

YOUR EXPERTS

FOR BURNERS

AND COMBUSTORS



**COMBUSTION
SOLUTIONS**







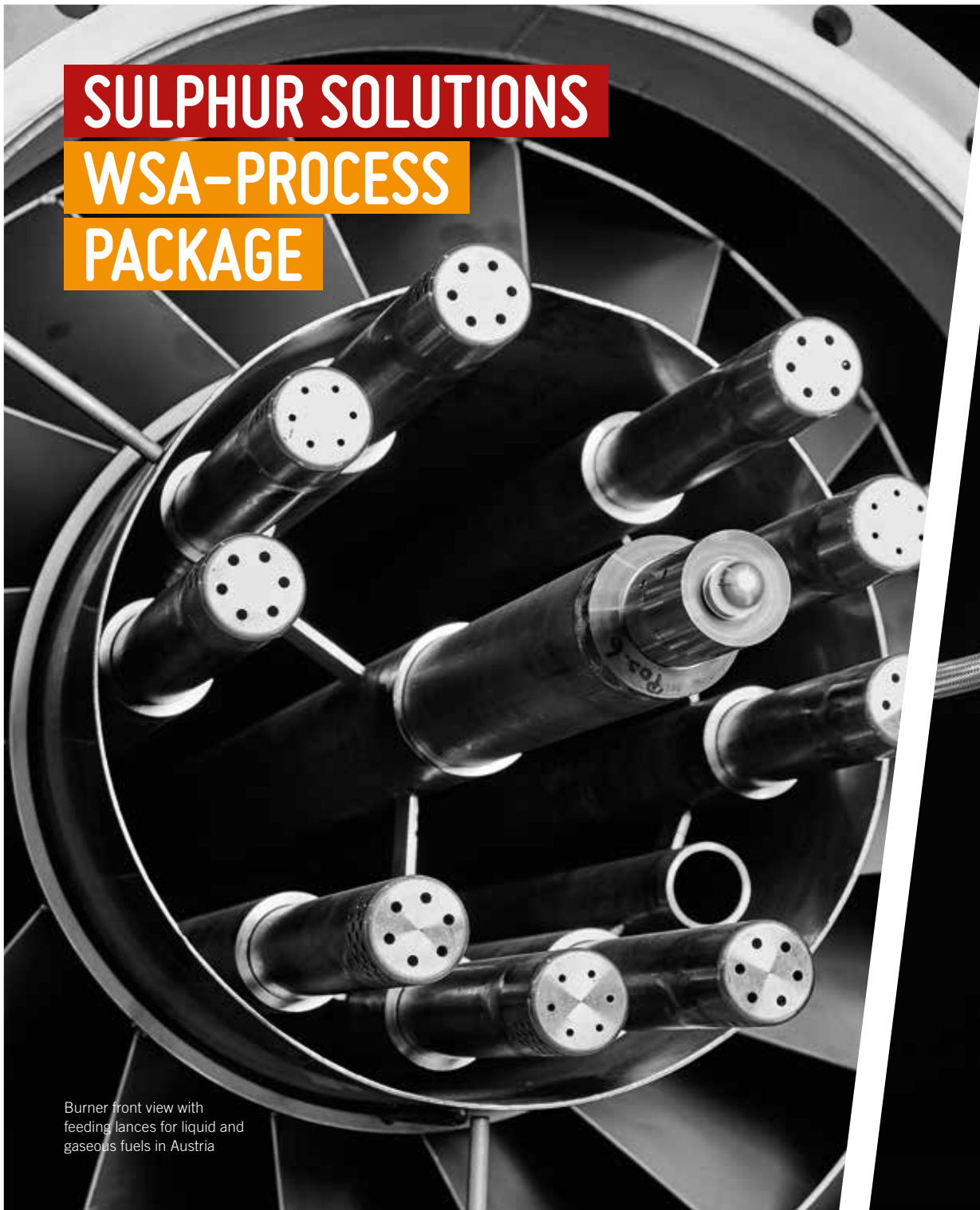
**CS offers fast and competent individual solutions for individual projects.
You can expect the following engineering and service features from CS**

- Evaluation and optimization of existing combustion processes
- Implementation of procedures for saving on operating costs
- Capacity increase with existing combustion plants
- Increasing plant availability
- Consulting for plant operators of combustion facilities
- Basic- and detail engineering of burners, combustors and incinerators
- Engineering for reconstruction, revamp and boosting of existing plants
- CFD-simulation
- Commissioning, maintenance, spare part supply and service

SULPHUR SOLUTIONS

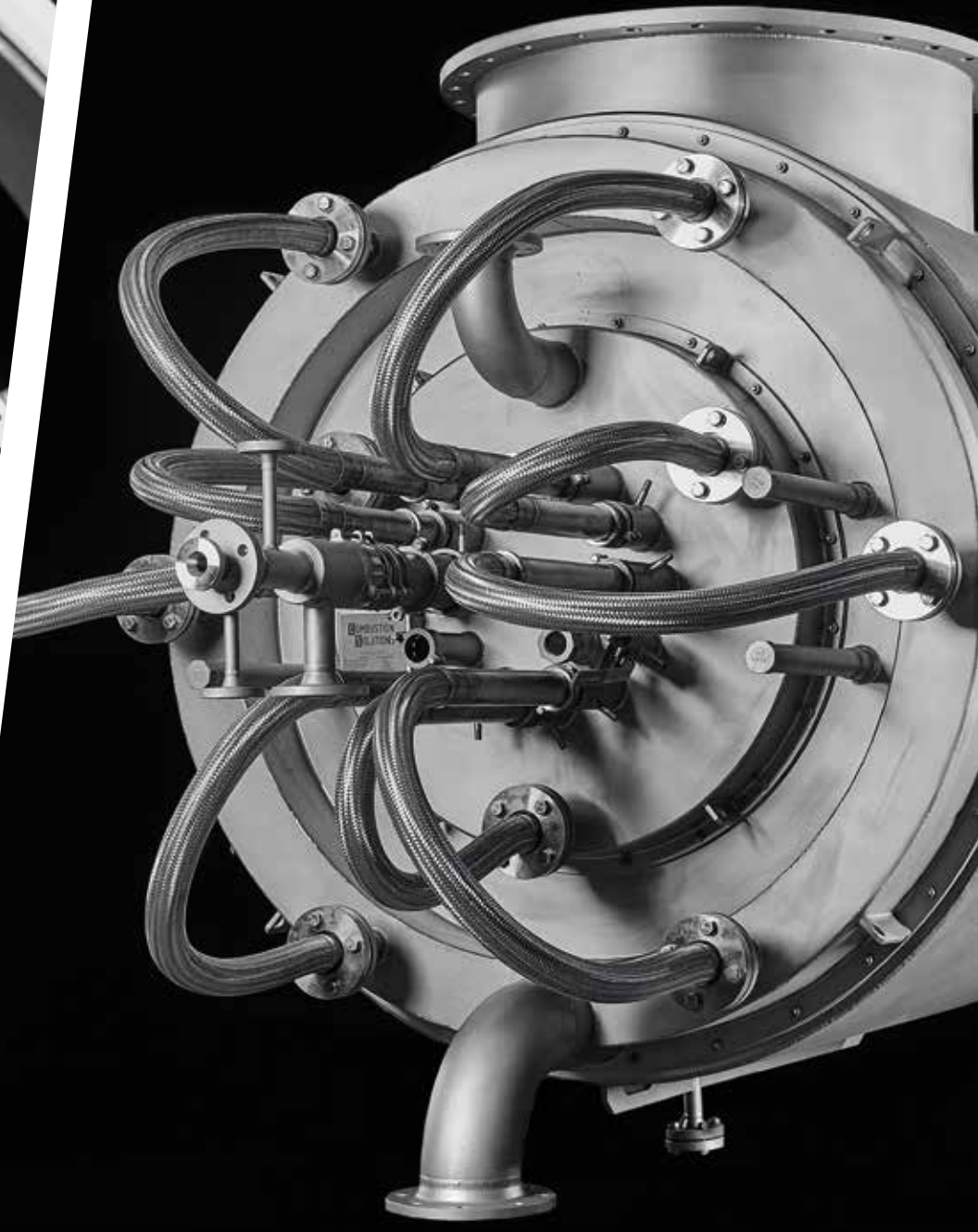
WSA-PROCESS

PACKAGE



Burner front view with feeding lances for liquid and gaseous fuels in Austria

Burner back plate-view for simultaneous combustion of H_2S gas, liquid sulphur, fuel gas



MAIN ISSUES:

- WSA-process package
- Common dry sulphur combustion
- Spent acid oxidation
- Boost your sulphur combustor with OXISPRAY® and OXIJET®
- What we offer

The WSA process converts sulphurous streams into sulphuric acid. WSA – wet gas sulphuric acid – treats the process gas with all of its water content. H₂S-gas and lean gas as well as liquid sulphur and spent acid are incinerated to SO₂ in a combustor followed by a waste heat boiler. If the feed gas does not contain enough combustibles, support fuel can be used. The process gas leaving the waste heat boiler has a temperature of approximately 400 °C and enters the SO₂ reactor which will contain one, two or three catalytic beds. As the reaction in the reactor is exothermal, it has to be cooled between the beds in order to optimize the SO₃/SO₂ equilibrium. After that the process gas will be fed to the WSA condenser, where final hydration and condensation of acid takes place.

CHARACTERISTICS:

- During start up a lambda of 10–20 possible
- Continuous and stable combustion of liquid sulphur at a high turn down rate up to 1:10
- Continuous and simultaneous combustion of rich and lean gas with different H₂S and/or CS₂ content
- Combustion of spent acid with varying compositions and qualities

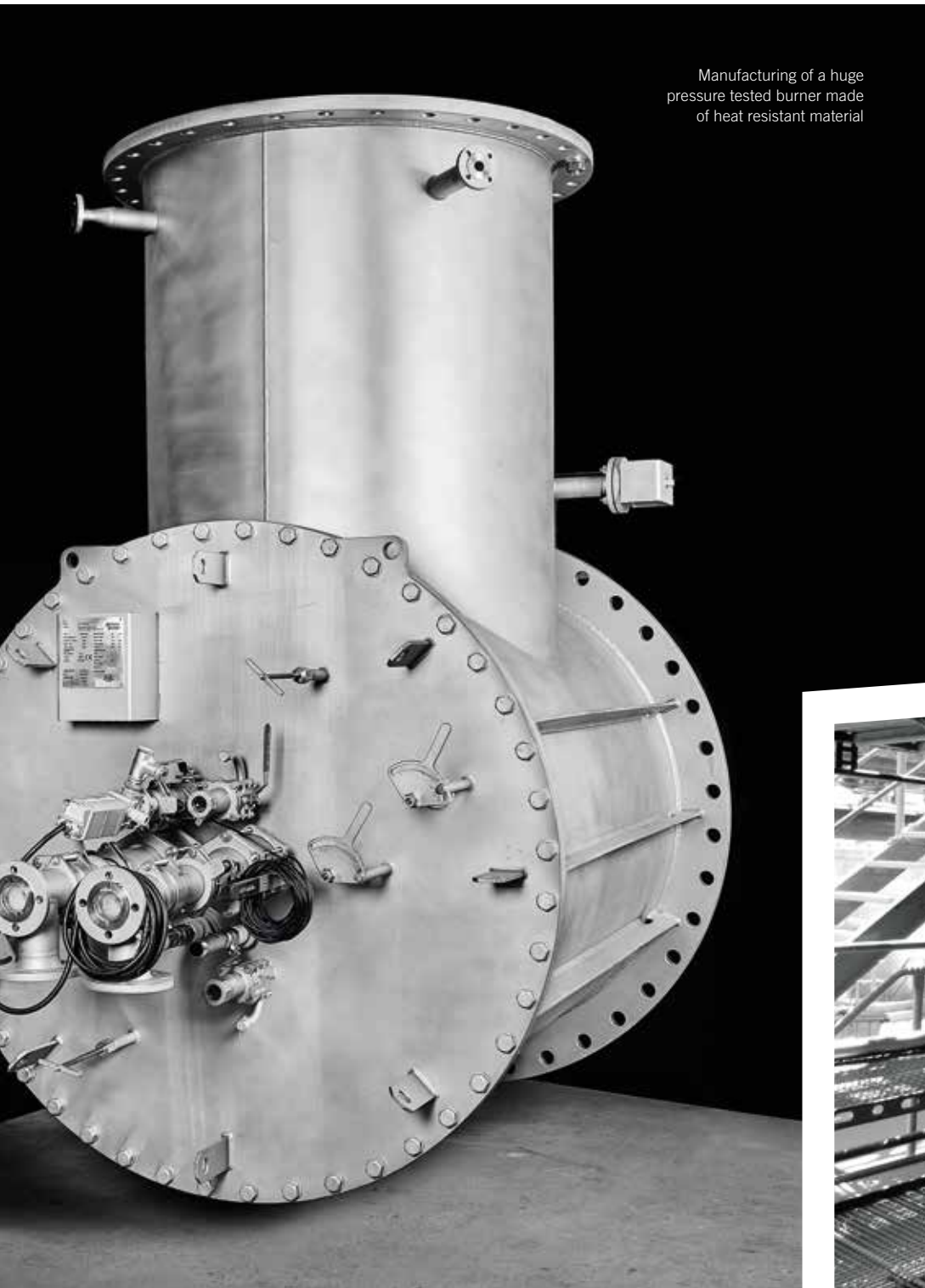
COMMON DRY SULPHUR COMBUSTION

With over 30 years of experience, the team of CS Combustion Solutions knows what it needs to guarantee a reliable and proofed design and supply of sulphuric oxidizers and firing systems for high SO₂ concentrated process gas up to 19 %. Our sulphur specialists provide quality expertise for applications like viscose production, detergent production, pulp and paper production as well as food industry.

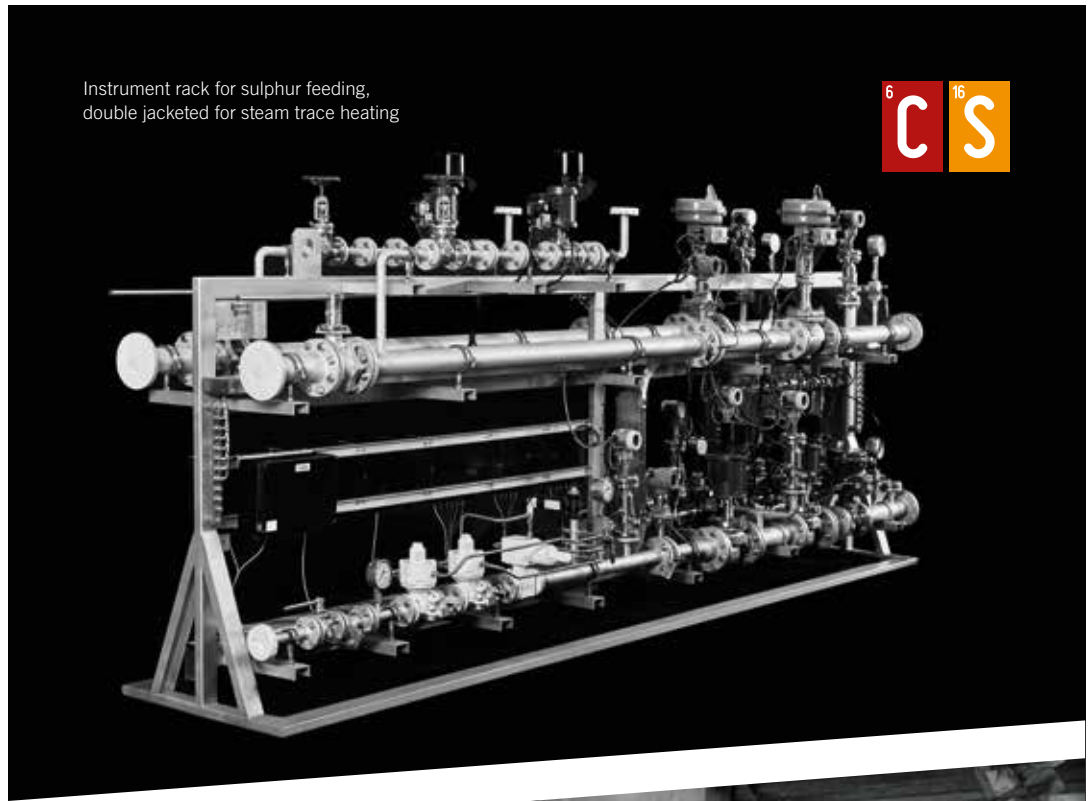
CHARACTERISTICS:

- SO₂-concentration in the process gas up to 19 % Vol. due to “high turbulence combustion”
- Stable and reliable ultrasonic spraying system
- Service free operation for 2 years and more
- Optimal solutions for high pressure plants with special designed nozzles
- High turn down range for sulphur feed

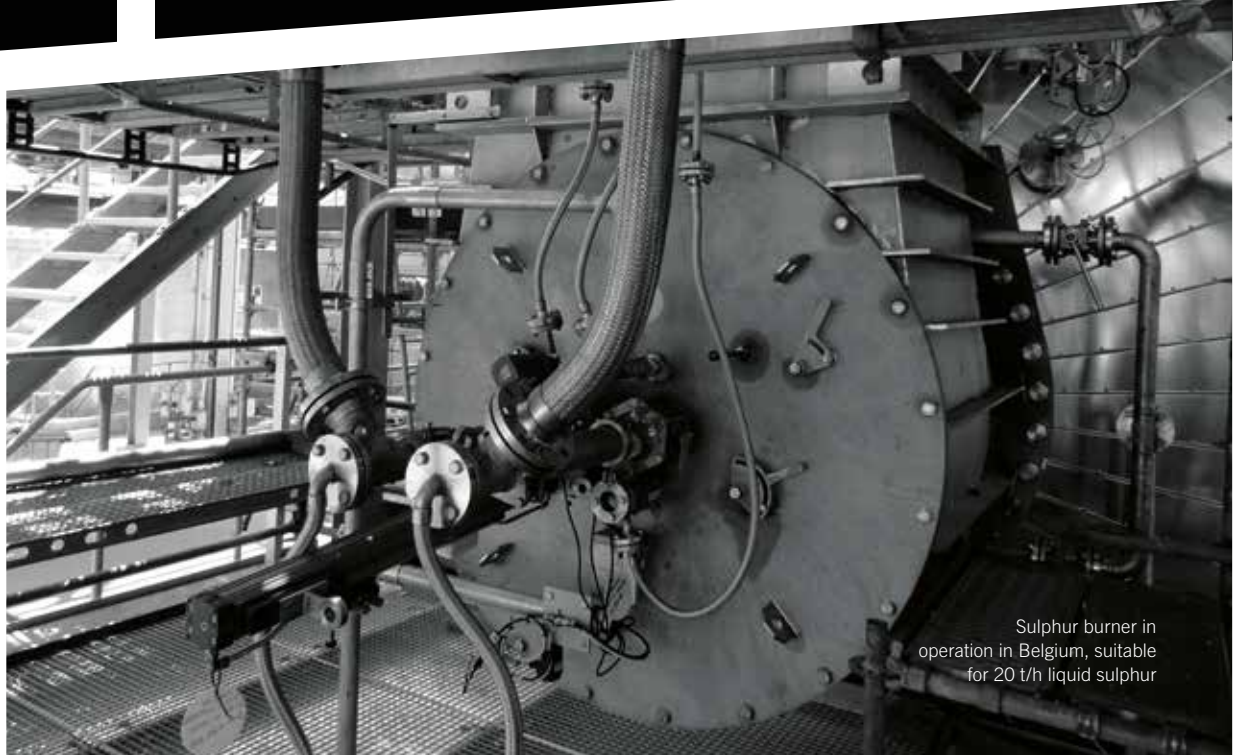




Manufacturing of a huge pressure tested burner made of heat resistant material



Instrument rack for sulphur feeding, double jacketed for steam trace heating

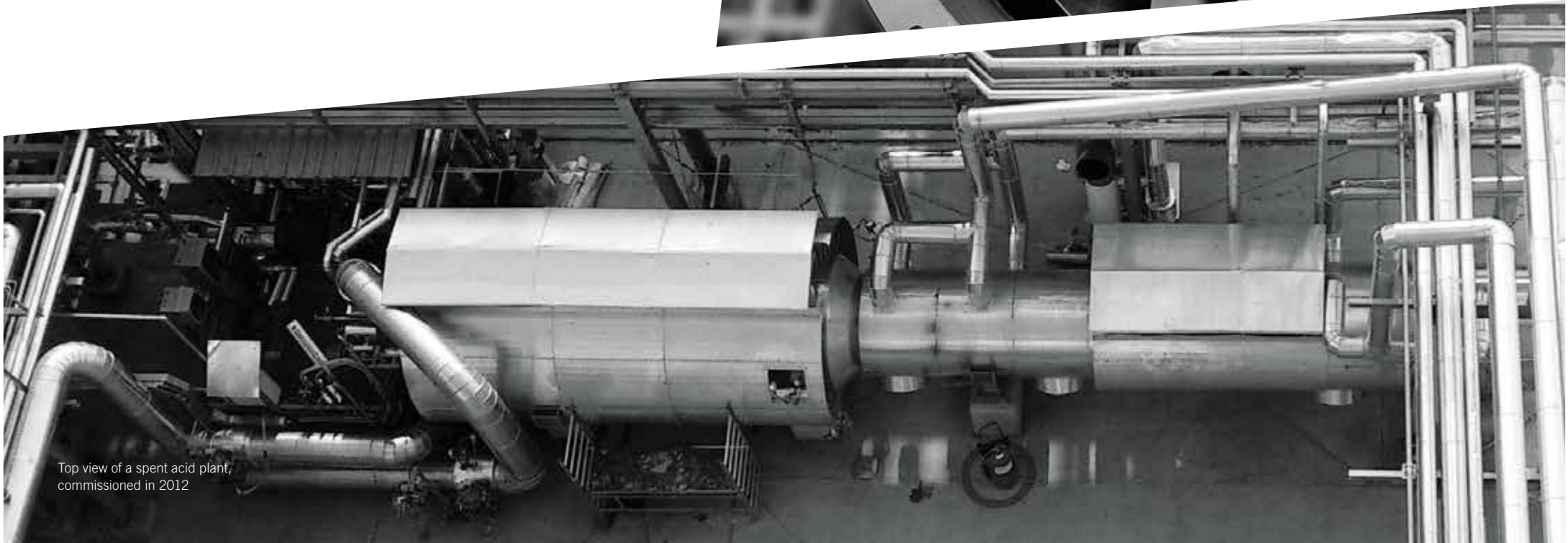


Sulphur burner in operation in Belgium, suitable for 20 t/h liquid sulphur

SPENT ACID OXIDATION



Burner for acid gas,
liquid sulphur, diesel oil,
natural gas



Top view of a spent acid plant,
commissioned in 2012

The horizontal construction and unique design of CS combustor components create new possibilities for the refitting, optimising and debottlenecking of existing facilities used for separating sulphuric acid.

With the CS concept the combustor is installed in a horizontal position. The support burner and the nozzles for injecting the sulphuric acid are located at the front side of the combustor. Injection of sulphuric acid to the combustor is accomplished with a small number of ultrasonic spraying lances located concentrically around the burner. Fulfilling the process parameters – time, temperature and turbulence – are guaranteed with a burner and nozzle system, which is well balanced with the combustor.

The CS burners and the ultrasonic atomizing nozzles for spent acid assure vaporisation and excellent mixing, thereby reducing residence time for the flue gas inside the combustor.

CHARACTERISTICS:

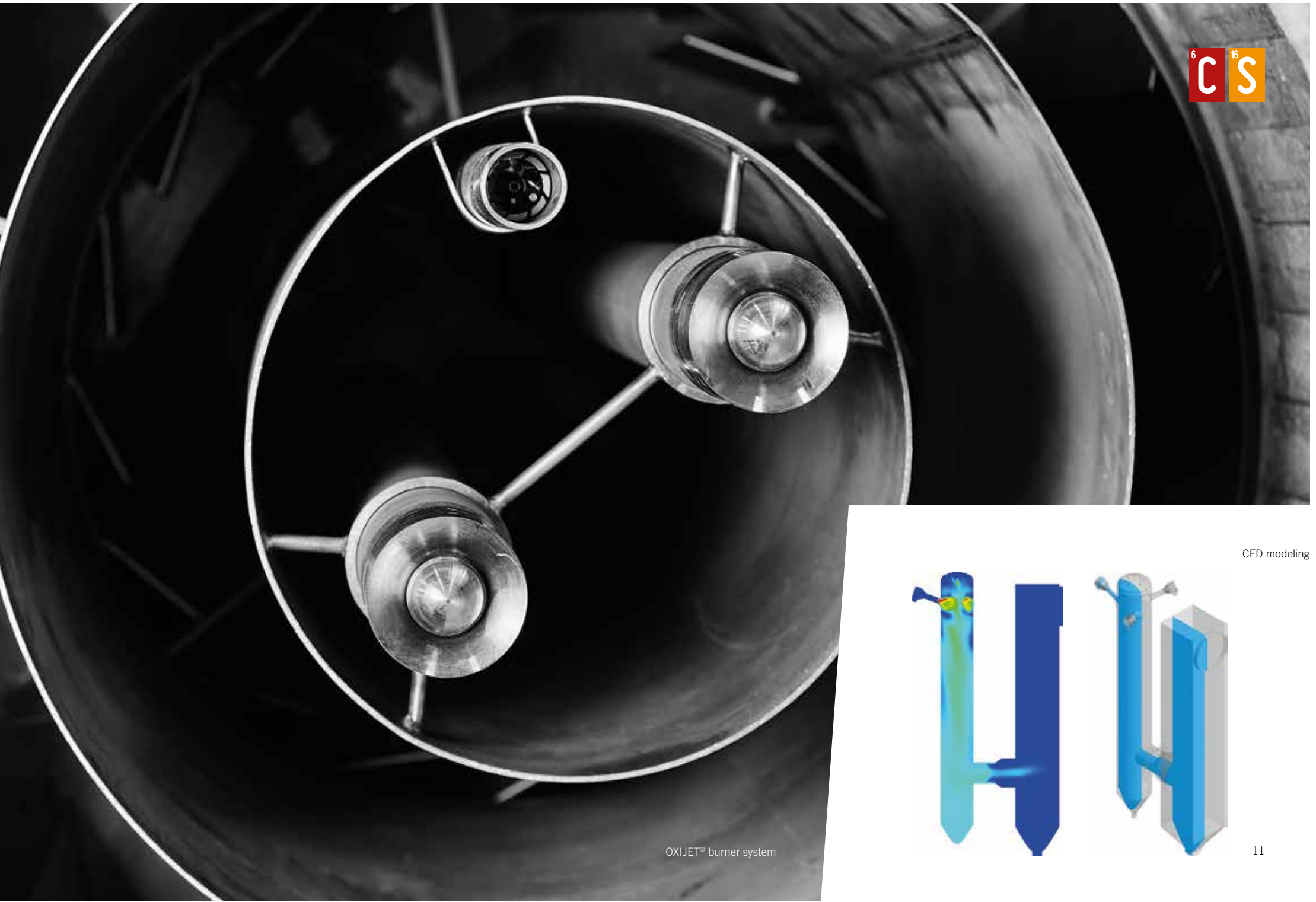
- Considerably less pressure for acid nozzles required
- Lower investment costs, due to the use of smaller, horizontal combustor
- Compact design of the combustor
- Simplification of servicing and facility modifications

BOOST YOUR SULPHUR COMBUSTOR WITH OXISPRAY[®] AND OXIJET[®]

Increased levels of flue gas greatly reduce the retention and burnout times or respectively, increase the pressure loss of the flue gas in common processes for production of SO_2 and H_2SO_4 . Operators also battle against poor part load performance in connection with poorly mixed gases and CO strands resulting from burning residues of increasingly disparate quality. Conventional air burners do not have the extreme flexibility necessary to satisfactorily cope with these problems, if they can take care of them at all. CS has developed solutions that deal with these difficult conditions.

CHARACTERISTICS:

- Up to 100 % SO_2 -concentration in the flue gas
- Efficiency enhancement through pure oxygen atomization of liquid feeds
- Process intensification through pure oxygen
- Prevention of side-product N_2
- Smaller size of equipment for complete process



OXIJET® burner system

CFD modeling

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your experts for burners and combustors