



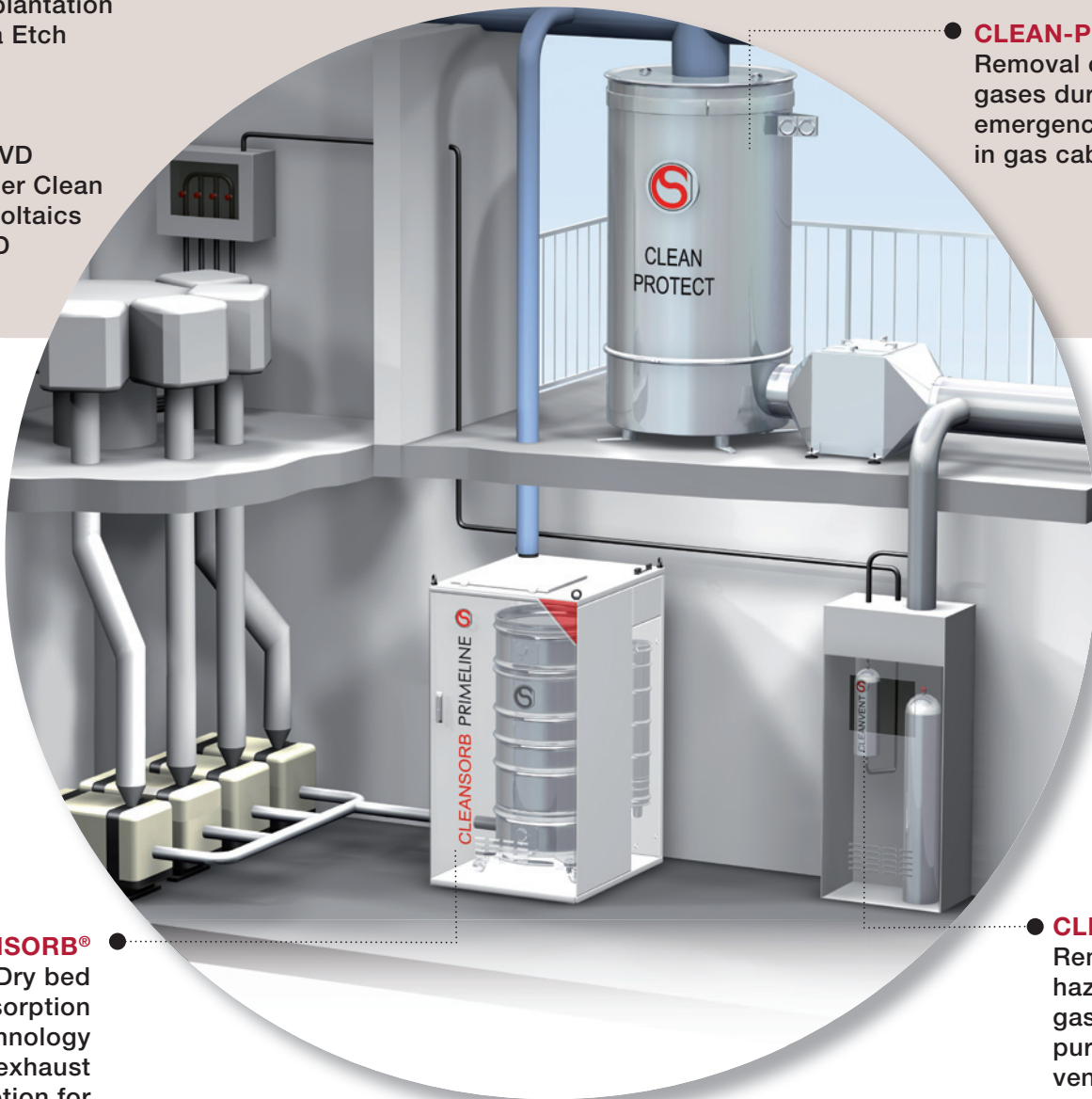
CS CLEAN SOLUTIONS

EXHAUST GAS TREATMENT

CLEANSORB® Dry Bed Abatement

PROCESS APPLICATIONS

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



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

- **CLEANSORB®**
Dry bed chemisorption technology
Point-of-exhaust absorption for process waste gas

- **CLEANVENT**
Removal of hazardous gases during purging of vent lines

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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 ₄ F ₈
Nitride Etch, Oxide Etch	CF ₄ , CHF ₃ , C ₂ F ₆ , C ₃ F ₈ , C ₄ F ₈ , CH ₂ F 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 ₂ H 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 ₂ H ₆)
Oxynitride, (doped)	SiH ₄ , NH ₃ , N ₂ O, (TMP, TMB, SiH ₄ , PH ₃ , B ₂ H 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 ₂ F ₆ , C ₄ F ₈ , NF ₃
Remote NF3 plasma	F ₂
Epitaxy	
Silicon (doped)	DCS, TCS, SiH ₄ , HCl, (AsH ₃ , PH ₃ , B ₂ H ₆)
Silicon-Germanium	SiH ₄ , GeH ₄ , CBr ₄ , 1MS, 2MS, 3MS, HCl
Silicon-Carbide (SiC)	SiH ₄ , TMAI, HCl
Compound Semiconductors, Optoelectronics, III-V on Si	
GaAs, InP MOCVD (OMVPE)	AsH ₃ , PH ₃ , TMAI, TMGa, TMIn, TBA, TBP, SbH ₃ , HCl, Cl 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 ₂ S, H ₂ Se

Consult us regarding applications not listed above at

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