IWSFG Template for Reviewer comments and IWSFG secretariat observations[1]

Document reviewed: IWSFG Standard 1:2017 – Criteria for recognition as a flushable product	**Due Date:** 2017-09-01

Initials	**Line number** (e.g. 17)	**Clause/ Subclause** (e.g. 3.1)	**Paragraph/ Figure/ Table/** (e.g. Table 1)	**Type of comment**[2]	**Comments**	**Proposed change**	**Observations of the secretariat**
Lenzing	114	2	Purpose	Ge	As IWSFG is not an organization defined by standard organisation in each country of the world, we recommend using the term “guideline” and not “standard” for the proposed IWSFG test methods.	Use the term “guideline” instead of “standard”.	
Lenzing	107	1	Introduction	Te	Why all materials other than natural cellulose products can impact the collection and treatment systems and affect the aquatic environment?	Show scientific facts which show the negative impact of other cellulosic materials on the environment. Literature Park et al. in 2004 shows that cotton (natural fiber) takes longer to biodegrade as compared to viscose fibers (Attachment 2). Remove line 107.	
Lenzing	154	4	Normative References	Te	Test method TAPPI/ANSI T 401 om-15 is designed for analysis of papers and paperboards. This test is not used in the textile and nonwovens industries.Therefore there are no technical experiences with this test. Moist toilet tissues and wipes are made of nonwovens fabrics. Nonwovens fabrics are not defined as papers or paperboards. Any fiber analysis to identify the fibers in nonwovens fabrics have to be tested with the standard tests used in the fibers industries. Lenzing as a cellulosic fibers producer uses the following test to identify fibers in textile and nonwoven fabrics more than 30 years: P.-A. Koch – microscopy of fibers materials Fr. Stratmann – to detect and identify the fibers Materials Microscopy in theory and practice, part 5 – Swiss textile apparel and fashion school	Replace the TAPPI/ANSI T 401 om-15 test by the Following test: P.-A. Koch – microscopy of fibers materials Fr. Stratmann – to detect and identify the fibers Materials Microscopy in theory and practice, part 5 – Swiss textile apparel and fashion school	

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Lenzing	180	6.2	Critical Criteria to be Met	Te	IWSFG is a guideline and the wording in the guideline needs to be adapted. Words such as “must” needs to be replaced by use of appropriate wording.	Change the word “must” to “should”. Change text to: To be considered to be a flushable product, products **should meet** the acceptance criteria of the IWSFG PAS documents as follows…	
Lenzing	181	6.2	Critical Criteria to be Met	Te	What is the reason to add all 3 disintegration tests? Are there any similarities between the 3 disintegration tests?	Explain and show data for a few products tested by all 3 disintegration tests.	
Lenzing	183 - 187	6.3	Conformity Assessment	Te	Who are the third party processes and laboratories? How is the certification process?	Explain the certification process and define laboratories to assess the products.	
Lenzing	198-199	6.4.1	Conforming Products	Ge	IWSFG is not an ISO organisation. How can a product be certified?	Clarify or remove lines 198-199.	
Lenzing	200-201	6.4.1	Conforming Products	Ge	What does the sentence in the note describe? The meaning in unclear.	Please clarify it.	
Lenzing	201-220	6.4.2	Non-Conforming Products	Ge	There is an INDA/EDANA Code of Practice guideline which was agreed between the nonwovens industries and water as well as waste water associations. We recommend using this guideline and stay with one language and guideline for the industries to avoid mistakes a misinterpretation.	Replace it by the second version of INDA/EDANA Code of Practice published in April 2017.	
Lenzing	226-231	7.1.1	Safety in the Environment and Human Health	Ge	What is the rationale for this statement?	Remove chapter 7.1.1.	
Lenzing	232-234	7.1.2	Plastics	Te	Definition for plastic is not related to any International Standards.	Find proper definition for plastics based on International Standards. One possibility is to use the terms and definition in ISO TC 61- Plastics.	
Lenzing	235-254	7.1.3	Regenerated Cellulose Fibers	Te	There are no scientific facts to show non-biodegradability and negative impact of rayon on the environment. See details of	Remove chapter 7.1.3.	

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					comments in PAS 1 for chapter 7.2.2.		
Lenzing		7.3. – 7.5.2.			Comments to these sections are prepared in separate documents.		

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Lenzing	82	1	Introduction	Ge	The term “moist wipes” is not used in the nonwoven industry	Recommend to replace it by “wet wipes”	
Lenzing	196-202	5.2.1.	Biodisintegration	Te	Description for “Biodisintegration” in this chapter describes “Biodegradation” according to the ISO 472:2013, 2.1680. It does not describe “Biodisintegration” (see below). *Copy of ISO 472:2013, 2.1680 Biodegradation:* *<composting of plastics waste> degradation caused by biological activity, especially by enzymatic action, leading to a significant change in the chemical structure of a material.* “Disintegration” and “Biodegradation” are 2 different definitions (see ISO 14855-1:2012 Chapter 3 and ISO 17088:2012 Chapters 1 & 3).	Change text to: 5.2.1. Disintegration: Physical breakdown of a material into very small fragments. Source: ISO 14855-1:2012: “Determination of the ultimate aerobic biodegradability of plastic materials under controlled composting conditions — Method by analysis of evolved carbon dioxide Part 1 (Chapter 3 point 3.3. disintegration) And ISO 17088:2012: “Specifications for compostable plastics” (point 3.6 disintegration) Remove NOTE for biodegradability	
Lenzing	204-210	5.2.2.	Disintegration	Te	There is only one definition for “Disintegration” in ISO 14855-1 and ISO 17088 which describes the physical break down of a material into very small fragments. These are related to biological disintegration. There is no standard definition for disintegration e.g. Slosh-Box disintegration.	Change text to: A process in which a product weakens, loses integrity, and breaks into smaller parts Remove NOTES	
Lenzing	231-234	5.3.1.	Applied Substances	ED	Sentence is not clear.	Use different wording for the clarity and avoiding misunderstanding.	
Lenzing	235-238	5.3.2.	Dry Tissues	Te	ISO 24294:2013 is a standard for Timber — Round and sawn timber Vocabulary. Point 6.14 in the ISO 24294:2013 describes absolute dry timber, oven dry timber, oven dry wood, en CA US, timber (3.2) that contains neither free moisture (6.2) nor	Add an international standard definition for the term “Dry Tissues” or remove 5.3.2.	

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					bound moisture (6.3). ISO 24294:2013 does not define any dry tissues. There are also no definitions for dry tissues in ISO 12625-1:2011 “Tissue Paper and Tissue Products”.		
Lenzing	244-257	5.3.4.	Flushable Product	Te, Ge	What is the reason to have a new definition for “Flushable Product” in the IWSFG documents? Flushable Products are defined in the second version of INDA/EDANA Code of Practice published in April 2017 which was agreed between nonwovens industries, water and waste water associations in US.	To get the same understanding and clarity across the entire nonwoven industries, water and waste water associations about flushable products, it is recommended to use the same language and wording for “Flushable Products” as explained in the second version of INDA/EDANA Code of Practice published in April 2017.	
Lenzing	259-265	5.3.5.	Moist Tissues	Te	ISO 24294:2013 is a standard for Timber — Round and sawn timber Vocabulary Point 6.14 in the ISO 24294:2013 describes absolute dry timber, oven dry timber, oven dry wood, en CA US, timber (3.2) that contains neither free moisture (6.2) nor bound moisture (6.3). ISO 24294:2013 does not define any moist tissues. There is also no definition for moist tissues in ISO12625-1:2011	Add an international standard definition for “Moist Tissues” or remove chapter 5.3.5.	
Lenzing	298-304	5.3.12	Tissue	Te	This chapter does not explain moist toilet tissues or wipes. Substrates of moist toilet tissues and wet wipes are nonwoven fabrics. ISO 12625-1:2011 is an ISO standard for Tissue paper and Tissue products. Chapter 4.6 in ISO 12625-1:2011 describes base paper.	Remove chapter 5.3.12.	

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					According to the ISO 12625-1:2011 3.0 "General principles for the use of the term "tissue" *nonwovens are not classified as tissue, even if one subgroup of the nonwovens is manufactured in a wet-laid manner according to a process similar to the tissue making process.*		
Lenzing	305-308	5.3.13	Toilet Paper	Ge	Why toilet papers need to be added in IWSFG documents? If toilet paper is part of the term "Dry Tissues" (see section 5.3.2) why there is a need to define again toilet paper?	Explain the reasons to have toilet paper in this document. Note: ISO TC6 working groups are focused on topics with papers, boards and pulp. Clarify if toilet paper is part of the dry tissues. Make consistent content in 5.3.2. and 5.3.13 or remove chapter 5.3.13.	
Lenzing	339-343	5.4.6	Regenerated Cellulose	Te	There are no scientific facts and references to show the non-biodegradability of viscose/rayon in the range of natural environments and it's negative impact on the environment. Therefore, no need to add the term "regenerated cellulose" in the PAS 0 (see Lenzing's comments for chapter 7.2.2. in PAS 1).	Remove chapter 5.4.6.	
Lenzing	345-346	5.4.7.	Specification	Ed	What is the reason to cite an ISO reference?	Remove line 346	
Lenzing	348-354	5.4.8.	Unit Size	Ed	There is no definition here. Dry tissues, facial tissues and moist tissues are mentioned without any international standard definition for those terms.	Define the unit size. Define dry tissues, moist tissues, facial tissues based on existing international standards. If there are no standards to define those products terms, define only the unit size and remove the lines 351 – 355.	

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Lenzing			Plastics	Ge	In PAS 1 the term plastics is used, but there is no definition for plastics in PAS 0.	Add an international standard definition for plastics according to the existing standards such as ISO 472:2013, Plastics - Vocabulary	

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Lenzing	78-81	4.1.	Normative References	Te	Test method TAPPI/ANSI T 401 om-15 is designed for analysis of papers and paperboards. This test is not used in the textile and nonwovens industries to analyze fibers. Therefore, there are not existing technical experiences with this test. Moist toilet tissues and wipes are made of nonwovens fabrics. Nonwovens fabrics are not defined as papers or paperboards. Any fiber analysis to identify the fibers in nonwovens fabrics has to be tested with the standard tests used in the fibers industries. Lenzing as a wood-based cellulose fiber producer uses the following test to identify different fibers in the textile and nonwovens fabrics more than 40 years: P.-A. Koch – microscopy of fibers materials Fr. Stratmann – to detect and identify the fibers Materials Microscopy in theory and practice, part 5 – Swiss textile apparel and fashion school.	Replace the TAPPI/ANSI T 401 om-15 test by the Following test: P.-A. Koch – microscopy of fibers materials Fr. Stratmann – to detect and identify the Fibers Materials Microscopy in theory and practice, part 5 – Swiss textile apparel and fashion school	
Lenzing	101-102	7.2.1.	Plastics	Te	Definition for plastic is not related to any International Standards.	Provide a definition for plastics based on international standards. One possibility is to use the terms and definition for Plastics according to the ISO TC 61- Plastics.	
Lenzing	103 - 117	7.2.2.	Regenerated Cellulose Fibers	Te	References 1 and 2 were cited as technical arguments to ban viscoe/rayon in flushable products. References 1 and 2 do not show any relevant and scientific facts to ban viscose/rayon in flushable products: **Reference 1**: This is an old version of the UNEP report (2015). The new report of UNEP published in 2016 mentions the synthetic polymers made from fossil fuels identified as a source of microplastics and not viscose/rayon. **Conclusion: Viscose/rayon is not identified as a source of microplastics in the UNEP report 2016 (Attachment 1; Executive Summary).**	**Remove chapter 7.2.2.**	

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					UNEP report 2016 cites the literature Shen et. al. 2010 which shows Life Cycle Analysis studies on viscose, lyocell fibers and cotton (Attachment 1, chapter 8, the role of LCA assessment p. 126 and p. 250). This reference mentions higher impact of cotton (natural fibers) on the environment compared to those of man-viscose and lyocell fibers. This was on the basis of ecotoxicity, eutrophication, water use and land use of cotton. **Reference 2:** *When microplastics is not plastic: The Ingestion of Artificial Cellulose Fibers by Macrofauna Living in Seagrass Macrophytodetritus* Following issues were identified with this reference: 1) The study raises issues with dyed fibers and dye stuffs and their impact on aquatic organisms. It does not discuss the impact of fibers itself on the aquatic organisms. **Fact: Current flushable moist toilet tissues on the market are not colored and do not contain any dye stuffs.** *2)* Chapter 4 “Discussion” on p. D: *“As composition only 11 out of 91 fibers have been confirmed by Raman Spectroscopy and results or any interpretation must be taken with care”.* **Fact: To determine 11 out of 91 fibers is statistically not significant. Results are not statistically proofed.** *3)* Chapter 4 “Discussion” on p. D. & E: *“That was confirmed by Raman spectroscopy analyses that demonstrated their cellulose composition. The comparison of the analyzed AFs morphology with photographs of fibers from the literature revealed a close similarity with viscose fibers from the previous studies of Kramar et al (Figure 7)”.* **Fact: Raman spectroscopy is in general an alternative method to differentiate between pure cellulose I (cotton) and pure cellulose II (viscose/rayon) as long as the fibers are not**		

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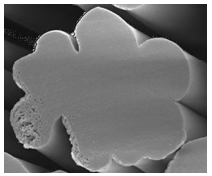
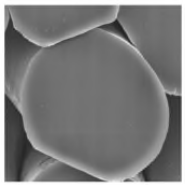
					contaminated with other solid or chemical compounds. If fibers are contaminated with other substances, identification between fiber types by use of Raman Spectroscopy will not lead to 100% accurate results. **SEM image in figure 7 (p. F), shows fiber length and fiber surface and not the fiber cross-section. Therefore, it is not clear if this image is a viscose fiber or not. To identify different fibers types by SEM method, a SEM image must be also made for the fiber cross-section.** 4) Chapter 4 "Discussion" p. E: "*Nonsynthetic materials such as viscose can easily be mistaken for plastic due to its color, shape, or buoyancy".* **This statement is not correct. Viscose and synthetic fibers such as polyester show completely different fiber surfaces, fibers cross-sections, chemical and physical properties.** Fiber cross-section viscose:  Polyester 		

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					5) Regarding retention of fibers: Chapter 4 “Discussion”, p. G: *“Even though 27% of sampled organisms contained 1 or more artificial fibers, the average amount of artificial fibers in each individual digestive tract was small (1.38 fiber) which is relatively low and could therefore indicate the small retention time of these fibers in the guts of the sampled invertebrates.”* **Fact: The fibers do not accumulate in the guts of the invertebrates.** 6) Regarding “take-up” in the food chain: Chapter 4 “Discussion” p. G: *“It has recently been demonstrated by in vitro studies that microplastics can be transferred in invertebrates from one trophic level to another. Plastics can be translocated to consumer tissues and then be transmitted to the predator or directly be transmitted from the consumer’s digestive tract to the predator’s digestive tract. The observed viscose/rayon fibers thus do not seem to be transmitted from lower to higher trophic levels via predation. One of the main possible explanations could be related to the lower retention time of the nonplastic observed fibers here in the gut.”* **Fact: The statement regarding potential take-up in the food chain, implying bio-accumulation, is proven false by this reference which states *“The observed viscose/rayon fibers thus do not seem to be transmitted from lower to higher trophic levels via predation.”*** 7) Regarding biodegradation of viscose: Chapter 4 “Discussion” p. G: *“Indeed, cellulose, even of artificial origin like viscose, is more digestible and degradable than plastic. Some marine invertebrates are known to be able to digest cellulose, and this*		

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					could explain both the faster digestive transit of the fibers and the absence of accumulation. The small average amount of AFs found in the invertebrates' gut contents also seems to favor this nonaccumulation or transmission." **Fact: Results of study support both the biodegradation and lack of bioaccumulation of viscose/rayon.** Below are references which show: A) Higher biodegradability of viscose compared to natural fibers "cotton", B) Mistakes in analytical testing to differentiate between cotton and viscose/rayon in the marine environment and C) Biodegradability VINCOTTE certificates for Lenzing™ wood-based cellulose fibers TENCEL® branded lyocell fibers and Lenzing Viscose® fibers in soil, marine, home compost and compost. **A) Biodegradation of viscose compared to cotton:** *Park, C. H.; Kang Y. K.; Im S. S.; „Biodegradability of cellulose fabrics", J. Appl. Polym. Sci. 2004, Vol. 94, 248-253 (Attachment 2).* Park et al. in 2004 shows the higher biodegradability of viscose/rayon compared to those of cotton. **Parts of the ABSTRACT:** Biodegradability of cellulose fabrics was evaluated by use of a soil burial test, an activated sewage sludge test, and an enzyme hydrolysis. Surface changes after biodegradation were observed by optical microscopy. From X-ray diffraction analysis (XRD), changes in the crystallinities and the internal structures as a result of degradation were also investigated. It was shown that		

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					biodegradability decreased in the following order: rayon>cotton>acetate. **B) Fibers in the marine environment (microplastics)** **Fiber type identification: differentiation between natural (cotton) and regenerated cellulose fibers (viscose/rayon)** I.*R.Comnea-Stancu, K.Wieland, G. Ramer, A. Schwaighofer and B. Lendl "On the identification of rayon/viscose as a major fraction of microplastics in the marine environment: discrimination between natural and man-made cellulosic fibers by Fourier Transform Infrared Spectroscopy" – Applied Spectroscopy published in 2016* (Attachment 3) A final note on studies that report on fibres found in the marine environment: attempts to differentiate between viscose/rayon (wood-based cellulose fibers) and natural cellulose fibres - using Fourier transform infrared (FT-IR) transmission spectroscopy and commercial libraries, as applied in the referenced deep sea debris research - lead to ambivalent results, with a high likelihood of false identification of natural fibres as viscose/rayon (wood based cellulose fibres). Therefore, the published results do not prove the presence of viscose/rayon fibres in the sampled marine environments. Attenuated total reflection (ATR) IR spectroscopy technique is a more suitable technique for discriminating types of natural versus viscose/rayon fibres, when used with a reference data set of spectra obtained with the same sampling technique. **C) Biodegradability of Lenzing™ wood-based cellulose fibers** "Lenzing Viscose® fibers and TENCEL® fibers are being used for many years in wipes applications. These are made of pulp and pulp is made of renewable sources wood. The cellulose in Lenzing® viscose fibers, TENCEL® fibers, in natural cellulose fibers (e.g. cotton, bast fibers) and pulp are the same biopolymer and all fibers are fully biodegradable in a range of natural environments. Lenzing provides all VINCOTTE certificates which		

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					show the biodegradability of their wood-based cellulose fibers in soil, in the sea water and in compost (home and industrial). Certificates VINCOTTE are based on current existing International Standards Tests and proofed by 3rd party (Attachment 4).		
Lenzing	120-121	7.2.3.	Test Method	Te	Test method TAPPI/ANSI T401 om-15 is designed for analysis of papers and paperboards. This test is not used in the textile and nonwovens industries to analyze fibers. Therefore, there are not existing technical experiences with this test. Moist toilet tissues and wipes are made of nonwovens fabrics. Nonwovens fabrics are not defined as papers or paperboards. Any fiber analysis to identify the fibers in nonwovens fabrics needs to be tested with the standard tests used in the textile and nonwovens industries. Lenzing as a wood-based cellulose fiber producer uses the following test to identify fibers in textile and nonwoven fabrics more than 30 years: P.-A. Koch – microscopy of fibers materials Fr. Stratmann – to detect and identify the fibers Materials Microscopy in theory and practice, part 5 – Swiss textile apparel and fashion school	Replace the TAPPI/ANSI test by the following test: P.-A. Koch – microscopy of fibers materials Fr. Stratmann – to detect and identify the fibers Materials Microscopy in theory and practice, part 5 – Swiss textile apparel and fashion school	
Lenzing	122-123	7.2.3.	Test Method	Te	Viscose and lyocell fibers are wood-based cellulose fibers and fully biodegradable in a range of natural environments. They do not show negative impact on the environment (Attachment 4). Therefore, no need to analyse regenerated cellulose.	Delete regenerated cellulose from the note. Change text to: *NOTE: This test identifies synthetic fibers.* Find a definition for “synthetic fibers” and add it into the PAS 0.	
Lenzing	124-126	7.2.3.	Test Method	Te	What is the reason to add this statement?	Remove lines 124 – 126.	
Lenzing	129-130	7.3.	Other Materials	Te	What is the reason to add this statement in chapter 7.3.?	Clarify it.	
Lenzing	172-173	[1]	Bibliography	Te	Reference 1 is the old version of the UNEP report. There is a new report of UNEP published in 2016 (Attachment 1).	Replace reference 1 to: UNEP (2016). Marine plastic debris and microplastics –	

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						Global lessons and research to inspire action and guide policy change. United Nations Environment Programme, Nairobi (Attachment 1).	
Lenzing	182-184	[5]	Bibliography	Te	Reference 5 cannot be opened.	Please make it assessable.	
Lenzing			**ATTACHMENTS:**				
Lenzing			Attachment 1		UNEP (2016). Marine plastic debris and microplastics – Global lessons and research to inspire action and guide policy change. United Nations Environment Programme, Nairobi.		
Lenzing			Attachment 2		Park, C. H.; Kang Y. K.; Im S. S.; „Biodegradability of cellulose fabrics“, J. Appl. Polym. Sci. 2004, Vol. 94, 248-253		
Lenzing			Attachment 3		I.R.Comnea-Stancu, K.Wieland, G. Ramer, A. Schwaighofer and B. Lendl On the identification of rayon/viscose as a major fraction of microplastics in the marine environment: discrimination between natural and man-made cellulosic fibers by Fourier Transform Infrared Spectroscopy – Applied Spectroscopy published in 2016. Open access available at: http://journals.sagepub.com/doi/abs/10.1177/0003702816660725?ai=1gvoi&mi=3ricys&af=R		
Lenzing			Attachment 4		VINCOTTE biodegradability certificates for TENCEL® fibers		

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Initials	**Line number** (e.g. 17)	**Clause/ Subclause** (e.g. 3.1)	**Paragraph/ Figure/ Table/** (e.g. Table 1)	**Type of comment**[2]	**Comments**	**Proposed change**	**Observations of the secretariat**

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IWSFG Template for Reviewer comments and IWSFG secretariat observations[1]

Document reviewed: PAS 2A:2017 – toilet and Drain Line Clearance Test Methods – Toilet Clearance	**Due Date:** 2017-09-01

Initials	**Line number** (e.g. 17)	**Clause/ Subclause** (e.g. 3.1)	**Paragraph/ Figure/ Table/** (e.g. Table 1)	**Type of comment**[2]	**Comments**	**Proposed change**	**Observations of the secretariat**
Lenzing	84	2	Purpose	Ge	The note is not clear.	Rewrite the note.	
Lenzing	100-101	5.1.	Unit size for dry tissues	Ge	What is the definition for dry tissues? As mentioned in PAS 0, there is no standard definition for dry tissues. ISO 24294:2013 cited in PAS 0 is a standard for Timber — Round and sawn timber Vocabulary. It does not describe the term “Dry Tissues”. What is the difference between section 5.1. and 5.4.?	Add an international standard definition for “Dry tissues” in PAS 0. Otherwise replace the term “Dry Tissues” by other appropriate international standard terms. Remove paragraph 5.1. and rewrite paragraph 5.4.	
Lenzing	102-105	5.2.		Ge	For which kinds of products is this unit size? Is it for toilet tissue? The text looks like the text in the INDA/EDANA GD3 guideline FG501 4.3. which describes sampling for toilet tissue. However, in paragraph 5.2. of IWSFG PAS 2A, there is no wording for “toilet tissue”. It is only mentioned in Figure 1 in line 108.	Rewrite it for better understanding.	
Lenzing	177-178	8.3.1	Dry Tissues	Ge	As mentioned in PAS 0, there is no standard definition for dry tissues. ISO 24294:2013 cited in PAS 0 is a standard for Timber — Round and sawn timber Vocabulary. It does not describe the term “Dry Tissues”.	Add an international standard definition for “Dry tissues” in PAS 0. Otherwise replace the term “Dry Tissues” by other appropriate international standard terms.	
Lenzing	180-183	8.3.2.	Moist Tissues	Ed	This is already described in 5.3.	Remove lines 180 - 183	
Lenzing	189-191	8.3.3	Other Products	Ed	This is already described in 5.4.	Remove 8.3.3	
Lenzing	209-210	9.1.	Storage of samples	Ge	Lines 209-210 in chapter 9.1. are not consistent with the lines 170-171 in chapter 8.2. If moist tissues removed from the package and have to be tested immediately, no need	Remove lines 209 - 210. Remove lines 213 – 221 for moist tissue storage.	

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					to bring the rest back again into the package. Note: By opening a wipes package, water evaporation starts immediately and the solid/moisture ratio will be changed which can have an impact on the test results.		
Lenzing	237 - 269	10.2.	Test procedure	Ed	To have a test procedure and note in this section is confusing.	Rewrite 10.2. for the exact test procedure without any notes.	
Lenzing	271-275	10.2	Table 1	Ed	The third part in the table 1 is not understandable: *Specimen still remains in the bowl or trap following a 3rd flush. Visual evidence of clogging (e.g. rise in water level) with insufficient capacity in the bowl to accommodate a further flush:* *1. The specific flush test has failed.* *2. Continue with the next designated flush in the series.*	Please explain it.	
Lenzing	284 - 288	10.4	Calculations	Ge	There is no need for calculation if a sample requires more than 3 flushes and it fails (see also chapter 11 of this document).	Explain 10.4. or remove it.	

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Document reviewed: PAS 2A:2017 – toilet and Drain Line Clearance Test Methods – Toilet Clearance	**Due Date:** 2017-09-01

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Document reviewed: PAS 2A:2017 – toilet and Drain Line Clearance Test Methods – Toilet Clearance	**Due Date:** 2017-09-01

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IWSFG Template for Reviewer comments and IWSFG secretariat observations[1]

Document reviewed: PAS 3B:2017 – Disintegration Test Methods-Slosh Box	**Due Date:** 2017-09-01

Initials	**Line number** (e.g. 17)	**Clause/ Subclause** (e.g. 3.1)	**Paragraph/ Figure/ Table/** (e.g. Table 1)	**Type of comment**[2]	**Comments**	**Proposed change**	**Observations of the secretariat**
Lenzing	120	2	Purpose	Te	Where does the Reynolds number 20,000 come from?	Explain the scientific background and it's relation to the waste water sewage systems.	
Lenzing	155	7.1	Apparatus	Te	The material for plastic box of Slosh-Box needs to be defined. Some materials show calcification on the surface especially if the hard water is used. It causes that fibers fragments will pick on the surface of the box and influence the test results.	Discuss this issue with the manufacturer of Slosh-Box to define the materials for the boxes.	
Lenzing	156-157	7.1	Slosh Box Design Parameters	Ge	Why is the inside dimension of the Slosh-Box different as those of Slosh-Box described in the INDA/EDANA GD3 FG502 (Chapter 4.1)	Explain the size differences of Slosh-Box.	
Lenzing	164	7.1	Slosh Box Design Parameters	Ge	A.1.2. not mentioned in Annex 1.	Add A.1.2. to Annex 1	
Lenzing	179	7.3 (b)	Other Equipment	Te	According to our experience use of fine sieve or a strainer will have an impact on the test results. Disintegrated materials agglomerate on the strainer. No need to have a sieve or hand strainer.	Remove 7.3 (b)	
Lenzing	180	7.3 (c)	Other Equipment	Te	What is the technical reason to use a sieve with significantly smaller pore size (6.3 mm) for Slosh-Box test as those of described in GD3 FG502 (12.5 mm)?	Provide scientific references which explain the necessity for use of smaller pore size of the sieve for the slosh-box test.	
Lenzing	193	8.2	Number of test pieces	Te	Why 5 specimens and not 6 (FG502 uses 6 specimens)? If the slosh-box is designed with 3 boxes it makes more sense to test 6 specimens.	Explain the use of 5 specimens instead of 6.	
Lenzing	193-197	8.2	Number of test pieces	Ge	If 5 specimens have to be tested and the package of wipes is in divided in 5 sections to take one sample from each section, then the following sentence is not clear: Specimens should be obtained at least from two distinct packages of a product.	Remove the text: Specimens should be obtained at least from two distinct packages of a product.	

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Lenzing	208-210	8.3.1	Dry Tissues	Ge	The title is about dry tissues and not toilet papers. Toilet papers and their performance are in the scope of ISO TC 6 working groups (paper, board and pulps).	Replace toilet paper in line 208 and 210 by dry tissues.	
Lenzing	209-210	8.3.1	Dry Tissues	Te	How is the total area of 180 – 300 cm^2 calculated?	Explain.	
Lenzing	216-224	8.3.2	Moist Tissues	Ge	What is the purpose of chapter 8.3.2? Number of test specimens was mentioned in chapter 8.2.	Explain or rewrite chapter 8.3.2	
Lenzing	219	8.3.2	Moist Tissues	Te	Why the size of the fabric should be at 260 cm^2?	Explain.	
Lenzing	236-243	9.1	Storage of Samples	Ge	If the package of moist tissues is cut on its side (lines 200-202), how is it possible to store the rest of the samples in the same soft plastic package?	A consistent sampling procedure and sample storage is required.	
Lenzing	254-255	10.1.1	Toilet and Drain Line Method	Ge	If the toilet with 4.5 L flush is not available what would be recommended?	Give a table with different toilets flushes for different regions in the world.	
Lenzing	269-270	10.1.1	Toilet and Drain Line Method	Ge	How and where the sample should be hold for 15 minutes?	It is not clear. Explain it.	
Lenzing	274-278	10.2 (b, c)	Test Set-Up	Te	Why 4l/13 rpm?	Explain the technical reasons in a wastewater system for a decision 4l/13 rpm.	
Lenzing	289-294	10.3	Test Procedures	Te	How is it possible to measure pieces 6mm x 6mm visually in a moving Slosh-Box to take a picture?	Describe a procedure.	
Lenzing	295-299	10.3 (4a)	Test Procedures	Te	What is the diameter of the sieve plate? 4 l Box is very difficult to handle it and it is not safe for the lab technician to poor the 4l content on a very small sieve with a pore size of 6.3 mm. What is the procedure if the boxes do not equipped with a drain to empty the water?	Safety is very important for lab technicians. Any test procedure has to be safe for the laboratory stuffs. Provide appropriate values for the diameter of the sieve plate with a pore size of 6.3 mm. Define a test procedure to empty the boxes which do not equipped with a drain.	

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					A range of 10 – 15 cm distance between the drain and the top surface of the sieve is not clear.	Define an exact value for the distance. Define also a distance in a test procedure if boxes are not equipped with a drain to empty the water.	
Lenzing	300-302	10.3 (4b)	Test Procedures	Te	It is not clear the function of a hand sieve in this context. As commented for line 179 use of any hand sieve shows an impact on the test results (fibers fragments agglomerate on a strainer).	Remove lines 300-302 [10.3 (4b)].	
Lenzing	308	10.3	Test Procedures	Te	What is the technical reason to use 6.3 mm sieve instead of 12.5 mm sieve?	Provide information related to the wastewater systems.	
Lenzing	309-310	10.3	Test Procedures	Te	What is the reason to rinse the sieve 6.3 mm at 4l for one minute instead of 2 minutes?	Provide information for this change.	
Lenzing	339	10.5	Test Results	Te	Moist toilet tissues are made of cellulosic fibers. Drying of cellulosic materials at 103°C for 4 hours is low. Depends on the material size and morphology, it takes at least 8 hours to dry cellulosic materials at 105°C.	Change the text to: Quantify the dry-mass of all residual fragments from the 5 specimens by **drying the fragments at 105 °C in the oven overnight.**	
Lenzing	345-348	10.6	Calculation	Te	10.3.10 (a) describes a sample with no residuals remaining on the sieve.	Remove line 345.	
Lenzing	372-373	11	Acceptance Criteria	Te	Lines 372-373 are not aligned with section 10.5. (b). Section 10.5. (b): Record the test results for each of the 5 specimens. Collect any residual fragments that remained on the 6.3 mm sieve during each test. Quantify the dry-mass of all residual fragments from the 5 specimens by drying the fragments at 103 °C for 4 to 8 hours. For a product to pass, total dry-mass of the residual fragments (>6.3 mm) must be less than 5 % of the average initial dry mass calculated dry-mass of 5 specimens.	Rewrite section 11 or 10.5. (b) for clarity and consistency.	

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					Section 11, lines 372 - 373: If there is material left on the 6.3 mm sieve after the 1 minute rinse, the percent of the total initial dry mass (as computed in step b of section 10.5) passing through the 6.3 mm sieve for the four (4) of the five (5) test specimens after 120 minutes of testing must be greater than 95%. This result must be supported with visual examination and pictures of solids on the sieve.		
Lenzing	421-422	A.1.1	Sources	Ed	Lenzing Instruments GmbH & Co. is cited as a source for Slosh-Box.	Add a picture of Slosh-Box from Lenzing Instruments GmbH in Annex 1.1. 	
Lenzing	497-498	A.4.4.1	Equipment	Te	If there are no toilets at 4.5 L flushes there should be a table to recommend other toilets.	Provide a table with different toilet flushes for different regions of the world.	
Lenzing	510	A.4.4.2	Procedure	Te	Line 510 in section A.4.4.2 describes no more than 2 wipes should be flushed at one time. However it is not mentioned in section 10.1.1.	Consistency in test procedure in A.4.4.2 and 10.1.1 is required.	
Lenzing	528-529	A.4.5.2	Procedure	Te	In A.4.5.2 is mentioned to submerge the specimen in the water and swirl them for approx. 30 seconds or longer if necessary to remove any perceptible lotion or additives. What is longer? How can the labs determine if a material needs longer than 30 seconds to remove the lotion?	If IWSFG PAS 3B is intended to be used by external labs globally, test procedures shall be described very precise to avoid any mistakes in testing.	
Lenzing	587	A.5.4.1 (1)	Procedure	Te	Use of a strainer shows an impact on the	Remove line 587.	

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					test results. Because fiber fragments will agglomerate and it influences the test results.		
Lenzing	588	A.5.4.1 (2)	Procedure	Te	The test requires 4 L water in a box and the picher is 3L. Which one is correct?	Clarify.	
Lenzing	615	A.5.4.2	Procedure	Te	The picture 3 describes transfer samples/fibers from strainer to 3 L picher. Test requires 4 L water in a box. This is an inconsistent message.	Clarify or rewrite the picture 3 in line 615.	
Lenzing	635-636	A.6.2.1 (2)	Loss of Mass Calculation Procedures	Te	It is mentioned to dry the materials in the oven at 103°C.	Recommend to change the temperature from 103°C to 105°C to dry the cellulosic materials completely.	
Lenzing	641	A.6.2.1 (5)	Loss of Mass Calculation Procedures	Te	The time to dry the material in this section is not the same as the time mentioned in the section 10.5 (b).	Change text to: Dry the specimen in the oven overnight.	
Lenzing	647	A.6.2.1 (10)	Loss of Mass Calculation Procedures	Te	This is inconsistent with section 11 (lines 372-373). Section 10.5 (b): Record the test results for each of the 5 specimens. Collect any residual fragments that remained on the 6.3 mm sieve during each test. Quantify the dry-mass of all residual fragments from the 5 specimens by drying the fragments at 103 °C for 4 to 8 hours. For a product to pass, total dry-mass of the residual fragments (>6.3 mm) must be less than 5 % of the average initial dry mass calculated dry-mass of 5 specimens. Section 11 lines 372-373: If there is material left on the 6.3 mm sieve after the 1 minute rinse, the percent of the total initial dry mass (as computed in step b of section 10.5) passing through the 6.3 mm	Requires a consistent description for sections 10.5. (b), 11 (lines 372-373) and A.6.2.1. (10).	

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					sieve for the four (4) of the five (5) test specimens after 120 minutes of testing must be greater than 95%. This result must be supported with visual examination and pictures of solids on the sieve. A.6.2.1 (10): Record the total weight of residuals from tests 1-5.		
Lenzing	655	A.6.3.1 (3)	Initial Dry Mass Calculation Procedure	Te	To dry completely cellulosic materials it is recommended to change the oven temperature from 103°C to 105°C.	Recommend to change the oven temperature from 103°C to 105°C.	
Lenzing	660	A.6.3.1 (6)	Initial Dry Mass Calculation Procedure	Te	Inconsistent with sections 10.5 (b)	Change text to: Dry the specimen in the oven overnight.	
Lenzing	689-725	Annex 8	Alternative Approach for Recovering and Rinsing Materials from the Slosh-Box	Ed	Already described in A.5.4.	Remove Annex 8.	

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Document reviewed: PAS 4:2017 – Settlement Test Method	**Due Date:** 2017-09-01

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Lenzing	87-88	2	Purpose	Te	Is it talking about the settlement in a septic tank?	Clarify it.	
Lenzing	140-141	6 (note)	Principles	Te	What is required in the note?	Not clear and needs to be explained.	
Lenzing	148-172	7	Apparatus	Ed	There are no Annexes to show the column. There is a need to have photographs to understand the equipment and avoid any mistakes.	Add appropriate photos for the equipments.	
Lenzing	191	8.2	Number of test pieces	Te	What is the difference between specimen and unit size?	Explain specimen.	
Lenzing	208	8.3.1	Dry Tissues	Te	The title is about dry tissues and not toilet papers.	Delete toilet paper from the text and change it to: The specimen shall comprise one unit of dry tissues.	
Lenzing	243-252	9.1 (2-4)	Storage of Samples	Ge	If the package of moist tissues is cut on its side (lines 197-199), how is it possible to store the rest of the samples in the same soft plastic package?	A consistent sampling procedure and sample storage is required.	
Lenzing	263-264	9.2 (note 2)	Conditioning for the test	Ed	The wording is inconsistent with lines 215-217 - ***"****No attempt to remove the lotion should be made and the removed moist tissue should not be left for any time, to reduce the evaporation of the moisture****."***	Clarify it.	
Lenzing	271	10.2	Test Procedure	Ge	There is no temperature measurement of the water and room before starting the test and after test.	Recommend to add measurement of the temperature of the water and room before testing and after the test.	
Lenzing	302	10.4	Calculations	Ed	What are 10.a and 10.b?	Clarify it.	
Lenzing	315	11 (b)	Acceptance Criteria	Ed	What is "see 1 above"?	Clarify it.	
Lenzing				Ge	Missing test validation as described in the INDA/EDANA GD3 FG504 in section 6.5.	Recommends to add a section for test validation as described in the INDA/EDANA GD3 FG504 in section 6.5.	

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Lenzing	122-124	5.2	Unit Size Toilet Paper	Te	There is a technical working group in ISO TC 6 who handles topics with toilet papers.	Remove toilet paper and section 5.2.	
Lenzing	138	7 (a)	Apparatus	Te	INDA/EDANA GD3 FG505A asks for a 1 or 2 inch orbital shaker capable of 75-100 rpm speed. The speed of rotation has to be defined clearly. It makes a big difference if the test is performed at 50 or 300 rpm!	Provide exact number of rpm for an orbital shaker table with 1 inch orbit.	
Lenzing	139	7 (b)	Apparatus	Te	Is 600 µm the new required pore size of the sieve? INDA/EDANA GD3 FG505A requires 1mm at a diameter of 20 cm. A USA standard testing sieve ≠ 30 (600 micron) greater than 18 cm diameter. What is the number greater than 18 cm?	Provide scientific references to explain the reduction of the sieve's pore size to 600 micron . Provide exact diameter of the new sieve.	
Lenzing	141-142	7 (d,e)	Apparatus	Te	What are the use of 10 L and 20 L plastics Bottles and buckets?	Provide the use of Bottles and buckets in d and e section.	
Lenzing	143	7 (f)	Apparatus	Te	What exactly?	Provide more information.	
Lenzing	145	7 (h)	Apparatus	Te	Also gas chromatography should be mentioned as possible device.	Add gas chromatography to the list to measure the oxygen level.	
Lenzing	146	7 (i)	Apparatus	Te	TSS can also be determined classical by gravimetric method, hasn't to be necessarily portable.	Explain why to use portable suspended solids (TSS) analyzer.	
Lenzing	162	8.2	Number of Test Pieces	Te	How are 3 specimen defined? Are these defined as unit size mentioned in section 5?	Define exactly the specimen and differences between specimen and unit size.	
Lenzing	162-165	8.2	Number of Test pieces	Te	Why specimen should be obtained from at least 2 packages if three specimens are required for each complete testing and this can be obtained from one package of moist tissues divided in 3 sections (one specimen from each section will be used for testing)?	Remove the following sentence: *Specimens should be obtained from at least two distinct packages of a product.*	

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Lenzing		8.3	Sample Preparation	Te	Missing samples to obtain average dry weight for the test product for the final calculation (e.g. moist toilet tissues).	There is a need to obtain an average dry weight for the substrate of moist toilet tissues (without lotion) for the calculation of percentage biodisintegration. Provide a test procedure to obtain an average dry weight of moist toilet tissues (without lotion).	
Lenzing	178	8.3.1	Dry Tissues	Te	The title is about dry tissues and not toilet papers. Toilet papers and their performance are in the scope of ISO TC 6 working groups (paper, board and pulps).	Delete toilet paper from the sentence. Change text to: The sample shall comprise one unit of dry tissue.	
Lenzing	188	8.3.3	Other Products	Te	How it is known that other products will have a mass of 1-3 g at 2-4 cm^3? Every product is different in density, thickness, bulkiness….Therefore it is sufficient to mention the required samples weight. What is the reason to have 1-3 g of sample? What is the reason for the range 1-3 g?	Delete the volume 2-4 cm^3 for the samples and define exact number for the sample weight (1 or 2 or 3 g).	
Lenzing	193	8.3.4	Test Mixture	Te	Is a liquid aerobic sludge an activated sludge? How is it prepared? Why is this procedure different than those of in INDA/EDANA GD3 FG505A? *Preparation of activated sludge in the INDA/EDANA GD3 FG505A section 6.2 was described as follows:* *Activated sludge mixed liquor should be collected from a municipal wastewater treatment plant receiving predominantly domestic wastewater.* *It should be collected and prepared following the procedures described in SG003.* *Briefly, mixed liquor should be taken from the aeration basin and screened through a #18 (1mm) USA Standard Testing*	Define the liquid aerobic sludge and how to prepare it for the test.	

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					Sieve. *The pH should range between 6 and 9.* *The Total Suspended Solids (TSS) should be determined and if necessary be* *adjusted as described in SG003 so they range between 2,000 and 4,500 mg/L.*		
Lenzing	194	8.3.4 (1)	Test Mixture	Te	Why does TSS have a different value than those of INDA/EDANA GD3 FG505A? *IWSFG: 2,000 – 4,000 mg/l* *INDA/EDANA GD3 FG505A: 2,000 – 4,500 mg/l*	Explain the value changes of TSS.	
Lenzing	196	8.3.4 (3)	Test Mixture	Te	Sludge should pass through 600 micron sieve to remove the large particles?	Complete the sentence.	
Lenzing	197	8.3.4. (4)	Test Mixture	Te	What is the reason to define a liquid temperature between 10°C and 25°C?	Explain the values for the liquid temperature.	
Lenzing	212-219	9.1. (2-4)	Storage of Samples	Te	If the package of moist tissues is cut on its side how is it possible to store the rest of the samples in the same soft plastic package?	Remove the lines 212-219.	
Lenzing	230	10.1	Procedure Summary	Te	Test consists of the exposure of three specimens (triplicate) to warm conditions…. What is warm condition? Is it summer time?	Define warm condition.	
Lenzing	237	10.2 (1)	Test Procedure	Te	What is wetted specimen? Why 750 ml activated sludge instead of 1000 ml activated sludge (INDA/EDANA GD3 FG505A section 6.3. Test Set-Up)?	Define wetted specimen and how to wet it out. Explain the reduction in amount of activated sludge from 1000 ml to 750 ml?	
Lenzing			Test Procedure	Ge, te	Missing a blank sample containing activated sludge in test procedure.	Add a blank sample containing activated sludge in the section test procedure.	
Lenzing			Test Procedure	Ge, Te	Missing reference sample for the test. *INDA/EDANA GD3 FG505A section 5.0 reference material:* *It is recommended that a biodegradable reference material (positive control) be used to verify that the sludge is biologically active. This material should exist in a solid form,*	Explain it.	

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					which will not pass through a 1mm sieve. USP purified cotton is an example of such a material.		
Lenzing	244	10.2 (6)	Test Procedure	Te	How shall DOL level be measured during the 21 days test? And why should it be at 2 mg/l?	Define a procedure to measure a DOL level during the 21 days test.	
Lenzing	257	10.2 (13)	Test Procedure	Te	What is the reason to reduce the sieve size from 1000 micron to 600 micron? What is the reason to reduce the rinse time from 2 minutes to one minute? According to our experiences it will be very challenging to reduce the rinse time. Because parts of the sludge will still remain on the sieve.	Provide scientific references to explain this change.	
Lenzing	308	12 (1)	Test Report	Te	What is the reference?	Define the reference.	
Lenzing	313	12 (6)	Test Report	Te	It is not defined a test procedure to obtain an average weight of the original weight of the test product e.g. moist toilet tissue.	Provide a test procedure to obtain an average weight of the original weight of the test product.	
Lenzing				Ge	The test is designed to use of activated sludge, therefore it is worth to have a section to describe the test validation as describes in the INDA/EDANA GD 3 FG505A in section 6.7.	Add a new section test validation.	
Lenzing	362-371	A.2.1	Introduction	Ge	This describes the pre-rinsing of the test product to remove water soluble additives from products before using them in the determination of the initial dry mass. This Annex is not mentioned in the sample preparation or test procedure of PAS 5A.	Add references (Annex 2) to the text in different sections of PAS 5A.	
Lenzing	392-393	A.2.3.1	Equipment	Ge	What is the alternative if there is not existing toilets with 4.5 L flushes?	Provide a table with different types of toilets and flushes for different regions of the world.	
Lenzing	499	A.4.2 (2)	Loss of mass calculation	Te	Cellulosic materials will be better dried at	Recommend to change the temperature in the	

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			procedure		105°C overnight.	oven from 103°C to 105°C.	
Lenzing	503	A.4.2 (5)	Loss of mass calculation procedure	Te	Cellulosic materials will be better dried at 105°C overnight.	Change text to: Dry the specimens in the oven overnight.	
Lenzing	515-516	A.4.3.2 (3)	Initial Dry Mass Calculation Procedure	Te	Set the oven to a temperature appropriate for the chemical and physical properties of the specimen – this is typically 103 °C.	Change the text to: Set the oven to a temperature appropriate for the chemical and physical properties of the specimen – this is typically 105 °C, and dry the specimen at this temperature overnight.	

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IWSFG Template for Reviewer comments and IWSFG secretariat observations[1]

Document reviewed: PAS 5B:2017 – Anaerobic Biodisintegration Test	**Due Date:** 2017-09-01

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Lenzing	148	7 (g)	Apparatus	Te	What is greater than 18 cm in diameter? Why use of 600 micron instead of 1000 micron?	Provide exact value for the diameter of the new sieve. Provide scientific references to explain the reduction in sieve pore size from 1000 to 600 micron.	
Lenzing	160	8.2	Number of test pieces	Te	How are 3 specimen defined? Are these defined as unit size mentioned in section 5?	Define exactly the specimen and differences between specimen and unit size.	
Lenzing	160-163	8.2	Number of test pieces	Te	Why specimen should be obtained from at least 2 packages if three specimens are required for each complete testing and this can be obtained from one package of moist tissues divided in 3 sections (one specimen from each section will be used for testing)?	Remove the following sentence: *Specimens should be obtained from at least two distinct packages of a product.*	
Lenzing		8.3	Sample Preparation	Te	Missing samples to obtain average dry weight for the test product for the final calculation (e.g. moist toilet tissues).	There is a need to obtain an average dry weight for the substrate of moist toilet tissues (without lotion) for the calculation of percentage biodisintegration. Provide a test procedure to obtain an average dry weight of moist toilet tissues (without lotion).	
Lenzing	176	8.3.1	Dry Tissues	Te	The title is about dry tissues and not toilet papers. Toilet papers and their performance are in the scope of ISO TC 6 working groups (paper, board and pulps).	Delete toilet paper from the sentence. Change text to: The sample shall comprise one unit of dry tissue.	
Lenzing	186	8.3.3	Other Products	Te	How is it known that other products will have a mass of 1-3 g at 2-4 cm^3? Every product is different in density, thickness, bulkiness….Therefore it is sufficient to mention the required samples weight. What is the reason to have 1-3 g of sample? What is the reason for the range 1-3 g?	Delete the volume 2-4 cm^3 for the samples and define exact number for the sample weight (1 or 2 or 3 g).	
Lenzing	191	8.3.4	Test Mixture	Te	Is a liquid anaerobic sludge a digester sludge? How is it prepared?	Define the liquid anaerobic sludge and how to prepare it for the test. In INDA/EDANA GD3 FG506A is an Annex SG003 how to prepare waste water and sludges.	

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					Why is this procedure different than those of in INDA/EDANA GD3 FG506A? *Collection and Preparation of Digester Sludge in the INDA/EDANA GD3 FG506A section 6.2 was described as follows:* Digester sludge should be collected from a municipal wastewater treatment plant receiving predominantly domestic wastewater. It should be collected and prepared following the procedures described in SG003. Briefly, digester sludge is obtained from a 2nd stage digester or a location where the digester is stabilized but still active. It is screened through a **1mm sieve** taking precautions to maintain its anaerobic integrity. The pH should be between 6 and 8.5. The Total Suspended Solids (TSS) should be determined and if necessary be adjusted as described in SG003 so they range between **8,000 and 10,000 mg/L.**	PAS 5B is the same as those of the INDA/EDANA GD3 FG506A, explain the changes.	
Lenzing	192-193	8.3.4 (1,2)	Test Mixture		The two lines provide different interpretation. First line describes **total solids** between 0.8 and 1%. The second line talks about **total suspended solids** between 2000 and 4000 mg/l. These show a significant change in values within anaerobic municipal sludge. How those changes shall be understood? Why does TSS have a significant different value than those of INDA/EDANA GD3 FG506A?	Clarify differences between **total solids** and **total suspended solids.** Provide scientific references to explain the significant value changes of TSS from 8,000-10,000 to 2,000-4,000 mg/l.	

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Lenzing	211-218	9.1 (2-4)	Storage of Samples		If the package of moist tissues is cut on its side how is it possible to store the rest of the samples in the same soft plastic package?	Remove the lines 211-218.	
Lenzing	230	10.1	Procedure Summary	Te	What is warm condition? Summer time?	Define warm condition.	
Lenzing	230	10.1	Procedure Summary	Te	Change the test duration from 28 days (INDA/EDANA GD3 FG506A) to 21 days in PAS 5B is quite significant.	Provide scientific references to explain this significant change.	
Lenzing	237	10.2 (1)	Test Procedure	Te	This is the first time to mention a cotton control sample. What is the type and grade of cotton for the control sample?	Define the cotton control sample.	
Lenzing	239-240	10.2 (2)	Test Procedure	Te	Why the cotton control sample should be wetted out?	Provide information and explain.	
Lenzing	245	10.2 (5)	Test Procedure	Te	Wetted specimen is not defined.	Define wetted specimen.	
Lenzing	251-252	10.2 (8)	Test Procedure	Te	Change the test duration from 28 days (INDA/EDANA GD3 FG506A) to 21 days in PAS 5B is quite significant.	Provide scientific references to explain this significant change.	
Lenzing	256	10.2	Test Procedure	Te	Change the test duration from 28 days (INDA/EDANA GD3 FG506A) to 21 days in PAS 5B is quite significant.	Provide scientific references to explain this significant change.	
Lenzing	261	10.2 (12)	Test Procedure	Te	What is upper and lower part of the sieve?	Explain it.	
	262-263	10.2 (13)	Test Procedure	Te	Sieve size is significantly reduced from 1000 micron (INDA/EDANA GD 3 FG506A) to 600 micron. What is the reason to reduce the rinse time from 2 minutes to one minute? According to our experiences it will be very challenging to reduce the rinse time because parts of the sludge will still remain on the sieve.	Provide scientific references to explain those changes.	
Lenzing	322	12 (6)	Test Report	Te, Ge	It is not defined a test procedure to obtain an average weight of the original weight of the test product e.g. moist toilet tissue.	Provide a test procedure to obtain an average weight of the original weight of the test product.	

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Lenzing				Ge	The test is designed to use digester sludge, therefore it is worth to have a section to describe the test validation as describes in the INDA/EDANA GD 3 FG505A in section 6.7.	Add a new section “test validation”.	
Lenzing	343	1.	Bibliography	Ed	Wrong reference.	Change it to FG506A “Anaerobic Biodisintegration Test”	
Lenzing	366-375	A.2.1	Introduction	Ge	This describes the pre-rinsing of the test product to remove water soluble additives from products before using them in the determination of the initial dry mass. This Annex is not mentioned in the sample preparation or test procedure of PAS 5B.	Add references (Annex 2) to the text in different sections of PAS 5B.	
Lenzing	396-397	A.2.3.1	Equipment	Ge	What is the alternative if there is not existing toilets with 4.5 L flushes?	Provide a table with different types of toilets and flushes for different regions of the world.	
Lenzing	487	A.3.3	Procedure	Ge	Photo is not for the shower head rinse and flow regulator.	Provide photos that show the intended equipment.	
Lenzing	505-506	A.4.2 (2)	Loss of mass calculation procedure	Te	Cellulosic materials will be better dried at 105°C overnight.	Recommend to change the temperature in the oven from 103°C to 105°C and dry the product overnight.	
Lenzing	510	A.4.2 (5)	Loss of mass calculation procedure	Te	Cellulosic materials will be better dried at 105°C overnight.	Change text to: Dry the specimens in the oven overnight.	
Lenzing	522-523	A.4.3.2 (3)	Initial Dry Mass Calculation Procedure	Te	Set the oven to a temperature appropriate for the chemical and physical properties of the specimen – this is typically 103 °C.	Change the text to: Set the oven to a temperature appropriate for the chemical and physical properties of the specimen – this is typically 105 °C, and dry the specimen at this temperature overnight.	
Lenzing	566	A.4.3.2	Initial Dry Mass Calculation Procedure	Te	Annex 2 Section A.2.3 does not describe how to select specimens.		

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