

YOUR EXPERTS

FOR BURNERS

AND COMBUSTORS



**COMBUSTION
SOLUTIONS**



CS COMBUSTION SOLUTIONS

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AND COMBUSTORS**

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CS Combustion Solutions is a team of senior specialists dedicated to reliability and innovating the field of combustion technology.

With more than 10 years independent presence on the market and 30 years experienced engineers, CS is known as competent and flexible partner for complex combustion systems.

CS has references in designing, developing and manufacturing solutions for following systems

- Liquid sulphur and sulphur containing media incineration (wet and dry process)
- Spent acid regeneration (SAR)
- Thermal sulphur recovery units (SRU)
- Burners for rotary kilns
- Thermal treatment of waste
- Hazardous waste incineration
- Pasty waste/fluids
- Low-carbon combustion
- Low NOx applications
- Oxygen applications

CS COMBUSTION SOLUTIONS

TIMELINE

2009

- Foundation of CS Austria by a team of experienced experts in the field of combustion technology
- First order of a combustor for a spent acid regeneration plant

2011

- Expansion of the business area to include liquid and gaseous combustion plants and wastewater incineration plants

2013

- Increased presence through sales partners in China
- Equipment of the first sulphuric acid production plants with CS burners in China

2015

- Patent granted for VARIEX backfire-proof lance
- Launch of the CERAMICS Acidgas nozzle
- Signing of the contract for a liquid and gaseous waste incineration plant of almost 80 MW

2010

- Development and expansion of competence in the field of incineration plants and components for sulphuric acid production and fission acid plants

2012

- Development of oxygen applications for plant capacity
- Trademark rights for OXIJET and OXISPRAY for combustion solutions using pure oxygen
- First equipment of a refinery in Russia with a combustion chamber waste heat boiler system for a WSA plant

2014

- Expansion of CS presence in South America and India
- Conversion of a nickel smelting furnace in Brazil to a sulphuric acid plant

2016

- Opening CS Environmental Equipment Shanghai Ltd.

2017

- **JULIP patent granted for ultrasonic atomizer nozzle**
- Equipping the first 1200 MPTD fission acid plants with a CS combustion system

2019

- **First order for the equipment of a Claus plant**
- **10 years CS – new office and new CI with registered figurative mark CS**

2021

- **Research project including test plant for NH₃ combustion – AMONOX system**

2023

- **Expansion of CS presence in the Middle East**
- **Further developed OXYJET burner started operation**

2018

- **Decision on development of SRU burner systems**

2020

- **Biggest contract in CS history despite Covid-19 pandemic**

2022

- **Trademark rights for AMONOX and AMINOX**

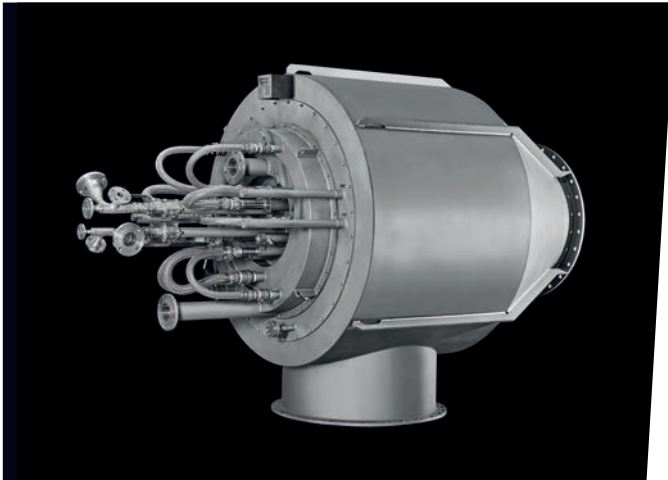
BURNER

FOR EVERY

APPLICATION AN

INDIVIDUAL SOLUTION





CS COMBUSTION SOLUTIONS engineers and supplies burners for special applications with performance range between 1 and 90 MW.

The burner systems are customized and designed according to customer needs and requirements. The SWB/SWP burner operates on a variety of standard and special fuels which can be directly injected simultaneously into the burner.

Fuels

- Standard fuels as NG, diesel fuel, HFO, ...
- Spent acid, acid & black liquor
- Coke gas, lean gas, synthesis gas, H₂S-gas, tail gas
- Sulphur, brominates & nitrogenous waste
- Waste water, solvent, chlorinated & halogenated fluids
- Solid and liquid TAR
- Pure H₂ combustion
- NH₃ incineration with low NO_x

Features

- Various materials for the burner (carbon steel, stainless steel, alloy,...)
- According to EN, ASME & GOST standards
- High temperature- & high pressure applications
- Various nozzle systems for the best available atomization
- High corrosion resistant atomizing systems
- Low atomizer consumption
- High turbulence burners

COMBUSTORS FOR THERMAL OXIDATION

CS COMBUSTION SOLUTIONS is your expert for the thermal oxidation of liquids, gases and powdered solids accrued as byproducts in the refinery, petrochemical, chemical & pharmaceutical industries.

The team of CS has plenty of experience in designing and supplying of thermal oxidizers and combustion chambers.

CS provides you with the full range of engineering and supply services consisting of

- Task definition
- Layout and design of combustors including burner system
- Static calculations
- CFD simulations
- Detailed engineering, selection of lining materials
- Manufacturing according to various standards & regulations
- Transport, supervision of erection and commissioning

CS supplies combustors and incinerators for thermal oxidation for the following (waste) fuels

- Liquid sulphur, spent acid & acid gas (up to 20% SO₂-content in the flue gas)
- Chlorinated waste gas & vent air
- Waste water
- Solid TAR
- Hazardous & waste liquids with high content of chlorine, salts and halogens
- Low NOx – Applications
- Low-carbon combustion



6 C 16 S



INJECTION SYSTEMS

CS COMBUSTION SOLUTIONS engineers are able to provide the optimal atomizing system for the specified application. In order to find the optimum set-up between atomizing result and atomizing media consumption, CS relies on several atomizing technologies such as

- Ultrasonic atomizing systems
- Premixing Nozzles
- Mechanical pressure atomizer

CS offers lance/nozzle systems for industrial burners and for direct injection of fluids into incinerators, boilers and all kind of combustion systems.

Additionally, CS offers nozzles for the following applications

- Ammonia injection systems for SNCR-plants
- Fluegas cooling & quenching systems
- Lime milk injection for semi-dry desulfurization
- Process applications for food- & chemical industries

CS Combustions Solutions keeps the patent for a highly efficient ultrasonic atomizing system named JULIP. Very low consumption of atomizing media, compared to conventional systems, is one of the key features.

Plenty of different materials for different purposes can be offered.

- High heat resistant stainless steel
- Different grades of nickel-based alloy
- Zirconium for high corrosive applications
- Different types of ceramic materials

Ultrasonic atomizing nozzle type CS

For highly viscous and polluted media as well as standard fuels. Dual fluid nozzle – mixture of fluid and atomizer outside the nozzle hence low abrasion on the nozzle body itself caused from particles contained in the fluid.

Mass flow of liquid media up to 10.000 kg/h at low pressure.

As atomizer, compressed air, steam, pure oxygen or all other non-combustible gaseous streams can be used. In special cases gaseous streams with high calorific value can be used as atomizer for boosting the process.

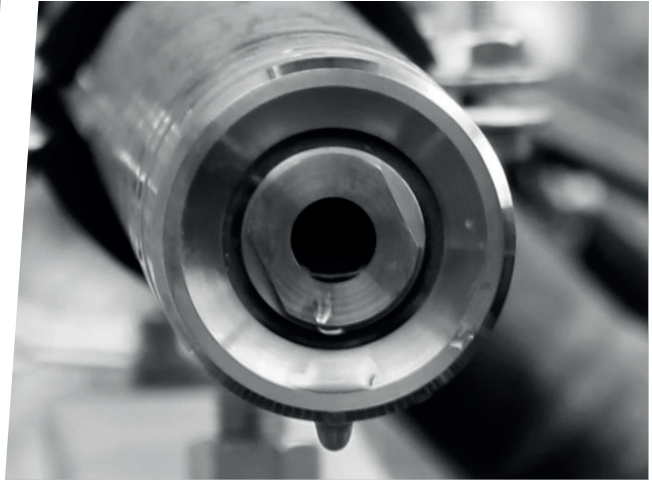
A control range of 1:10 can be achieved easily. For low heating value media, the range can be extended to 100% -0%.

Premixing nozzle type SL

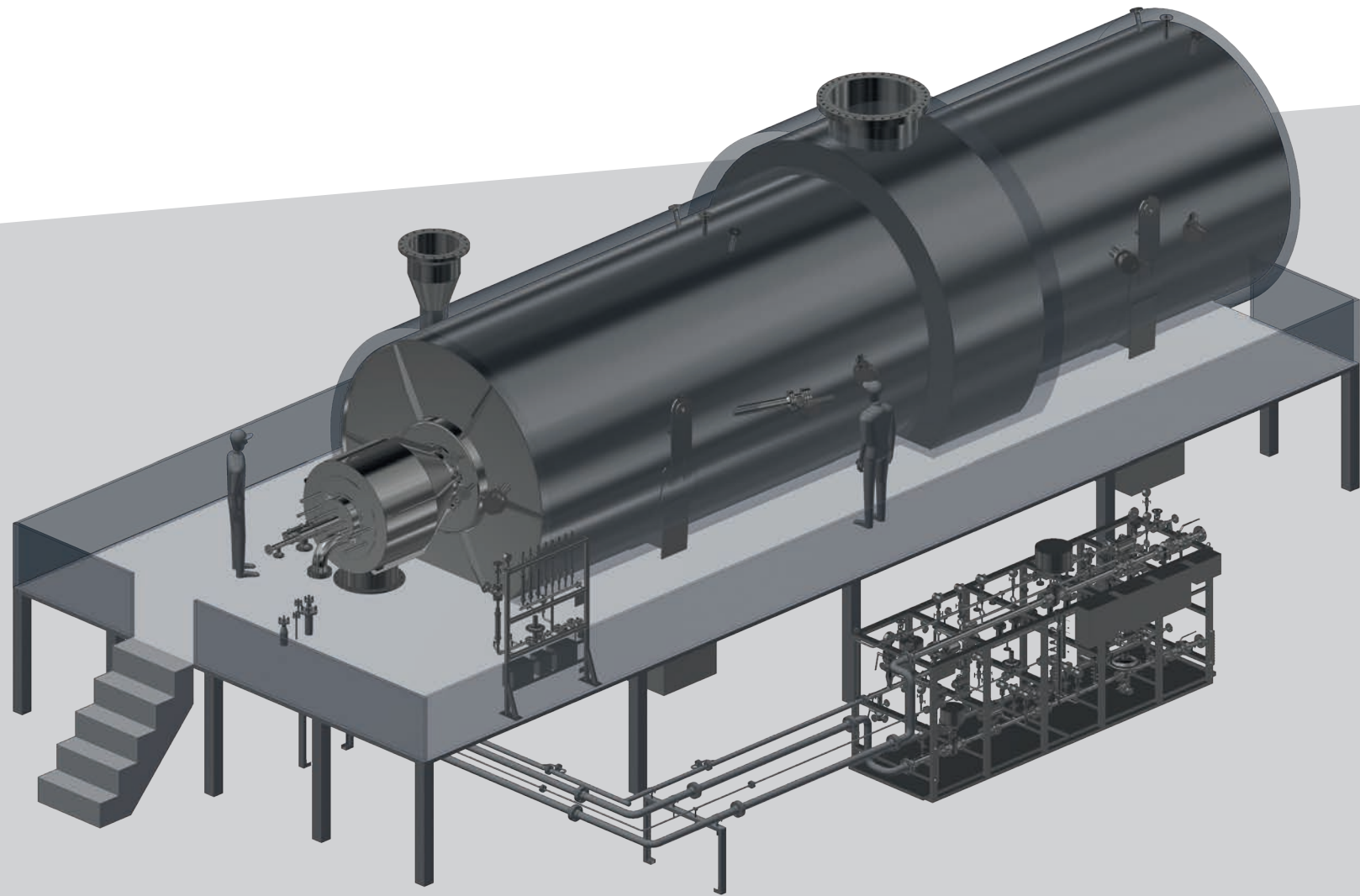
For clean and moderate polluted media. Dual fluid nozzle – mixture of fluid and atomizer in the mixing chamber. Very low consumption of atomizer (approx. 4-6%). Mass flow up to 10.000 kg/h. The spray angle of our new, further developed SR-P nozzle can be adjusted between 110° and 65° to meet varying requirements of different applications.

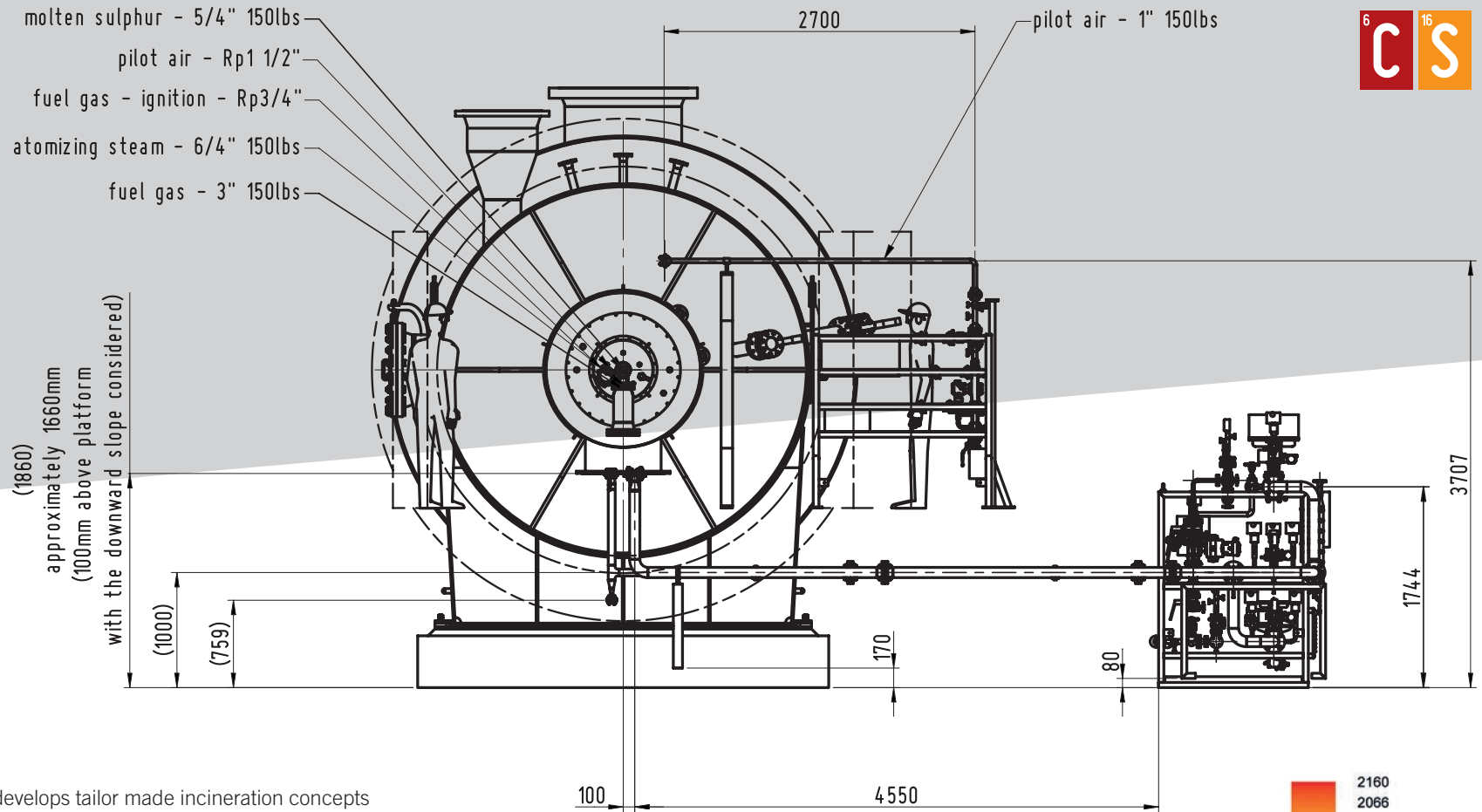
Mechanical pressure atomizing nozzle type ZL

For clean media. Single fluid nozzle – no atomizer necessary. The nozzle can be adjusted during operation. Max. control range 1:8. Mass flow up to 15.000 kg/h.



ENGINEERING & SERVICE

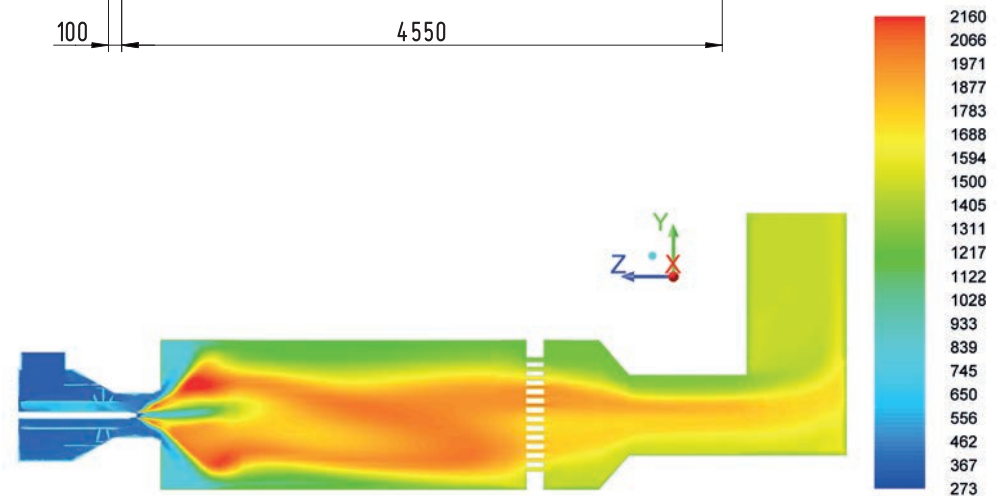




CS COMBUSTION SOLUTIONS develops tailor made incineration concepts for your unique requirements.

Following engineering & service features from CS can be expected

- Basic & detail engineering of burners, combustors and incinerators
- Evaluation & optimization of existing combustion processes
- Implementation of procedures for saving operating costs
- Capacity increase of existing combustion plants
- Increasing plant availability
- Consulting for plant operators of combustion facilities
- Engineering for reconstruction, revamp, retrofits and boosting of existing plants
- CFD-analysis
- Commissioning & service
- After Sales and spareparts



PATENTS AND

WORD IMAGE BRANDS

CS COMBUSTION SOLUTIONS registered patents and word image brands over the last 10 years based on research & development focused on customer needs.

O X I J E T

OXIJET – boosting of liquid media atomizing system by using pure oxygen as atomizing media.

O X I S P R A Y

OXISPRAY – boosting of gaseous media incineration by oxygen enrichment.

V A R I E X

VARIEX (EP 2 821 700 A1) – controllable lance for combustion and injection of vent gas and explosive streams with high variation of the flow rate without admixture of Nitrogen in low flow case. Due to the control possibility the exit velocity can be maintained in a wide range of flow rate (backfire protection).

C E R A M I C S

CERAMICS – Injection systems for high corrosive applications made from different types of ceramic materials.

J U L I P

JULIP (EP 3 168 533 A1) – ultrasonic atomizing system with low atomizing media consumption for efficient atomization.

A M O N O X

AMONOX is an innovative, low NO_x process developed by CS Combustion Solutions for the direct combustion of ammonia in industrial incinerators, with the aim of replacing fossil fuels and decarbonizing existing processes.

A M I N O X

AMINOX is the advanced AMONOX process to recycle all amines (derivatives of NH₃ with linked alkyl groups), which are usually generated as waste, as substitute fuel. The aim of this process is to thermally recycle the nitrogenous amines, whose structure and properties are very diverse, with a low NO_x content.

V A R I S P R A Y

VARISPRAY is a further development of the established ultrasonic nozzles, in which the set atomization angle can be changed during operation. This allows system operators to readjust the flame shape as conditions change, even fully automatically from the control room.

**„THERE IS NOTHING MORE
POWERFUL THAN AN IDEA
WHOSE TIME HAS COME.“**

Victor Hugo

BRANCH OFFICES





Headquarter

CS Combustion Solutions GmbH

Lemböckgasse 49/Object 2/D/1st floor
1230 Vienna · Austria
T +43 1 907 44 16
sales@comb-sol.com · www.comb-sol.com

Wholly owned entities

CS Environmental Equipment (Shanghai) Co., Ltd.

Rm. 603, Block A, Hongqiao Vantone Center, No. 333 Suhong Rd.,
Minhang District, 201106 Shanghai · China
Admin., Sales: +86 21 6220 6795 · PM, I&C etc.: +86 21 6220 5925
sales@comb-sol.com · www.comb-sol.com

Partners

MAVIM Gesellschaft f. d. Export technischer Anlagen GmbH

Alserbachstraße 18/7 · 1090 Vienna · Austria

MB Consultores Ltda

Travessa Alexandre Ferreira, 15 – sala 313 · Centro – Rio Bonito
28800-000 Rio de Janeiro · Brazil

Adoset

P.O. Box 32950 · Abu Dhabi · UAE

Hakan Özağaç - Renelko

Özge Sokak No:1 ZinD Is Merkezi K:3 D:18 Çekmeköy · 34782 Istanbul · Turkey

REFERENCES & COMMENTS



I appreciate the great knowledge and professionalism at CS. I'm always amazed, when I go to customer's visit, to see our discussion partners brighten when they realize that, not only we clearly understand their challenges and the technical problems they encounter, but we can clearly pin-point what is going wrong, how to remedy to the problem, and we have the technical and material solutions for this.

Bernard de Hecpée
Area Manager



I am extremely proud of what we have achieved in the recent years. This has been made possible by our long-standing customers, who have recognised that competence and partnership still have value. Thanks to the CS team – you make the impossible possible!

Thomas Bartonek
General Manager

What I like about my work as Senior Project Manager, is the interesting and varied work with our customers, suppliers and, of course, my own colleagues.

Gerhard Pravlovsky
Senior Project Manager



What is coming to my mind regarding CS? Quite stable and solid partner in quite unstable fast changing world.

Jaroslav Pacal
Commissioning Engineer

I appreciate the team spirit in stressful situations every day and our individual solution-oriented way of working.

Elizabeth Landbauer
Finance & Accounting



CS is like a circus – loud, colourful and varied. You are the juggler, trying to keep the balls. When you think, they're all may fall, there's always a colleague, customer or supplier who helps you.

Walter Schweinberger
Head of Engineering



MB and Combustion Solutions share the same enthusiasm in creating solutions to our customers with technology, innovation and sustainability.

Sofia Beer

Controlling Manager,
H2SO4 I MB Consultores e
Catalisadores, Brazil



My experience with CS: Extremely high technical competence, flexibility, unconventional solutions, stimulating constructive discussions even on very difficult topics, solution-oriented, specialised know-how in their field.

Martin Kürten

Head of H2SO4 and Recycling,
Grillo-Werke AG, Germany



CS has accompanied Suez in it's projects in China since the beginning and this has helped us deliver the highest standards in terms of hazardous waste incineration to the Chinese market, where growth opportunities for both our companies are quite important.

Benjamin Chan-Piu

Senior Vice President – Liquid &
Hazardous Waste, Veolia, China



Dynasafe decided to build flue gas cleaning systems for special applications 10 years ago. The afterburner chamber in our first chemical weapons destruction plant for the American market came from CS in 2009. This has developed into a partnership that continues to this day.

Holger Weigel

Managing Director, Dynasafe,
Germany

MAIN CONTACT PERSONS

Walter Schweinberger
Head of Engineering

Phone +43 1 907 44 16 566
Mobile +43 676 845 184 566
E-Mail schweinberger@comb-sol.com



Florian Kistl
Head of Sales

Phone +43 1 907 44 16 568
Mobile +43 676 845 184 568
E-Mail kistl@comb-sol.com



Dirk Schubert
Head of Project Management

Phone +43 1 907 44 16 556
Mobile +43 676 845 184 556
E-Mail schubert@comb-sol.com



Elizabeth Landbauer
Finance and Administration

Phone +43 1 907 44 16 555
E-Mail landbauer@comb-sol.com



Matthias Förster
Head of After Sales
QM Representative

Phone +43 1 907 44 16 581
Mobile +43 676 845 184 581
E-Mail foerster@comb-sol.com



Thomas Bartonek
General Manager

Phone +43 1 907 44 16 558
Mobile +43 676 845 184 558
E-Mail bartonek@comb-sol.com

**„COMING TOGETHER IS THE
BEGINNING. KEEPING TOGETHER
IS PROGRESS. WORKING
TOGETHER IS SUCCESS.“**

Henry Ford

CS COMBUSTION SOLUTIONS

DIRECTIONS

How to find us

Our office is located at Lemböckgasse 49/Object 2/D/1st floor, 1230 Vienna.

Parking

Directly in front of the entrance of object 2 (**a**) there is a marked parking lot with the number 10 available. You can also use the paid parking lot in front of object 1 (**b**). After your visit you will receive a ticket to the free exit. The gateway to the parking garage is at Talpagasse (**c**).

Arrival by public transport

To get to Lemböckgasse by public transport, take the underground line U6 to Siebenhirten. You can reach us in a few minutes via the exit Wienerflur (••••).



Legal notice

CS Combustion Solutions GmbH
Lemböckgasse 49/Object 2/D/1st floor
1230 Vienna · Austria
+43 1 907 44 16
sales@comb-sol.com
www.comb-sol.com

Editorial team

CS Combustion Solutions

Design

designlounge e.U.
Gartengasse 10/1
8665 Langenwang · Austria
www.designlounge.media

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