CS CLEAN
SOLUTIONS



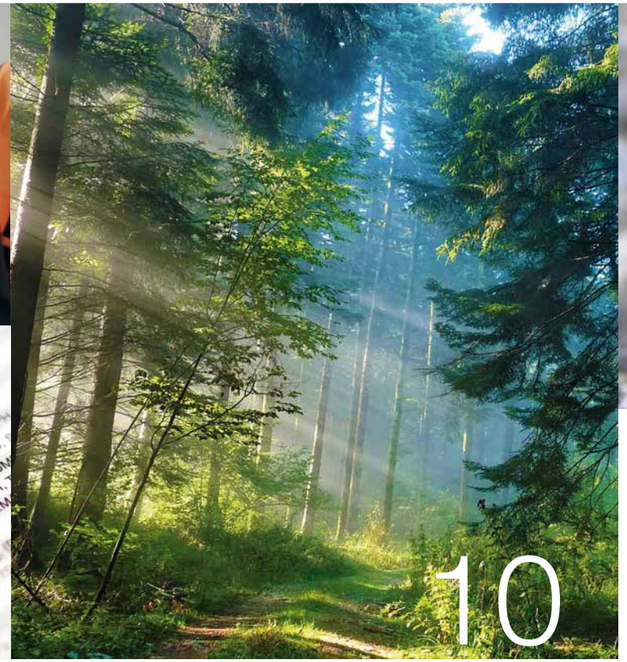


EXHAUST GAS TREATMENT PRODUCTS

Discover the Advantages



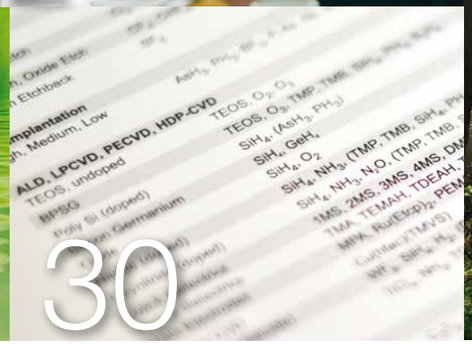














DISCOVER THE ADVANTAGES

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Disposable, safe and efficent

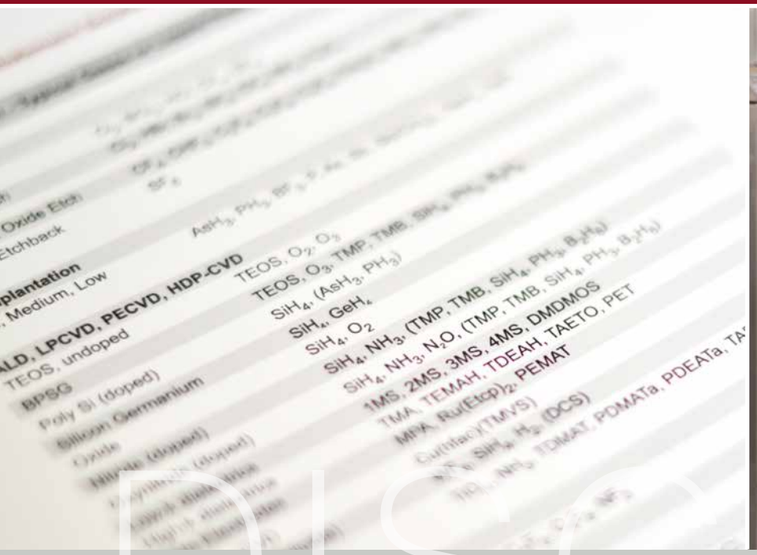
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Compact disposable, high efficiency and capacity

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For sustainable manufacturing

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Contact us
Our worldwide sales and service network










DISCOVER

DISCOVER THE ADVANTAGES

As an internationally operating company with a global network of service centers, CS CLEAN SOLUTIONS has been serving customers in the semiconductor and related high tech industries since 1986.
Based on our proprietary dry bed absorption technology, our products have earned an unparalleled track record for safety, process reliability and environmentally-sustainable manufacturing.

Whether your work relates to semiconductors, photovoltaics, pharmaceuticals or chemicals, on an R&D or manufacturing scale, if your application requires removal of downstream reactive gases please contact us and discover the advantages of CS CLEAN SOLUTIONS unique technology and worldwide support!



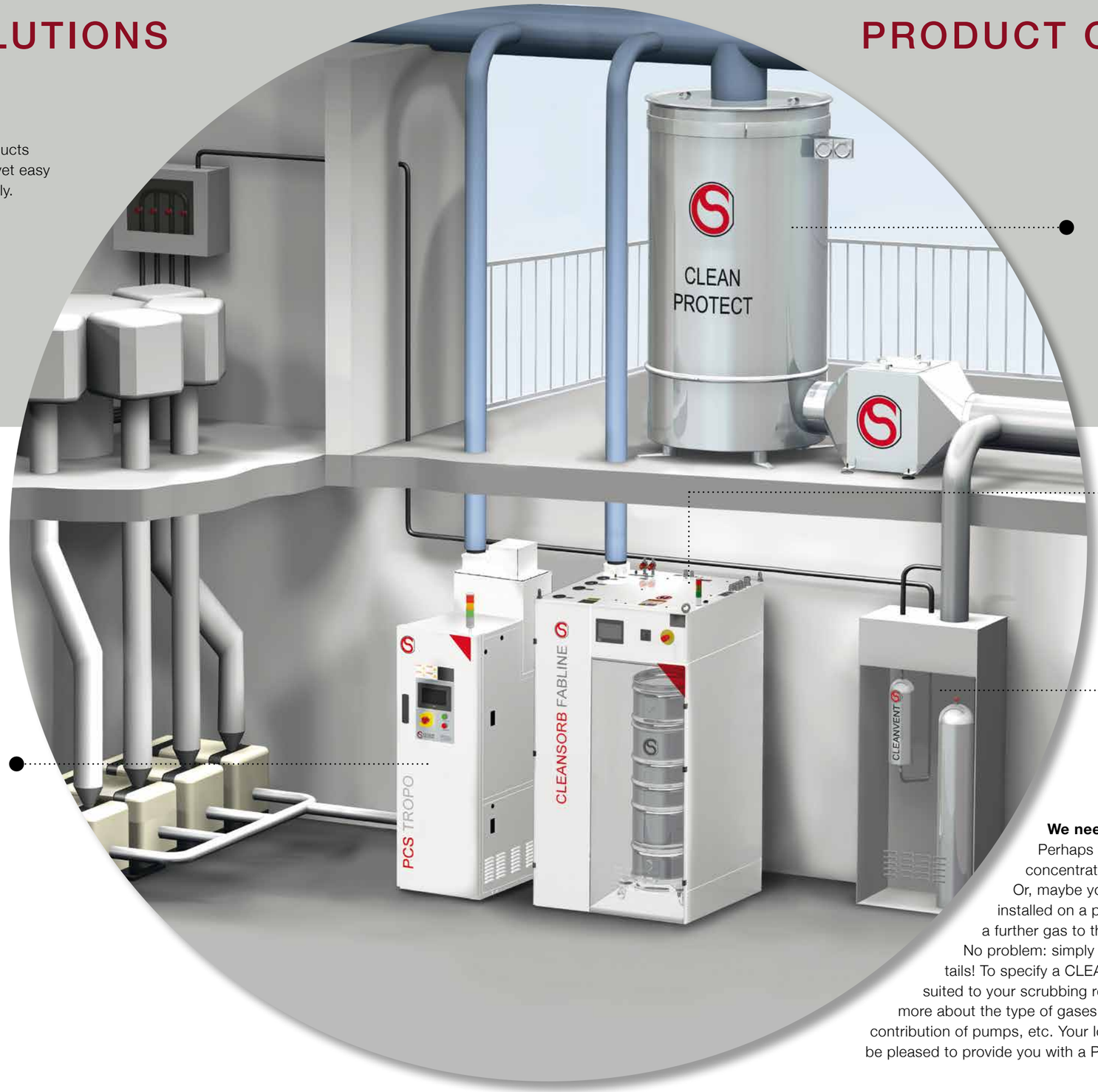

CS CLEAN SOLUTIONS

CS CLEAN SOLUTIONS gas abatement products are unmatched in their scrubbing efficiency, yet easy to operate and extremely maintenance-friendly.

The schematic shows an overview of the various product lines as installed on the gas supply and process exhaust of a typical semiconductor wafer manufacturing fab. Refer to the following pages for a further description of the various product lines.

PROCESS APPLICATION

- Ion Implantation
- Plasma Etch
- Chamber Clean
- Photovoltaics
- HDP-CVD
- LPCVD
- PECVD
- MOCVD
- ALD



PRODUCT OVERVIEW

CLEAN-PROTECT
Removal of toxic gases during emergency leakage in gas cabinets

CLEANSORB®
Point-of-exhaust absorption for process waste gas

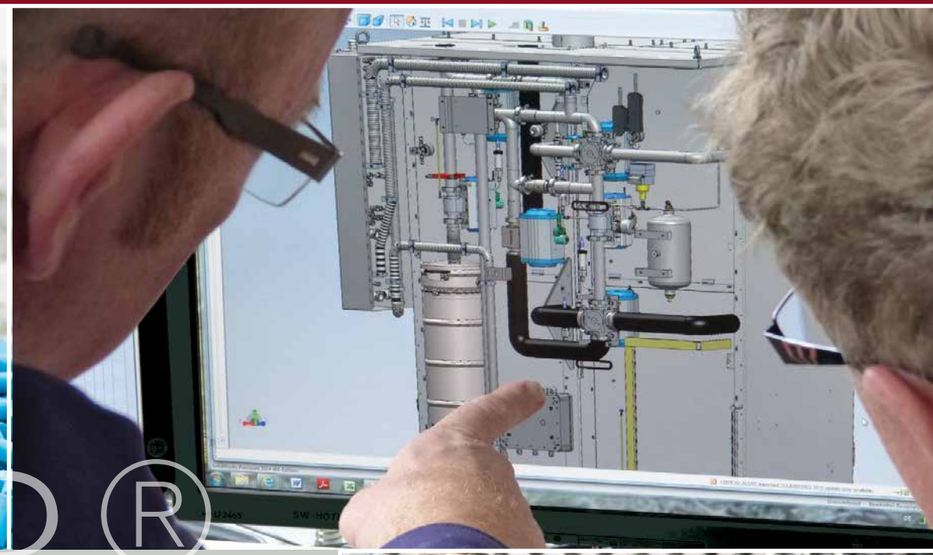
CLEANVENT
Removal of hazardous gases during purging of vent lines

PLASMA CONVERSION SYSTEMS
Removal of perflourinated compounds by high efficiency atmospheric plasma

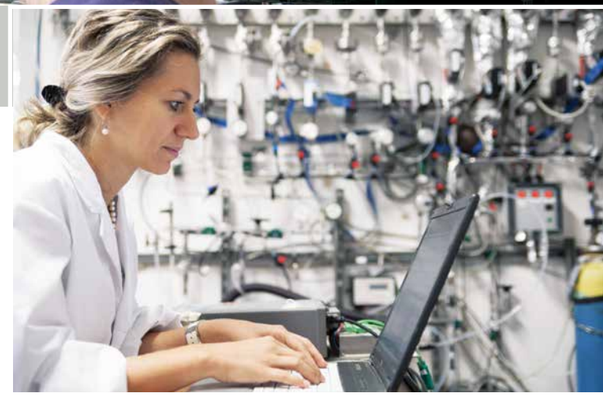
We need your input!
Perhaps your system has a small volume of concentrated gas which requires periodic venting. Or, maybe you already have a CLEANSORB® system installed on a plasma etch application and intend to add a further gas to the etch recipe.
No problem: simply contact us and provide us with the details! To specify a CLEANSORB® model and configuration best suited to your scrubbing requirements, we need to understand more about the type of gases to be removed, carrier gas flow, inert gas contribution of pumps, etc. Your local sales and service partner will be pleased to provide you with a Process Definition Sheet for this purpose.







CLEANSORB®



CLEANSORB® TECHNOLOGY

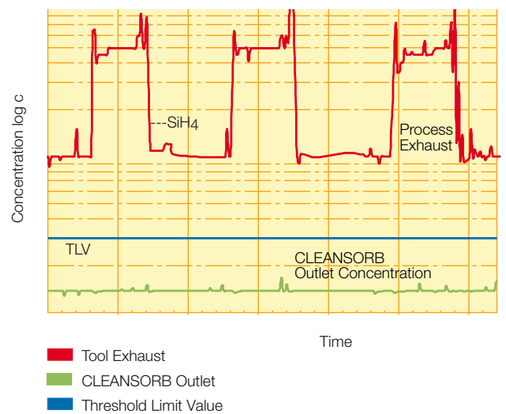
CLEANSORB® dry chemisorber media removes hazardous process gases by chemical conversion to stable solids at ambient temperature. It is the enabling technology for the CS CLEAN SOLUTIONS line of dry scrubbing products. No external heating, moisturization, or other facilities are required for operation. Hence the CLEANSORB® system is fully passive, and is permanently on stand-by, even in the event of a power outage or other facilities failure.

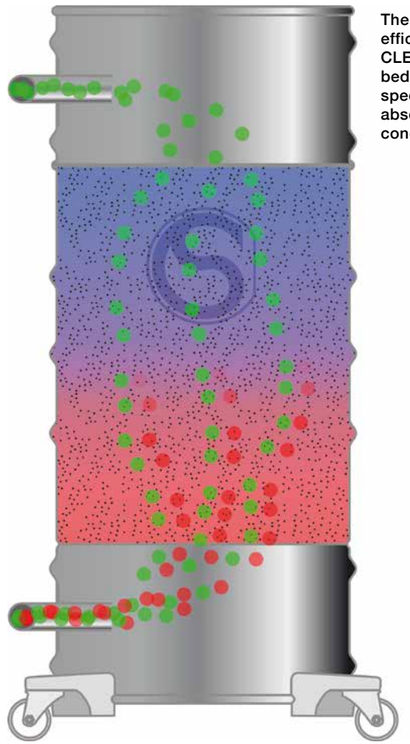
Where scrubbing performance is expressed in terms of “percent waste gas removal”, the non-retained percentage of gas is often enough to cause considerable corrosion or blockage of downstream ducting and equipment.

CS CLEAN SOLUTIONS specifies retention efficiency of its dry bed columns as absolute ppm concentrations. Gas concentration at the CLEANSORB® column’s outlet typically lies below the detection level of commonly used gas detectors- right up until the end of absorber capacity lifetime.

CS CLEAN SOLUTIONS has a dedicated team of R&D chemists focussed on expanding its range of CLEANSORB® granulates.

Our chemisorber materials are developed “from scratch” in our laboratory and scaled up to the bulk manufacturing level. Ongoing review and testing ensures that our media keeps pace with the latest manufacturing technologies and process chemistries.





The retention efficiency of CLEANSORB® dry bed columns is specified in terms of absolute ppm concentrations.

Benefits

- Safe, non-combustible inorganic medium (no charcoal)
- Highest capacities
- Unique customised material compositions
- No consumption of electricity, city water, oxygen, nitrogen
- No secondary emissions to the environment
- Excellent Cost-of-Ownership
- Irreversible conversion of hazardous gases to stable inorganic solids at ambient temperature







CLEANSORB®

CLEAN, SAFE, EXHAUST GAS ABATEMENT

Many of the specialty process gases used in semi-conductor wafer manufacturing and related high-tech industries are either pyrophoric, toxic, or corrosive. Unused process gases and their hazardous by-products must be efficiently and safely removed from exhaust lines to ensure safety of personnel, compliance with regulatory emission standards, and process uptime.

Increasing levels of device integration and shrinking critical dimensions require new materials for the deposition of inter-level metal connectors, barrier-, and dielectric layers. Increasingly, these are complex metalorganic molecules supplied from liquid sources. Over the years, CS CLEAN SOLUTIONS has gained extensive experience in the abatement of MO precursors through its exposure to compound semiconductor and ALD applications. Point-of-use CLEANSORB® models are available to meet the needs of all our customers, from small-scale university researchers to round-the-clock fabrication.

Benefits

- No consumption of water resources
- No generation of waste water
- No secondary emissions
- Room temperature operation
- No pressure drop over column lifetime
- Safety bypass
- Outlet concentrations can be monitored as absolute,TLV- level concentrations
- Passive operating principle
- Applicable to a wide range of hazardous gases

CLEANSORB® COLUMNS

The CLEANSORB® absorber column has been specially designed with handling and refilling logistics in mind. The dry scrubbing columns are approved as container vessels for road transport of the spent absorber material in accordance with applicable ADR/ DOT regulations. CLEANSORB® columns are not discarded after use, but refilled with fresh absorbent.

The columns are manufactured from high quality 316L stainless steel to ensure long working life, even on harsh process applications such as Metal Etching or Tungsten CVD. The inlet and outlet connections to the patented CLEANSORB® absorber column are made via its own integrated valves. Before taking a column off-line, the valves are shut off to isolate the absorber bed and any process deposits - ensuring maximum safety and ease of handling for the operator.



The CLEANSORB® column can accommodate high flowrates – as typical when multiple process chambers need to be hooked up. Even at high flows, pressure drop across the column is usually negligible. The sub-pressure operation as well as the dry working atmosphere greatly reduces formation of solids, leading to greatly improved process uptime.

Benefits

- Reusable
- UN-approved for transportation
- Local disposal service worldwide
- Maximum operational safety
- No exposure to chemicals
- Hermetically sealed modules









WORLDWIDE

CUSTOMER SERVICE

Even when working in high volume production, the maintenance-friendly CLEANSORB® dry bed absorber rarely requires intervention from factory service technicians. There are no moving parts or heated components which require frequent attention, or scrubber parts which require regular cleaning. Most typically, service work is limited to change-out of the column, periodic calibration of the endpoint (gas) sensor, and annual preventive replacement of inlet steel bellows and O-rings.

CLEANSORB® customers enjoy a comprehensive maintenance package comprising a unique take-back and disposal service for the spent absorber media. After removal from the CLEANSORB® cabinet, the column is ready for shipment to the nearest CS CLEAN SOLUTIONS Refill and Service Center. There, the expended absorber granulates are collected and sorted in accordance with applicable local regulations for their classification and disposal. Where possible, the spent materials are re-processed for recovery of metals, or for other industrial uses.

Before being recharged with fresh CLEANSORB® granulate, the emptied columns are washed, thoroughly cleaned and dried. All sealing gaskets are replaced. The refilled columns are subjected to a strict quality control check-out procedure which includes helium leak-testing and packaging compatible with the customer's grey area.

Consult your local CS CLEAN SOLUTIONS partner for annual preventive maintenance contracts or waste gas analysis measurements.

Benefits

- Process application support
- Start-up support
- Installation support
- Service and maintenance
- Refill services









CLEANSORB®

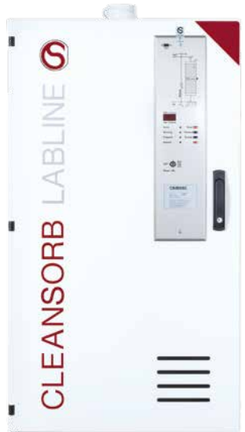
DRY BED ABSORBER MODELS

CLEANSORB® LABLINE
The CLEANSORB® LABLINE features a small absorber column in a compact, air-extracted cabinet.

The wide selectivity of CLEANSORB® chemisorber media to a diverse list of gases and liquid precursors, ranging from corrosive or toxic species to latest-generation metalorganic complexes, offers ideal flexibility for R&D requirements.

A particular advantage for sporadic laboratory work is the passive operating principle. The LABLINE is always ready and does not have to be switched on, heated up or otherwise activated each time a new experiment is to be run.

CLEANSORB® PRIMELINE
The PRIMELINE series, comprising the PS and PD model platforms, is described on the following pages.



LABLINE



PRIMELINE PD

CLEANSORB® FABLINE
FABLINE FS is the standard CLEANSORB® model for waste gas removal on factory-scale applications. Available in three column sizes, the system is readily adaptable to the requirements of both pilotline and full-scale manufacturing.



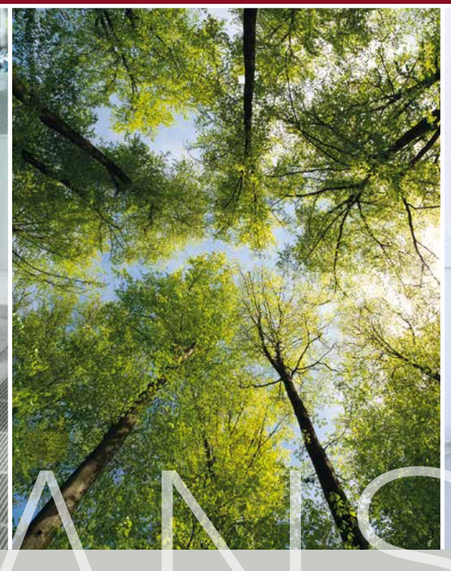
FABLINE FX



FABLINE FS

FABLINE FX is the latest version of the series that has proven its reliability in thousands of CS CLEAN SOLUTIONS installations worldwide. An additional backup column on the FABLINE FX product offers the benefits of an uninterrupted operation using the dual-column model, but with a smaller footprint. With the safety and performance of all CLEANSORB® chemisorber media, FABLINE is the model of choice for your specific process application, including: Plasma Etching, CVD, ALD, Ion Implantation and CIGS Photovoltaics.









CLEANSORB®

CLEANSORB® PRIMELINE PS AND PD

Every single hour of process time lost to exhaust and scrubber maintenance can add thousands of dollars to product manufacturing costs. The CLEANSORB® PRIMELINE series brings unsurpassed cost-of-ownership to high volume manufacturing.

On most installations, operator intervention is only required every few months. A key enabler for uptime is the minimized time required for column change. The smaller-footprint CLEANSORB PRIMELINE PS model. features a back-up column, allowing production to be run to completion even after the capacity of the main absorber column has become depleted. The larger CLEANSORB PRIMELINE PD model incorporates two full-size absorber columns plus a back-up column; one column can remain active absorbing exhaust gas with full SEMI S2-compliant safety protection, while the second column is independently purged before removal from the cabinet for refilling.

The PRIMELINE series represents the fully-featured safety version of the CLEANSORB® family. In the event of a loss of facilities, the system will revert to a safe state with redundant absorption capability. The system is specially engineered to handle safety-critical applications such as Metal Organic Chemical Vapor Deposition.



PRIMELINE PS



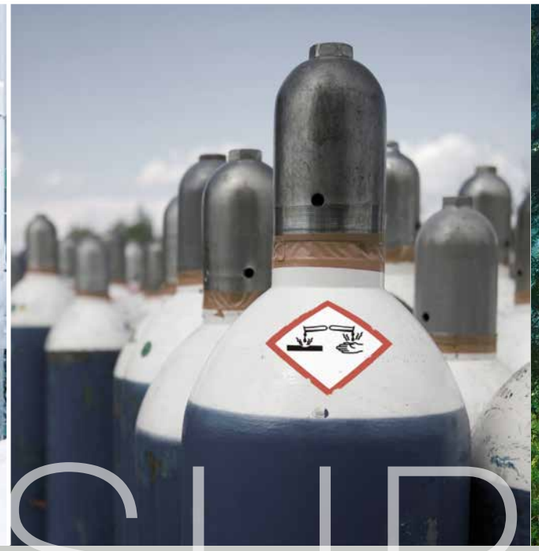
PRIMELINE PD

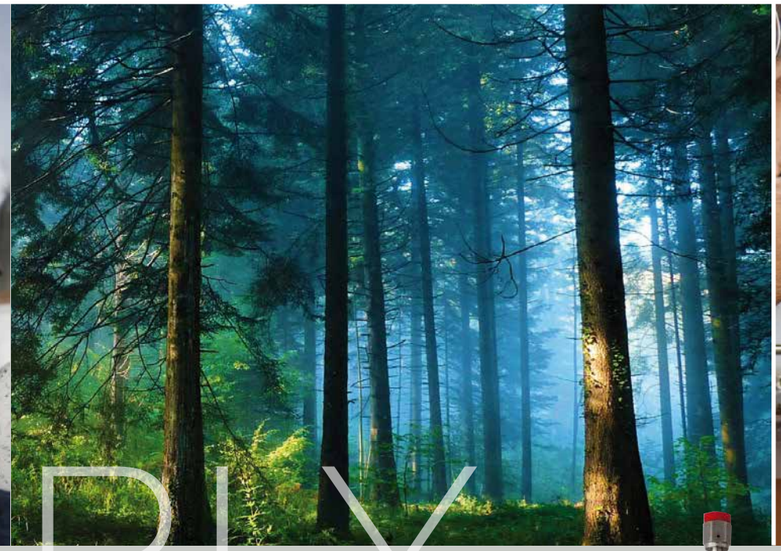


When configured for hydride gas processes such as MOCVD, unique control functions include an infra-red array for contactless temperature monitoring of the absorber columns, as well as an inert gas cooling mechanism. A dedicated class of CLEANSORB® chemisorber media ensures highly effective, temperature-managed removal of toxics such as arsine or phosphine.

In both models, the individual columns are independently monitored for gas breakthrough. Automated routines for in-situ leak-testing and inert gas purging enhance safety and ease of operation. Further attributes of the PRIMELINE PD model are its touch screen, event and data logging, independent safety PLC, and SIL-certified components.









GAS SUPPLY

CLEAN-PROTECT

Safeguard against emergency gas escape.
Uncontrolled release from gas cylinders poses a serious threat to environment and safety, owing to the high quantity of pressurized gas usually present in concentrated form. Gas leakages are known to have occurred: during storage of fresh cylinders; due to improper connection of fittings in gas cabinets; component failure, e.g. rupture of pressure regulator diaphragm; during storage of empty cylinders.

The purpose of the CLEAN-PROTECT is to absorb toxic or otherwise hazardous gases during a gas release incident. Escaping gases undergo an irreversible chemical reaction (oxidation or neutralization) within the CLEAN-PROTECT absorber bed, where they are safely converted into solid by-products. The system is installed in line with downstream air extract ducting and does not require power or other facilities to operate, meaning that it is permanently on 24/7 stand-by.

The unit is applicable to a wide range of hazardous gases, including: AsH_3, BF_3, Br_2, Cl_2, ClF_3, $COCl_2$, F_2, HCl, HF, HBr, H_2S, H_2Se, HCN, NH_3, N_2H_4, PH_3, SO_2. If no gas release incident occurs, the change-out frequency of the absorber bed is five years.



Benefits

- High flow rates. Up to 3600m³/h
- Absorption of toxic gas cylinder release
- Low pressure drop
- Permanently online
- Suitable for multi-cabinet installations
- Passive operating principle
- Applicable to a wide range of hazardous Gases

CLEANVENT

Mini Cartridge for Gas Cabinet Vent Lines
Before a new gas cylinder is put on-line within a gas supply cabinet, process gas remaining from the previous cylinder must first be removed – both for reasons of safety and to ensure integrity of the gas supply. The dead volume of residual gas is likely to be highly concentrated, toxic, pyrophoric, or corrosive.

For almost 40 years the CLEANVENT cartridge has proven itself a safe solution for the removal of hazardous purge gases. Installed within the gas cabinet on the suction side of the venturi vacuum generator, or in a valve manifold box, the CLEANVENT cartridge allows residual gases to be scrubbed “at-source“.

Refillable CLEANVENT cartridge types are available for a broad range of specialty gases and are supported by our worldwide network of service partners.

Benefits

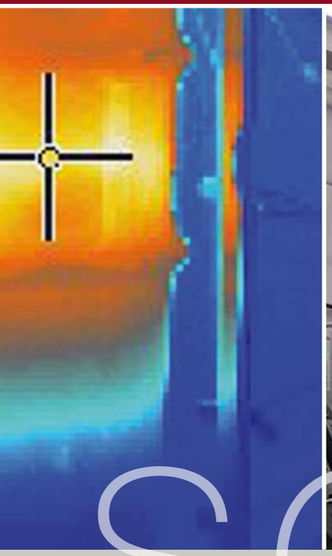
- At-source removal of purge gases
- Gas cabinet installation
- Applicable to a wide range of hazardous gases





CLEANVENT CV10ST
Thermal Dry Bed Absorber for NF_3 Removal
Designed for the removal of purge gases which are chemically stable at room temperature, the CLEANVENT CV10ST features a heated cartridge with control and monitoring elements in an air-extracted cabinet.
The CV10ST is most commonly used for the removal of nitrogen trifluoride – a chemically stable gas used in the plasma cleaning of CVD chambers in semiconductor and photovoltaic manufacturing. Despite its stability, NF_3 is a greenhouse gas with a high global warming potential.

The CV10ST is installed downstream of the gas supply cabinet or bulk gas supply manifold.







SCALE-UP

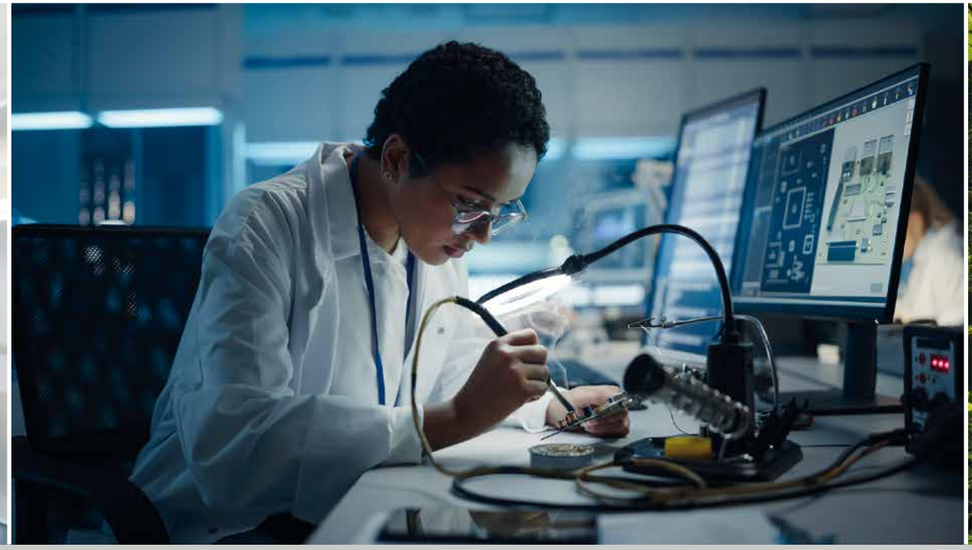
SCALED-UP ENGINEERING SOLUTIONS

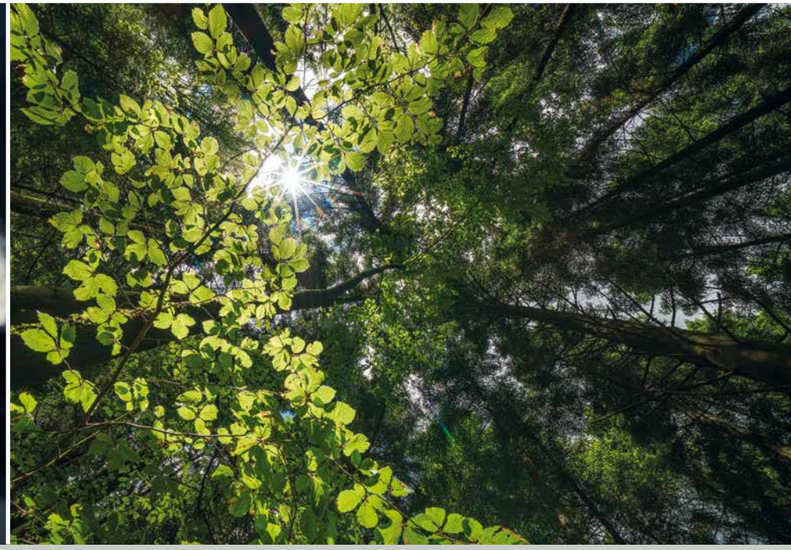
In certain cases, CLEANSORB® dry bed chemisorption technology can be scaled up to benefit return-on-investment for waste gas treatment in high volume manufacturing. The pictures on this page show a moving bed reactor in an “end-of-pipe” configuration to handle the combined effluent of several process exhausts.
CLEANSORB® dry media is dosed to match the incoming flow of waste gas. Previously, this process had been abated using wet scrubbing technology which produced 15 kg of contaminated waste water/ sludge per cubic meter of treated waste gas. For the corresponding amount of effluent gas, the reaction by-product from the environmentally-friendly CLEANSORB® system is 2.5 kg of stable, odorless granulate. Disposal of the consumed material is handled by CS CLEAN SOLUTIONS local service partner.

Customized Design and Manufacture
To establish the feasibility of using dry bed scrubbing technology on the particular application, the process can first be simulated on a small scale within our gas testing laboratory. Next, CS CLEAN SOLUTIONS engineering staff work closely with the customer to define the design requirements. Fluid flow simulation and computer modeling are useful tools in the early conceptualization and design phases. The machine is constructed in a dedicated area of our factory to meet the highest standards of engineering, reliability and safety. Following the Factory Acceptance Test, the system is disassembled for shipping to the customer site. There, it is reassembled and integrated into the customer’s process infrastructure. Our engineers remain on site until commissioning, hand-over of documentation, training and Final Acceptance have been completed. Signal interfaces allow remote monitoring and diagnostics by our product specialists, while the customer can avail of 24/7 troubleshooting and service support.









PCS

PLASMA CONVERSION SYSTEMS (PCS)

To widen our product range and process all varieties of exhaust gas treatments, CS CLEAN SOLUTIONS introduced its new Plasma Conversion Systems (PCS).

These systems leverage high-energy plasma technology to treat and convert unreactive yet harmful exhaust gases and chemical compounds. The plasma-products can then be treated further with conventional methods. Plasma, the ionized state of gas, facilitates highly efficient chemical reactions that can break down complex substances in waste treatment or other industrial applications. This advanced technology offers significant benefits, including reduced environmental impact and the ability to handle a variety of exhaust gases across industries. Here‘s a closer look at how plasma conversion works and its applications.



PCS EXO



PCS EXO

Abatement of NH_3 and H_2 for GaN and similar Process Applications

The PCS EXO system is a high performance plasma source, developed to destroy NH_3 and H_2, which is emitted from GaN and related processes.

Our PCS systems work resource-saving, water-free and without additional fuel gas.

For existing installations requiring NH3 removal capability, the PCS EXO is readily retrofitted. Chlorine used during cleaning steps is best removed using a CLEANSORB® dry bed chemisorber.









PCS

PCS TROPO AND STRATO

Removal of Perfluorinated Compounds (PFCs)
The PCS TROPO and PCS STRATO atmospheric plasma conversion systems are high performance plasma sources, developed to destroy perfluorinated compounds/ greenhouse gases such as CF_4, CHF_3, SF_6 and NF_3 that are emitted from semiconductor etch and related processes.

The reactive by-products created by both PCS systems are best removed using a CLEANSORB® dry bed chemisorber. For existing installations requiring PFC removal capability, both PCS systems are readily retrofitted upstream of existing abatement systems such as central wet scrubbers.

Our PCS systems work resource-saving, water-free and without additional fuel gas.



PCS TROPO



PCS STRATO



Benefits

- Superior Destruction-Removal-Efficiency (DRE) of PFC gases
- Resource-saving, water-free operation
- No additional fuel gas, extremely low CoO
- Hybrid technology using direct and indirect energy sources
- Increased productivity
- Low installation costs
- Low operating costs
- Low maintenance costs







NOVAPURE®

NOVAPURE® EGS300 CANISTER DRY BED ABATEMENT SYSTEM

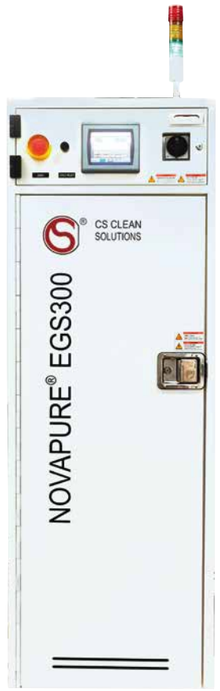
The Novapure® series offers a safe, reliable solution for efficient treatment of hazardous process gases and by-products.
The unique system uses chemisorption granulate technology to treat process gases in a negative pressure environment, ensuring only inbound flows. Species endpoint monitoring alerts the user when the absorber canister is reaching its capacity, maintaining sub-TLV outlet concentrations.

Benefits

- SEMI S2 Compliant
- Removal efficiency below TLV levels
- Continuous passive operation
- Constant pressure control system
- Integrated gas monitoring
- Low maintenance

The built-in 90% consumption detection feature provides warning of breakthrough when the granulate is 90% consumed. The remaining capacity allows the current process to run-to-finish and time to schedule a shutdown for canister replacement. This mode is useful for processes that generate significant heat during abatement, allowing cooling for maximum granulate efficiency.

Chemisorption technology provides irreversible reactions with process gases and their by-products, forming non-volatile solids. The spent absorber canister can then by safely disposed. No downstream waste is generated in the air or water systems of the facility

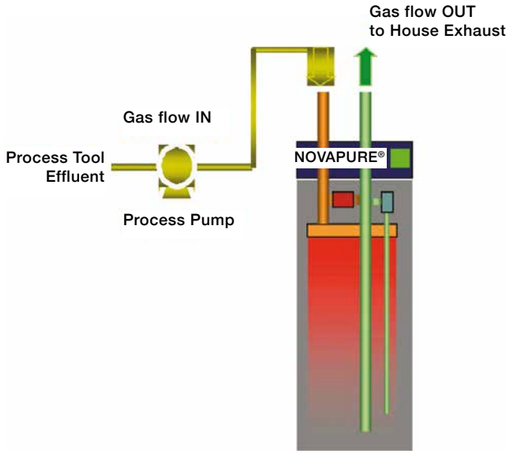


NOVAPURE® EGS300

The EGS300 Dual is a two canister system offering a variety of operating modes. Active/Standby mode allows one canister to operate until endpoint is reached, automatically switching to the standby canister to allow uninterrupted operation.
Switching mode allows a choice of a user-selectable time per canister operation.

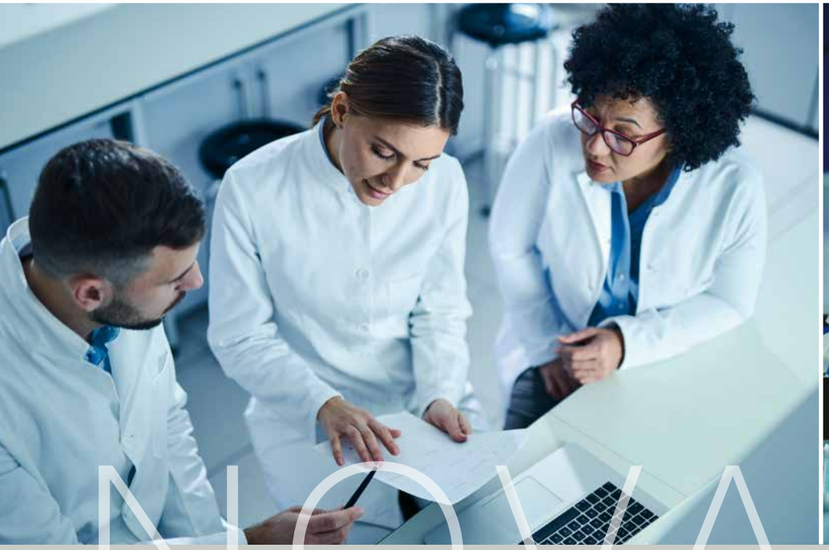


NOVAPURE® EGS300 DUAL



Benefits

- Dual Canister Design
- Continuous Passive Operation
- Inlet Pressure Control
- 3-Zone Temperature Monitoring
- Outlet Concentrations below TLV
- Time based canister switching
- Optional End-Point detection
- Optional Air Oxidation Functionality







NOVASAFE®



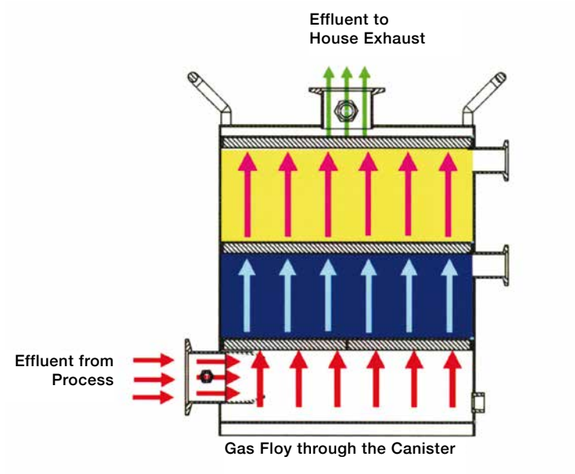
NOVASAFE®
DRY BED ABATEMENT TECHNOLOGY

With its compact and low impact design, the NOVASAFE® is the ultimate uptime and economical abatement solution.

NOVASAFE® combines high efficiency and high capacity in a compact, in-situ solution providing compliance with appropriate exhaust gas regulatory requirements.

NOVASAFE® is a passive abatement solution for semiconductor, vent gas, R&D, and laboratory applications. As a zero footprint scrubber, the NOVASAFE® can be easily integrated with your vacuum pump system.

Effluents are abated with the NOVASAFE® to sub-TLV levels from roughing pumps. There are no moving parts. Change-outs are accomplished easily and have minimal impact on operations.



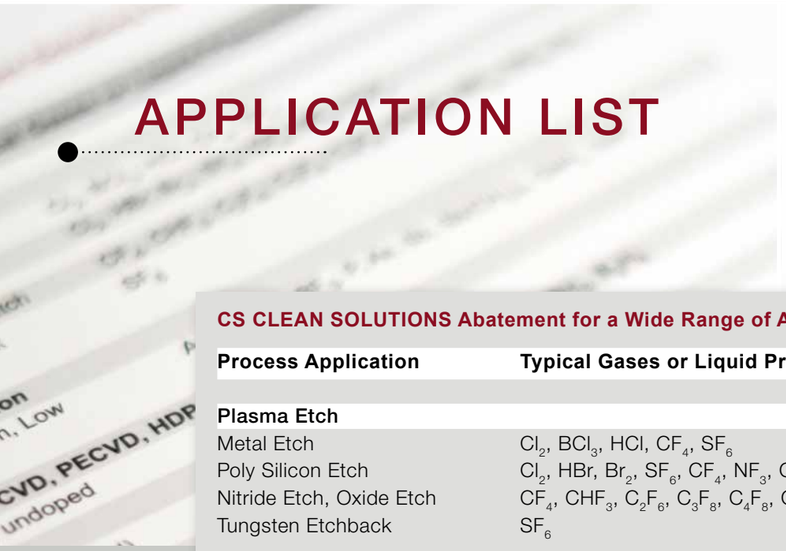


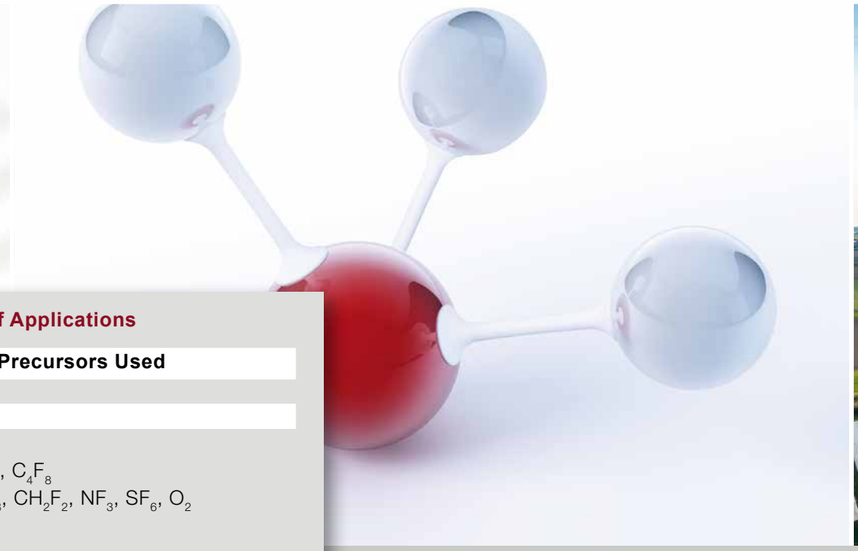
NOVASAFE®

Benefits

- Chemisorption
- Each canister connected to one pump
- Continuous passive operation
- Low operating and capital cost
- Process selectable granulate mix
- Compact size

APPLICATION LIST



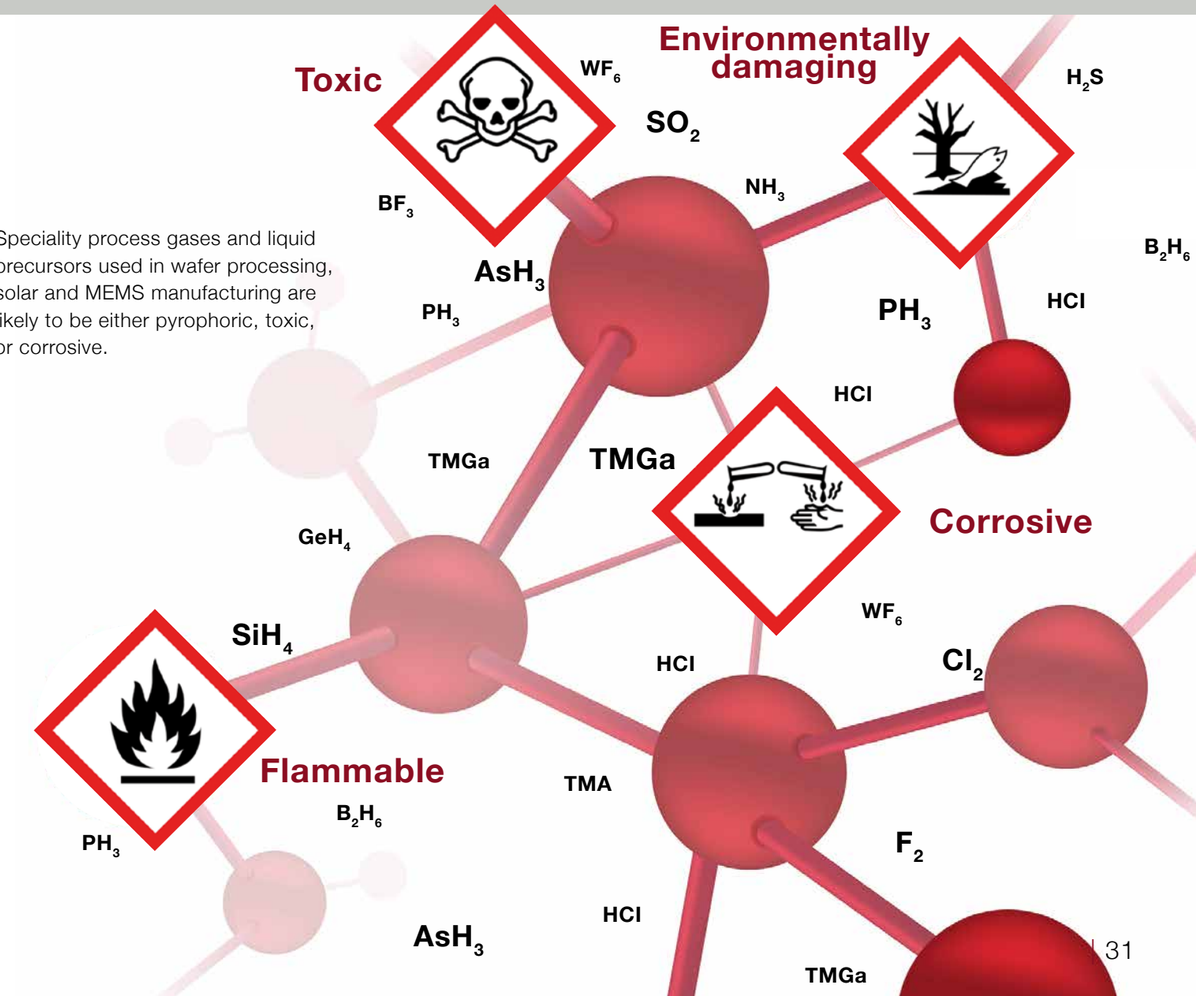




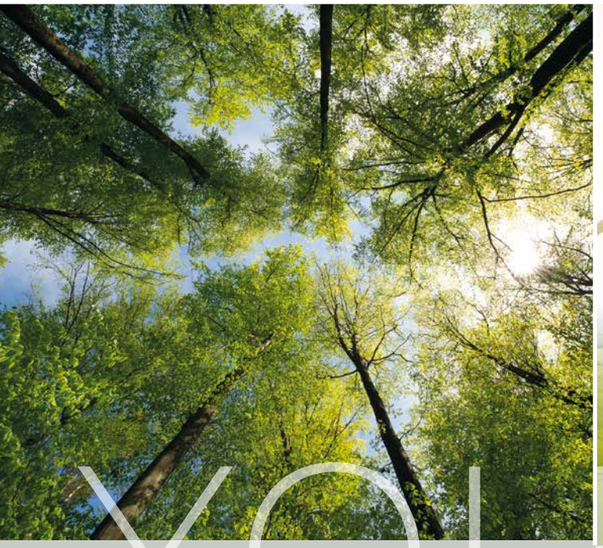
CS CLEAN SOLUTIONS Abatement for a Wide Range of Applications

Process Application	Typical Gases or Liquid Precursors Used
Plasma Etch	
Metal Etch	Cl_2, BCl_3, HCl, CF_4, SF_6
Poly Silicon Etch	Cl_2, HBr, Br_2, SF_6, CF_4, NF_3, C_4F_8
Nitride Etch, Oxide Etch	CF_4, CHF_3, C_2F_6, C_3F_8, C_4F_8, CH_2F_2, NF_3, SF_6, O_2
Tungsten Etchback	SF_6
Ion Implantation	
High, Medium, Low	AsH_3, PH_3, BF_3, P, As, Sb, $Sb(CH_3)_3$, GeH_4, GeF_4, TMGa, GaI_3
ALD, LPCVD, PECVD, HDP-CVD	
TEOS, undoped	TEOS, O_2, O_3
BPSG	TEOS, O_3, TMP, TMB, SiH_4, PH_3, B_2H_6
Poly-Si (doped)	SiH_4, (AsH_3, PH_3)
Silicon Germanium	SiH_4, GeH_4
Oxide	SiH_4, O_2
Nitride, (doped)	SiH_4, NH_3, (TMP, TMB, SiH_4, PH_3, B_2H_6)
Oxynitride, (doped)	SiH_4, NH_3, N_2O, (TMP, TMB, SiH_4, PH_3, B_2H_6)
Low-k dielectrics	1MS, 2MS, 3MS, 4MS, DMDMOS
High-k dielectrics	TMA, TEMAH, TDEAH, TAETO, PET
Gate Electrodes	MPA, $Ru(Etcp)_2$, PEMAT
Copper & Cobalt CVD	Cu(hfac)(TMVS), Cobaltocene and related metalorganics
Tungsten (Silicide)	WF_6, SiH_4, (DCS)
Barrier Layers	$TiCl_4$, NH_3, TDMAT, PDMATa, PDEATa, TAETO, $W(CO)_6$
Plasma Cleaning	
PFC plasma	C_2F_6, C_4F_8, NF_3
Remote NF3 plasma	F_2
Epitaxy	
Silicon (doped)	DCS, TCS, SiH_4, HCl, (AsH_3, PH_3, B_2H_6)
Silicon-Germanium	SiH_4, GeH_4, CBr_4, 1MS, 2MS, 3MS, HCl
Silicon-Carbide (SiC)	SiH_4, TMAl, HCl
Compound Semiconductors, Optoelectronics, III-V on Si	
GaAs, InP MOCVD (OMVPE)	AsH_3, PH_3, TMAl, TMGa, TMIn, TBA, TBP, SbH_3, HCl, Cl_2
GaN MOCVD	NH_3, H_2
GaN MOCVD Chamber Clean	HCl, Cl_2
MBE (MOMBE)	As, P, AsH_3, PH_3, SbH_3
III-V Etch	Cl_2, BCl_3, HBr, SiF_4, SF_6, CH_4, $GaCl_3$, $InCl_3$, AsH_3, O_2
Photovoltaics	
Concentrator Photovoltaics	PH_3, AsH_3, III-V metalorganics, SiH_4, GeH_4
CIGS	H_2S, H_2Se

Consult us regarding applications not listed above at www.csclean.com



Speciality process gases and liquid precursors used in wafer processing, solar and MEMS manufacturing are likely to be either pyrophoric, toxic, or corrosive.







YOUR PARTNER

FOR SUSTAINABLE MANUFACTURING

Safety and the Environment...

For CS CLEAN SOLUTIONS, environmental protection is the essence of our business.
Our eco-friendly CLEANSORB® technology safely removes hazardous waste gases without consuming energy, water or fuel.
One CLEANSORB® column will typically have an absorbing lifetime of several months up to two years. During this time, several thousand liters of waste gases will be bound in a compact dry form. Our PCS atmospheric plasma conversion systems also do not require water or fuel gas to destroy perfluorinated compounds.
Both technologies do not create secondary emissions to the environment in the form of wastewater. All our products are designed for lifetime serviceability and re-use.

Best Prepared for the Future...

The process technologies and precursor materials used for chip manufacture continue to diversify against the background of a maturing, globalized industry with increased emphasis on Cost-of-Ownership.
At the same time, growing environmental awareness is demanding more efficient usage ofmaterials and a reduction in factory emissions.
Proud of our reputation for innovative product design and high-quality engineering, CS CLEAN SOLUTIONS is best prepared and fully committed to solving these exciting new challenges. We look forward to serving you in the coming years ahead.





Disclaimer

This brochure is intended as an introduction to our organization, products and services. While every effort has been made to ensure that the information given in this document is accurate, it is not a legal document nor a source of technical specifications. Responsibility cannot be accepted for any liability incurred or loss suffered as a consequence of relying on any matter published in this broschure.
The reader should be aware that the configuration of a waste gas abatement system requires specialist consideration of the exhaust gases to be treated and the associated process conditions. CS CLEAN SOLUTIONS or one of its authorized sales and service partners will be pleased to advise you regarding the specific waste gas treatment requirements of your process.





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CS CLEAN
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