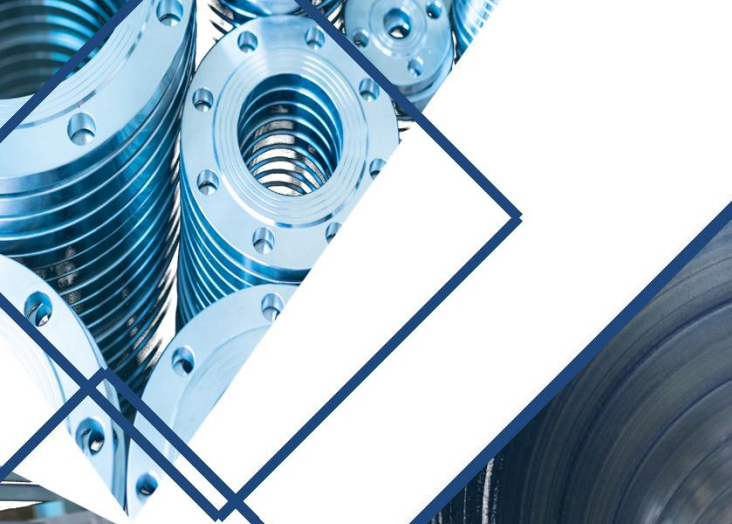
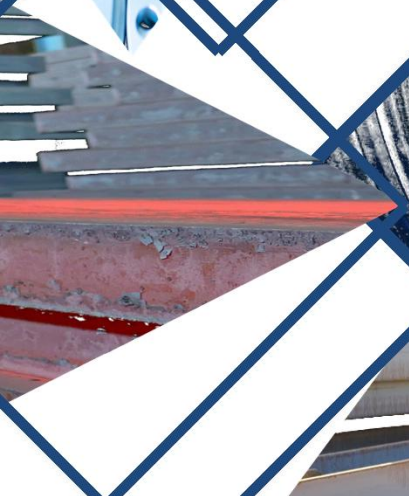




STS | STEEL TRADING SOLUTIONS

STEEL SOLUTIONS FOR CARBON CAPTURE & STORAGE

Clad pipe, corrosion-resistant alloys & line pipe for the CO_2 value chain

STS STEEL TRADING SOLUTIONS

ONSHORE ENERGY and CARBON CAPTURE

STS STEEL TRADING SOLUTIONS

A Generational Infrastructure Build

Carbon capture is moving from demonstration to deployment — and almost all of it runs through steel.

US$8B+

Global CCUS market by 2030

Up from ~US$4.9B in 2024; CCS alone to ~US$20B by 2034.

20,000–40,000

km of new CO_2 pipeline by 2030

Against only ~8,000 km in service today (IEA).

~US$40B/yr

CO_2 infrastructure investment

Rising from ~US$1B today to ~US$40B by 2030 (IEA).

~20×

Growth in CO_2 storage needed

From ~50 Mt to ~1 Gt per year by 2030.

Every tonne of captured CO_2 must be compressed, transported and injected — the pipe, vessels and tubing required form one of the largest new steel-demand pools of the energy transition.

Sources: IEA Net Zero / CO_2 Transport & Storage; ABI Research; Fortune Business Insights.

STS STEEL TRADING SOLUTIONS

STS Sits at the Centre of the Regional Build-Out

Western Australia is positioning itself as a global carbon-storage hub, with a CCUS Action Plan published in 2024 and a deep pipeline of LNG-linked projects. Based in Perth, STS is on the doorstep of the operators, EPCs and engineering houses specifying steel — backed by 40+ years of combined APAC energy supply experience.

Gorgon (Chevron) — WA

World's largest CCS; 11 Mt+ stored since 2019, up to 4 Mtpa.

Operating

Moomba (Santos / Beach) — SA

Live since 2024 at 1.7 Mtpa, at under US$30 per tonne.

Operating

Bayu-Undan (Santos) — NT / Timor-Leste

~10 Mtpa proposed; 500+ km CO_2 pipeline from Darwin; FID stage.

FEED / FID

Bonaparte · Angel · Karratha Hub — WA / NT

INPEX, Woodside & partners assessing large multi-user storage hubs.

Feasibility

STS STEEL TRADING SOLUTIONS

Where Steel Meets Carbon Capture

Steel is embedded at every stage — from the capture plant to the injection well.

1

Capture

Pressure vessels, process plate & structural steel at the capture plant.

2

Compression

Compressor-station piping, fittings & dense-phase conditioning.

3

Transport

Line pipe & CRA-clad pipe moving CO_2 across distance.

4

Injection

OCTG injection tubing, wellheads & downhole CRA strings.

5

Storage

Long-life well integrity for 50+ years of secure containment.

STS supplies across the full chain — carbon steel where it is safe, corrosion-resistant alloys where it is essential.

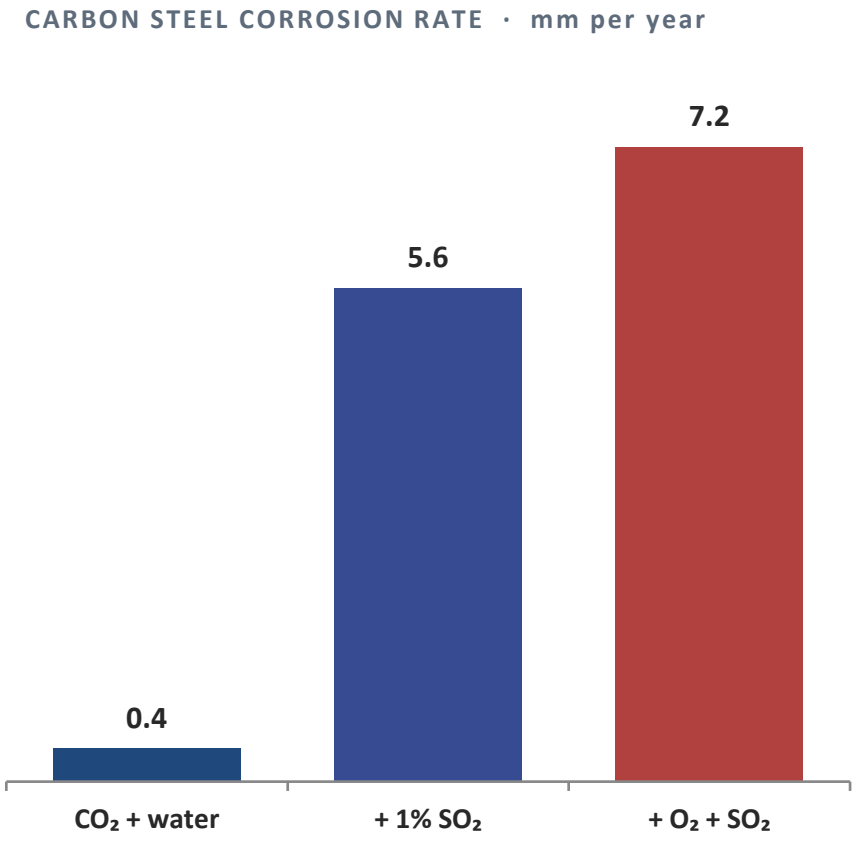
STS STEEL TRADING SOLUTIONS

Captured CO_2 Is Not Clean CO_2

Dry, dense-phase CO_2 can run safely in carbon steel. But captured streams carry water and impurities — **O_2, SO_x, NO_x and H_2S** — that form aggressive acids the moment free water is present. Multi-source captured CO_2 is dirtier and far less predictable than naturally occurring CO_2.

THE CORROSION PENALTY IS SEVERE

In supercritical CO_2 with water, adding just 1% SO_2 drives the corrosion rate of carbon steel from **0.38 to 5.6 mm/yr** — beyond **7 mm/yr** once oxygen is also present. Up to an 18-fold acceleration.



Source: Effect of impurities on CO_2 transmission pipeline steel in supercritical CO_2–water environments (Env. Sci. Technol.).

STS STEEL TRADING SOLUTIONS

The Cost of Specifying the Wrong Steel

In CCS, a material decision made once at FEED is locked in for decades.

Unplanned downtime

Corrosion-driven inspection and repair halts injection and disrupts the entire capture operation upstream.

Early replacement & capex blow-out

Premature pipe and tubing failures force re-investment the business case never accounted for.

Integrity & leak risk

A CO_2 release is a safety, environmental and regulatory event — and a threat to stored-carbon credits.

50+ year design life

CCS assets must outlast typical oil & gas design lives of 30 years, raising the bar on selection.

Get the metallurgy right once — and the asset performs for its full design life.

STS STEEL TRADING SOLUTIONS

Clad Pipe: Carbon-Steel Economics, CRA-Grade Protection

Clad and lined pipe bond a thin corrosion-resistant alloy layer to a structural carbon-steel backing — metallurgically bonded **(clad)** or mechanically bonded **(lined)**. The CRA delivers corrosion performance; the carbon steel carries the load and the cost.

TYPICAL CLADDING ALLOYS

- 316L
- Alloy 625
- Alloy 825
- 22Cr Duplex
- 25Cr Super Duplex
- 254 SMo

≤0.1 mm/yr

25Cr super duplex shows under 0.1 mm/yr and no pitting even with O_2/SO_2 impurities — against multiple mm/yr for bare carbon steel.

STS STEEL TRADING SOLUTIONS

The Right Material, in the Right Place

Deploy CRA performance precisely where the stream turns corrosive — not everywhere.

Option	Resistance in wet / sour CO_2	Material cost	Best-fit application	Whole-of-life value
Carbon steel	**Low — fails once free water + impurities appear**	**$**	Dry, dense-phase transport	**Poor in corrosive service**
CRA-clad / lined	**High — CRA surface, carbon-steel backing**	**$$**	**Wet, sour & injection-critical lines**	**Optimal**
Solid CRA	**Highest**	**$$$$**	Severe, short specialist runs	**Over-spec for most scope**

The commercial optimum: clad pipe delivers near-solid-CRA corrosion performance at a fraction of the cost — the engineering and budget sweet spot for CCS corrosive sections.

STS STEEL TRADING SOLUTIONS

Onshore & Carbon Capture — Product Profile

Applications we supply: LNG trains · process & compression modules · pipe racks · pipelines.

PROCESS PIPING

- Pipe
- Fittings
- Flanges & valves
- Specialty forgings

CLAD STEEL

- Explosion-bonded or weld-overlay
- Plate
- Pipe, fittings & flanges
- CRA-lined options

PIPELINE

- Seamless & welded line pipe
- Coated line pipe
- Bends (3D / 5D) & special fittings
- Inspection, testing & logistics

Coated line pipe for onshore & offshore CO_2 service. STS delivers seamless and welded line pipe, pipe coating, inspection, testing, technical support and full logistics solutions — a complete pipeline materials package from a single partner.

STS STEEL TRADING SOLUTIONS

Clad Material — Specification & Capability

MANUFACTURING STANDARD

- SY/T 6623
- API Spec 5LD
- DNV-OS-F101
- GB/T 37701

CLADDING MATERIAL

- 410 · 304L · 316L · 321
- 2205 (duplex)
- 254 SMo
- Alloy 825 · Alloy 625

SUBSTRATE

- Q245R · Q345R
- L245 – L485 (line pipe)
- 15CrMoR
- 09MnNiDR (low-temp)

PRODUCT SPECIFICATION

Pipe diameter: DN50 – DN2000

Cladding wall thickness: 2 – 5 mm

Substrate wall thickness: 6 – 60 mm

Length: ≤ 13,000 mm

OPERATING CONDITION

Pressure: ≤ 50 MPa

Temperature: -46°C – 400°C

Service media: Cl^-, CO_2, H_2S

Forms: plate · pipe · fittings · flanges

STS STEEL TRADING SOLUTIONS

What STS Supplies to the Carbon Capture Market

CRA-clad & lined pipe

Explosion-bonded, weld-overlay & lined pipe in 316L, 625, 825 and duplex grades.

Line pipe

Carbon-steel & duplex line pipe for dense-phase CO_2 transport; SAW / seamless.

OCTG & injection tubing

CRA and carbon OCTG, injection strings & accessories for long-life wells.

Pressure-vessel & process plate

Plate and forgings for capture-plant vessels, separators & compression.

Structural steel & piling

Sections, plate & piling for capture-plant and facility structures.

Fittings, flanges & forgings

Matching CRA and carbon components for complete packages.

One partner across the full materials scope — from FEED enquiry to delivery on site.

STS STEEL TRADING SOLUTIONS

Why Partner with STS

A trader providing Integrated Project Management (IPM) — specifying clad and CRA correctly is only half the task; the other half is sourcing, certifying and landing it on site, on schedule.

Long-standing mill relationships

Close ties with leading mills across multiple product lines, built over many years — “favoured” and “protected” supply channels.

Product & technical knowledge

Specialty materials for the harshest service, backed by engineering, metallurgy and project-management expertise.

Full traceability & certification

Products to API, ISO, DNV and NORSOK; STS quality control during production, shipment and delivery.

Worldwide inventory & logistics

Global vendor network with stock near major hydrocarbon regions for fast, efficient delivery to site.

Quality & project management

Experienced document, quality and expediting management coordinating complex multi-party CCS scopes.

Local content support

Complements Australian industry, supports local-content requirements and de-risks the supply chain.

Specify with confidence.
Source with certainty.

Partner with STS to de-risk material selection and secure clad, CRA and line-pipe supply for your carbon capture project — from enquiry to delivery.

STS | STEEL TRADING SOLUTIONS

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