CARBON SCRUBBER

CRA
Engineering a Safer World

FINAL POLISH TO BELOW 5 PPM FOR ENGINES AND MEMBRANES

The Carbon Scrubber is CRA's final polishing stage ahead of engines, membranes and catalysts. Gas passes through a fixed bed of impregnated activated carbon, where the remaining H_2S is adsorbed and oxidised on the carbon surface.

The same bed removes siloxanes and volatile organic compounds. The vessel has no moving parts and runs without power or chemical dosing.

CRA supplies the vessels singly or as a lead and lag pair, so the lead bed can be changed with the line still running. The media is selected against the gas analysis and its moisture.



Below 5 ppm
Outlet H_2S after polishing

Zero
Power and chemical dosing

3.4 kg
Sulphur left each day in 1,000 Nm^3/h of gas at 100 ppm

Lead and lag
Change-out with the line still running

THE SULPHUR LOAD ON THE BED

The carbon is used up in proportion to the sulphur it takes up, so CRA sizes the bed from the sulphur load, which is gas flow (Nm^3/h) × H_2S into the bed (ppm) × 0.0000343 kg a day.

Gas flow, Nm^3/h	H_2S into the bed, ppm	Sulphur load, kg a day	Duty
500	100	1.7	After bulk removal
1,000	100	3.4	After bulk removal
2,000	100	6.9	After bulk removal
250	500	4.3	On its own, at a low inlet

CRA selects the carbon and sizes the bed for each project against the gas analysis and its moisture.

TWO ARRANGEMENTS

Single vessel

One vessel carries the duty, and the carbon is changed during a planned stop.

Lead and lag pair

Two vessels run in series. The lead bed is changed with the lag vessel in duty, so the line keeps running.

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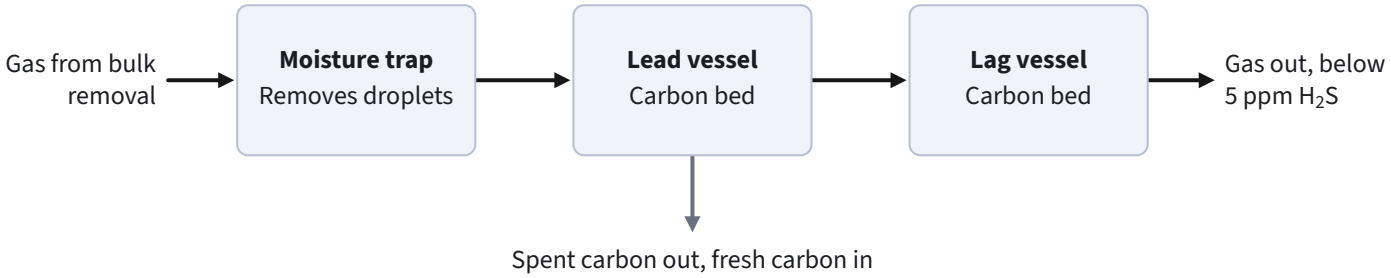
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WORKING AND CONFIGURATION

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A FIXED CARBON BED, AS ONE VESSEL OR A LEAD AND LAG PAIR

HOW IT WORKS



1. Moisture removal

A demister and moisture trap ahead of the bed remove droplets and aerosols, which protects the carbon.

2. Adsorption

The gas passes through the impregnated carbon, where H_2S and trace organic compounds are adsorbed on its surface.

3. Change-out

With a lead and lag pair, the lag vessel stays in duty while the carbon in the lead vessel is replaced.

TYPICAL CONFIGURATION

Duty	Final polish after bulk removal, ahead of engines, membranes and catalysts
Outlet H_2S	Below 5 ppm
Also removes	Siloxanes and VOCs
Media	Impregnated activated carbon pellets, selected against the gas analysis
Arrangement	A single vessel, or a lead and lag pair
Change-out	Through a manhole, with the lag vessel in duty
Ahead of the bed	Demister and moisture trap
Vessel	Stainless steel, or carbon steel with FRP lining
Fittings	Media support grid, inlet distributor, sample points and differential pressure indication
Power and dosing	None
Waste	Dry spent carbon

Materials, instruments and scope are confirmed for each project against the gas analysis and the site standards.

To size a unit, send CRA the gas flow, the inlet H_2S, the gas composition, the gas use and the utilities at site, or book a call with a process engineer at www.cra.energy.

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