

	Initial	Starting Line Number (e.g. 17)	Ending Line Number (e.g. 23)	Clause/Subclause (e.g. 3.1)	Type of comment <sup>1</sup>	Comments	Proposed change	Observation of the secretariat
<b>1</b>	KC2	1			Ge	The document title and organization title suggests that this PAS will apply in all countries worldwide	Please provide list of all countries for which this specification document is valid noting any exclusions.	NOT ACCEPTED - Countries who want to adapt it can
<b>2</b>	NP	1	Various places throughout document		Ge	The word " specification" is not appropriate here. As specification means "a detailed description of the design and materials used to make something." These test methods should be presented as guidelines. Does IWSFG intend to provide design parameters for flushable products?	Recommend changing the "specification" to "guideline" throughout all relevant documents.	NOT ACCEPTED
<b>3</b>	PG	1			Ge	Submitting comments on the IWSFG PAS documents in this public comment period in no way represents participation in the development process of the IWSFG PAS documents. Nor does commenting imply agreement with any content; where portions of the IWSFG documents have not been commented upon, consent with the content therein is not implied.		NOT ACCEPTED - No Relevance to PAS
<b>4</b>	PG	1			Ge	Revisions to PAS-3 to reduce intra-lab and inter-lab variability are necessary prior to publication. Extensive interlaboratory studies are necessary to establish the viability, reproducibility and validity of the proposed method parameters and criteria.	Conduct a set of inter-laboratory round robin experiment to establish the validity of the PAS-3 method (and/or alternative methods) prior to publication of the IWSFG documents.	NOT ACCEPTED - No Relevance to PAS
<b>5</b>	PG	1			Ge	The PAS-3 disintegration test has been shown to be unreliable and unrepeatable between laboratories and thus will require significant modification and further method development before it should be considered for inclusion in an international specification.	Conduct a set of inter-laboratory round robin experiment to establish the validity of the PAS-3 method (and/or alternative methods) prior to publication of the IWSFG documents.	NOT ACCEPTED
<b>6</b>	PG	1			Ge	The IWSFG PAS documents do not outline an approach for determining compatibility with wastewater infrastructure. The IWSFG documents lack any content or context regarding infrastructure issues currently experienced by wastewater utilities. Further, the IWSFG documents contain no data, examples or details regarding issues that can be attributed to flushable wipes. Therefore, the IWSFG documents provide no justification for stipulating qualities or characteristics for flushable products, and as such, represent arbitrary requirements that are unfounded and unrelated to issues faced by wastewater	Provide examples of infrastructure issues currently experienced by wastewater utilities specifically attributed to flushable wipes.	NOT ACCEPTED - No Relevance to PAS

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7	PG	1			Ge	The IWSFG documents do not contain sufficient documentation or information to establish why the IWSFG documents have been developed, or what results the IWSFG documents seek to achieve regarding flushable wipes beyond vague and unsupported performance concepts. The IWSFG PAS documents contain no documentation of operational issues that have been experienced by IWSFG members, or the utilities they represent, that have been caused by flushable wipes. Further, no justification for how those issues would be resolved as a result of implementation of the IWSFG PASs for flushable wipes is provided. Based on the results of field testing and forensics conducted by a range of stakeholders since 2010, all available evidence continues to reinforce that flushable wipes are compatible with wastewater	Provide examples of infrastructure issues currently experienced by wastewater utilities specifically attributed to flushable wipes.	NOT ACCEPTED - No Relevance to PAS
8	PG	1			Ge	The IWSFG has provided no details regarding the process utilized to establish baseline performance. Outside of photographs within an Annex, no data regarding the performance of materials in PAS-1 or PAS-3 has been included in the documents available for public review. Further, no references to supporting documentation, test results, or other relevant substantiation demonstrating how and why the proposed disintegration performance is required for infrastructure compatibility were provided for review. Without such documentation, the current IWSFG documents are a collection of unproven assumptions and untested hypotheses. As such, a thorough and complete review of the IWSFG PAS documents cannot be conducted without access to relevant test results/data utilized to establish benchmark performance in the IWSFG PAS tests, and importantly, why and how that specific level of performance is necessary to	Provide details of all testing done to establish all test parameters and criteria.	NOT ACCEPTED
9	PG	1			Ge	The IWSFG PAS documents do not account for all pathways a material may take in wastewater infrastructure, from the toilet through wastewater treatment. Of greatest significance is the omission of test methods for evaluating compatibility with either household or municipal pumps, and aerobic biological	Provide the rationale for why the IWSFG documents do not provide testing to evaluate compatibility with pumps, or testing to evaluate the ability to degrade biologically under aerobic conditions.	NOT ACCEPTED - No Relevance to PAS IWSF is of opinion that effective disintegration test overcomes need for any pump test. Aerobic test was dropped because it was not a representative of wastewater treatment system.
10	PG	1			Ge	Misuse of the word "standard," and variations thereof, occurs in the texts. The documents assembled by the IWSFG are neither a standard, nor are they Publicly Available Specifications developed, for example, in accordance with the process set forth by the British Standards Institute (BSI). Misuse of the word "require," and variations thereof, occurs frequently throughout the texts. The IWSFG documents can in no way require action.	Clarify that the documents are guidelines.	NOT ACCEPTED

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11	PG	1			Ge	There is significant overlap of content (both verbiage and technical details) between the IWSFG documents and existing copyrighted material- in particular the work of Working Group 10, within Technical Committee 224 of the International Standards Organization- and there is no reference to consent from the copyright owners with regards to this use.	Provide acknowledgement from the ISO copyright office allowing the use of ISO content. From ISO TC224/WG10/TR 25424 WD3: "All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the	NOT ACCEPTED - No Relevance to PAS
12	PG	1			Ge	The first draft of the IWSFG documents consisted of a Standard and associated Publicly Available Specification (PAS) documents, and the entire body of work was described as the IWSFG Flushability Guidelines ( <a href="http://wsgf.org/wsgf-flushability-guidelines/">http://wsgf.org/wsgf-flushability-guidelines/</a> ). The second draft consists of three PAS documents and are referred to collectively as the Flushability Specification.	Provide the rationale and basis for renaming the IWSFG documents from "Guidelines" to a "Specification."	NOT ACCEPTED
13	PG	1			Ge	The documents do not appear to have been developed per an established Publicly Available Specification process- for example, by the process set forth by the British Standards Institute (BSI). Revise all instances to utilize an appropriate term such as "Guideline" or equivalent. Alternatively, provide details of the national or international standards organization that is accrediting the documents as "Publicly Available Specifications." Note to Entry: The first sentence of the British Standards Institute (BSI) definition of a standard requires agreement- not among a single organization or group of common stakeholders- but among "manufacturers, sellers, buyers, customers, trade associations, users or regulators." The full definition reads ( <a href="https://www.bsigroup.com/en-GB/standards/information-about-standards/what-is-a-standard/">https://www.bsigroup.com/en-GB/standards/information-about-standards/what-is-a-standard/</a> ): "In essence, a standard is an agreed way of doing something. It could be about making a product, managing a process, delivering a service or supplying materials – standards can cover a huge range of activities undertaken by organizations and used by their customers. Standards are the distilled wisdom of people with expertise in their subject matter and who know the needs of the organizations they represent – people such as manufacturers, sellers, buyers, customers, trade associations, users or regulators... They are designed for	Clarify if the IWSFG has developed the PAS documents in accordance with a standard process in accordance with a third-party certification body (ISO or BSI, as examples).  In the interest of transparency, list the stakeholders groups and organizations that participated in the development (i.e., activities other than the public comment) of the IWSFG Standard and PAS documents.	NOT ACCEPTED - No Relevance to PAS -See PAS 1 Answer 19
14	PG	1				Both the test method and criteria proposed in IWSFG PAS-3 are appropriate for the evaluation of any products, including flushable wipes. Based on the results of an interlaboratory investigation of the PAS-3 disintegration test, three of eight toilet papers tested would not meet the proposed acceptance criteria. An additional three of the five toilet papers tested would not meet the proposed acceptable criteria if the rinse step were removed. As such, it can be concluded that the rinse step alone resulted in 50% of the materials artificially meeting the criteria (i.e., false positive results). It should be noted that the toilet papers tested have been used by consumers for many years, without any evidence of	Conduct a set of inter-laboratory round robin experiments to establish the validity of the PAS-3 method (and/or alternative methods) prior to publication of the IWSFG documents.	NOT ACCEPTED

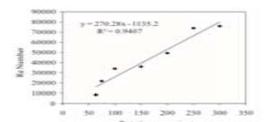
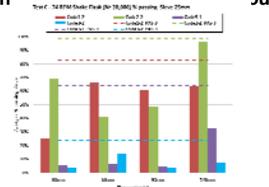
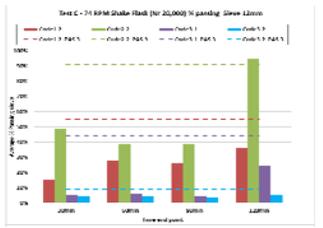
	Initial	Starting Line Number (e.g. 17)	Ending Line Number (e.g. 23)	Clause/Subclause (e.g. 3.1)	Type of comment <sup>1</sup>	Comments	Proposed change	Observation of the secretariat
15	KC1	11	13	Copyright Notice	Ed	Copyright notice is relevant to the current document, stating purpose for future documents seems superfluous.		NOT ACCEPTED
16	INDA	15	24		Ge	<p>The statement made in this paragraph is misleading. The IWSFG takes unacceptable liberties in describing who actually has developed the criteria in this draft specification.</p> <p>First and foremost, the criteria discussed in this draft have been collected by a relatively small group of global wastewater “experts”, including only six voting members none of whom are from the UK and only one from Europe. With no line of sight to individual members participating from each country along with background and credentials, there is no validation of “expertise”. Use of terms like “worldwide coalition” and “global consensus” should be struck.</p> <p>In addition, three of the five “critical characteristics” described in section 6.2 are pulled verbatim (with one minor alteration) from INDA and EDANA’s 3<sup>rd</sup> ed. Guidelines for Assessing Flushability of Disposable Nonwoven Products (as referenced within this draft). In addition, the test method used in PAS 3 is sourced from GD3 (with parameter and pass/fail changes). In essence, adoption of this methodology points to the fact that INDA and EDANA members (along with wastewater representatives who have been involved over the years with these guidelines) are the true “experts” in developing guidelines such as these.</p> <p>Use of this wording in the forward as an attempt to convey broader acceptance than is warranted is disingenuous at best.</p>	<p>The proposed change is to rewrite the forward using the following messaging:</p> <p>1) The current makeup of the IWSFG members who worked on this document, including the background credentials of each and the process used to gain a “global consensus”.</p> <p>2) Acknowledgement that the majority of this document is due to the long-standing work of industry experts working with wastewater representatives over the years,</p>	ACCEPTED -Language added to forward
17	NP	15	23	Foreword	Ge	Who are the consensus members? And how are these test methods and pass/fail criteria are designed? What was the protocol that was followed to get global consensus on these documents?	Clarify the section by adding members of the consensus and basis for how the test methods and criteria for flushable product designed. Explain the protocol or program that was followed for global alignment of all wastewater services.	NOT ACCEPTED
18	KC3	16	17	Foreword	Ed	Does country representation from USA, Australia, Japan, Canada, New Zealand and Spain (?) truly represent a worldwide coalition?	Replace “worldwide ‘ with “international”	ACCEPTED -
19	KC4	18	19	Foreword	Ed/Ge	“ without remuneration of any kind” Does this also cover frequent flier miles accrued for international flights to attend		NOT ACCEPTED - No Relevance to PAS NOT ACCEPTED

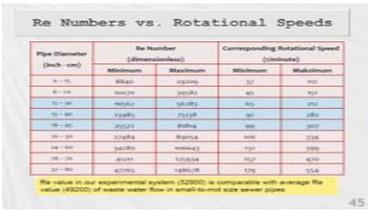
	Initial	Starting Line Number (e.g. 17)	Ending Line Number (e.g. 23)	Clause/Subclause (e.g. 3.1)	Type of comment <sup>1</sup>	Comments	Proposed change	Observation of the secretariat
20	PG	20	24	Foreword	Te	Document appears to share common authorship with documents generated, and therefore the intellectual property of, the International Standards Organization (ISO) Technical Committee (TC) 224. While superficial changes have been made, language and concepts in IWSFG PAS-1 appear to have been developed from current and/or draft versions of the documents generated as part of the work of ISO TC224 WG10. From "ISO TR 24524: WD 3" (noted as: © ISO 2018 – All rights reserved): "This Technical Report addresses the hydraulic, mechanical and environmental conditions found in transport and treatment systems. The conditions listed in this report may be taken into account when designing and evaluating the performance of products which could potentially be flushed via the toilet... It is expected that this Technical Report and may provide the basis for wastewater services to delineate the qualities and characteristics of discharges to the wastewater system." From the IWSFG PAS-1 (noted as: Copyright 2018 IWSFG): "The criteria for flushability and the appropriate test methods... reflect the hydraulic, mechanical and environmental conditions of drain lines, various onsite treatment and	As the work of ISO TC224 WG10 pre-dates the work of the IWSFG, where necessary and appropriate, provide proper attribution and/or reference to language and concepts drawn from the draft ISO TC224 WG10 documents. Further, in the interest of transparency, identify the affiliation of the author(s) of the IWSFG PAS documents, and state if they have been, or are currently, members of ISO TC224 WG10.	NOT ACCEPTED
21	PG	20	24	Foreword	Te	Contradicts definition of "Flushable Product" in Section 5. Definition of "Flushable Product" in Section 5 accurately and succinctly describes a flushable product, and as such, is a suitable summary of the purpose of the PAS documents. The language utilized in the Foreword mischaracterizes the PAS documents, as none of the three documents contain sufficient information to "reflect the hydraulic, mechanical and environmental conditions of drain lines, various onsite treatment and wastewater collection and treatment systems as well as the	Revise Foreword to be consistent with "Flushable Product" definition in Section 5: "The criteria for flushability and the appropriate test methods are the product of a global consensus of the coalition members and reflect <u>test methods and criteria to ensure a product labeled as flushable</u> the hydraulic, mechanical and environmental conditions of it <u>will not</u>	NOT ACCEPTED
22	KC5a	21	23	Foreword	Ed/Ge	Per earlier comment – not truly a global consensus	Suggest amending to reflect limitations in PAS	PARTIALLY ACCEPTED -
23	KC5b	21	23	Foreword	Ed/Ge	The lack of a household pump test , municipal pump test, or Aerobic Biodisintegration Test are significant gaps in the protocol offered if it is to be considered an holistic assessment of Flushability. These should be called out as exceptions.		NOT ACCEPTED
24	KC5bc	21	23	Foreword	Ed/Ge	PAS 3 does not reflect hydraulic, mechanical or environmental condition. See PAS 3 comments	The criteria for flushability and the appropriate test methods are the product of a global consensus of among IWSFG coalition members, which are thought to approximate some of and reflect the hydraulic, mechanical and environmental conditions found <u>in</u> drain lines, various-anaerobic onsite treatment, wastewater collection and <u>anaerobic</u> treatment systems. <u>as well as the nature of the receiving waters for treatment plant effluents.</u> Consideration of Aerobic Treatment, Household Pump or Municipal Pump compatibility are not included.	PARTIALLY ACCEPTED - See PAS1
25	KC5d	21	23	Foreword	Ed/Ge	"as well as the nature of the receiving waters for treatment plant effluents." Statement is not clear and there is no discussion on the nature of receiving waters throughout PAS1,PAS2,PAS3		NOT ACCEPTED

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26	NP	24		Foreword	Ge	In the foreword 4th paragraph, it states that "the task of the group was to prepare standards reflecting the above purpose." It does not state that this group accomplished that goal. Did they?	Please clarify.	NOT ACCEPTED
27	INDA	25	27		Ge	As discussed in the Main Document from Draft 1, this language is unacceptable. Although the comment was "NOT ACCEPTED" in the first draft, there was no reasoning behind the decision. In light of lack of an explanation, it needs to be brought up again.  This statement is presumptuous. The IWSFG implies that not adhering to this standard precludes the possibility of being socially responsible or environmentally sustainable. The IWSFG has neither the expertise nor the authority to define what is meant by "socially responsible" and "environmentally sustainable". At best, this can be stated as an opinion of the IWSFG.	Remove statement or reword to reflect this is an opinion of the IWSFG.	ACCEPTED -
28	PG	25	27	Foreword	Te	In the United States, wastewater treatment plants are permitted to continuously discharge known pollutants including but not limited to Total Suspended Solids (TSS), Oxygen depleting substances [typically measured as Biological Oxygen Demand (BOD)] and nutrients (defined as pollutants in the United States Environmental Protection Agency [EPA]'s Report to Congress on the Impacts and Control of CSOs and SSOs; 2004). These pollutants can and do have a negative impact on "the nature of the receiving waters for treatment plant effluents" (IWSFG PAS-1).	Describe how the risk from the discharge of pollutants (as defined by the US EPA) in the form of TSS, BOD and nutrients by wastewater treatment plants represented by IWSFG members is deemed appropriate. In particular, describe how risk and budget, as well as receiving water quality determine the extent of treatment for a WWTP.	NOT ACCEPTED - No Relevance to PAS
29	PG	25	27	Foreword	Te	Sentence describing wastewater services is an oversimplification. The expectations of the IWSFG are irrelevant to the document.	Delete the following sentence: "Wastewater services are organizations acting for the public good as a public service. The group expects the manufacturers and distributors of their products to act in a socially responsible and environmentally sustainable manner by adhering to the established standards." If the sentence is retained, for context, provide the IWSFG's position on "blending," specifically how the practice of blending protects the public good and represents socially and environmentally sustainable operation by wastewater services. Note to entry: "The [US Environmental Protection Agency] EPA issued guidance in the mid-2000s banning a technique used by some utilities in which some wastewater is routed around the treatment process before being blended with treated flows and then discharged into areas in the receiving waters known as mixing zones. The practice is used to keep the high volumes of wastewater, such as those during storms, from overwhelming the treatment plant. The group said	NOT ACCEPTED - No Relevance to PAS
30	NP	26	28	Foreword	Ge	What is the authority of Wastewater services to expect the manufacturers and distributors of the products to act in a socially responsible and environmentally sustainable manner?	Please clarify.	See PAS1

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31	PG	26	27	Foreword	Te	Document contains language significantly similar to that found in draft versions of the ISO TC224 WG10. From the IWSFG PAS-1 (noted as: Copyright 2018 IWSFG): "The group expects the manufacturers and distributors of their products to act in a socially responsible and environmentally sustainable manner by adhering to the established specifications." From "ISO TR 24524: WD 2 v1" (noted as: © ISO 2017 – All rights reserved): "It is equally hoped that manufacturers and distributors of products that would be marked flushable or which by their location and use are likely to be flushed would take these conditions into account when designing and marketing such products. Thereby demonstrating their conformity with the principles of social responsibility as set out in ISO 26000 which provides guidance on how businesses and organizations can	In the interest of transparency, declare if the author(s) of the IWSFG PAS documents are members of ISO TC224 WG10. Further, declare if the author(s) have participated in the development of both documents.	NOT ACCEPTED - No Relevance to PAS
32		26	27	Foreword	Te	Proposed Change continued from above	[continued from above] (from: <a href="https://www.bna.com/wastewater-practice-mostly-n57982084593/">https://www.bna.com/wastewater-practice-mostly-n57982084593/</a> ). "Opponents argue that the blending ban raises costs for wastewater utilities." (From <a href="https://www.wateronline.com/doc/epa-s-wet-weather-policies-debated-in-court-0001">https://www.wateronline.com/doc/epa-s-wet-weather-policies-debated-in-court-0001</a> ).	NOT ACCEPTED - No Relevance to PAS
33	PG	27	27	Foreword	Te	Improperly implies that the opinions presented by the IWSFG in the Foreword are social and/or environmental sustainability metrics. This is unfounded, unreferenced and untrue as no such metrics exist. The opinions of the IWSFG cannot be utilized to measure social and/or environmental sustainability. Additionally, the language implies that adherence to IWSFG PAS documents demonstrates social and/or environmental sustainability, or alternatively, that failure to adhere to the PAS indicates an entity either neither socially or environmentally sustainable. Neither of these scenarios is true.	Delete. Inappropriately and improperly implies that the opinions presented by the IWSFG are social and/or environmental sustainability metrics.	NOT ACCEPTED - No Relevance to PAS
34	INDA	104	105		Te	The first sentence of the introduction implies that disintegration is, in and of itself, all that is necessary for a material to be compatible with a wastewater transport system. This is entirely untrue, or why would there be other tests within this specification.  In addition, the concept of rapid disintegration being "necessary" to insure compatibility is not borne out in testing – either in field studies or in laboratory studies.	<i>This document provides a description of the test method and threshold criteria for determining if a product will disintegrate sufficiently to be compatible with wastewater transport systems.</i>	NOT ACCEPTED

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35	NP	104	107	1	Te	"This document provides a description of the test method and threshold criteria for determining if a product will disintegrate sufficiently to be compatible with wastewater transport systems." This sentence creates a misunderstanding that <i>only</i> rapid disintegration is required to be compatible with wastewater transport systems. But the other documents also talks about; 1. Environmental and public health protection; 2. Toilet and drain line clearance; 4. Settling; and 5. Biodisintegration criteria as critical.	Recommend to change this sentence to "This document provides a description of the test method and threshold criteria for determining if a product will disintegrate."	NOT ACCEPTED
36	PG	104	105	1	Te	Describe how the IWSFG determined what amount of disintegration was "sufficient" to be compatible with wastewater transport systems." NB: Available literature contradicts this statement. Specifically, disintegration is not necessary to be compatible with wastewater transport systems (i.e., plumbing, drainlines, and municipal sewer systems). The idea that disintegration is required for compatibility is the opinion of the IWSFG and is refuted by multiple sources. Consider the transport mechanism for solids in small diameter piping (i.e., drainline or plumbing), which is well establishing in the literature and is referred to as a "sliding dam" where all materials in the plumbing and drainline (including toilet paper, feces and flushable wipes) form a dam at the invert of the pipe that is propelled forward by the leading edge of the wave of water behind the material. "As mentioned earlier, for many solids found in sewers, typically gross solids in combination with toilet paper, the usual mode of movement is not floating in the wave, but by contact with the invert of the pipe at all times: a sliding, leaking dam... The solid obstructs the flow down the pipe, and causes a build up of head behind it. The amount of	Revise to indicate that this statement is the opinion of the IWSFG: "This document provides a description of the test method and threshold criteria for determining if a product will disintegrate sufficiently, <u>in the view of the IWSFG</u> , to be compatible with wastewater transport systems." If unrevised, provide reference to all materials utilized to establish the amount of disintegration required for compatibility with wastewater infrastructure (with references), including but not limited to: toilets, plumbing, drainlines, household pumps, septic tanks, municipal sewer systems, municipal lift station pumps, and wastewater treatment plants.	NOT ACCEPTED
37	PG	104	105	1	Te	Continued from above: (Butler et al; 2005; A model for the movement of large solids in small sewers; Water Science & Technology; Vol. 52; Issue 5; Pg. 69-76). Regarding transport distance, Butler and Davies (Butler and Davies; 2011; Urban Drainage; 3rd Edition; Spon Press; London, UK) concluded (emphasis added): "Solids which are large compared with the flush wave and pipe diameter move with a sliding dam mechanism (Littlewood and Butler, 2003). In this case, the flush wave builds up behind the solid, which acts as a dam in the base of the pipe. When the flow's hydrostatic head and momentum overcome the friction between solid and pipe wall, the solid begins to move along the pipe invert. The amount of movement that occurs depends on how 'efficient' the solid is as a dam; the higher the efficiency, the further the solid will move for the same flush wave... Photograph (a) shows toilet tissue alone in the flow and photograph (b) shows toilet tissue and an artificial faecal solid in combination. Note the pool of water forming behind the solid and propelling it along. The role of toilet tissue in forming the 'dam' is noteworthy. Solids tend to move furthest in the sliding dam mode." In other words, the more intact a material is in the drainline, the farther it will be transported, due to the increased surface area against which the wave of water from the toilet flush can push, and is the mechanism by which they are transported in the plumbing and drainline. This simple fact, that intact material is more effectively transported in the drainline, contradicts fundamental principles of the IWSFG's	As above, revise to indicate that this statement is the opinion of the IWSFG: "This document provides a description of the test method and threshold criteria for determining if a product will disintegrate sufficiently, <u>in the view of the IWSFG</u> , to be compatible with wastewater transport systems." If unrevised, provide reference to all materials utilized to establish the amount of disintegration required for compatibility with wastewater infrastructure (with references), including but not limited to: toilets, plumbing, drainlines, household pumps, septic tanks, municipal sewer systems, municipal lift station pumps, and wastewater treatment plants.	See Answer 36
38	SUO	104	105		Te	It is mentioned in the first sentence that this test method will determine the whether the product will disintergrate sufficiently and will be compatible with wastewater transport system. This method is one of the criteria in determining whether the product is safe for wastewater transport system in addition to other test methods. Moreover, there is no evidence or field sudy for these test method to validate that it is safe for wastewater transport system and the product will fully disintegrate.	IWSFG PAS 3– Slosh Box provides a testing method to determine whether the product will fully disintegrate.	NOT ACCEPTED
39	KC6	105	105	1	Ed	Define compatible	Provide data/evidence for what constitutes sufficient disintegration to not cause operational issues in conveyance and treatment	NOT ACCEPTED

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40	KC10a	108	112	2 Purpose	Te	Karadaghli et al (Water Environment Research, Vol 84,5 ; May 2012; pp. 424-433(10) ) reported that a Shaker Flask run at 74rpm using Bellco Baffled Flasks containing 1L of water on a 1" shaker orbit generated $N_R \sim 20,000$ .	Please provide evidence that the forces in a reciprocating PAS3 slosh box are the same to $N_R \sim 20000$ seen in a linear flowing system and suitable for assessment of International Toilet Papers.	NOT ACCEPTED - Toilet Paper is out of scope. The comments regarding force from Draft 1 were taken into account. We revisited the slosh box work from Dr. Karadaglia and agreed with the commenter that based on that work 13 rpm did not produce a Reynolds Number of 20,000. Since there were data points from 4L@13rpm and 4L@20 rpm they were graphed and 16 was the rpm where the Re of 20,000 intersected. The rpm was changed to 18 in the final PAS3 to maintain the Reynolds Number of 20,000 after the temperature was adjusted to 15 C
41	KC10b	108	112	2 Purpose	Te	 <p>Figure 4—Estimated Reynolds number values (dimensionless) for the shake flask containing 1 L water at rotational speeds ranging from 64 to 300 rpm (dimension<sup>-1</sup>).</p> <p>Water Environment Research, Volume 84, Number 5</p>		See Answer 40
42	KC10c	108	112	2 Purpose	Te	Dry toilet paper codes tested in the shake flask set up reported by Karadağlı do not line up well with PAS 3 results (also at $N_R \sim 20,000$ ) un 		See Answer 40
43	KC10d	108	112	2 Purpose	Te			See Answer 40

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44	KC10e	108	112	2 Purpose	Te	Disintegration rate of the dry toilet paper samples is less than anticipated.		See Answer 40
45	KC10f	108	112	2 Purpose	Te	The low level of disintegration even at 2 hours suggest that neither PAS 3 or the Shake Flask are fulfilling the role of $N_R$ 20,000 intended		See Answer 40
46	KC10g	108	112	2 Purpose	Te	Source: KC Labs. Report 18-006		See Answer 40
47	KC11a	108	112	2 Purpose	Te	Interestingly, at the ISO TC224 WG 10 Technical Session held on May 5, 2015. Dr Karaghli (nonvoting associated of IWSFG) presented his continued research of disintegration using a shake flask. Summary slide 45 shown below. He suggests that waste water flow in small to mid-size corresponds to a Reynolds Number of 49200 - which would in turn correspond to a rotational speed of 187 rpm (Note that INDA guidelines edition 1 used this method at 150rpm and 3hours). No testing has been completed at 187rpm, but it is reasonable to expect more complete disintegration of the 8 toilet paper samples under these more turbulent conditions. Dr. Karadağlı's estimate of Reynolds number may prove to be a better testing point than the current 20,000.No testing has been completed at 187rpm, but it is reasonable to expect more complete disintegration of the 8 toilet paper samples under these more turbulent conditions. Dr. Karadağlı's estimate of		NOT ACCEPTED An 8" pipe with approximately 30 % flow is the basis for the Re calculation -- This has been confirmed at 18,800 and presented at a GD4 meeting. This was independently varified and and rounded to 20,000.
48	KC11b	108	112	2 Purpose	Te			See Answer 47

	Initial	Starting Line Number (e.g. 17)	Ending Line Number (e.g. 23)	Clause/Subclause (e.g. 3.1)	Type of comment <sup>1</sup>	Comments	Proposed change	Observation of the secretariat
<b>49</b>	KC7	108	112	2 Purpose	Te	This test produces forces in a reciprocating system which pulses with large variation between max and min. The tumbling hydraulic forces caused by rapid acceleration and deceleration are unlikely to be an exact analogue for a flowing pipe. Unless specific studies or analysis exists which confirms that the forces in PAS 3 are equivalent to the forces in an 8" pipe (forces will depend on flow, depth of water in pipe, pipe construction and slope – not referenced in definition) then the scope statement needs to be simplified	Suggest changing to "The purpose of this test is to assess the disintegration performance of a material when it is subjected to hydraulic forces. typically found in continuous flow conditions in small diameter (8 inch/200 mm) wastewater transport systems, immediately after a product is flushed: i.e. forces equivalent to a Reynolds number of 20,000. "	NOT ACCEPTED - The proposed change is the exact wording in currently in PURPOSE
<b>50</b>	KC8a	108	112	2 Purpose	Te	The Reynolds Number for this method is stated once again to be 20,000 yet the speed of the oscillation (between PAS3B and PAS3) has been increased by 23% - they cannot both provide a Reynolds Number of 20000.	Please provide evidence that the forces in a reciprocating slosh box are the same to 20,000 seen in a linear flowing system.	SEE answer 40
<b>51</b>	KC8b	108	112	2 Purpose	Te	Reynolds number has a linear relationship with velocity, so changing RPM and speed of the water flow in the box, will change the "effective Reynolds number" for the method	Expertise for CFD modelling in a slosh box were identified by NACWA at Saint Louis University, Parks College of Engineering, Aviation, and Technology, CIVIL ENGINEERING Department	NOT ACCEPTED - INDA, representing the manufacturers rejected the proposal for this study made by the wastewater caucus during GD4 . - See also answer 40
<b>52</b>	KC8c	108	112	2 Purpose	Te	There is no justification for the RPM change provided in the replies to version 1 public comments.		See Answer 40
<b>53</b>	KC8d	108	112	2 Purpose	Te	Reducing the time end point to 30 minutes and increasing the sieve size do not change the Reynolds number.		NOT ACCEPTED
<b>54</b>	KC9a	108	112	2 Purpose	Te	The Reynolds Number for this method is stated once again to be 20,000 yet the speed of the oscillation (between PAS3B and PAS3) has been increased by 23% - they cannot both provide Reynolds Number of 20000.		See Answer 40

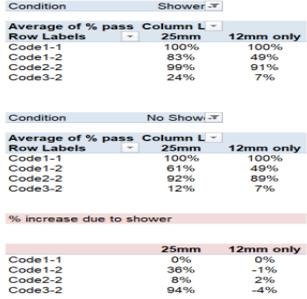
	Initial	Starting Line Number (e.g. 17)	Ending Line Number (e.g. 23)	Clause/Subclause (e.g. 3.1)	Type of comment <sup>1</sup>	Comments	Proposed change	Observation of the secretariat																																		
55	KC9b	108	112	2 Purpose	Te	Testing in KC labs with 3 different US toilet papers (1,2, and 3 plies) it is clear that: 16 rpm is generating significantly more disintegration (at the same Reynolds Number?) but this may still not be sufficient for assessment of Dry Toilet Papers against a criteria of 95%. Not all samples pass the PAS3 criteria at 30 minutes		NOT ACCEPTED - Toilet Paper is out of scope for this PAS																																		
56	KC9c	108	112	2 Purpose	Te	<p>% Passing 25mm Sieve - at different time endpoints and 13rpm/16rpm</p> <table border="1"> <thead> <tr> <th rowspan="2"></th> <th colspan="2">30 min</th> <th colspan="2">60 min</th> <th colspan="2">90 min</th> </tr> <tr> <th>13 rpm</th> <th>16 rpm</th> <th>13 rpm</th> <th>16 rpm</th> <th>13 rpm</th> <th>16 rpm</th> </tr> </thead> <tbody> <tr> <td>1 ply US TP</td> <td>52%</td> <td>88%</td> <td>84%</td> <td>94%</td> <td>83%</td> <td>96%</td> </tr> <tr> <td>2 ply US TP</td> <td>98%</td> <td>98%</td> <td>100%</td> <td>100%</td> <td>100%</td> <td>100%</td> </tr> <tr> <td>3 ply US TP</td> <td>8%</td> <td>22%</td> <td>12%</td> <td>45%</td> <td>32%</td> <td>44%</td> </tr> </tbody> </table>		30 min		60 min		90 min		13 rpm	16 rpm	13 rpm	16 rpm	13 rpm	16 rpm	1 ply US TP	52%	88%	84%	94%	83%	96%	2 ply US TP	98%	98%	100%	100%	100%	100%	3 ply US TP	8%	22%	12%	45%	32%	44%	Source: KC Labs. Report 18-006	See Answer 55
	30 min		60 min		90 min																																					
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3 ply US TP	8%	22%	12%	45%	32%	44%																																				
57	INDA	109	112		Te	The forces found in a system immediately after flushing can in no way be represented by a Reynolds Number of 20,000. Immediately after flushing, a product can be subjected to the strong mechanical agitation of a household pump, or it may sit in the drain-line for hours until other water flow moves it.	Remove the phrase "immediately after a product is flushed".	PARTIALLY ACCEPTED - language modified																																		
58	NP	109	112	2	Te	The agitation levels would vary within the system from time to time. What is the study that was used to determine the Reynolds number here?	Please explain how Reynolds number of 20000 correlate agitation in the drain line immediately after flushing.	NOT ACCEPTED - the Re of 20,000 is calculated for an 8"/200mm pipe and not a drainline																																		
59	PG	109	110	2	Te	Lacks sufficient details. The statement "hydraulic forces typically found in continuous flow conditions in small diameter (8 inch/200 mm) wastewater transport systems, immediately after a product is flushed: i.e. forces equivalent to a Reynolds number of 20,000" requires additional information. Define "continuous flow conditions." NB: The Reynolds Number for an 8" pipe carrying wastewater continuously can vary from ~4,600 to ~42,000 depending on the volume and characteristics of the wastewater conveyed. This does not consider temperature effects on the Reynolds Number (see below). To imply a Reynolds Number of ~20,000 is "typical" for an 8" pipe is unfounded, wholly unsubstantiated and incorrect. Flow varies in sewers continuously throughout each day, and as such, the wastewater flow in an 8" pipe can be described by a Reynold's Number of 20,000 for less than ~15 minutes each day, or ~1% of each day. in	Revise: "The purpose of this test is to assess the disintegration performance of a material when it is subjected to turbulence hydraulic forces for a short duration. typically found in continuous flow conditions in small diameter (8 inch/200 mm) wastewater transport systems, immediately after a product is flushed: i.e. forces equivalent to a Reynolds number of 20,000."	NOT ACCEPTED																																		
60	PG	109	110	2	Te	The Reynolds Number varies with temperature. For example, for an 8" pipe flowing 1/3rd full carrying wastewater at a temperature of 50 degrees Fahrenheit, the Reynolds Number would equal	Provide the rationale the IWSFG utilized for choosing 20,000 as the appropriate Reynolds Number for testing	see answer 40																																		

	Initial	Starting Line Number (e.g. 17)	Ending Line Number (e.g. 23)	Clause/Subclause (e.g. 3.1)	Type of comment <sup>1</sup>	Comments	Proposed change	Observation of the secretariat
61	PG	109	110	2	Te	As noted above, the Reynolds Number varies with temperature. Importantly, the Reynolds Number also varies throughout the day with the pattern of change in wastewater volume commonly referred to as diurnal flow. For the examples above, taking into account diurnal flow patterns, for the 8" pipe carrying wastewater at a temperature of 50 degrees Fahrenheit, the Reynolds Number will vary between ~6,300 to ~27,800. For the same pipe with wastewater at a temperature of 80 degrees Fahrenheit, taking into account diurnal flow patterns, the Reynolds Number would vary between ~7,800 to ~34,000. As such, for an 8" pipe that can convey wastewater with a Reynolds Number of ~20,000 under certain conditions and at certain times, <u>the Reynolds Number can vary between ~6,000 and ~34,000 daily</u> . For example, at 4:00am, flow in an 8" pipe can be described by a Reynold's Number of ~6,000, and as a result of diurnal flow, the same pipe will convey wastewater that can be described by a	Provide the rationale the IWSFG utilized for choosing 20,000 as the appropriate Reynolds Number for testing disintegration in PAS-3 in the context of diurnal flow. NB: An 8" pipe will convey wastewater described by a Reynolds Number ranging between ~6,000 and ~20,000 <u>within a span of 5 hours</u> as a result of diurnal flow.	See answer 40
62	afgc	111	112	2	Te	"forces equivalent to a Reynolds number of 20,000" is confusing as Reynolds number is dimensionless whereas force has a dimension. The inference here is that test method requires to simulate the hydraulic forces experienced in turbulent flow conditions within sewerage systems.	ratio of forces equivalent to a Reynolds number of 20,000	ACCEPTED -
63	INDA	111	112		Te	There were numerous comments reflected in the first draft around choice of a Reynolds Number of 20,000 and use of that to define a conveyance system. In addition, there were comments questioning how the parameters of the Slosh Box Test were equated to a Reynolds Number of 20,000.	Draft 1 response to comment suggested this issue would be addressed in the second draft.	See answer 40
64	NP	111	112		2 Te	How does 4 l, 16 rpm simulate Re=20,000? The flow is • laminar when Re < 2300 • transient when 2300 < Re < 4000 • turbulent when 4000 < Re Based on our calculations, Reynolds number for 8 in pipe is around 48000 and for 4 in pipe is around 93000. As the water temperature increases or decrease these numbers will change. Also in the wastewater system, since it is not pure water as it has other effluents in it and this changes the viscosity of the water and velocity and it will change the calculation of the Reynolds number. So it would appear that the system is more dynamic than 20000. What were the conditions in the system while calculating the chosen Reynolds number?	Please reference studies or articles in the document to show these calculations and conditions in the waster water system.	See answer 40

	Initial	Starting Line Number (e.g. 17)	Ending Line Number (e.g. 23)	Clause/Subclause (e.g. 3.1)	Type of comment <sup>1</sup>	Comments	Proposed change	Observation of the secretariat
65	PG	111	112	2	Te	No references provided to establish correlation between the slosh box and the Reynolds Number.	Add an Annex that includes all work conducted by the IWSFG to establish correlation between the slosh box and the Reynolds Number. NB: Any correlation should account for the relationship between temperature and diurnal flow on the Reynolds Number as outlined above.	NOT ACCEPTED
66	PG	111	112	2	Te	While no correlation between the slosh box and the Reynolds Number is available (as noted above), the work of Karadağlı et. al. established a relationship between rotational speed of a shake flask and the Reynold's Number. Using the correlation provided by Karadağlı et. al., a Reynold's Number of ~20,000 occurs at a shake flask speed of approximately 74 revolutions per minute.	Conduct an interlab test evaluating disintegration of a range of materials using a shake flask with a rotational speed of 74 RPM to evaluate teh validity of the IWSFG's position that a material must disintegrate (with 95% passing a 25 mm sieve) after 30 minutes of exposure to conditions described by a Reynold's Number of 20,000 to be compatible with wastewater transport systems.	NOT ACCEPTED - See Answer 40
67	SUO	111	112		Te	Please provide a reference of Reynolds numbers of 20,000 which is found in continuous flow condition in wastewater transport		NOT ACCEPTED - No Relevance to PAS
68	AF&PA	113	117	3	Te	The Scope of PAS3 is inappropriate because it is not consistent with PAS1 and PAS2. It must exclude toilet paper.	Add the following language from PAS1 to PAS3 Scope: "Toilet paper is out of scope of this document because it is intended to be covered by a separate paper manufacturing standard being developed by the International Standards Organization working group ISO TC6 SC2 WG27."	PARTIALLY ACCEPTED - PAS3 scope replaced by modified scope from PAS1
69	KC12	113	117	3 Scope	Ge	ISO TC6 SC2 WG27 is only developing a test method to measure disintegration of paper using agitation within a small flask and stirrer. There will be no pass/fail criteria associated with this standard.	Scope statement needs to be amended to reflect output of TC6 SC2 WG27	Not Accepted

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70	afgc	114	114	3	Ed	Spelling of 'distributer'; is this the American spelling?	distributor	ACCEPTED - see modified scope
71	GHC	114	114		Te	Suggest strike distributor from line 114	... a manufacturer -may wish to identify as being flushable ...	ACCEPTED - accepted
72	GHC	114	117		Te	It should be borne in mind that the slosh box test was designed for sheet nonwovens. This test would not be suitable for "all	Narrow the scope of this PAS.	See answer 68
73	INDA	114	114		Te	To the best of our knowledge, distributors of retail products do not make the determination of whether or not a product is considered flushable. Retailers, brand owners, private label owners – these are groups responsible for requesting from a brand manufacturer or private label manufacturer a product that is acceptable for being marketed as “flushable”.	... a manufacturer <del>or distributor</del> may wish to identify as being flushable ...	ACCEPTED - Accepted
74	INDA	114	117		Te	Broadly defining the scope of this document when it was originally designed for sheet or sheet-like materials is problematic. This test cannot predict the nature of future products that may be considered flushable.  Examples of potentially problematic products include disposable ostomy bags or toilet seat liners.	Narrow the scope, or include language that details the potential issues of using materials not intended for this test.	See answer 68
75	NP	114	117	3	Te	There are other products in the market that is used for toilet bowl cleaning or bathroom cleaning and they might not get contaminated with human excreta. Does IWSFG not consider	Please clarify.	See answer 68
76	PG	114	117	3	Te	Contradicts Scope of PAS-1. Scope of PAS-3 is significantly different from PAS-1, specifically with regards to toilet paper. PAS-3, by failing to exclude toilet paper (as done in PAS-1), appears to include toilet paper is in scope for PAS-3.	Revise Scope of PAS-3 and/or PAS-1 to clearly identify the products that are in Scope.	See answer 68
77	NP	134	136	6	Te	See comments for 111-112.	Please clarify.	See Answer 40
78	KC13	135		6	Principles	Te If the test is to demonstrate potential to disintegrate a pass / fail Criteria of 95% is unnecessarily aggressive, given the variability associated with using 25mm sieve. Refer to picture of Brand X wipe after 30minutes (A.8.2) – the accompanying data indicates ~ 85% passing 25mm which would be a fail, implying that this sample would not have potential to disintegrate?		NOT ACCEPTED - No Relevance to PAS

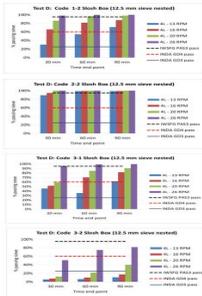
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79	PG	135	136	6	Te	Vague. As noted above, the description of the Reynolds Number in Section 2 is incomplete and lacks sufficient detail to understand the conditions implied. Further, the Reynolds Number is a ratio of forces, and therefore a dimensionless number, not a measure of hydraulic force. No description of hydraulic force is included in Section 2.	Revise with appropriate description of the Reynold's Number.	<b>PARTIALLY ACCEPTED - Reynolds Number Definition in PAS2 was modified</b>
80	Lenzing	141	142	slosh-Box D	Te	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.	<b>NOT ACCEPTED</b> The size of the box in PAS 3B/PAS3 is indeed different from GD3. It is the size from GD2. The box sizes were discussed in GD4 meetings and members agreed to continue use of sizes in GD2
81	KC14	142		7.1	Te	Check with manufacturer references, the depth of slosh boxes from Lenzing is 6.5"(16.5cm)	Check, update and consider note to allow a range of depths for slosh box from 6.5 – 12.0 inches.	<b>ACCEPTED</b>
82	IPS	153		7.2	Te	0.5 degree tolerance in the slosh box mechanism is too tight because there is typically a half to one full degree in the motor of play itself. This tolerance is too tight on the unit and very difficult to adjust.	Change to ± 1 degree.	<b>NOT ACCEPTED</b>
83	KC15	153			Te	11 degrees (+/- 0.5 degrees)	Please share data that confirms variance in % pass through across the angle range specified for set up.	<b>NOT ACCEPTED</b>
84	PG	153	153	7.2	Te	With a base of 18" and a specified travel of 4", the rock angle is calculated as 12.8 degrees. Given the discrepancy between the calculation and the angle prescribed, the allowable rock angle should be adjusted to include both measures.	Suggest: The platform should rock to both sides at <u>10.5 - 13</u> degrees from the vertical. If retained, revise the vertical travel to produce a rock angle of ~11 degrees.	<b>NOT ACCEPTED</b> - GD2 provides a drawing that was relied upon to calculate the rock angle (10.98 degrees) which was rounded to 11.0 degrees. The basis for this measurement comes from the use of the base plate dimension of 21", and not the slosh box internal dimension of 18" for the calculation. Since GD3 did not contain this calculation the IWSFG added this critical information to PAS3B/PAS3. See also Answer 80 that addresses the difference in size for the GD3 slosh box
85	KC16	154			Te	Angle is measured against horizontal	Change vertical to horizontal	<b>ACCEPTED</b> - vertical changed to horizontal
86	KC17	154	155		Te	Not necessary to measure angle and displacement. Stick with angle as shown in appendix	Delete "With a vertical travel of 10 cm from top of stroke to bottom of stroke as measured from the bottom edge of the test tank's base platform."	<b>ACCEPTED</b> - Language deleted

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87	afgc	158	158	7.2	Te	There is a significant difference (30%) between the 16 rpm specified in PAS 3 vs 23 rpm as specified by INDA/EDANA standard. The oscillating cycle of the testing equipment needs to be sufficient to simulate the turbulence experienced through a sewerage network, that is, 20,000 Re. The appropriate speed needs to be validated via empirical study. It appears that 16 rpm does not simulate turbulent flow. In the absence of an empirical study, then adopt 23 rpm which appears to provide conditions more closely simulating 20,000 Re.	23 rpm	NOT ACCEPTED - See answer 40 Since the PAS3 test is modeled after the INDA/EDANA GD3 FG502 Slosh Box Disintegration test, and uses the same equipment, the test that GD3 relies on to demonstrate disintegration and protection of the sewer systems, would be subject to the same set of comments. To the best of our knowledge neither INDA or EDANA has done the analysis requested by the commenter on the force provided in the GD3 FG502 test. Work comparing the FG502 slosh box results to a Continually Flowing Pipe (CFP) demonstrate the FG502 test produces significantly more force than the CFP with a Reynolds Number of 49,000. <b>To match the disintegration for a Reynolds Number of 49,000 the water volume in the test would need to be increased from 2L to 9L.</b>																																													
88	SUO	158	159		Te	It is mentioned that the cam shall be 16 rpm. Does this rpm equivalent to Reynolds number of 20,000?	Please check what cam speed corresponds to Reynolds number of	See Answer 40																																													
89	Lenzing	163	163	7.3 Other	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.	Remove line 163	ACCEPTED - All references to the use of the strainer are deleted, including Annex 6																																													
90	afgc	165	165	7.3	Te	There is a significant difference (100%) between 25mm sieve aperture in PAS 3 vs 12.5mm for the INDA/EDANA standard. Consideration should be given to determine a sieve size to reflect the most prominent screen size protecting equipment within the sewerage system or the screen size guarding the equipment most prone to snagging.		NOT ACCEPTED - No Relevance to PAS																																													
91	KC18a	165		10.4	Te	Testing 1,2,3 ply toilet papers using PAS3 by KC with both 25mm and 12.5 mm sieves indicates that % passing 25mm sieve is dependent on showering without any attempt to "force the passage" .	Change 25mm sieve to 12.5mm sieve and reassess pass / fail due to lower pass through amounts on the smaller sieve hole size.	NOT ACCEPTED - In response to comments regarding the exact issue raised in this comment from KC in Draft 1 (Comments 97 & 98) the IWSFG increased the sieve size. The sieve size is consistent with the pass criteria from the INDA /EDANA GD2 FG522.2 It states that: "the purpose of the test is to assess the breakup or dispersibility of test material during wastewater conveyance". To demonstrate that it required at least 95% of the product to break up into 25 mm pieces, or pass through a 25 mm sieve.																																													
92	KC18b	165		10.4	Te	 <p>Condition Shower</p> <table border="1"> <thead> <tr> <th>Average of % pass</th> <th>Column L</th> <th>12mm only</th> </tr> </thead> <tbody> <tr> <td>Code1-1</td> <td>100%</td> <td>100%</td> </tr> <tr> <td>Code1-2</td> <td>83%</td> <td>49%</td> </tr> <tr> <td>Code2-2</td> <td>99%</td> <td>91%</td> </tr> <tr> <td>Code3-2</td> <td>24%</td> <td>7%</td> </tr> </tbody> </table> <p>Condition No Shower</p> <table border="1"> <thead> <tr> <th>Average of % pass</th> <th>Column L</th> <th>12mm only</th> </tr> </thead> <tbody> <tr> <td>Code1-1</td> <td>100%</td> <td>100%</td> </tr> <tr> <td>Code1-2</td> <td>61%</td> <td>49%</td> </tr> <tr> <td>Code2-2</td> <td>92%</td> <td>89%</td> </tr> <tr> <td>Code3-2</td> <td>12%</td> <td>7%</td> </tr> </tbody> </table> <p>% increase due to shower</p> <table border="1"> <thead> <tr> <th></th> <th>25mm</th> <th>12mm only</th> </tr> </thead> <tbody> <tr> <td>Code1-1</td> <td>0%</td> <td>0%</td> </tr> <tr> <td>Code1-2</td> <td>36%</td> <td>-1%</td> </tr> <tr> <td>Code2-2</td> <td>8%</td> <td>2%</td> </tr> <tr> <td>Code3-2</td> <td>94%</td> <td>-4%</td> </tr> </tbody> </table>	Average of % pass	Column L	12mm only	Code1-1	100%	100%	Code1-2	83%	49%	Code2-2	99%	91%	Code3-2	24%	7%	Average of % pass	Column L	12mm only	Code1-1	100%	100%	Code1-2	61%	49%	Code2-2	92%	89%	Code3-2	12%	7%		25mm	12mm only	Code1-1	0%	0%	Code1-2	36%	-1%	Code2-2	8%	2%	Code3-2	94%	-4%		See Answer 91
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93	KC18c	165		10.4	Te	The % passing 12.5mm sieve is only minimally affected by showering and is the correct choice of sieve for Toilet Papers. Source KC labs Report 18-006		See Answer 91																																																	
94	KC19a	165		10.4	Te	Round robin testing of PAS3 between KC and PV labs using 8 international toilet papers reveals false positive errors in both labs (Type 1) for the 25mm sieve	Change 25mm sieve to 12.5mm sieve	NOT ACCEPTED																																																	
95	KC19b	165		10.4	Te	<p><b>Rinsing</b> - generating type 1 errors</p> <ul style="list-style-type: none"> <li>Causes 3 codes to move from fail to pass - PG</li> <li>Causes 1 code to move from fail to pass - KC</li> </ul> <p>ISWFG : PAS3 Round Robin Testing at KC and PG Labs</p> <p>Data by lab KC : 2L and 4L Pour PG : 1L and 4L Pour</p> <table border="1"> <thead> <tr> <th rowspan="2">Code Name</th> <th colspan="2">KC</th> <th colspan="2">PG</th> </tr> <tr> <th>Mean</th> <th>Std Dev</th> <th>Mean</th> <th>Std Dev</th> </tr> </thead> <tbody> <tr> <td>Code 1-1</td> <td>99.9%</td> <td>0.2%</td> <td>100.0%</td> <td>0.0%</td> </tr> <tr> <td>Code 1-2</td> <td>90.8%</td> <td>12.8%</td> <td>82.0%</td> <td>9.8%</td> </tr> <tr> <td>Code 2-1</td> <td>89.4%</td> <td>6.0%</td> <td>92.8%</td> <td>4.0%</td> </tr> <tr> <td>Code 2-2</td> <td>91.2%</td> <td>2.7%</td> <td>98.0%</td> <td>1.4%</td> </tr> <tr> <td>Code 3-1</td> <td>72.2%</td> <td>14.1%</td> <td>64.5%</td> <td>6.0%</td> </tr> <tr> <td>Code 3-2</td> <td>12.2%</td> <td>10.3%</td> <td>23.9%</td> <td>13.8%</td> </tr> <tr> <td>Code 4-1</td> <td>97.7%</td> <td>1.3%</td> <td>100.0%</td> <td>0.1%</td> </tr> <tr> <td>Code 4-2</td> <td>81.5%</td> <td>5.3%</td> <td>76.4%</td> <td>3.9%</td> </tr> </tbody> </table> <p>Note : Conditional formatting of both tables set per &gt;95% criteria</p>	Code Name	KC		PG		Mean	Std Dev	Mean	Std Dev	Code 1-1	99.9%	0.2%	100.0%	0.0%	Code 1-2	90.8%	12.8%	82.0%	9.8%	Code 2-1	89.4%	6.0%	92.8%	4.0%	Code 2-2	91.2%	2.7%	98.0%	1.4%	Code 3-1	72.2%	14.1%	64.5%	6.0%	Code 3-2	12.2%	10.3%	23.9%	13.8%	Code 4-1	97.7%	1.3%	100.0%	0.1%	Code 4-2	81.5%	5.3%	76.4%	3.9%		See Answer 94
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96	KC20a	165		10.4	Te	Round robin testing of PAS3 with international dry toilet papers reveals that PAS3 is not repeatable between 2 labs	Test method PAS3 needs further work to ensure that the method is repeatable between experienced labs.	NOT ACCEPTED																																																	
97	KC20b	165		10.4	Te	<p>PAS3 - Interlab variability (KC and PG)</p> <p>One way analysis of means - between labs</p> <p>1. Codes statistically the same : Code 1-2, 3-2, 4-2</p> <p>2. Codes statistically different : Code 2-2, 3-1, 3-2, 4-1</p>		See Answer 96																																																	
98	KC21	176	185	8.2 Number of pieces	Te	To allow for equal sampling between two packs it would make more sense to sample 6, this would also improve the calculation of average.	Change 5 specimens to 6 specimens	NOT ACCEPTED																																																	
99	Lenzing	177	177	8.2. Number of test pieces	Te	Use of 3 specimens from one package of wipes and 2 specimens from the 2nd package of wipes is not equal.	Recommend to use 6 specimens. Slosh-Box with 3 boxes according to the Annex A1.2 requires 2 series of tests with each 3 specimens (one sample in each box).	NOT ACCEPTED																																																	
##	SUO	177	182		Ge	It is mentioned that only five (5) specimen are required for each complete testing. A typical slosh box instrument has 3 boxes which means three samples can be tested at a time. Having one empty box for the next two sample testing will unnecessarily create disturbance in the slosh box instrument.	<del>5 sample are required for each complete testing. It is recommended that, where possible, specimens should be obtained at least from two distinct packages or rolls of a product (3 from one and 3 from the other).</del>	NOT ACCEPTED																																																	

	Initial	Starting Line Number (e.g. 17)	Ending Line Number (e.g. 23)	Clause/Subclause (e.g. 3.1)	Type of comment <sup>1</sup>	Comments	Proposed change	Observation of the secretariat
##	INDA	186	186		Ge	Is dry tissue in or out of scope for this method ?	Clarify if dry tissue is or is not toilet paper.	ACCEPTED- Toilet Paper is out of scope. Dry Tissue section deleted - See also changes the PAS2 Definition
##	GHC	188	194		Ge	Dry tissue (toilet paper) is not within the scope of the PAS	Delete section	See Answer 101
##	NP	188	194	8.3.1	Ge	It was mentioned in PAS1 between 147-150 that the document does not cover toilet paper. What does dry tissue stand for? Is it toilet paper or facial tissue made with wet strength agents?	Please clarify if dry tissues is toilet paper or other types of tissue. And please clarify if this method is designed for toilet paper or not.	See Answer 101
##	PG	188	194	8.3.1	Te	Per PAS-1, toilet paper is not in scope.	Delete.	See Answer 101
##	KC22a	189			Te	For 3ply dry toilet paper (code 3-1) it can be demonstrated that the % pass is a function of the starting mass (or sheet count). For code 3-1 statistically different results are obtained with 1 and 2 sheets. The results should not be a function of mass loading. See analysis of means below	Further work is required with method PAS3 to ensure sample size does not affect outcome.	See Answer 101
##	KC22b	189			Te		Furthermore the sample size/quantity used in the slosh box should reflect the material usage. For dry toilet paper this should be an implement of 6 sheets. Source : KC lab 18-003	See Answer 101
##	Lenzing	189	191	8.3.1 Dry T	Te	Using the sample will influence the results as the starting material is already smaller. Thus physical disintegration can be expected to be improved.	Starting materials should initially be all of the same size of grammage respectively.	See Answer 101
##	SUO	189	190		Te	It was said that the specimen size shall be either one or two sheets of toilet paper but in reality and actual use its more than 2 sheets of toilet tissue.	Instead of two sheet of toilet tissue, 6 sheets of toilet tissue should be used for testing criteria irrespective of the type and mass of toilet tissue as nobody uses 2 sheets of toilet tissue for their personal	See Answer 101
##	INDA	193	194		Te	The prior paragraph says one or two. This paragraph says one.	Clarify, one or two.	See Answer 101
##	NP	193	194	8.3.1	Te	Is it one or two sheets? It says one or two sheets depending on the dimensions in the previous paragraph.	Please clarify and correct.	See Answer 101
##	NP	197	198	8.3.1	Te	What are other products? If it is anything that can potentially flushed, what can those products be?	Please include examples or a list. Hygiene products, house cleaning products, personal cleaning products, etc.?	NOT ACCEPTED - defined in scope
##	INDA	198	198		Te	This assumes you know what the product is.	Language needs to be included in this document that gives guidance to a tester who might need to test a product in some other form. If the scope is left broad, the IWSFG must anticipate how the test might be adapted.	NOT ACCEPTED - defined in scope
##	IPS	205		9.1	Te	What is the preoccupation of double-bagging samples, including dry products?	Strike from method.	ACCEPTED

	Initial	Starting Line Number (e.g. 17)	Ending Line Number (e.g. 23)	Clause/Subclause (e.g. 3.1)	Type of comment <sup>1</sup>	Comments	Proposed change	Observation of the secretariat
##	INDA	207	214		Te	In light of the need to produce random samples from multiple packages (which includes pulling samples from the middle of packages), it may be prudent to suggest for each new test a new set of packages should be chosen. Once a package is open, there is no control over how the product will react.  Comments similar to this were made in the first draft of these specifications.	Recommend storing samples in this way for archival purposes, but recommend using fresh samples for each new test.	ACCEPTED- sentence now reads as follows: If the samples have been removed from the manufacturer's original packaging, the samples shall be identified and stored for archival purposes as follows: When possible, it is recommended to use fresh samples for each new test.
##	NP	207	215	9.1	Te	The explanation for storage of the samples are very vague. Number 2 and number 3 points both talk about hard plastic containers but tells a different storage procedure. Overall, the procedure does not talk about how long these samples can be stored before the next set of testing. It might be more controllable if a new package is open for each set of testing. What does secure laboratory cabinets mean? with locks or specially	Please clarify the procedure and add using new package for each set of testing if there will be a stop between the test sets.	See Answer 114
##	KC23	215		9.1	Ge	Any reason for cabinet to be secured?		ACCEPTED -- requirement will be deleted
##	INDA	219	219		Ge	For completeness sake and clarity, the IWSFG should reference the conditioning step in the summary.	Reference the conditioning step in the summary.	ACCEPTED - Language added
##	KC24	219	230	10.1 Summary	Ed	Not clear, needs to be re written. I think I know what it means	Make clear	ACCEPTED -- Last sentence revised
##	SUO	220	230		Te	It is mentioned that the passing criteria for test product should be greater than 95% in 30 mins.	Please provide rationale behind the changes made compared to first draft from a 120 min test to a 30 min test.	NOT ACCEPTED - The test method seeks to be consistent with the US Federal Trade Commision (FTC) settlement with Nice-Pak that states: Specifically, any tests, analyses, research, studies, or other evidence purporting to substantiate any of the above representations must at least: A. demonstrate that the Covered Product disperses in a sufficiently short amount of time after flushing to avoid clogging, or other operational problems in, household and municipal sewage lines, septic systems, and other standard wastewater equipment; Based on data from surveys and transit time studies presented in GD4 meeting (Travel and Residence Times for Wipes after Flushing March 25, 2015) – in this paper the analysis showed that time for transit times from flush to pump had a minimum of less than 10 minutes and the 10th percentile was 31 minutes) the time should favor the minimum transit times of 30 minutes or less to be consistent with the "conservative criteria" definition from GD1 and GD2, or the idea that lab tests should be conservative to allow for the variations in wastewater systems.
##	afgc	223	223	10.1	Te	There is a significant difference (100%) between 4L of water in PAS 3 vs 2L as specified by INDA/EDANA. The higher volume of water will have a greater capacity to absorb the inertial forces induced by the oscillating testing equipment. Fluid friction is a factor in developing turbulent flow. Counteracting this effect is the viscosity of the fluid, and the volume, which as they increase, progressively inhibit turbulence, as more kinetic energy is absorbed by the liquid. The appropriate volume needs to be validated via empirical study. It appears that 4L does not simulate turbulent flow. In the absence of an empirical study, then adopt 2L which appears to provide conditions more closely simulating 20	2L	NOT ACCEPTED -- See Answer 87

	Initial	Starting Line Number (e.g. 17)	Ending Line Number (e.g. 23)	Clause/Subclause (e.g. 3.1)	Type of comment <sup>1</sup>	Comments	Proposed change	Observation of the secretariat
##	GHC	223	226		Te	The testing parameters and the final pass/fail criteria have changed dramatically since the first draft. Why? Thus: 13 rpm changes to 16 rpm 120 minutes changes to 30 minutes 6 mm sieve changes to 25 mm sieve		NOT ACCEPTED - No Relevance to PAS - See Answer 87
##	INDA	223	226		Te	The testing parameters and the final pass/fail criteria have changed dramatically since the first draft. There were no indications in the IWSFG responses to comments in the first draft that these specific changes were to be made.  13 rpm – 16 rpm 120 minutes – 30 minutes 6 mm sieve – 25 mm sieve	Can the IWSFG please provide the rationale behind these significant changes to the testing parameters and pass/fail criteria ?	NOT ACCEPTED - No Relevance to PAS - See Answer 87
##	KC25a	223	225	10.1 Summary	Te	Testing dry toilet papers at 4l, 16rpm, 30 minutes in the Slosh Box does not appear to generate lower levels of disintegration than anticipated. A slosh box ladder using 4l at 13,16,20,26 rpm with time end points of 30,60,90 minutes and a 12.5mm sieve		NOT ACCEPTED - No Relevance to PAS - PAS3 uses a 25mm sieve and there is no proposed change suggested
##	KC25b	223	225	10.1 Summary	Te			NOT ACCEPTED - No Relevance to PAS - See Answer 123
##	KC25c	223	225	10.1 Summary	Te	The output of the Slosh Box ladder is directionally supports the results reported to ISO TC224 WG10 N287 when a linear flowing system (10" pipe) was set to run half full at 1.2ft/sec to approximate to Nr ~20,000 and then correlated to various Slosh boxes – using Dry Toilet Paper samples		NOT ACCEPTED - No Relevance to PAS See Answer 123

	Initial	Starting Line Number (e.g. 17)	Ending Line Number (e.g. 23)	Clause/Subclause (e.g. 3.1)	Type of comment <sup>1</sup>	Comments	Proposed change	Observation of the secretariat
##	KC25d	223	225	10.1 Summary	Te			NOT ACCEPTED - No Relevance to PAS - See Answer 123
##	Lenzing	223	225	10.1. Sum	Te	Slosch-Box criteria were changed significantly (4l/16 rpm after 30 min., use of sieve 25mm)	Please explain the science behind this decision.	NOT ACCEPTED - No Relevance to PAS - See Answer 87
##	NP	223	226	10.1	Te	<p>How does 4 l, 16 rpm, 30 min and 25 mm hole sieve replicate the transportation conditions in the wastewater system?</p> <p>How does the previous conditions change to these new conditions? What is the rationale behind choosing 16 rpm over 13 rpm and GD3 conditions?</p> <p>13 rpm to 16 rpm 120 minutes to 30 minutes 6 mm sieve to 25 mm sieve</p> <p>Is there any data or collection studies that shows GD3 complaint flushable wipes create clogs and blockages in the systems?</p>	Please show data or reference studies that proves these conditions replicates what commonly exists in wastewater systems. Please reference a study or data that shows these new parameters will create improvements in wastewater clogs and blockages.	NOT ACCEPTED - No Relevance to PAS - See Answer 87
##	SUO	223	225		Te	It is mentioned that the slosh box should be filled with 4L of water. Does 16 rpm of cam speed and 4L of water equivalent to Reynolds number of 20,000?	The test measures the overall breaking down of wipes/tissue in water with certain hydraulic forces. Please provide a reference backed by field/lab study on how 16 rpm of cam speed and 4L of water provides hydraulic forces which can be found similar in wastewater and treatment	NOT ACCEPTED - No Relevance to PAS - See Answer 40
##	afgc	224	224	10.1	Te	There is a significant difference (30%) between the 16 rpm specified in PAS 3 vs 23 rpm as specified by INDA/EDANA standard. The oscillating cycle of the testing equipment needs to be sufficient to simulate the turbulence experienced through a sewerage network, that is, 20,000 Re. The appropriate speed needs to be validated via empirical study. It appears that 16 rpm does not simulate turbulent flow. In the absence of an empirical study, then adopt 23 rpm which appears to provide conditions	23 rpm	NOT ACCEPTED - no data provided to back the claim that 23rpm more closely simulates a Re 20000. Also not sure where 23 rpm comes from. It is not a GD3 parameter.
##	PG	224	224	10.1	Te	No justification for conducting the test at 16 RPM is provided. It can be inferred that this speed is meant to mimic a Reynold's Number of 20,000, though no supporting information is provided to establish the validity of this relationship.	1. Provide the rationale for changing the speed of the slosh box from 13 RPM to 16 RPM. 2. Further, state whether 4L @ 13RPM (as stated in the first draft of the IWSFG PAS documents- IWSFG-PAS-3B-Slosch-Box-Test-2017-07-21) or 4L @ 16RPM represents a Reynolds Number of 20,000. NB: Both speeds cannot replicate	NOT ACCEPTED - No Relevance to PAS - See Answer 40

	Initial	Starting Line Number (e.g. 17)	Ending Line Number (e.g. 23)	Clause/Subclause (e.g. 3.1)	Type of comment <sup>1</sup>	Comments	Proposed change	Observation of the secretariat
##	PG	224	225	10.1	Te	No justification for the 30 minute test duration is provided. Specifically, no information detailing why disintegration to the extent proposed in this document within 30 minutes is necessary for compatibility with wastewater transport systems. Laboratory and field testing have repeatedly demonstrated that 1., materials that are compatible with wastewater transport systems remain intact longer than 30 minutes, and 2., intact, weakened, and/or partially disintegrated materials are compatible with the toilet, <del>drainline, household pumps, septic tanks, municipal wastewater</del>	1. Provide the rationale for changing the duration of the test from 120 minutes to 30 minutes. 2. Further, state whether 4L @ 13RPM for 2 hours (as stipulated in IWSFG-PAS-3B-Slosh-Box-Test-2017-07-21), or 4L @ 16RPM for 30 minutes represents a Reynolds Number of 20,000. NB: Both combinations cannot replicate an Re of 20,000	NOT ACCEPTED - No Relevance to PAS - See Answer 87
##	IPS	227		10.1	Te	Trying to photograph the bottom of the sieve can lead to remnants falling from the sieve and affecting the final weight of product. Too many photographs taken.	Strike from method and photograph total remnants taken from sieve.	PARTIALLY ACCEPTED - requirement for photographing the underside was removed
##	IPS	236		10.2.1	Te	Why 4.5 L flush when most toilets are 6 L flush?	Change to 6 L flush.	PARTIALLY ACCEPTED - Patially Accepted -- will Provide a Range 3-6L -- it is true that the current flush volume for US toilets is 6L
##	KC26	236			Te/Ge	Is the flush volume important/The flush volume spec shown doesn't exist for toilets in USA.	Suggest dropping any reference to flush volume or provide a range which could encompass International flush volumes i.e. 4.5 - 6.0L	see 134
##	SUO	250	251		Te	It is mentioned that the sample must be hold for 30 min in drainline or dry contianer before placing it in the slosh box. Keeping the sample in drainline or dry container will have dramatic effect on the test. 30 min will significantly dry the sample	Sample must be used immediately for testing after taking out from drainline to prevent drying out of sample.	NOT ACCEPTED - the sample is thoroughly saturated during the flush and transport through the drainline. It does not dry out in the 30 minute hold time
##	AK	253	253	10.3	te	The sewage water temperature rages between 10° and 20°C . In Ohio at times dipping below 10° in the winter. The proposed test method allows for temperatures up to 23° C (20° +/-3°). I believe the test method should use the minimum of the range instead of the maximum.	Change the test temperature to 10° C	PARTIALLY ACCEPTED - 20°C is changed to 15° (+/-1°)Changes made in all relevant sections to reflect change
##	JN	253	253	10.3	te	The sewage water temperature rages between 10° and 20°C . Often times dipping below 10 dgrees in the winter. The proposed test method allows for temperatures up to 23° C (20° +/-3°). I believe the test method should use the minimum of the range instead of the maximum.	Change the test temperature to 10° C	See Answer 137
##	SV	253	253	10.3	te	The sewage water temperature rages between 10° and 20°C . In Indiana at times dipping below 10° in the winter. The proposed test method allows for temperatures up to 23° C (20° +/-3°). I believe the test method should use the minimum of the range instead of the maximum.	Change the test temperature to 10° C	See Answer 137
##	TR	253	253	10.3	te	The sewage water temperature rages between 10 and 20 degrees C . Often times dipping below 10 dgrees in the winter. The proposed test method allows for temperatures up to 23 degrees C (20 +/-3). I believe the test method should use the minimum of the range instead of the maximum.	Change the test temperature to 10 degrees C	See Answer 137

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##	afgc	256	257	10.3	Te	There is a significant difference (30%) between the 16 rpm specified in PAS 3 vs 23 rpm as specified by INDA/EDANA standard. The oscillating cycle of the testing equipment needs to be sufficient to simulate the turbulence experienced through a sewerage network, that is, 20,000 Re. The appropriate speed needs to be validated via empirical study. It appears that 16 rpm does not simulate turbulent flow. In the absence of an empirical study, then adopt 23 rpm which appears to provide conditions	23 rpm by measuring the time to complete 23 oscillations	NOT ACCEPTED see answer 87
##	IPS	259		10.3	Te	Tolerance too tight and not easy to adjust or can't adjust at all.	Strike from method.	NOT ACCEPTED - there needs to be a consistent angle specified to prevent variability from lab to lab from impacting the results. GD3 did not have this criteria and it was felt that adding it would reduce the chance for variability in the test. The slosh box can be adjusted
##	KC28	259		10.3 Set up	Te	If angle is critical, is it safe to wait 30 days? Would it make sense to check before every run?		NOT ACCEPTED - Based on experience, the angle seems to be relatively stable, once set
##	INDA	261	261		Ed	Unsure as to the meaning of this statement. Specifically, <i>Record on left and right angles ...</i>	Clarify.	ACCEPTED- Section modified for clarity
##	NP	261		10.3	Te	What is left and right angle on the slosh box? Is it when you look from the front of the box or side of the box?	Please clarify.	NOT ACCEPTED Looking at it from the perspective of the pivot point
##	afgc	267	267	10.4	Te	There is a significant difference (80+%) between the time 30 minutes specified in PAS3 vs 180 minutes specified for INDA/EDANA. The rationale for selecting 30 minutes as opposed to 180 minutes as specified in INDA/EDANA needs to be understood. Is it based on the average time that sewage takes to reach a municipal sewage treatment plant or the average time taken to reach the first screen within the network? In the absence of this rationale, suggest a residence time to better reflect actual conditions within a municipal system.	180	NOT ACCEPTED - See Answer 119
##	KC27	270			Te	If distance is important then provide a range for the shower distance	E.g. 10-15cm	PARTIALLY ACCEPTED - In the reviewing comments to the 1st draft the IWSFG accepted the comment that it should be a fixed distance and set the distance at 10cm. We will remove word "approximately"
##	PG	272	272	10.4	Ed	Term "quantitatively" appears to be misplaced.	Delete. If retained, provide a rate to qualify the term "slowly."	PARTIALLY ACCEPTED - word deleted - the term "slowly pour" was taken directly from the GD3 SG004 text -- there was no rate of pour given there - if the commenter would like to supply a rate of pour we will review it
##	afgc	284	284	A.5.3	Te	Change distance of 10cm to be consistent with line 476 which specifies 10 to 15cm	10-15cm	NOT ACCEPTED - see 147
##	INDA	284	288		Te	A 25 mm circular orifice is a large area to rinse flimsy materials through. Has the IWSFG confirmed that the rinsing variability from tester to tester and lab to lab is acceptable? I would recommend conducting a round-robin using a material, such as a baby wipe, that has pre-cut sizes and shapes ranging from 25 mm to 55 mm in 10 mm increments	It is necessary to validate the ability to differentiate identical sizes of materials through the rinsing and sieving process. The accuracy and precision of this sieving method is in question.	NOT ACCEPTED - taken from GD1 and GD2 - See Answer 91
##	NP	284	288	10.4	Te	The hole size is extremely large to create a repeatable test method. Did IWSFG do any studies to confirm that the results will not change from lab to lab or person to person? Was a validation procedure followed to confirm that this part of the test is repeatable? This could generate a lot of variability in the test results. Is the test method repeatable?	Please explain if a validation procedure is followed for this part of the test.	NOT ACCEPTED - taken from GD1 and GD2 - See Answer 91
##	KC29	288		10.4	Te	"Do not force the passage of any material through the sieve." See earlier comments which confirm that 12.5 mm sieve is more secure than 25mm sieve for avoiding "forcing the passage of	Change to 12.5mm sieve to reduce variability cause by rinse/showering	NOT ACCEPTED - taken from GD1 and GD2 - See Answer 91

	Initial	Starting Line Number (e.g. 17)	Ending Line Number (e.g. 23)	Clause/Subclause (e.g. 3.1)	Type of comment <sup>1</sup>	Comments	Proposed change	Observation of the secretariat
##	PG	288	288	10.4	Te	Regarding Step 7: "Do not force the passage of any material through the sieve." Interlab testing utilizing PAS-3 demonstrates that the rinse procedure outlined in Section 10.4 is of such force and duration that it results in disintegration of material initially retained on the sieve, which is subsequently forced through the sieve, in violation of the method. Given the IWSFG positions on toilet paper outlined in Lines 147-150 of PAS-1, a range of toilet paper from three continents were tested to evaluate the resolution of PAS-3 with respect to toilet paper. In summary, the results demonstrated that the proposed PAS-3 is not suited for evaluating different toilet papers, let alone a range of different materials. Of eight toilet papers tested using the PAS-3 method, five reached 95% passing the 25mm sieve, while three toilet papers tested did not achieve 95% passing the 25mm sieve (per PAS-3: fail the disintegration test). Further, and importantly, of the eight toilet papers, only two reached 95% passing the 25mm sieve without the one minute rinse. As such, it is concluded that the rinsing and	1. Remove or revise rinsing step. 2. If rinse step is retained, provide justification for the inclusion of the step, citing inter-lab test results that establish that a., the rinse step is not a source of variability, and b., the rinse step is not a cause of false-positive errors. 3. Conduct round-robin laboratory experiments to understand sources and extent of variability and the rate of occurrences of false-positive results.	NOT ACCEPTED - the details came from GD2, and GD3 Siosh Box Test text SG004 Section 4.0 Procedures Bullet 3
##	PG	293	293	10.4	Te	Regarding Step 10a: visual observation is qualitative.	Replace "quantitative" with "qualitative"	ACCEPTED
##	GHC	300	300		Te	Is a "round of testing" the same as an "agitation sequence" ?	Please clarify the terminology.	ACCEPTED - the language in sections 10.1 and 10.5 were revised for consistency
##	INDA	300	300		Te	Is a "round of testing" equivalent to an "agitation sequence" ?	Please clarify the terminology.	ACCEPTED - the language in sections 10.1 and 10.5 were revised for consistency
##	INDA	303	307		Te	Line 303 states "each article's mass", but the equation and subsequent description states all five samples.	Please clarify.	ACCEPTED- delete the text "each article's"
##	Lenzing	303	303	10.6 Calcul	Te	It is mentioned each article's mass, but in the equation is talking about the total dry mass of 5 specimens.	Please clarify it.	ACCEPTED- delete the text "each article's"
##	NP	303	307	10.6	Te	What does total dry mass equal to? Is it one article or total of 5 articles? There is contradictory descriptions.	Please clarify.	ACCEPTED- delete the text "each article's"
##	PG	303	307	10.6	Te	Language states that percentage calculation is based on individual mass of product- contradicts language in Lines 306-307 stating total mass from 5 tests.	Rectify difference.	ACCEPTED- delete the text "each article's"
##	PV	306	309	10.6	Ge	For clarity, rewording required Three separate sentences	Where:... Total dry mass of the retained fraction on the sieve = the sum of the ... The total initial dry mass of sample = .	PARTIALLY ACCEPTED -examples and clarifications were done to the section
##	NP	310	315	11	Te	What is the pass/fail criteria? Is it the percentage of pass through the sieve or pictures or both? If it also includes pictures, what is the criteria for pictures? It is not defined here. Also do we use individual test values to calculate the dry mass pass through the sieve and add all 5 together and get the average value for final	Please clarify.	The pass through percentage - the pictures are there for transparency purposes
##	PG	311	314	11	Te	No justification provided for proposed criteria: 95% passing 25mm sieve in 30 minutes.	Provide an Annex that describes in detail how the IWSFG determined that this performance is necessary for compatibility with infrastructure. Include all calculations, references to sewer design,	See Answer 91
##	INDA	312	315		Te	It is critical to insure the acceptance criteria is spelled out very clearly. The current interpretation is that the average of all five tested samples is used together, not individually. This becomes important since combination of the weights of all five samples allows for individual samples to be <95% and the product still passes (e.g., four can test to 100%, and one can test to 81% and the product passes).	Insure the criteria are not open to interpretation - be very perscriptive and clear in this requirement.  Even in your examples in A.7 you show the calculations both ways.	PARTIALLY ACCEPTED - language revised and example provided

	Initial	Starting Line Number (e.g. 17)	Ending Line Number (e.g. 23)	Clause/Subclause (e.g. 3.1)	Type of comment <sup>1</sup>	Comments	Proposed change	Observation of the secretariat
##	KC30	312	315	11 Acceptance Criteria	Ed	Unclear if this requires the average of 5 replicates to be >95% pass through	Make clearer	PARTIALLY ACCEPTED - language revised and example provided
##	NP	329	335	12	Te	The explanation here is confusing as it does not explain clearly that if it is being talked about one article of total of 5 articles. Is it one article passing/failing the test or total of 5 articles or average	Please clarify.	See answer 114
##	INDA	330	332		Te	In light of the discussion from Line 312, 11 a) adds confusion. This implies each individual article must be analyzed and calculated separately ?	Please clarify.	See answer 114
##	PG	330	332	12	Te	Regarding Step 11a.: Irrelevant. 100% of the specimens tests may have disintegrated, but to an extent (ex. 94% average passing the sieve) that does not meet the criteria outlined in PAS-3. The test result is recorded in Step 11b.	Delete.	Previously Changed
##	PG	339	345	13	Te	Precision section does not describe precision but rather variability. Further, variability of materials, slosh box angle and speed are covered in other sections.	Delete. If retained, rename "Variability." If retained as "Precision," add definition for precision to PAS-2.	ACCEPTED
##	GHC	342	343		Te	30 days is a long time between checking .	Suggest checking the angle before each test sequence.	See Answer 143
##	INDA	342	343		Te	Having a check for angle based on time (30 days) is problematic. A machine that is used daily will have more need to be checked than a machine that is used monthly.	Suggest checking the angle before each test, just like rpm.	See Answer 143
##	NP	342	343	13	Te	How should the necessary adjustments be made? Is there a procedure to follow? Is it explained by manufacturer of the equipment for those listed in this document? Is calibrating the oscillation every 30 days enough for any frequency of use? Is +/- 0.5 degree within the capability of the equipment that are referenced in this document? Is this capability confirmed with the supplier of these equipment and can it be found in their official tech specs? Current equipment capability of the slosh boxes are not capable of generating a +/- 1/2 or 1/4 degree accuracy when they oscillate. They are not made this sophisticated so a new design should be recommended in the test method.	Please explain and add necessary language. Please clarify if this restriction impacted test accuracy and reproducibility.	NOT ACCEPTED
##	afgc	345	345	13	Te	There is a significant difference (30%) between the 16 rpm specified in PAS 3 vs 23 rpm as specified by INDA/EDANA standard. The oscillating cycle of the testing equipment needs to be sufficient to simulate the turbulence experienced through a sewerage network, that is, 20,000 Re. The appropriate speed needs to be validated via empirical study. It appears that 16 rpm does not simulate turbulent flow. In the absence of an empirical study, then adopt 23 rpm which appears to provide conditions	23 rpm	NOT ACCEPTED - no basis provided for suggested change.
##	KC31	358		A1.1 Sources	Ed	Slosh Box manufacturing reference from FG502 omitted		ACCEPTED - Language for a 3rd source provided by Kimberly Clark was inserted

	Initial	Starting Line Number (e.g. 17)	Ending Line Number (e.g. 23)	Clause/Subclause (e.g. 3.1)	Type of comment <sup>1</sup>	Comments	Proposed change	Observation of the secretariat
##	afgc	399	399	Annex 2,	Te	There is a significant difference (30%) between the 16 rpm specified in PAS 3 vs 23 rpm as specified by INDA/EDANA standard. The oscillating cycle of the testing equipment needs to be sufficient to simulate the turbulence experienced through a sewerage network, that is, 20,000 Re. The appropriate speed needs to be validated via empirical study. It appears that 16 rpm does not simulate turbulent flow. In the absence of an empirical study, then adopt 23 rpm which appears to provide conditions	2 L @23rpm for 180 minutes	NOT ACCEPTED see 87
##	INDA	399	399		Te	Figure 3. Confusing. Remove and hold ... . Based on the text in the document, the requirement is either to hold the wipe IN THE DRAIN-LINE or place the wipe in a dry container.	Please clarify.	ACCEPTED - Section 3 text changed to: Wipe at the End of the Pipe – Leave the wipe in the pipe 30 minutes before it is put in the Slosh Box (4 L @16rpm for 30 minutes). Do not flush again or add additional water during the 30 minute hold time. Section 4 text changed to: Alternative Hold Method – remove wipe from drainline and hold in a dry container for 30 minutes before it is put in the Slosh Box (4 L @16rpm for 30 minutes)  Footnote: in the drainline method the water runs away from the wipe and essentially creates a dry container where no additional water is added for 30 minutes. This alternative allows for the wipe to be removed so the drainline can be used for other testing.
##	IPS	399		Annex 2	Te	Why hold rinsed wipe in dry container for 30 minutes prior to testing?	Strike from method.	NOT ACCEPTED The holding time mimics real drainline conditions where a wipe may not make it all the way out in a single flush
##	NP	399		Annex 2.1	Ge	If this test is designed for multiple products, shouldn't it say as an example if a wipe is tested?	This section should say wipe being used as an example. Otherwise it is narrowing	ACCEPTED -- Text Added
##	NP	399		Annex 2.3	Te	"Wipe at the end of the pipe - Remove the wipe and hold the wipe wet for 30 minutes before it is put in the slosh box." What is the purpose of keeping the wipe for 30 minutes before the slosh box? How was it determined that 30 min is necessary? And if it is, why is it 30 min? Why can't we test the wipe immediately? Similar comment was made in Draft 1 and was not given an explanation on reasoning for waiting.	Please explain.	NOT ACCEPTED - No Relevance to PAS
##	NP	399		Annex 2.3, 4	Te	Confusing statements. Do we hold the wipe wet? Where and how? Do we keep in water or take it out of water and put it in an empty container?	Please clarify.	See Answer 176
##	PG	399	399	Annex 2	Te	Steps 3 and 4: What is the rationale for holding the product being tested in a quasi-dry state for 30 minutes?	Provide the rationale, and all data used, to support the inclusion of a step where the product being tested is held in a quasi-dry state for 30 minutes. If this step is meant to mimic retention in plumbing or a drainline, provide the data that states the percentage of products that are retained in a drainline globally, and the range of retention times globally. Is 30 minutes a minimum, a maximum or an average? For specific countries represented by the IWSFG or globally?	NOT ACCEPTED
##	PV	399		Item 3	Ge	Need rewording to reflect intended meaning	Suggest wording - Remove the wipe and 'keep it wet for 30 minutes.....	See Answer 176

	Initial	Starting Line Number (e.g. 17)	Ending Line Number (e.g. 23)	Clause/Subclause (e.g. 3.1)	Type of comment <sup>1</sup>	Comments	Proposed change	Observation of the secretariat
##	IPS	401		A.3.1	Te	This shows how to measure slosh box angle but not how to calibrate it.	Add calibration method or strike from method.	PARTIALLY ACCEPTED - refer 184
##	KC32	401	405	Annex 3 – Slosh Box Angle Calibration Procedure	Ed/Te		This is a measuring procedure, not a calibration procedure. Please provide guidance on how to adjust angle for the 2 different box models A1.1	Accepted -- following words have been added, if the measurement is not within the specified tolerance, adjust the machinery per the manufacturers specifications, or do not use for testing.
##	NP	401	404	Annex 3	Te	since a digital level needs to be used for calibration of the slosh box, do we need to use a calibrated digital level as well? Is there a calibration method for digital level that is used in the industry?	Please explain.	NOT ACCEPTED
##	NP	401	404		4 Te	This is a very subjective method as the continuous oscillation makes it very hard to read the values while the table is all the way to the left or right (as stated in the calibration method), this might create some variability on this calibration measurement from person to person. Is this method validated?	Please show validation data and clarify.	NOT ACCEPTED
##	PV	404		Item 3	Ge	Need rewording to reflect intended meaning	Allow the table to tilt all the way to the right and record the angle of tilt in degrees	ACCEPTED
##	KC34	421			Ed/Ge	Unable to locate the “swirling products in a container of tap water” method		NOT ACCEPTED - Correct - it was removed
##	GHC	432	432		Ed	should be 4.3	Change	ACCEPTED- change made
##	INDA	432	432		Ed	Missing 4.3	Re-number.	ACCEPTED - change made
##	Lenzing	432	432		Ge	The point 4.4.3. is missing	Please change.	ACCEPTED - change made
##	KC35	435			Te	4.5L flush toilet isn't standard in US	Suggest a range 4.5-6.0L if flush volume is not critical for rinsing lotion	ACCEPTED
##	PV	445	446	A 4.4.2	Ge	reword for clarity as shown.	.....flushes without further products in order to move used products out of .....	ACCEPTED
##	PV	464	464	5.2	Te	List aperture size for fine mesh		NOT ACCEPTED - No Relevance to PAS

	Initial	Starting Line Number (e.g. 17)	Ending Line Number (e.g. 23)	Clause/Subclause (e.g. 3.1)	Type of comment <sup>1</sup>	Comments	Proposed change	Observation of the secretariat
##	NP	467		A.5.2	Te	Should there be also rinsing sieve in this list?	Please add.	NOT ACCEPTED --
##	PG	570	570	A.7.4	Te	Table header incorrectly denotes column as "% Disintegration."	Revise to read the actual values of the column: "% Passing 25 mm sieve"	PARTIALLY ACCEPTED - table revised and this Column deleted
##	afgc	574	574	A.8.1	Ed	To avoid confusion suggest changing Test Result (pass/Fail) result column to Fail	Fail	ACCEPTED
##	GHC	574	574	Table	Ed	<i>The percentage of product remaining on sieve</i> should be 15.10 %, 84.90% is the percentage passing through the sieve.	Edit line.	ACCEPTED - modifications made
##	INDA	574	574		Ed	Fail, not pass according to the criteria. Additionally, the line <i>The percentage of product remaining on sieve</i> is in error. The percentage that is remaining should be 15.10 %. 84.90% is the percentage that passes through the sieve.	Edit line.	See Answer 203
##	NP	574		Annex 8	Te	Percentage remaining on the sieve cannot be 84.9% if we compare to the pictures on page 30. Also how can it be pass if this is only 1 of 5 of the tests? And if it is a pass, was the pass/fail criteria 95% or more?	Please explain and correct.	See Answer 203
##	PG	574	574	Annex 8	Te	Test Result: Pass	Reconcile difference with Table A.7.4.	See Answer 203
##	PG	574	574	Annex 8	Te	Table states "percentage of product remaining" but provides % passing 25mm sieve.	Reconcile difference.	See Answer 203
##	INDA	576	576		Ge	The visual record is a nice touch to the method. One comment.  The image after 30 minutes shows the disintegrated wipe. Based on the report, this is a FAIL at 84.9% of the mass passing through the sieve.  In reality, this means these criteria are indicating that a material that breaks up to this extent is incompatible with wastewater infrastructure !!  I would like to see the justification from the IWSFG that a material like this is truly incompatible.	Based solely on this image, the IWSFG needs to re-evaluate the criteria or supply some type of justification for needing more than this level of disintegration for compatibility.	NOT ACCEPTED - It is a "SAMPLE REPORT" - it is not a photo to determine pass or fail from -- Picture changed
##	NP	576		A.8.2	Te	Confusing test values versus picture of end result for Brand X wipe. If a wipe is broken to this extend, does it still have a negative impact to the wastewater infrastructure? Is there any studies done to prove this?	Please justify these results causing a negative impact to the wastewater infrastructure.	See Answer 208
##	PG	576	576	A.8.2	Te	Brand X, based on the results shown, appears to provide an opportunity to establish a laboratory control for PAS-3.	Provide access to Brand X to all stakeholders for testing to verify	See Answer 208

	Initial	Starting Line Number (e.g. 17)	Ending Line Number (e.g. 23)	Clause/Subclause (e.g. 3.1)	Type of comment <sup>1</sup>	Comments	Proposed change	Observation of the secretariat
##	PG	576	576	A.8.2	Te	Were additional replicates conducted? Testing using PAS-3, in conjunction with the rinsing technique required, resulted in significant variability for materials that disintegrate to the extent of Brand X. In addition, variability between laboratories was also noted for PAS-3, as written. Was testing conducted at multiple labs to verify that each lab obtained equivalent results to the IWSFG?	1. Provide the number of replicates of Brand X that were conducted in total by the IWSFG and all relevant statistical measures, including but not limited to the standard deviation. 2. Provide the number of laboratories that tested Brand X using PAS-3. Were the results equal to the results shared in Annex 8? Provide all raw data. 3. State whether any of the replicates reached 95% for any of the labs.	See Answer 208
##	PG	576	576	A.8.2	Te	Brand X demonstrated significant potential for disintegration during sewer transit based on the photographic record provided. Despite this, the IWSFG has determined that this degree of disintegration still renders Brand X incompatible with wastewater transport systems, yet no explanation is provided to support this opinion.	Section 1 of PAS-3 reads that the test is for: "determining if a product will disintegrate sufficiently to be compatible with wastewater transport systems." 1. Provide the basis for determining that the disintegration demonstrated by Brand X is insufficient. 2. Specifically, detail the wastewater transport system elements	See Answer 208
##	NP	578		Annex 8.1	Te	What is the purpose of the photography? Does this have any affect on pass/fail for the test? If it does, there should be standard images here to compare. Comparing a result picture to a standard picture is a very subjective method and the perception can be changed from person to person. Also moving the broken article to get better visual might cause modification of the results	Please clarify what this section is going to be used for.	See Answer 208
##	KC36	A8.1			Te/Ed	84.90% is a fail not a PASS	Change Test Result to FAIL	ACCEPTED - See answer 203
##	KC37	A8.2			Te/Ge	Brand X Wipe after 30 minutes looks well broken up but fails criteria (84.90%)	Please explain why this Brand X wipe would not be compatible with Wastewater infrastructure?	NOT ACCEPTED - Picture changed