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iis memo 2202: Reproducibility of AZO Dyes in Leather/Footwear and Textiles in iis PTs

Proficiency tests for the determination of AZO Dyes in Leather/Footwear and/or Textiles have been organized by the Institute for Interlaboratory Studies (iis) since 1997.
For the determination of Aromatic Amines derived from AZO colorants test method ISO17234 is considered to be the official test method in Leather/Footwear and for Textile it is test method ISO14362.
Unfortunately, only for a few Aromatic Amines precision data are mentioned in these test methods and if mentioned the precision data is often not for a large concentration range and sometimes not conclusive. As alternative for the Aromatic Amines not mentioned in the test methods iis had used an estimated target reproducibility calculated with the Horwitz equation. Unfortunately, this could give a quite strict target value for the reproducibility.
Therefore, iis decided to use the iis PT data gathered from 2010 to 2021 to estimate a more realistic target reproducibility for the evaluation of the quality of the test results for the determination of Aromatic Amines derived from AZO Dyes in Leather/Footwear or in Textile.
Furthermore, it was decided to use the same target reproducibility for all Aromatic Amines.

The average relative standard deviations over all iis PTs and components for Leather is 27% and for Textile 21%. The relative standard deviations over the iis PTs for Leather are given in Table 1 and for Textile in table 2.

The estimated target reproducibilities can be calculated as follows: mean * iis target variation (RSD) * 2.8.

For future PTs on the determination of Aromatic Amines derived from AZO colorants, starting from 2022 PT iis22A02 (for leather/footwear) and iis22T05 (for textiles) iis will use the estimated target reproducibilities as mentioned in this memo (iis memo 2202).

year	component	RSD (%)
2021	4-Aminoazobenzene	19
2021	Benzidine	21
2020	Benzidine	29
2020	o-Ansidine	61
2019	3,3'-dimethoxybenzidine	23
2018	Benzidine	20
2017	Benzidine	20
2016	3,3'-dimethylbenzidine	39
2016	Benzidine	34
2016	o-Toluidine	37
2015	3,3'-dimethylbenzidine	24
2014	Benzidine	20
2013	2,4-Xylidine	36
2013	Benzidine	28
2012	4-Aminodiphenyl	25
2012	Benzidine	20
2011	2,4-Xylidine	19
2010	2,4-Xylidine	16
average		**27**

Table 1: Relative standard deviation (RSD_R) in % from 2010-2021 leather/footwear iis PTs

year	component	RSD (%)
2021	o-Anisidine	14
2021	2,4-Diaminotoluene	25
2020	3,3-dimethoxybenzidine	11
2019	2,4-Xylidine	26
2019	3,3-dimethoxybenzidine	11
2018	4-Amino-azobenzene	30
2018	3,3-dimethoxybenzidine	12
2018	Benzidine	12
2017	3,3'-dimethylbenzidine	36
2017	3,3-dimethoxybenzidine	17
2016	Benzidine 2nd sample	18
2016	3,3-dimethoxybenzidine	16
2016	Benzidine	17
2015	3,3'-dimethylbenzidine	15
2015	Benzidine	20
2014	o-Toluidine	32
2014	4.4 Diaminodiphenylmethane	21
2014	4-Chloro-o-Toluidine	24
2014	3,3-dimethoxybenzidine	21
2014	Benzidine	15
2014	4-Aminodiphenyl	21
2013	o-Toluidine	27
2013	2,4-diaminoanisol	53
2013	p-chloroaniline	56
2013	3,3-dimethoxybenzidine	17
2012	Benzidine	21
2012	3,3'-dimethoxybenzidine	18
2012	4-Aminodiphenyl	18
2011	4,4'-diaminodiphenylether	14
2011	4,4'-diamino-3,3'-dichlorodiphenylmethane	20
2011	3,3'-dimethoxybenzidine	17
2011	Benzidine	18
2011	4-Aminodiphenyl	31
2010	3,3'-dimethylbenzidine	18
2010	Benzidine	19
2010	4-Aminodiphenyl	18
2010	o-Toluidine	19
2010	4,4'-diaminodiphenylsulfide	18
average		**21**

Table 2: Relative standard deviation (RSD_R) in % from 2010-2021 textiles iis PTs