

## MEMO: Precision data of Orthophenyl phenol and Pentachlorophenol in textile

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By: Ronald Starink

Proficiency tests for Ortho-phenyl phenol (OPP) and Pentachlorophenol (PCP) have been organized by the Institute for Interlaboratory since 2004.

Due to the lack of relevant standard test methods for the determination of OPP, calculated reproducibilities were compared with reproducibilities estimated from the Horwitz equation ( $RSD_R = 2 \times c^{-0.15}$ ) until now. For Pentachlorophenol (PCP), both existing methods (LFGB 82.02-8 and ISO17070:2006, the latter method superseding DIN53313:1996 and DIN14494:2003), mention identical precision data for leather only. These precision data for leather are in full agreement with the Horwitz equation and were used in the calculation of the z-scores due to lack of a better alternative.

In other PTs for other determinations, a quality improvement is visible over the years as a decrease of the dispersion is observed, see for example the article "Reliability of proficiency test results for metals and phthalates in plastics, Accred Qual Assur, 14:29-34 (2009)" by R.G. Visser. However, in the case of OPP and PCP a quality improvement is not clearly visible and therefore it is doubtful whether the target reproducibility based on the Horwitz equation will ever be met. This goal may be unreachable. Therefore it was now decided to use the iis PT data gathered since 2004, to estimate a more realistic target reproducibility. The PT data from 11 PTs and 18 different data sets resulting in 921 test results for OPP and 1050 test results for PCP are presented in Appendix 1. From these data is visible that the relative reproducibilities of the subsequent PTs show large similarity. As it is assumed that the actual dispersion of the test results will be concentration dependent, a Horwitz like equation was prepared to estimate the target reproducibilities for OPP and PCP:  $RSD_R = 4.6 \times c^{-0.15}$

For future PTs on OPP and PCP in textile, starting the 2015 PT iis15A07, iis will use this Horwitz-like equation to estimate the target reproducibilities to be used for the evaluation of the quality of the test results.

This document can be downloaded from the iis website [www.iisnl.com](http://www.iisnl.com)

## Appendix 1:

### OPP in textile:

Report	iis sample	n	outliers	Average	R	Rel. R (%)
iis04A05	0483	23	5	521.9	342.1	66%
iis06A02	0605	23	2	38.24	46.26	121%
iis07A02	0706	27	10	174.89	106.29	61%
iis07A02	0707	26	10	165.04	102.77	62%
iis08A02	0806	38	5	21.42	13.60	63%
iis08A02	0807	37	6	24.98	16.89	68%
iis09A02	0943	39	5	32.31	26.43	82%
iis09A02	0944	42	2	18.66	18.24	98%
iis10A02	1007	40	5	9.90	5.29	53%
iis10A02	1008	42	3	38.53	18.18	47%
iis10A08	1098	37	5	26.34	23.28	88%
iis10A08	1099	37	5	408.11	191.38	47%
iis11A06	11135	57	4	7.554	5.145	68%
iis11A06	11136	58	3	23.545	14.179	60%
iis12A06	12162	71	5	5.925	4.729	80%
iis12A06	12163	71	4	11.614	9.435	81%
iis13A06	13234	84	6	14.300	11.574	81%
iis14A07	14252	82	2	28.636	22.392	78%

Table 1: OPP in textile

### PCP in textile:

Report	iis sample	n	outliers	Average	R	Rel. R (%)
iis04A05	0483	28	4	2390.3	2002.2	84%
iis06A02	0605	32	1	38.39	38.65	101%
iis07A02	0706	34	12	189.67	124.06	65%
iis07A02	0707	29	15	547.4	289.1	53%
iis08A02	0806	48	0	19.71	16.13	82%
iis08A02	0807	48	0	46.61	49.43	106%
iis09A02	0943	50	2	38.35	31.36	82%
iis09A02	0944	51	1	19.23	16.95	88%
iis10A02	1007	48	1	10.06	5.58	55%
iis10A02	1008	45	5	53.29	27.19	51%
iis10A08	1098	41	5	7.620	3.133	41%
iis10A08	1099	42	4	537.14	355.53	66%
iis11A06	11135	68	4	7.123	3.774	53%
iis11A06	11136	68	4	15.784	8.736	55%
iis12A06	12162	80	4	8.923	5.812	65%
iis12A06	12163	80	8	21.309	9.582	45%
iis13A06	13238	93	4	14.955	8.289	55%
iis14A07	14253	88	3	29.531	21.455	73%

Table 2: PCP in textile