



by E.R. Montenij-Bos and A.S. Noordman-de Neef

iis memo 2201: Reproducibility of Phthalates in Leather observed in iis PTs

Proficiency tests for Phthalates in Polymers have been organized by the Institute for Interlaboratory since 2001. In 2017 iis started with a proficiency test for Phthalates in Leather which was shortly followed by a proficiency test for Phthalates in Textile in 2019.

Due to the lack of standard test methods with well described precision statements for the determination of Phthalates in the different matrices iis decided to develop an estimated relative reproducibility for Phthalates in Polymers based on iis PTs conducted from 2010 until 2017. This work is described in iis memo 1701 and used for the evaluation of the test results of Phthalates in Polymers, Leather and Textile since 2017. The target reproducibility as based on iis memo 1701 was estimated as the relative standard deviation of 16% of the mean multiplied by 2.8.

Test method ISO16181 (former ISO/TS16181), considered to be the test method for Phthalates in Leather, provides a variety of unclear precision data and therefore it was decided to continue to use the estimated iis target reproducibility from the Polymers PT also for the Leather PT (and in the future also for Textile).

With the progress of the iis PTs of Phthalates in Leather it was noticed that the observed reproducibility for Phthalates in Polymers is on average somewhat better than for Leather. Therefore, it was decided in 2022 to stop using the target reproducibility based on Phthalates in Polymers any longer and to develop a new target reproducibility based on the iis PTs for Phthalates in Leather to estimate a more realistic target variation for Phthalates in Leather. The PT data are given in Table 1 (next page) and are obtained from 6 iis PTs and 26 different data sets for 12 different Phthalates. It is observed that the relative standard deviation of the subsequent PTs and the different Phthalates is not dependent on the different Phthalates alone and could be combined to one target relative standard deviation for the different Phthalates of 21%.

This means that starting from 2022 PT iis22A01 for the evaluation of the quality of Phthalates in leather test results iis will use a target variation RSD_R of 21%. The target reproducibility based on iis memo 2201 was estimated as the relative standard deviation of 21% of the mean multiplied by 2.8.

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	2022	2021	2020	2019	2018	2017
BBP	14%	17%	22%	n.e.	16%	13%
DEHP	n.e.	19%	25%	n.e.	n.e.	n.e.
DBP	n.e.	17-21%	n.e.	n.e.	n.e.	18%
DIDP	n.e.	38%	n.e.	21%	n.e.	n.e.
DINP	20%	18%	n.e.	29%	n.e.	n.e.
DNOP	22%	n.e.	n.e.	n.e.	n.e.	n.e.
DCHP	n.e.	n.e.	16%	n.e.	21%	n.e.
DEP	n.e.	n.e.	23-27%	n.e.	n.e.	n.e.
DMP	n.e.	n.e.	n.e.	33-46%	n.e.	n.e.
DNHP	n.e.	n.e.	n.e.	14%	n.e.	n.e.
DNPP	14%	n.e.	n.e.	n.e.	n.e.	n.e.
DIBP	16%	n.e.	n.e.	n.e.	n.e.	16%

Table1: variation in iis PTs as RSD_R in % from 2017 until 2022 Phthalates in Leather