jeremias®
CHIMNEY SYSTEMS

EXHAUST SILENCERS

Sound engineering solutions for exhaust systems

YOUR PARTNER JEREMIAS

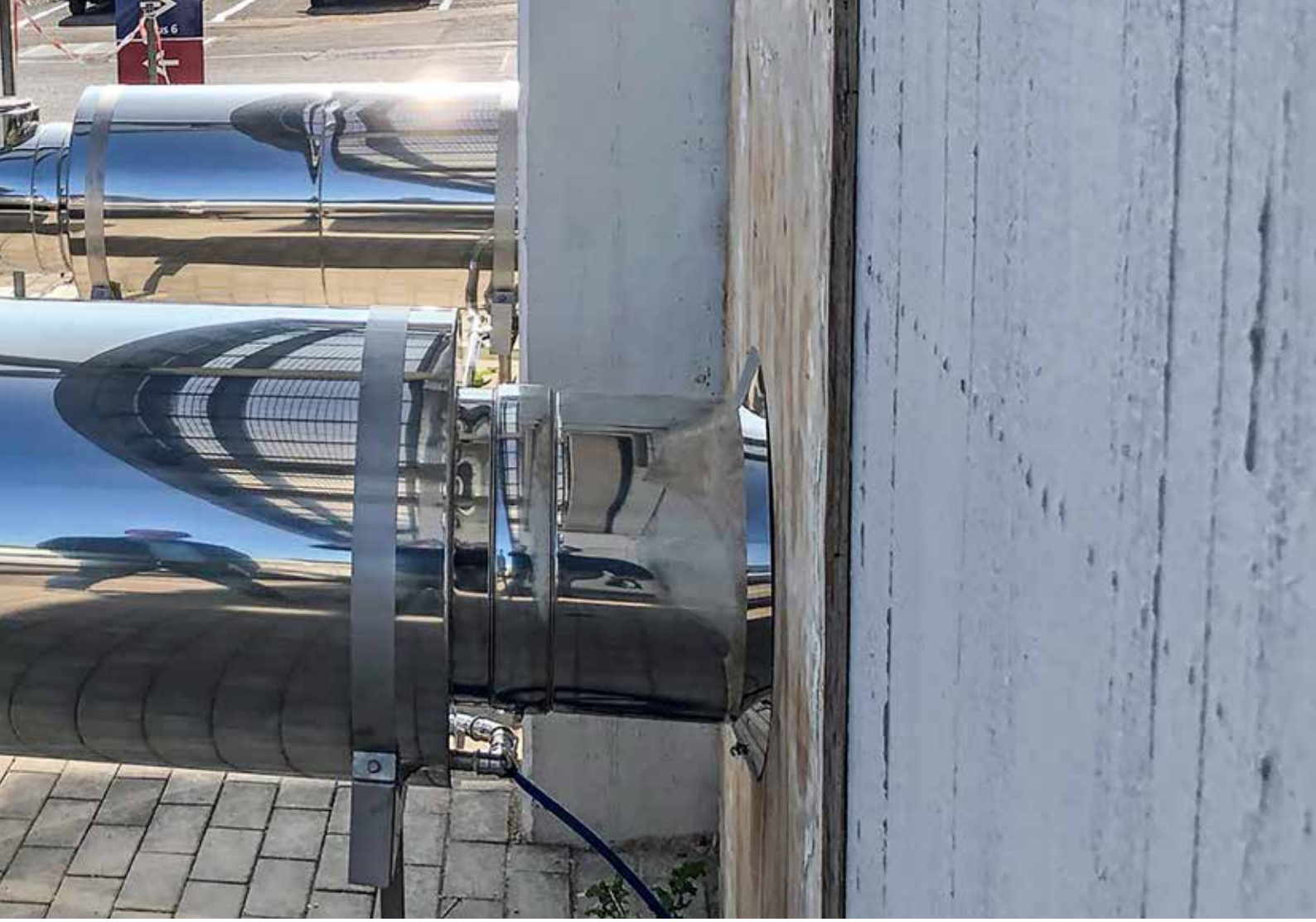
The Jeremias Group, headquartered in Wassertrüdingen (Bavaria), is one of the world's leading manufacturers of exhaust and chimney systems for all areas of heat and energy generation in industry and residential construction.

Strong, open and international – this is how we have presented ourselves for more than 50 years. Worldwide production sites and sales offices stand for

entrepreneurial success, ambitious visions and healthy growth. With innovative products, outstanding service and highly qualified employees, we want to inspire our customers every day and achieve the goal of sustainable shared success.

Our range currently includes more than 100 different CE-certified systems for private and commercial applications as well as free-standing steel chimneys with a diameter of up to four meters.

This brochure will guide you step by step to the right silencer. It also provides information about the differences between silencer types and shows their properties.



SERVICE

- Highly flexible manufacturing
- Special on customer request
- Planning support and construction advice
- Cross-section calculation
- Verifiable chimney statics
- Country-specific approvals
- Expert customer service
- Free software solutions

QUALITY

- Over 100 CE certified systems
- CNC laser and stamping technology
- Special stainless steel alloys
- Condensate/gas tight, polished welds
- 25 year warranty
- ISO 9001 certified

INNOVATION

- Largest product variety on the market
- Joint system development lungs with boiler, CHP and stove manufacturers
- Own development of Manufacturing machines
- Own test bench for stainless steel chimney systems and exhaust silencers
- Computer-based simulations

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WE ARE HERE FOR YOU

HOTLINE

Tel.: +49 9832 6868-50

Fax: +49 9832 6868-68

E-Mail: info@jeremias.de

SOUND PROTECTION FOR EXHAUST SYSTEMS

The operation of modern combined heat and power units, biomass systems and oil and gas boilers often results in undesirable noise pollution. In addition to the noise in the boiler room, the combustion noise entrained in the exhaust gas represents a source of emissions that should not be underestimated.

The medium and high-frequency noises of modern heating systems, as well as the mainly low-frequency hum of combined heat and power plants, are carried on through the exhaust pipe and the chimney. At higher sound levels these can be perceived as disturbing both in living spaces and in the neighborhood.

For years, Jeremias has been actively developing acoustic solutions for exhaust systems that effectively reduce such noise pollution. Our own silencer test bench underlines our outstanding quality standards. Take advantage of our over 10 years of know-how and our extensive services relating to sound insulation!

ADVANTAGE OF JEREMIAS

- Extensive range of standard silencers for every area of application
- Silencer production according to customer requirements and realization of special designs
- Carrying out sound measurements on site
- Factory acceptance of silencers on an internal acoustic test bench
- Complete exhaust systems from a single source
- Individual advice

SOUND MEASUREMENT OF EXHAUST SYSTEMS

Stainless steel flue gas pipes are very good sound conductors due to the material. Sound generated by the heating system is transmitted to the outlet via the exhaust pipe and the chimney and is radiated there into the environment. The sound level at the chimney mouth must comply with the emission limit values specified in the report.

Our specially trained staff would be happy to carry out sound measurements for you at the chimney mouth in accordance with DIN EN 45 635 Part 47.

SCOPE OF SOUND MEASUREMENT

- On-site assessment of the system
- Measurement of the emission sound level at the chimney mouth
- Use of a sound level meter of the highest accuracy class 1
- Testing of quiet/basic noise levels
- Check for low-frequency noises
- Measurement report with total level and sound spectrum

The data obtained can be used for optimal silencer design.

SOUND MEASUREMENT IN PRACTICE

We use a sound analyzer to measure the sound emissions of the system at a distance of 1 meter from the chimney mouth. From the results of this emission measurement, the sound immission values can then be calculated by experts or engineering offices, for example in neighboring residential areas.

Are you interested in measuring the sound of your chimney? Our experts will be pleased to advise you!

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+49 9832 68 68 998

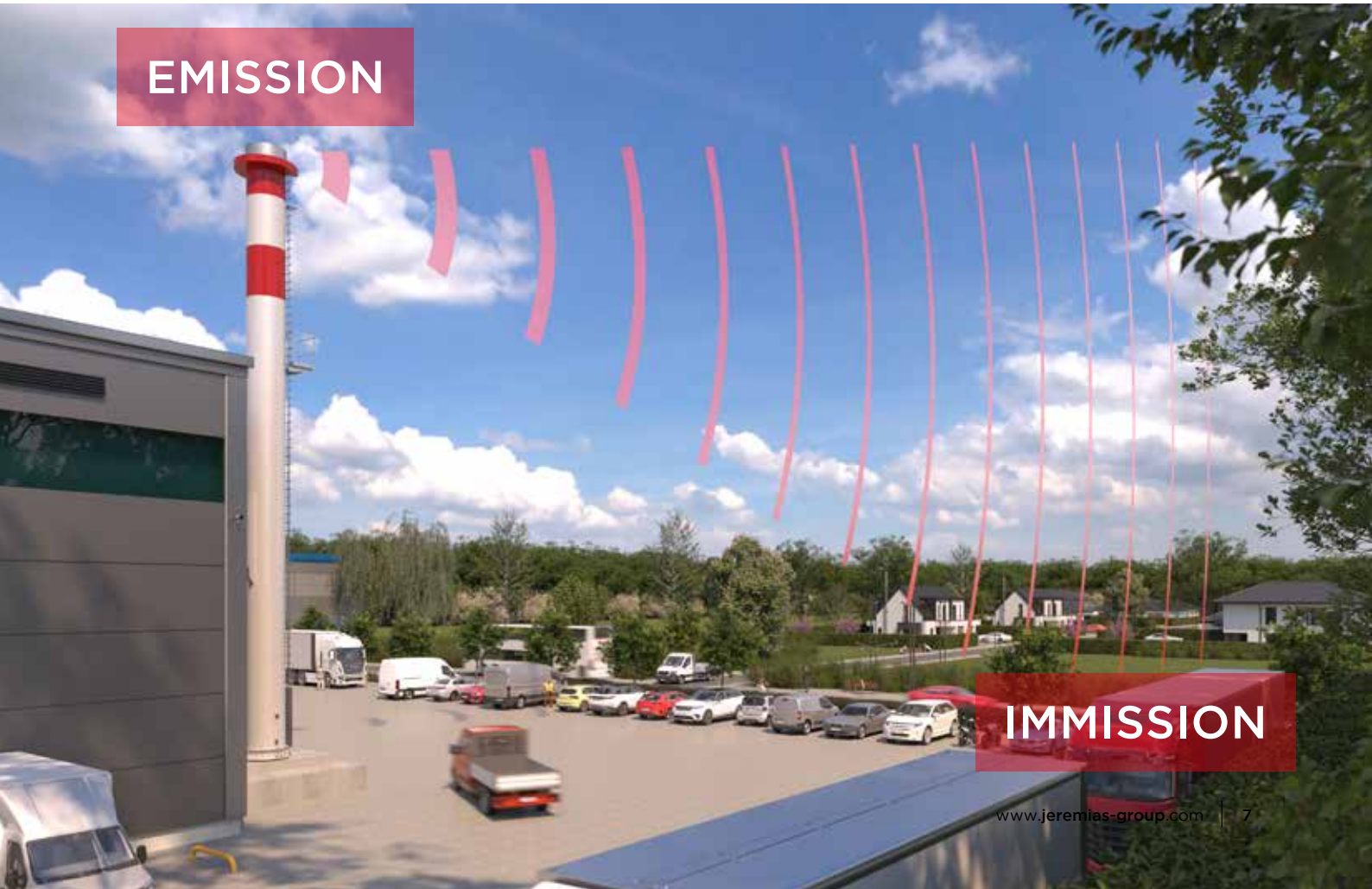
NOISE REGULATIONS

The exhaust noise caused by heating and energy systems can become a noise pollution in your own home, at your immediate neighbors or at a greater distance. The rating level formed from the immission values must not exceed the following immission guideline/limit values.

GERMANY	IMMISSION LIMIT dB(A)	
TA-Lärm (August 1998)	day	night
Industrial areas	70	70
Commercial areas	65	50
Core areas/village and mixed areas	60	45
General residential areas and small settlements	55	40
Purely residential areas	50	35
Spa areas	45	35

DIN 45680

As an addition to the TA-Lärm in Germany, DIN 45680 evaluates low-frequency noises in the third-octave range with the nominal center frequencies of 8 to 100 Hertz (HZ). If the perception threshold for a frequency in this range is exceeded in rooms in need of protection within a building, noise reduction measures must be taken at the sound source, even if the requirements of the TA noise are met.

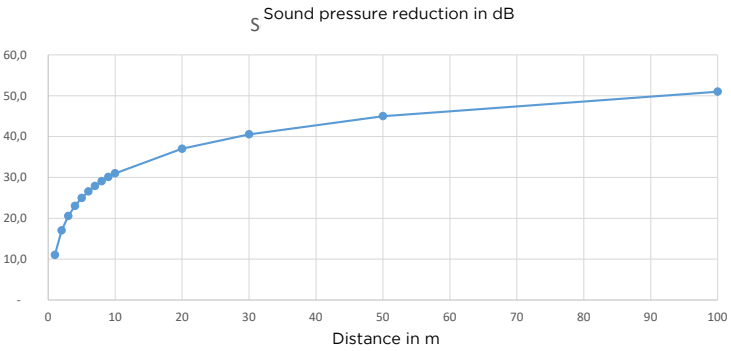


AUSTRIA	IMMISSION LIMIT dB(A)		
ÖNORM S 5021 (April 2010)	day	evening	night
Area with particularly high noise emissions (e.g. industrial areas)	-	-	-
Area for businesses with commercial and industrial goods production and service facilities	65	60	55
Core area (offices, shops, trade, administration, apartments), companies without noise emissions	60	55	50
Urban residential area, area for agricultural and forestry buildings with apartments	55	50	45
Suburban residential area, weekend home area, rural residential area	50	45	35
Rest area, spa area	45	40	35

SWITZERLAND	IMMISSION LIMIT dB(A)	
Noise protection ordinance (August 2010)	day	night
Industrial zones	70	60
Residential and commercial zones (mixed zones) and agricultural zones	65	55
Residential zones as well as zones for public buildings and facilities	60	50
Recreation areas	55	45

DISTANCE-RELATED SOUND DECREASE:

A doubling of the distance reduces noise emissions by 6 dB.



DISTANCE in m	SOUND PRESSURE REDUCTION in dB*
1	11,0
2	17,0
3	20,5
4	23,0
5	25,0
6	26,6
7	27,9
8	29,1
9	30,1
10	31,0
20	37,0
30	40,5
50	45,0
100	51,0
200	57,0
500	65,0
1000	71,0

* spherical sound radiation

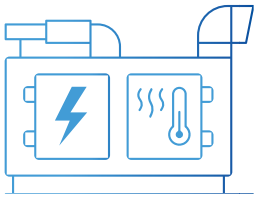
HEAT GENERATORS AND THEIR CHARACTERISTIC FREQUENCIES

Depending on the type of heat generator, the annoying exhaust noise usually follows characteristic frequency patterns. With the right type of exhaust silencer tailored to the respective frequency range, the interference frequencies can be minimized and the sound level can be reduced to the desired level.

FREQUENCY RANGE	SILENCER TYPE	SILENCER SERIES FOR		
		HEATING BOILER	CHP	BIOMASS
predominantly medium and high frequency	Absorption silencer	ASD	AED	AVD
predominantly low frequency	reflection/resonance silencer	RSD	RED	
broadband frequency range	Combined silencer	KSD	KED	

BOILER

The exhaust gases produced during the combustion process are released into the environment via the exhaust system. Here, flame noises from the boiler room as well as the “whirring” of the fan installed in condensing boilers can be transmitted. As a rule, these are medium and high-frequency noises that can be reduced using an absorption silencer. Especially with newer forced-air burners, the use of a combined silencer or a pure resonance silencer may be necessary for a broader range of damping.



COMBINATION HEATING POWER PLANTS / GENERATORS

In combined heat and power unit and generators, a motor primarily generates electrical power, with additional usable heat being generated in the CHP unit. The engine noise is often noticeable as a low-frequency hum; the individual frequency spectrum and the selection of the appropriate type of silencer depend to a large extent on the number of cylinders and the speed of the engine.

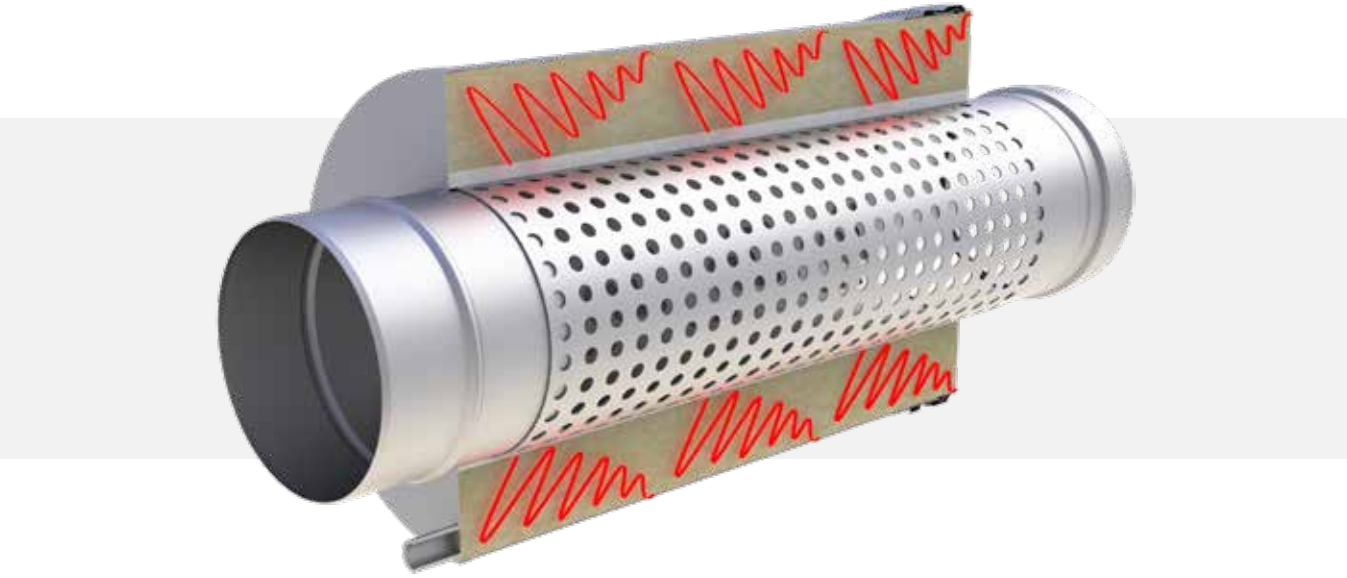
BIOMASS BOILER

The combustion of biomass such as wood, pellets or wood chips is almost silent. In this case, integrated fans are solely responsible for annoying, mostly medium to high-frequency noises. Due to the more aggressive composition of the exhaust gases, it is advisable to use an adapted absorption silencer with resistant glass silk fabric for biomass boilers.

Our specially trained team of experts is available to answer any questions you may have at any time and will support you in the decision-making process.

ABSORPTION SILENCER

Silencers that work according to the absorption principle achieve sound reduction, especially in the medium and high frequency range, through the use of open-pored, sound-absorbing material, e.g mineral wool. Through an internal perforated plate, the sound waves from the exhaust gas flow reach the mineral wool behind it, where they are absorbed and the sound energy is converted into heat due to friction effects.



All Jeremias absorption silencers are filled with non-combustible mineral wool. In order to protect these from fiber discharge by the exhaust gas flow, a protective fleece is often incorporated between the perforated sheet metal and the mineral wool. Depending on the composition of the exhaust gases and the operating conditions, different materials are used to protect the mineral wool:

TYP	FOR	FABRIC TYPE	FUNCTION
ASD	Boiler	Stainless steel wool fleece	Protection against fiber discharge, permeable to condensation
AED	Engines and CHP	High temperature fabric /stainless steel wool fleece	Protection against fiber discharge, suitable for high temperatures
AVD	Biomass	Durable glass silk fabric	Protection against fiber discharge and pollution

Jeremias offers a large range of absorption silencers for connection to various single- and double-walled exhaust systems made of stainless steel and plastic. Depending on the pressure resistance requirements of the exhaust pipe, our silencers are available with and without a seal.

SPECIAL SHAPES:

MODULAR SILENCER

The ASD-BECO is the modular silencer in our range, because it can be expanded as desired to include the ASE-ECO absorption elements for higher damping requirements.

This silencer is intended for connection to the EW-ALBI and EW-FU exhaust systems. As standard, it is supplied with seals, which can be removed for negative pressure operation.

MUZZLE SILENCER/
SOUND INSULATING CORE

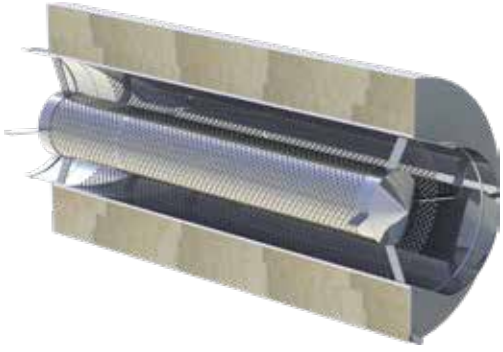
The base plate of the ASM muzzle silencer can be subsequently placed on a brick chimney and secured there at any time. Mounted at the top, the ASM attenuates high and medium frequencies before they escape to the outside. The position of the silencer allows installation without serious cuts in the existing exhaust system.

Sound insulation cores of the SDK type are also designed for subsequent installation in the chimney and contribute to the effective reduction of noise peaks. They are hooked into the mouth of the chimney from above. Installation is easy and can be done later at any time.

Due to the increase in flow resistance, a new cross-sectional calculation of the chimney is necessary if sound insulation cores are subsequently installed.

INTERNAL SILENCER
SOUND INSULATING CORE

The ASD-SDK is a 2 in 1 absorption silencer with an integrated sound insulation core, which enables higher damping performance with the same space requirement. Even if the sound insulation core inserted in the middle of the “main silencer” has a cylindrical design and is flow-optimized, the higher flow resistance on the exhaust side must be taken into account.



LENGTH ELEMENT - SILENCER

The ASS is a silencer specially designed for double-walled chimneys, which fits perfectly and almost inconspicuously into the overall appearance of an outdoor chimney. As standard, we offer two different length elements that can be used several times in a row depending on the noise reduction requirements.

The ASS can be connected to all double-walled systems using special transition elements.

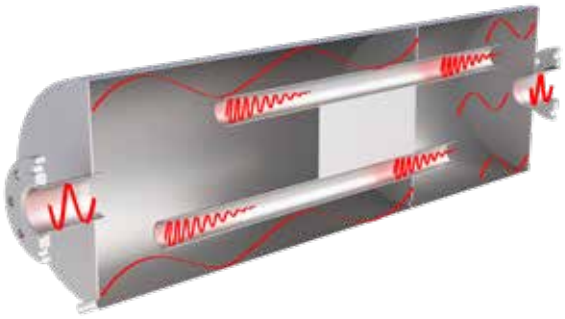
SPACE-SAVING SILENCERS

In the event that the premises do not allow the installation of a conventional absorption silencer, our space savers ASD-T and ASD-W represent alternative solutions With the ASD-T silencer, the absorption body is installed vertically to the exhaust pipe, so that the component length of the silencer is a lot shorter than normal, while the ASD-W with its 90° angle shape is also saves significant space savings.

REFLECTION SILENCER

Reflection silencers achieve broadband damping with high attenuation in the low-frequency range. The sound is reflected several times on integrated partition walls. Narrowed pipe cross-sections between the chambers ensure that unwanted sound is trapped in the individual hollow chambers and ultimately eliminated here through frequency superposition. The increased exhaust gas resistance also partly reduces noise, but leads to significantly increased noise pressure losses.

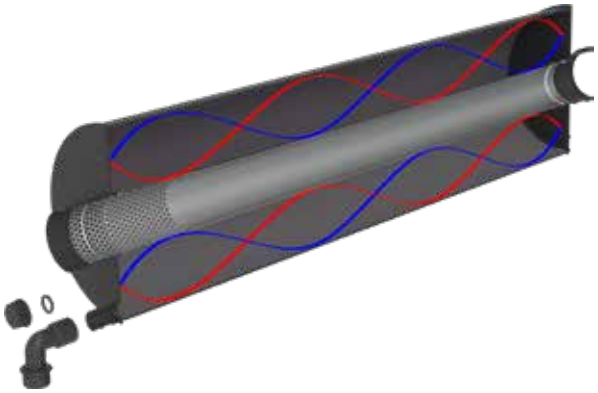
The reflection silencer is mainly used for sound sources with high, low-frequency noise components and sufficient available exhaust gas pressure.



RESONANCE SILENCER

Resonance silencers can be tuned particularly well for attenuation in the low frequency range. This type of silencer reduces noise pollution in a similar way to a reflection silencer by enclosing the sound in chambers.
The sound waves are directed into hollow chambers via a perforated sheet metal surface and switched off there by superposition in anti-phase. Depending on the requirements of the silencer, several chambers of different lengths can be used one behind the other. This enables very individual damping properties tailored to a wide range of frequency ranges.

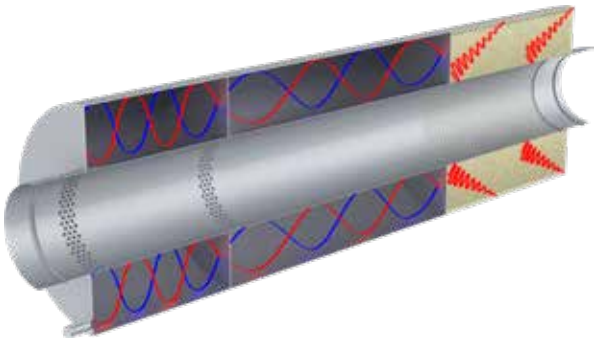
Since the chambers are arranged outside the exhaust pipe, the exhaust gas resistance is lower with this type of silencer and is therefore the method of choice for applications with low exhaust gas overpressure.



COMBINED SILENCER

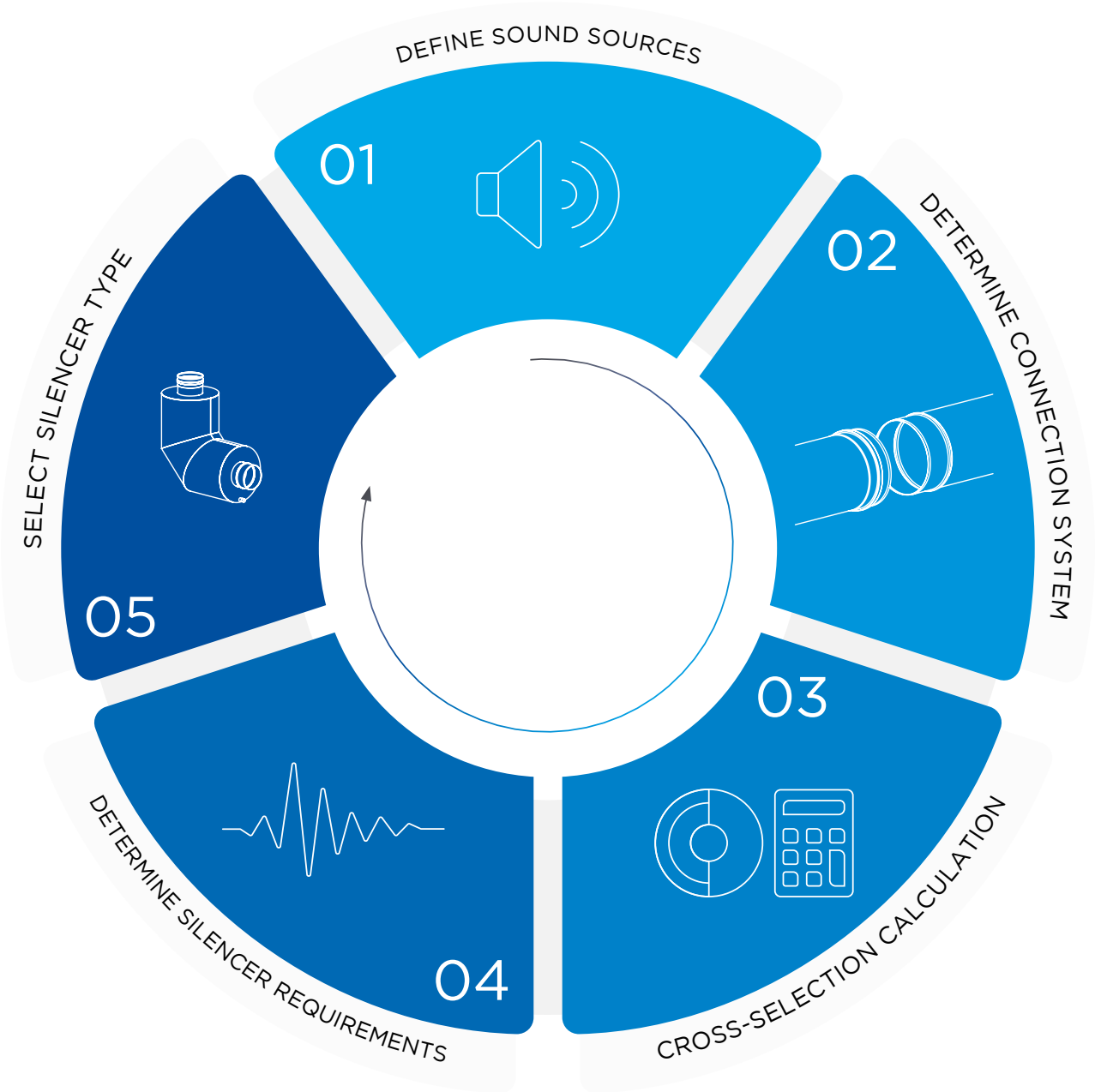
If broad band noise reduction is necessary, the resonance and absorption principles can also be combined in a single silencer.

In the first section of the silencer, mainly low-frequency noises are dampened by passing them from the exhaust pipe via a perforated plate into the outer hollow chambers and eliminating them there. In the second part, the classic absorption area ensures the additional reduction of medium and high-frequency sound.



SILENCER SELECTION

Despite the variety of different silencer types and series, selecting the right exhaust silencer for the respective application is not rocket science. Find the right silencer after five simple steps.



REACH YOUR GOAL IN 5 STEPS	EXAMPLE
1. Define sound source	Condensing boiler Humid operation Max. delivery pressure of 70 Pa Approx. 75 °C exhaust gas temperature
2. Determine the connection system	Exhaust system EW-ALBI Suitable for condensing operation overpressure tight up to 200 Pa temperature resistant up to 200°C
3. Calculate cross-section	Ø 130 mm
4. Determine silencer requirements	Sound attenuation in a high and medium frequencies Frequencyrange. Target level: reduction by 12dB Passage element, horizontal installation
5. Select silencer type	Absorption silencer
Results	**ASD-B ECO 15 130 or** **ASD-ALBI... 15 130** You can find a current overview of the Jeremias standard exhaust silencers in our price list or: Product overview at www.jeremias.de/downloads

If you have any questions when selecting the right silencer or require a special design, our team of experts will be happy to provide you with advice and support at any time.

JEREMIAS SILENCER HOTLINE:

+49 9832 68 68 8001

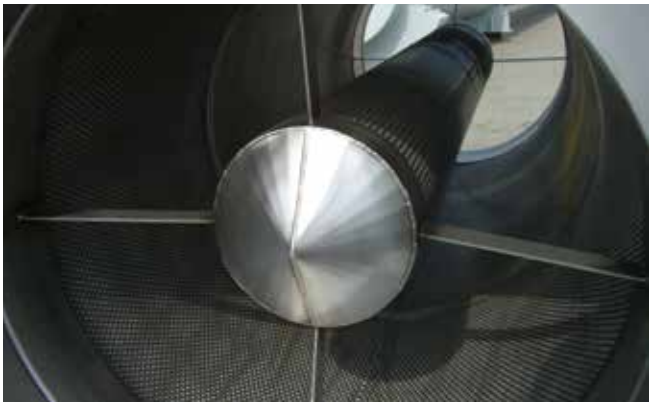
INDUSTRIAL SILENCER

Whether boilers, turbines, motors, fans or process systems: the range of applications for large-format industrial silencers is wide ranging.

In addition to the types of silencers already mentioned, special shapes designed specifically for the industrial sector are available, such as square splitter silencers, standing silencers or coated standard steel silencers with wall thicknesses between 2 and 10 mm, which are primarily used in the engine sector.

Depending on the chemical and mechanical stress, our industrial silencers are made from different materials such as stainless steel 1.4301, 1.4571, 1.4828 or steel types S235JR or Corten. The options in terms of connection systems (welding ends, flanges according to DIN, factory standards), connection positions, mounting elements and surface finish are just as diverse as the material used.

Depending on the sound source and the defined sound specifications, we develop an exhaust silencer that is perfectly tailored to your requirements - many successful completed projects worldwide speak for themselves!



MOUNTING ACCESSORIES

Our extensive assembly material enables installation in a wide variety of positions. A wide range of accessories gives you the opportunity to mount the silencer in a variety of installation positions depending on the type of silencer and requirements.

Hanging or lying installation on the wall, ceiling or floor can be implemented.

jeremias®
ABGASTECHNIK

DEUTSCHLAND

Jeremias Abgastechnik GmbH
Opfenrieder Str. 12
91717 Wassertrüdingen
Telefon: +49 9832 6868-50
E-Mail: info@jeremias.de
www.jeremias.de

POLEN
www.jeremias.pl

USA
www.jeremiasinc.com

SPANIEN
www.jeremias.com.es

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Qualitätsprodukte von Jeremias werden nur von ausgewählten Fachbetrieben installiert.

Der Fachbetrieb in Ihrer Nähe: