

## Measurement of a PCB-containing joint with and without TWO SCI SPS seal.

The experiment was carried out by John Mortensen RUC.

The experiment was carried out for TWO Teknik.

The experiment was carried out in the period July/August 2010.

The experiment aims to measure how much PCB escapes from the joint either with or without TWO SCI SPS (hereinafter referred to as SPS). The experiment takes place at 40 C as it turns out that the emission of PCB increases drastically with temperature.

Fig.1



Figure 1 thermostated column with joint

Figure 1 shows the experimental setup for the experiment. The joint is placed in the column and the air supply is filtered through XAD-2, which is an excellent absorbent for PCBs. The air is pumped at 850 ml/minute and the PCB is collected on an absorbent (XAD-2) in a Dräger tube. The joint has the dimensions  $60\text{cm} \times 1\text{cm}^2 \times 0.5\text{ cm}$ , which gives an area of  $180\text{ cm}^2$  or  $0.018\text{ m}^2$ . The dimension of the pipe is 3.5 cm in diameter and 100 cm in length, which gives a volume of approx. 1 litre. With a pump speed of 0.85 l/min, it provides an air change of 55 times per hour.

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It was pumped for approx. a day. Approximately 1.2 m of air is pumped in a day.

Measurements were made on a GC-MS, where response factors for the standard PCBs 28, 52, 101, 118, 138, 153 and 180 were measured.

Table 1: Measurement on joint covered with SPS and without SPS<sup>2</sup>, values<sup>2</sup>in ng/m air/cm joint.

	hold times		Med SPS	Without SPS	% reduction
	8,00	PCB28	0,112	1,945	94,01
	8,40	PCB52	0,584	38,133	98,47
*	8,60		0,616	7,430	91,71
*	9,34		3,182	188,520	98,31
*	9,72	PCB101	2,901	111,630	97,40
	10,34		1,022	32,782	96,88
(*)	10,86	PCB118	0,472	10,826	95,64
*	11,10	PCB138	2,919	104,625	97,21
*	11,60	PCB153	1,768	65,841	97,31
*	12,70	PCB180	0,185	8,773	97,89

Table 1 shows the reduction of PCB emission from a joint sealed with SPS. The first column shows the PCBs found in the joint (marked with \*). The first PCBs in the table are also the lightest (they are trichloro-PCBs), while the later ones are heavier (containing 4-7 chlorine in PCB). The second column shows the names of the P<sub>3</sub>CB standards, the third and fourth columns are measurements on the joint, respectively with and without SPS sealing.

The results are in ng PCB/(m air)/(m joint). Fifth column shows the reduction in PCB emission from a joint sealed with SPS. The value is calculated as  $\text{Reduction} = 100\% - 100 \cdot (\text{with SPS}) / (\text{without SPS})$ . It can be seen that all PCBs are reduced by at least 90%. The PCBs that give the worst reduction are also the ones that have the lowest measurement values for the joint sealed with TWO SPS. This is where the uncertainty of the measurements is greatest, and a possible background value (which, incidentally, was greatest for the first PCBs) therefore shows a worse reduction (lower %) than is actually the case (in addition, they were found in very low concentrations in the joint)

The conclusion is therefore that TWO SCI SPS can therefore reduce the PCB emission from a joint by approx. 95%

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