Location	Hau Giang, Vietnam
Boiler Type	Super-Critical Once Through, Two Pass



OBRA C Pressure Part # 1 660MW x 2 Units	
Period	08.May.2017 ~31.Oct.2018
Client	Uttar Pradesh Rajya Vidyut Utpadan Nigam Limited
Location	Sonebhadra Uttar Pradesh, India
Boiler Type	Two pass, Super-Critical Once Through



Nghì Son II TPP 600 MW x 2 Units	
Period	Apr.2018 ~ Jul.2022
Client	Nghì Son 2 Power Limited Liability Company
Location	Thanh Hoa, Vietnam
Boiler Type	



Van Phong I TPP 660MW x 2 Units	
Period	Oct.2019 ~ Oct.2022
Client	Van Phong Power Company Limited
Location	Khanh Hoa Province, Vietnam
Boiler Type	



Vung Ang II TPP 660MW x 2 Units	
Period	Jun.2014 ~
Client	Vung Ang II Thermal Power Ltd. Liability Company (VAPCO)
Location	Thanh Hoa Province, Vietnam
Boiler Type	



# CUSTOMER SATISFACTION

- Doosan's customer service is a partnership that creates a win-win to benefit all parties, both now and in the years ahead. It begins when we meet and it continues throughout our relationship. A key element in our Customer Satisfaction program is our operator training that ensures you are maximizing your investment.

- We are also committed to providing reliable service that minimizes downtime and response time that is amongst the quickest in the industry. Doosan's believes continuous innovation and customer satisfaction is what makes us stand out as the best; and makes us the crane manufacturer of choice for those looking for the most cost effective, durable and safest solutions for their material handling needs.

## GLOBAL NETWORK

### EUROPE

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#### **DOOSAN HF CONTROLS**

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