The CDRMax® Process

The CDRMax® process captures carbon dioxide (CO₂) from industrial flue gases or off-gases emitted from power plants, boilers, kilns and chemical facilities. The technology removes from 50 to 95% of the CO₂ from natural gas, coal, and petroleum-fired processes to produce industrial grade CO₂. The process is applicable from mid-scale (100s of metric tons per day) to large-scale (1,000s of metric tons per day) capacities for industrial carbon capture and utilization (ICCU) applications.

Technology Benefits

CDRMax® operates at atmospheric pressure to capture and purify CO₂ from low pressure flue gas and off-gas streams like kilns. The technology can be flexed to manage CO₂ concentrations in the source gas from 3% to 25% and produce CO₂ with purities between 95-99%.

Reduced Life-Cycle Costs

The CDRMax® process captures more CO₂ with smaller equipment and lower operating costs. CAPEX can be reduced by 20% and OPEX by 40% when compared to conventional MEA-based absorption. The process uses a proprietary solvent that:

- Increases CO₂ loading to reduce pump sizing & circulation
- Reduces heat/power duties by 20-40%
- Minimizes corrosion thereby extending equipment life
- Requires no anti-foaming and anti-corrosion additives
- Keeps working — resists solvent degradation and foaming
- Lowers solvent emissions and waste-disposal costs

For either greenfield plants or as drop-in replacements at brownfield sites, the APBS-CDRMax® solvent will reduce costs and extend plant life without major equipment changes.
Working Principles (Refer to Process Flow Diagram below.)

Flue Gas Conditioning – Flue gas is conditioned by an SOx/NOx scrubber (1) and then cooled (2).

Absorption – The conditioned gas enters an absorption column where it contacts the counter-current flow of our proprietary solvent for efficient CO\textsubscript{2} absorption.

Washing – The depleted flue gas exits the absorber column and passes through an integrated water washer (3) to minimize the loss of the solvent.

Stripping – The CO\textsubscript{2} rich solvent from the absorber bottom flows to the lean/rich heat exchanger (4), where the rich solvent is heated before entering the stripper column. The lean solvent (low CO\textsubscript{2}) flows to the reboiler, where it is heated by auxiliary steam (5). The steam from the reboiler enters the stripper tower (6) flowing upward, counter-current to the rich solution. The absorbed CO\textsubscript{2} is released from the rich solvent and flows to the top of the stripper tower (7). The lean solvent is returned to the absorber column via the lean/rich heat exchanger for further flue gas processing.

The high purity CO\textsubscript{2} is directed to the end-use application. (8)

Savings
- Regeneration energy: 40% less than MEA
- Lean solvent flow rate: 40% less than MEA
- New packing: 30% less pump HP
- Construction materials: 30% less on stainless
- Footprint: 20% less area
- Patented design: 10% less energy
- Wash water emission: Non-aerosol, low ppb solvent level
- Reclaimer: Ion exchange/thermal
- Health & Safety: REACH & GHS compliant
Presence and Experience

Carbon Clean Solutions maintains headquarters in the UK, and conducts operations through offices in the USA, Western Europe and India.

A Proven Track Record

CCSL is a recognized leader in CO₂ capture and reuse as demonstrated by > 30 plants now operating with our technology or solvent.

ADMINISTRATION

CORPORATE HEADQUARTERS  LONDON, UK
SALES OFFICE  HAMBURG, DE
SALES OFFICE  ALICANTE, ES
SALES OFFICE  CHICAGO, USA
RESEARCH CENTER  SHEFFIELD, UK
ENGINEERING CENTER  MUMBAI, INDIA

www.carboncleansolutions.com