

thyssenkrupp Uhde

Coke Plant Technologies

Dortmund – March 2023



thyssenkrupp

thyssenkrupp – a global corporation with
~ €34 bn sales, over 100,000 employees &
presence in 56 countries with ~1,100 locations



Serving a broad spectrum of industries

with an international footprint of around 4,500 employees

Customer industry



Units	tk nucera ¹	FER	PP	UHPT	UIF	CP
	thyssenkrupp nucera	Fertilizer & Methanol	Petrochemicals & Polymers	High Pressure Technologies	Polycondensation Technologies	Coke Plant & Inorganic Acids
Products	Green hydrogen (H ₂ O electrolysis), Chlor-Alkali, HCl	Ammonia & Urea, Nitric acid, Methanol, Urea Granulation	H ₂ O ₂ , Vinyls Propylene Oxide, PG, Polyols and Oleochemicals, PDH/BDH, PE/PP, Refineries, Reformer H ₂	LDPE, High Pressure Pr., Sup. Critical Fluids, Water Jet Cutting	PET, Polyamides, Polylactic acids	Coke plants, H ₂ SO ₄ , Phosphoric acid
Scope and Footprint	Project Management, Engineering, Procurement, Construction, Service, Digital Products etc.					

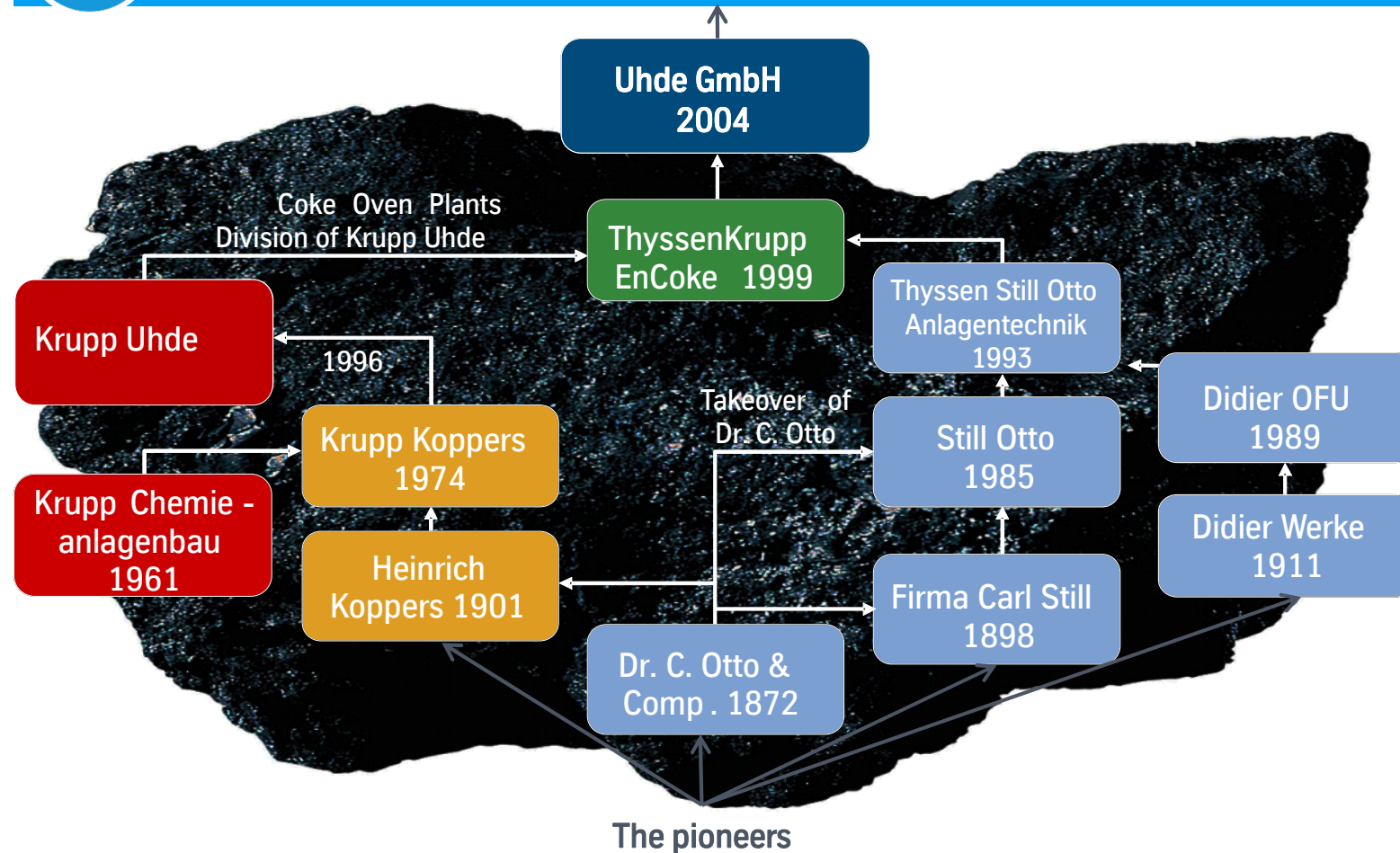
¹ Separate entity but close cooperation



150 years of experience in coke plant technologies...



thyssenkrupp Industrial Solutions Coke Plant Technologies



Sustainability

- Develop innovative technologies for an environmentally friendly industry
- Maximizing yields on raw material, minimizing environmental impact

Innovation

- Utilization of long-term experience and global cross-industry network allows for broad expertise to focus on integrated concepts to increase efficiency and operability
- Digitization of production process to further increase efficiency

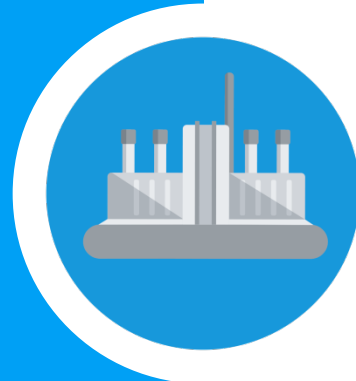


Coke Plant Technologies

150 years

experience in the
construction of coke plants

- Designing and building coke plants for 150 years
- Competence and know-how gained by the construction of more than 100,000 coke ovens worldwide
- Numerous inventions and developments, which are today recognized standards in modern and environmental friendly coke making
- Further development of coke oven gas treatment technologies for other applications (sulfur processing and environmental technologies).



Coke Plant Technologies



Portfolio

Coke oven batteries including stamp charging

Coke oven gas treatment plants

Tar distillation plants

Coke quenching plants

Coke oven service machines

Pollution control equipment

Coal and coke treatment facilities

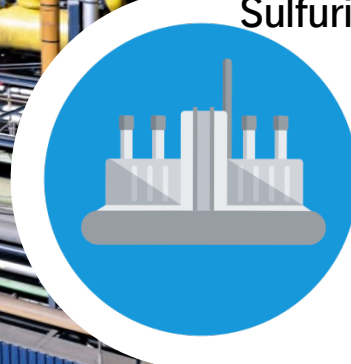
Heat-recovery coking plants

Technology services

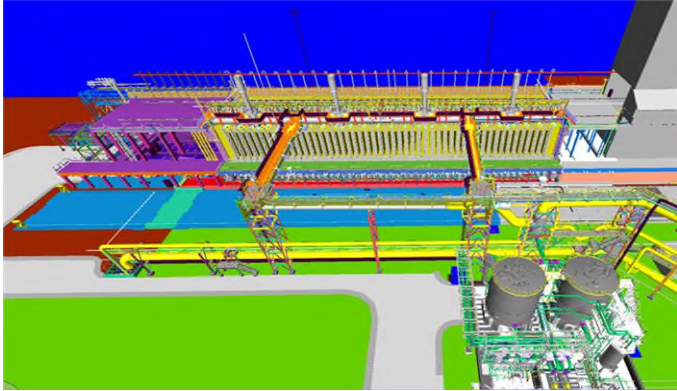
Desulfurization and sulphur recovery plants

Waste water treatment plants

Sulfuric and Phosphoric acid plants



ArcelorMittal Tubarão Brazil – Coke Oven Battery No. 4



- EPC implementation of a new coke oven battery
- 49 Compound coke ovens, 6,5m x 16,0m x 0.42m
- Capacity approx. 600.000t blast furnace coke/year



Hot repair and maintenance of coke oven batteries (service)

- Market leader for hot repairs in Europe and South America

- Major clients (current contracts):

ArcelorMittal (Germany, South Africa, France, Brazil)

CSN Brazil

HKM, Salzgitter and tkSE/Schwelgern (all Germany)

Tata Steel Europe (Netherlands)



New order from USIMINAS/Ipatinga-Brazil – Revamp of coke oven battery no. 3

- Oven front (complete mechanical part and end flues)
- Oven top
- Machines and automation (EPC execution)

Nippon Coke & Engineering/Kitakyushu-Japan – Rebuilt of a new battery

- Pad-up rebuilt of a battery of 54 ovens (7.2 meter height)
- EPSV implementation

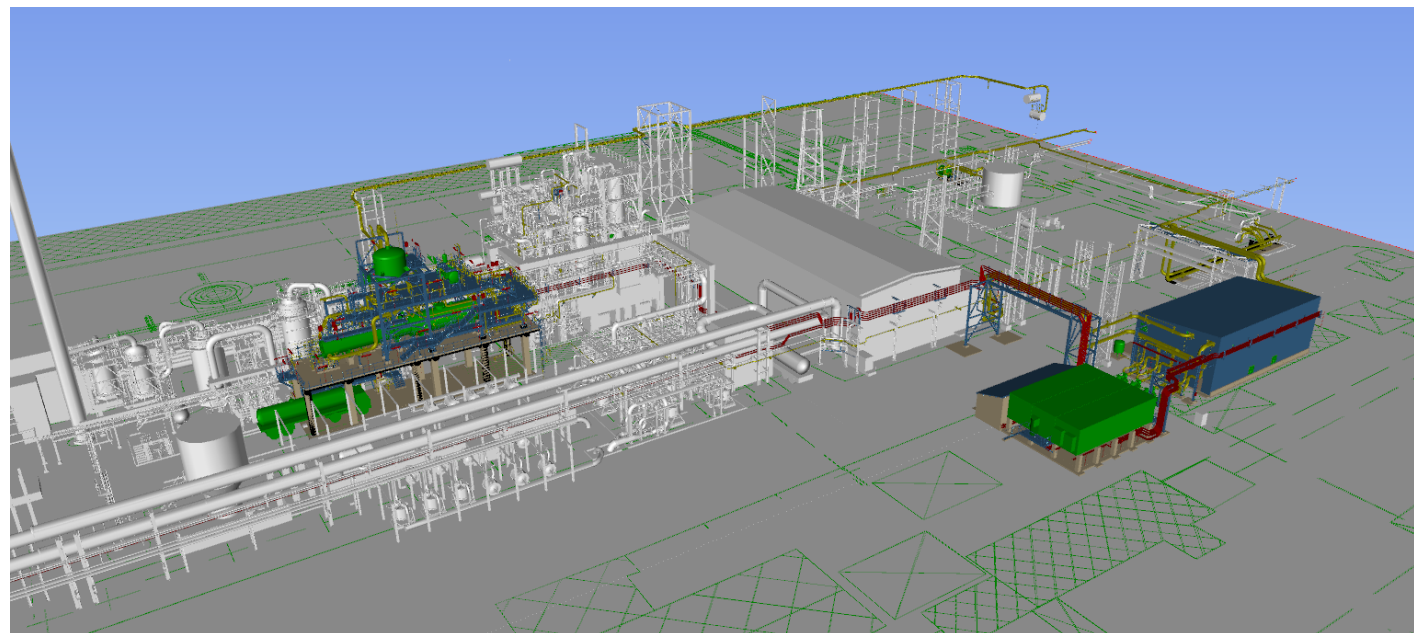


Coke oven gas desulfurization projects

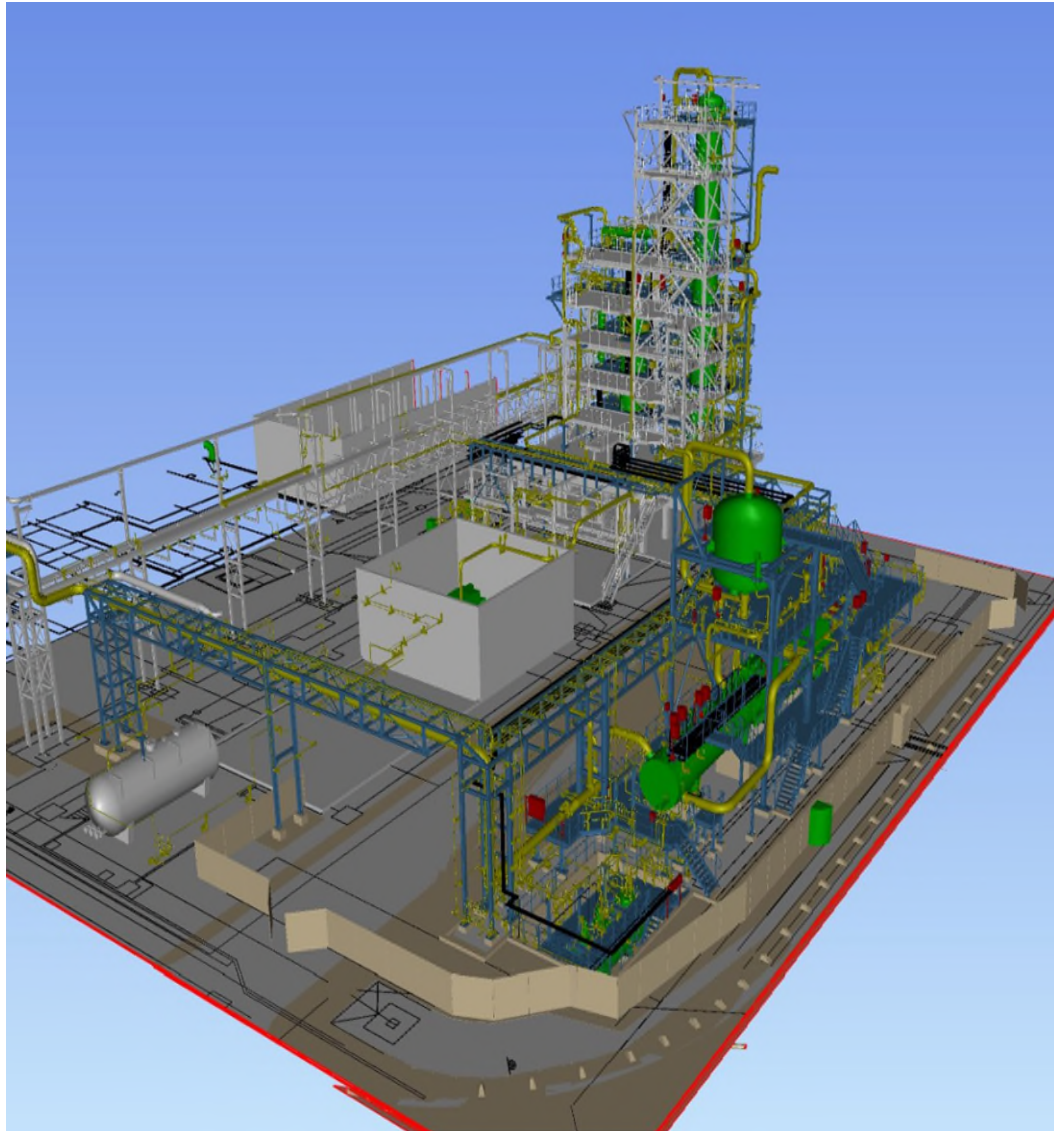


Acciaierie d'Italia, Taranto steel plant / Desulphurization Project

Execution model	EPC
Country/plant site	Italy/Taranto
Project scope:	- Revamp of H₂S/NH₃-Desorption plant - New Claus plant - New chiller plant
Environmental main targets	Reduction of H ₂ S content in COG $\leq 500\text{mg/Nm}^3$ NH ₃ content $\leq 50\text{ mg/Nm}^3$
Status	R.F.I.O. Ready for initial operation – April 2023 PAC reached in June 2023



Coke oven gas desulfurization projects

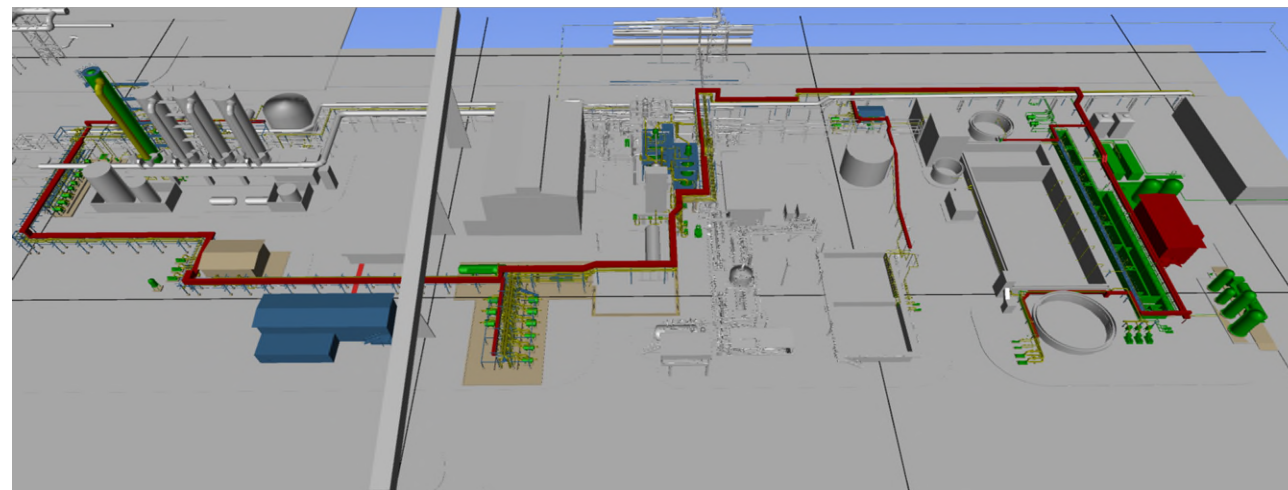
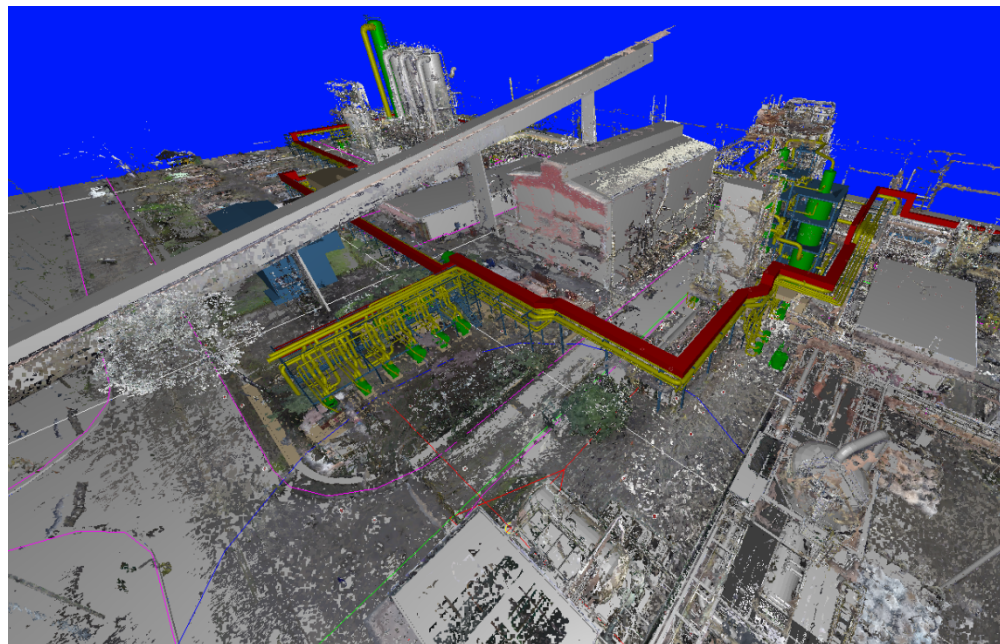


ArcelorMittal Gent, Desulphurization Project

Execution model	EPC
Country/plant site	Belgium/Gent
Project scope:	- New back up H₂S / NH₃ Desorption unit - New Claus plant
Environmental main targets	Reduction of H ₂ S content in COG $\leq 300\text{mg/Nm}^3$ and NH ₃ content $\leq 50\text{ mg/Nm}^3$
Status	More than 90 % of engineering completed Civil works ongoing Expected start of operation – June 2023



Coke oven gas desulfurization projects



ArcelorMittal Brazil, Tubarão steel plant / Desulphurization plant and upgrade of existing waste water treatment plant

Execution model	EPC
Country/plant site	Brazil/Tubarão
Project scope:	- H₂S/NH₃ removal unit - H₂S/NH₃ Desorption - New chiller unit - Revamp/Upgrade on existing biological wastewater treatment plant
Environmental main targets	Reduction of H ₂ S content in the COG $\leq 300\text{mg/Nm}^3$ and NH ₃ content $\leq 30\text{ mg/Nm}^3$ Total Cyanide in the waste water $\leq 0,2\text{mg/l}$ as well as COD $\leq 180\text{mg/l}$
Status	Project execution started in June 2022 Engineering and procurement activities ongoing PAC scheduled for November 2024

thyssenkrupp Industrial Solutions AG
Friedrich-Uhde-Straße15
44141 Dortmund, Germany
www.thyssenkrupp-industrial-solutions.com

Your contacts

Frank Redemann
Head of Sales
Coke Plant & Inorganic Acids

frank.redemann@thyssenkrupp.com
T: +49 231 547-2045

engineering.tomorrow.together.



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