



**BASEL CONVENTION**

**CATALYTIC HYDRO-DECHLORINATION METHOD (CHD)**  
**– Annex to POPs Technology Specification and Data Sheet**

**PROVISIONAL VERSION**

**Table 1: Technology Overview – Summary Technical Details**

Technology Provider	Technology	Scale +	Comp. treated	Related comp treated	Validation project experience **	Applicability Ranking++	Additional Remarks	Others	
Kanden Engineering	Catalytic Hydro-Dechlorination (CHD)	F	1:PCB taken from capacitors 2:PCB recovered by VTR treatment of capacitors 3:PCB separated from TCB by distillation	PCB			52 trial runs at Osaka plant in July 2006 Capacity:PCB-2t/D		
Kanden Engineering	Catalytic Hydro-Dechlorination (CHD)	F	1:PCB taken from capacitors 2:PCB recovered by VTR treatment of capacitors 3:PCB separated from TCB by distillation	PCB			Commercial operation at Osaka plant in October 2006 Capacity:PCB-2t/D		
Kanden Engineering	Catalytic Hydro-Dechlorination (CHD)	P	PCB taken from capacitors	PCB			Capacity:PCB-3.8kg/batch		
Kanden Engineering	Catalytic Hydro-Dechlorination (CHD)	P	PCB recovered by VTR treatment of capacitors	PCB			Capacity:PCB-3.8kg/batch		
+Key: F - Full-scale applications completed					++Key: Applicability ranking for pesticides				
P - Pilot/Demonstration scale completed; no F-applications					DA – Direct applicable				
B - Bench/Laboratory scale completed; no P or F-applications					FS 1 – Full scale within reasonable period possible 0-2 years				
T - Theoretical applicable, no B, P, F applications					FS 2 – Full scale within considerable period possible 2-5 years				
* Vendor claims performance of demonstration, but no data provided					**Validation on the basis of info provided in Table 2 and 3				



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**Table 2: Overview Project Experience per Technology Supplier**

Technology Provider	Contaminants	Amount treated in tons	Results incl. DRE, Pre-treat, Post treat Emissions, energy consumption, costs*	Client References Name, address, contact person phone, Email, fax
Kanden Engineering	PCB Oil	52 tests with amounts varying from 146 to 250 kg each of approx 10 t PCB in total	Test results: DRE 99.9996~99.9998 % PCB <0.35 mg/kg after reaction in all 52 batches It was confirmed that the metal after cleaning and VTR treatment, and the products of CHD can be recycled for the material and catalyst and solvent can be reused.	PCB treatment facility in Osaka controled under Japan government.
Kanden Engineering	PCB Oil	Commercial operation 231t treated (2006/10~2008/6)	No retreating in all batches.	PCB treatment facility in Osaka controled under Japan government.
Kanden Engineering	PCB Oil	3,8 kg/batch	PCB (pre-treat): 10%, Post treat: less than 0.5 mg/kg Catalyst performance did not change during 12 batches reaction. PCB concentrations of biphenyl which recovered after reaction by distillation and HCl solution were less than 0.5 ppm and 0.005ppm, respectively.	Pilot scale test plant
Kanden Engineering	PCB Oil	3,8 kg/batch	PCB (pre-treat): 10%, Post treat: less than 0.5 mg/kg	Mitsui Engineering & Shipbuilding Co., Ltd. Chiba factory.



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**Table 3: Overview detailed project information per project – Project name (from Table 2):**

Location project	Pre-treat mg/kg	Post-treat mg/kg	DREs	Emissions 1. Air (HCl, Dioxins & furans etc) 2. Water, 3. Waste (slags)	Energy consumption	Costs(Capital, operating costs)	Others, remarks
PCB treatment facility in Osaka	PCB:10%	0.210 ~ 0.350	99.9996 ~ 99.9998	1.none 2.none 3.biphenyl, HClaq,			
Pilot scale test plant (continuously 14 batches treating)	PCB:10% every batch	0.050~0.267	99.9997 ~ 99.99995	1.none 2.none 3.biphenyl, HClaq,			
Mitsui Engineering & Shipbuilding Co., Ltd. Chiba factory 3,8 kg (KC-300) PCB	no data available						

Notes:

1. PCBs concentration in the all samples after cleaning, VTR and CHD treatments in the test period at the PCB Waste Treatment Facility for Recycling of PCB in JESCO/Osaka JAPAN cleared the target value of detoxification.
2. PCB and Dioxin concentration in the air around the facility during the treatment cleared the target value (PCB: less than 0.0005 mg/m<sup>3</sup>, DXN: less than 0.6pg-TEQ/m<sup>3</sup>).  
(The exhaust gas from the each room in the facility, for example dismounting room, was treated properly, and CHD treatment is operated in the closed system, so it has no exhaust gas.)