

IWSFG Template for Reviewer comments and IWSFG secretariat observations¹

Document reviewed: IWSFG-Standard-1-Criteria-for-recognition-as-a-flushable-product-2017-07-21

Due Date: 2017-09-01

Initials	Line number (e.g. 17)	Clause/ Subclause (e.g. 3.1)	Paragraph/ Figure/ Table/ (e.g. Table 1)	Type of comment ²	Comments	Proposed change	Observations of the secretariat
KCC	All lines where it occurs			Ge	Amend the word standard to guideline throughout to stop any confusion on behalf of the reader that these documents are standards created under the multi stakeholder processes of the International Standards Organization (ISO)	Change the word standard to guideline throughout	
KCC		Forward		ED	Forward should be Foreword https://www.merriam-webster.com/dictionary/foreword	Correct	
KCC	117			Ed/TE	<p>“The goal of the IWSC is not to ban the production and/or use of these products...”</p> <p>This is a disingenuous statement knowing that a significant proportion of US Dry Toilet paper cannot pass the 3 disintegration tests in this ‘standard’</p> <p>A simple Interlab study of 5 toilet papers was carried out at the KC labs and 2 other labs (1 industry and 1 3rd Party lab)– all 3 labs confirmed that 3 of the 5 toilet papers tested, failed all 3 Disintegration Test using methods PAS3A and PAS 3B – see table below with all data from Interlab study</p>		

¹ Adapted from the ISO/IEC Commenting template. ² Te = Technical, Ge = General, Ed=Editorial

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KCC	119			ED	“Acceptable” must be grounded in data, and impact and not based on whim and personal favorites else we have an arbitrary ‘standard’ not grounded in science.		
KCC				Ed/TE	<p>If 3 disintegration test methods are offered, then all 3 tests must be capable of providing the same outcome when tested in one lab or multiple labs.</p> <p>Based on a the same quick Interlab study using 5 toilet Papers ,there is evidence that <u>within a single lab, all 3 tests do not provide the same outcome</u>—see Code G at KC lab and Code S at Industry Lab.</p> <p>See data table below showing data for Codes F,G,I</p>		

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KCC	179-182		Critical Characteristic	Te,Ge	<p>Throughout all the IWSFG documents, toilet paper is consistently put forward as exemplar material. There is no mention that any toilet paper is a problem, and that it is the more recent advent of 'wipes' in particular which have created problems.</p> <p>Given that Toilet Paper is in scope it would be</p>	All 3 disintegration tests need to be reconsidered and pass / fail criteria reset in order that any current toilet paper on US market today can pass with appropriate safety factor. See separate comment sheets																																																																																																																																																												

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					<p>normal and appropriate that any toilet paper should pass this test with a safety factor of 2 or 3, to allow for variability.</p> <p>Simple screening of toilet papers from the USA shows a significant number which will not only fail all 3 disintegration tests, but will fail by a significant margin. A 'standard' which uses Toilet Paper as a benchmark and fails to encompass toilet paper has missed its mark and needs to be reconsidered.</p>		
KCC				Ge	<p>Throughout all the IWSFG documents, toilet paper is consistently put forward as exemplar material. There is no mention that any toilet paper is a problem, and that it is the more recent advent of 'wipes' in particular which have created problems.</p> <p>Given that Toilet Paper is in scope it would be normal and appropriate that any toilet paper should pass this test with a safety factor of 2 or 3, to allow for variability.</p> <p>Simple screening of toilet papers from the USA shows a significant number which will not only fail all 3 disintegration tests, but will fail by a significant margin. This is absurd.</p>	Please provide evidence by way of reports, studies which confirm that US toilet paper is causing any issues in wastewater treatment.	
KCC	127-135	3. Scope		GE/ED	<p>Very broad scope.</p> <p>Toilet paper is very clearly in scope and is cited as exemplar material throughout, it makes no sense to have Toilet Paper Manufacturers labelling packs of toilet paper as Flushable and some non flushable – this will cause even greater confusion for consumers.</p>	Remove Toilet paper from scope	

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KCC	127-135	3. Scope		ED	Note: A product is considered to be flushable only if it has been tested to and certified by a third-party certifier as meeting the criteria set down in this standard.	Please provide a full list of all accredited third – party certifiers who have been trained and validated to run the IWSFG test methods. Please provide any interlab studies carried out to validate the different labs.	
KCC	107-110			TE/ED	Stipulation for only natural cellulose is at odds with Toilet Paper which uses natural cellulose and will impact wastewater treatment through the BOD loading of the pulp. This paragraph needs clarification.	Rewrite and provide any references.	
KCC	198-199			ED	Has IWSFG checked with all third party that they are prepared to accept liability for the claims?	Please provide a full list of all accredited third – party certifiers who have been trained and validated to run the IWSFG test methods.	
KCC	200-201			GE	This note adds nothing to the document.	Delete	
KCC	89-92			GE	This does not provide any context to the scale of the problem which the non-conforming product may represent. To go to the length of producing a ‘standard’ then there needs to be an intelligible problem statement which is relevant to impact. Many numbers have been used historically in WG10 intro and MD280 Testimony	Replace with a problem statement which can be substantiated and is based on impact.	
KCC		6.4 Section		ED	Creating alternate Do not flush logo requirements when there is already in existence a jointly agreed by NACWA, WEF, CWWA, APWA, INDA and EDANA is wasteful.	Suggest IWSFG adopt the INDA/EDANA Code of Practice Edition 2.	
KCC	226-231			Te/Ge	This may be superfluous as written Manufacturers are bound by the regulations in the	Consider It is the responsibility of manufacturers to comply	

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					countries in which they sell and have responsibilities for the human and environmental safety of their products. Any product which fails to meet the current regulatory requirements would not be sold.	with all relevant and current legislation for environmental and human health for the countries where they sell.	
KCC	232-235	7.1.2		TE	The term plastic is generic and used in this context is not correct. IUPAC (International Union of Pure and Applied Chemistry), provides more clarification around the term plastic and polymer. However since cellulose is also a polymeric material, an alternative word or phrase should be used. The definition that was developed in ISO TC224 WG10 could serve.	An alternative word or phrase should be used.	
KCC		7.1.3		Te/Ge	20% is an arbitrary number. Why not 35%? Why is a 5% reduction every 2 years necessary?	Please provide technical basis upon which IWSFG determined that an arbitrary level of 20% inclusion of regenerated cellulose was appropriate or technically possible for the manufacture of a viable flushable product for consumers that would meet the 'standard' as drafted?	
KCC		7.1.3			IWSFG deciding to have a moratorium on Regenerated Cellulose is premature and without any sound scientific basis which is shown in the reference [2] provided. Regenerated cellulose fibers readily degrade in both aerobic and anaerobic wastewater, often at a faster rate than wood pulp fibers due to low crystallinity. Flushable wipes produced with regenerated cellulose are designed to sink and upon entering wastewater should be consumed in the treatment process. It is unlikely that free regenerated cellulose fibers will be release in effluent. If any regenerated cellulose fibers did leave in effluent we need to consider if they are toxic and	Delete section 7.1.3	

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					<p>persistent which is dealt with by reference [2] provided.</p> <p>In respect of the concern for “potential take up in the food chain” and Reference: [2] When Microplastic is Not Plastic: The Ingestion of Artificial Cellulose Fibres by Macrofauna Living in Seagrass Macrophytodebris, Environmental Science and Technology, 2015, 49, 11158-11166, American Chemical Society.</p> <p>This paper observes that the regenerated cellulose fibers do not accumulate in the guts of the invertebrates.</p> <p>It also notes that “The observed viscose fibers thus do not seem to be transmitted from lower to higher trophic levels via predation.”</p> <p>And finally, the report states: “cellulose, even of artificial origin like viscose, is more digestible and degradable⁵² than plastic. Some marine invertebrates are known to be able to digest cellulose, and this could explain both the faster digestive transit of the fibers⁴⁵⁻⁴⁷ and the absence of accumulation. The small average amount of AFs found in the invertebrates’ gut contents also seems to favor this non accumulation or transmission.”</p> <p>Clearly, this study supports both the biodegradation and lack of bioaccumulation of regenerated cellulose</p>		
KCC	235-253				<p>This document is not a regulatory document, and this section extends beyond the scope of a guideline document.</p> <p>There is not a body of science available to support why IWSFG should need to consider any need to control and over time ban the use of a degradable fiber. As such, making an arbitrary, and</p>	This section 7.1.3 needs to be struck.	

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					<p>unscientifically founded distinction is discriminatory and inconsistent.</p> <p>Test results of cellulose and regenerated cellulose have demonstrated that their rates of disintegration in wastewater and receiving environments are equivalent.</p> <p>Washing machines and fabric laundering are a significant source of both synthetic and natural fibers to the sewer and wastewater treatment plants (Hartline, et al.; ES&T; 2016; Mahon, et al.; ES&T; 2016; Habib, et al.; Water, Air, and Soil Pollution; 1998; Carr, S; Integrated Environmental Assessment and Management; 2017).</p> <p>No studies have been provided to confirm if any pass through of Regenerated Cellulose fibers originating from wipes even occurs. If IWSFG has them please share.</p>		
KCC		256-257		Te/Ge	<p>All examples given are inert minerals.</p> <p>Why would inclusion of an inert material into a product be a reason for the product to be NOT FLUSHABLE</p> <p>If the real intent of this section is to control the sale of a 'flushable' pet litter then additional verbiage could then make the section make sense</p>	Delete section 7.1.4 or provide clear example	
KCC		7.2.1			See comments on regarding criteria sheet for PAS 2A		
KCC		7.2.3		Te/Ge	Please explain how IWSFG has determined that 5% of dry mass left on a self-tapping screw at the end of this test is the difference between pass and fail	Provide field studies which substantiate this method and the criteria in the real world	
KCC		7.3		Te/Ge	These criteria cannot be achieved with many US Dry Toilet Papers, the criteria and endpoint is not appropriate for scope and purpose of standard		

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					which uses toilet paper as the benchmark		
KCC		7.3.1		Te/Ge	Criteria 1 is redundant	Delete 1, keep 2	
KCC		7.3.2		Te/Ge	Criteria 1 is redundant	Delete 1, keep 2	
KCC		7.3.3		Te/Ge	Criteria 1 is redundant	Delete 1, keep 2	
KCC	375-376	7.4		Te/Ge	Superfluous, covered in criteria 1 and 2	Delete	
KCC	382-385			Te/Ge	Definition of biodegradation not relevant or useful	Delete lines 382-385	
KCC		7.5.1		Te/Ge	Criteria 1 is redundant	Delete 1, keep 2	
KCC		7.5.2		Te/Ge	Criteria 1 is redundant	Delete 1, keep 2	
KCC	432			ED	[5] not in body text. Superfluous	Delete [5]	

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KCC	All lines where it occurs			Ge	Amend the word standard to guideline throughout to stop any confusion on behalf of the reader that these documents are standards created under the multi stakeholder processes of the International Standards Organization (ISO)	Change the word standard to guideline throughout	
KCC		Forward		Ed	Forward should be Foreword https://www.merriam-webster.com/dictionary/foreword	Correct	
KCC	84-86			Ed	The systematic study of clogs in UK, influents at UK and US treatment plants provide clear data to support that the burden of clogging is not due to wipes labelled flushable. In classic risk assessment terms Wipes labelled flushable are low occurrence, low impact based on materials and design to break up and size Non flushable baby, cleaning wipes are high occurrence, super high impact based on materials and design to not break up Any mitigation plan should mitigate high/high risks not the low/low		
KCC	95-98			Ed	“The goal of the IWSC is not to ban the production and/or use of these products, but to encourage manufacturers to identify those products that do not meet the established IWSFG standards as not being “flushable” and to encourage users to dispose the products after use in a more appropriate manner.” This paragraph is disingenuous knowing that many US Toilet Papers cannot pass any of the 3 disintegration tests.		

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KCC	95-98			Ge, Te	<p>The scope of this 'standard' as written clearly includes toilet paper.</p> <p>The multiple Introductions used go to lengths to indicate that Toilet Paper is not the issue facing wastewater, but it is the advent on more recent hygienic products.</p> <p>Preliminary testing using the methods as written shows clearly that there are many Toilet papers which are capable of passing all of the 3 disintegration tests, however there is also a significant number of Toilet Papers which will clearly fail all 3 tests and would not be considered flushable.</p> <p>A simple Interlab study of 5 toilet papers was carried out at the KC labs and 2 other labs (An industry and a 3rd Party lab)– all 3 labs confirmed that 3 of the 5 toilet papers tested, failed all Disintegration Test using methods PAS3A and PAS 3B – see table below with all data from Interlab study</p>		

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					<table border="1"> <thead> <tr> <th>Code</th> <th>Lab</th> <th>PAS 3A % passing 6mm</th> <th>PAS 3B % Passing 6mm</th> <th>PAS 3C % Passing 6mm</th> </tr> </thead> <tbody> <tr><td>Code F</td><td>3rd Party Lab</td><td>70.15%</td><td>89.95%</td><td></td></tr> <tr><td>Code F</td><td>3rd Party Lab</td><td>71.01%</td><td>86.62%</td><td></td></tr> <tr><td>Code F</td><td>3rd Party Lab</td><td>71.14%</td><td>89.65%</td><td></td></tr> <tr><td>Code F</td><td>3rd Party Lab</td><td>65.63%</td><td>89.70%</td><td></td></tr> <tr><td>Code F</td><td>3rd Party Lab</td><td>70.85%</td><td>89.97%</td><td></td></tr> <tr><td>Code F</td><td>KC</td><td>72.10%</td><td>66.82%</td><td>95.14%</td></tr> <tr><td>Code F</td><td>KC</td><td>61.57%</td><td>66.33%</td><td>96.09%</td></tr> <tr><td>Code F</td><td>KC</td><td>75.56%</td><td>74.76%</td><td>93.77%</td></tr> <tr><td>Code F</td><td>KC</td><td>73.40%</td><td></td><td></td></tr> <tr><td>Code F</td><td>KC</td><td>79.79%</td><td></td><td></td></tr> <tr><td>Code 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F	KC	75.56%	74.76%	93.77%	Code F	KC	73.40%			Code F	KC	79.79%			Code F	Industry Lab	91.54%	74.49%	70.98%	Code F	Industry Lab	93.39%	73.28%	80.82%	Code F	Industry Lab	90.91%	72.34%	74.09%	Code F	Industry Lab	100.00%			Code F	Industry Lab	100.00%			Code G	3rd Party Lab	99.99%	99.68%		Code G	3rd Party Lab	99.96%	99.61%		Code G	3rd Party Lab	99.93%	99.23%		Code G	3rd Party Lab	99.96%	98.65%		Code G	3rd Party Lab	99.80%	98.33%		Code G	KC	99.39%	92.48%	96.03%	Code G	KC	100.00%	97.53%	98.87%	Code G	KC	99.43%	94.64%	97.13%	Code G	KC	99.80%			Code G	KC	99.75%			Code G	Industry Lab	100.00%	100.00%	100.00%	Code G	Industry Lab	100.00%	100.00%	100.00%	Code G	Industry Lab	100.00%	100.00%	100.00%	Code G	Industry Lab	100.00%			Code G	Industry Lab	100.00%			Code I	3rd Party Lab	100.00%	100.00%		Code I	3rd Party Lab	100.00%	100.00%		Code I	3rd Party Lab	100.00%	100.00%		Code I	3rd Party Lab	100.00%	100.00%		Code I	3rd Party Lab	100.00%	100.00%		Code I	KC	100.00%	100.00%	100.00%	Code 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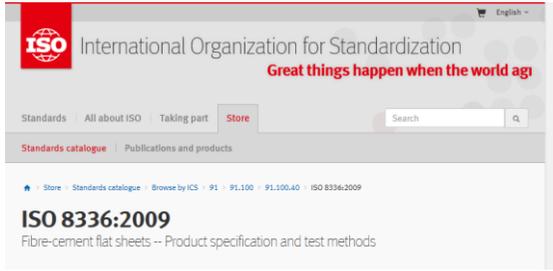
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					<table border="1"> <thead> <tr> <th>Code</th> <th>Lab</th> <th>PAS 3A % passing 6mm</th> <th>PAS 3B % Passing 6mm</th> <th>PAS 3C % Passing 6mm</th> </tr> </thead> <tbody> <tr><td>Code S</td><td>3rd Party Lab</td><td>71.40%</td><td>87.62%</td><td></td></tr> <tr><td>Code S</td><td>3rd Party Lab</td><td>77.58%</td><td>90.21%</td><td></td></tr> <tr><td>Code S</td><td>3rd Party Lab</td><td>70.28%</td><td>91.11%</td><td></td></tr> <tr><td>Code S</td><td>3rd Party Lab</td><td>61.80%</td><td>81.92%</td><td></td></tr> <tr><td>Code S</td><td>3rd Party Lab</td><td>59.36%</td><td>86.29%</td><td></td></tr> <tr><td>Code S</td><td>KC</td><td>89.26%</td><td>63.72%</td><td>87.48%</td></tr> <tr><td>Code S</td><td>KC</td><td>90.30%</td><td>63.89%</td><td>85.89%</td></tr> <tr><td>Code S</td><td>KC</td><td>88.91%</td><td>69.81%</td><td>88.06%</td></tr> <tr><td>Code S</td><td>KC</td><td>88.88%</td><td></td><td></td></tr> <tr><td>Code S</td><td>KC</td><td>84.30%</td><td></td><td></td></tr> <tr><td>Code S</td><td>Industry Lab</td><td>92.75%</td><td>82.40%</td><td>95.37%</td></tr> <tr><td>Code S</td><td>Industry Lab</td><td>94.30%</td><td>89.07%</td><td>97.39%</td></tr> <tr><td>Code S</td><td>Industry Lab</td><td>96.60%</td><td>84.89%</td><td>98.46%</td></tr> <tr><td>Code S</td><td>Industry Lab</td><td>88.71%</td><td></td><td></td></tr> <tr><td>Code S</td><td>Industry Lab</td><td>89.58%</td><td></td><td></td></tr> <tr><td>Code W</td><td>3rd Party Lab</td><td>76.44%</td><td>78.63%</td><td></td></tr> <tr><td>Code W</td><td>3rd Party Lab</td><td>71.02%</td><td>77.54%</td><td></td></tr> <tr><td>Code W</td><td>3rd Party Lab</td><td>69.34%</td><td>76.28%</td><td></td></tr> <tr><td>Code W</td><td>3rd Party Lab</td><td>78.26%</td><td>66.78%</td><td></td></tr> <tr><td>Code W</td><td>3rd Party Lab</td><td>63.47%</td><td>77.58%</td><td></td></tr> <tr><td>Code W</td><td>KC</td><td>86.09%</td><td>53.99%</td><td>64.97%</td></tr> <tr><td>Code W</td><td>KC</td><td>84.71%</td><td>50.89%</td><td>66.15%</td></tr> <tr><td>Code W</td><td>KC</td><td>87.95%</td><td>56.41%</td><td>63.47%</td></tr> <tr><td>Code W</td><td>KC</td><td>85.81%</td><td></td><td></td></tr> <tr><td>Code W</td><td>KC</td><td>85.07%</td><td></td><td></td></tr> <tr><td>Code W</td><td>Industry Lab</td><td>91.68%</td><td>78.53%</td><td>90.43%</td></tr> <tr><td>Code W</td><td>Industry Lab</td><td>96.91%</td><td>77.85%</td><td>77.89%</td></tr> <tr><td>Code W</td><td>Industry Lab</td><td>91.10%</td><td>74.47%</td><td>80.01%</td></tr> <tr><td>Code W</td><td>Industry Lab</td><td>91.21%</td><td></td><td></td></tr> <tr><td>Code W</td><td>Industry Lab</td><td>89.39%</td><td></td><td></td></tr> </tbody> </table> <p>A 'standard' which uses Toilet Paper as a benchmark and fails to encompass toilet paper has missed its mark and needs to be reconsidered.</p>	Code	Lab	PAS 3A % passing 6mm	PAS 3B % Passing 6mm	PAS 3C % Passing 6mm	Code S	3rd Party Lab	71.40%	87.62%		Code S	3rd Party Lab	77.58%	90.21%		Code S	3rd Party Lab	70.28%	91.11%		Code S	3rd Party Lab	61.80%	81.92%		Code S	3rd Party Lab	59.36%	86.29%		Code S	KC	89.26%	63.72%	87.48%	Code S	KC	90.30%	63.89%	85.89%	Code S	KC	88.91%	69.81%	88.06%	Code S	KC	88.88%			Code S	KC	84.30%			Code S	Industry Lab	92.75%	82.40%	95.37%	Code S	Industry Lab	94.30%	89.07%	97.39%	Code S	Industry Lab	96.60%	84.89%	98.46%	Code S	Industry Lab	88.71%			Code S	Industry Lab	89.58%			Code W	3rd Party Lab	76.44%	78.63%		Code W	3rd Party Lab	71.02%	77.54%		Code W	3rd Party Lab	69.34%	76.28%		Code W	3rd Party Lab	78.26%	66.78%		Code W	3rd Party Lab	63.47%	77.58%		Code W	KC	86.09%	53.99%	64.97%	Code W	KC	84.71%	50.89%	66.15%	Code W	KC	87.95%	56.41%	63.47%	Code W	KC	85.81%			Code W	KC	85.07%			Code W	Industry Lab	91.68%	78.53%	90.43%	Code W	Industry Lab	96.91%	77.85%	77.89%	Code W	Industry Lab	91.10%	74.47%	80.01%	Code W	Industry Lab	91.21%			Code W	Industry Lab	89.39%				
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KCC	142-155			Ed	These definitions have been taken from ISO which is covered by copyright, there is no reference given. Other examples exist and need to be checked	Provide citations/reference where needed.																																																																																																																																																												

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Initials	Line number (e.g. 17)	Clause/ Subclause (e.g. 3.1)	Paragraph/ Figure/ Table/ (e.g. Table 1)	Type of comment ²	Comments	Proposed change	Observations of the secretariat
					<p>ISO ISO TR 24524: WD 1</p> <p>236 3.1.4 infrastructure</p> <p>237 system of facilities, equipment and services needed for the operation of an organization.</p> <p>238 Note 1 to entry: In a wastewater utility, it is advisable to reserve the term "infrastructure" for physically fixed</p> <p>239 equipment and installations.</p> <p>240 [SOURCE: ISO 9000: 2015, Quality Management, 3.5.2, Modified - Note 1 added]</p> <p>241 3.1.5 on-site treatment system</p> <p>242 wastewater treatment system located on the property where the wastewater is generated.</p> <p>243 Note 1 to entry: an example of an on-site treatment system is a septic tank.</p> <p>244 Note 2 to entry: properly maintained on-site treatment systems require the regular removal of sludges</p> <p>245 and their transport for disposal and treatment at municipal systems.</p> <p>ISO ISO TR 24524: WD 1</p> <div style="border: 1px solid black; padding: 5px;"> <p>19 © ISO 2017. Published in Switzerland</p> <p>20 All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized</p> <p>21 otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the</p> <p>22 internet or an intranet, without prior written permission. Permission can be requested from either ISO at the</p> <p>23 address below or ISO's member body in the country of the requester.</p> <p>24 ISO copyright office</p> <p>25 Ch. de Blandonnet 8 • CP 401</p> <p>26 CH-1214 Versoix, Geneva, Switzerland</p> <p>27 Tel. + 41 22 749 01 11</p> <p>28 Fax + 41 22 749 09 47</p> <p>29 copyright@iso.org</p> <p>30 www.iso.org</p> </div>		
KCC	199			TE	<p>This definition adds no value to these documents, since there is no biodegradation tests.</p> <p>NOTE should be removed.</p>	Remove NOTE on biodegradable.	
KCC	211-218			Te	<p>Incorrect definition for Reynolds Number</p>	<p>Delete text</p> <p>Suggest finding a proper definition, there are many good references for this including dictionaries</p>	
KCC	212			Te	<p>"Dimensionless group of variables" – incorrect</p> <p>The variables used in the determination of Reynolds Number have dimensions</p> <p>The Reynolds number is dimensionless</p>	Find proper definition – see previous comment	

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KCC	235-238			Te	Dry Tissues (toilet tissue or facial tissue) will contain a low level of free moisture from the air	Find alternate definition which is correct	
KCC	240-242			ED	Semen is not excreta Vomit is excreta	Remove semen Include Vomit	
KCC	299			ED	Define "lightweight"	Needs clarification or deletion	
KCC				ED	Note 2 – Make no sense	Delete Note 2 – add definition of Moist Tissues	
KCC	309			ED	Missing definition of Moist tissues		
KCC	319-320			TE/ED	Check conditions Not consistent with Tappi Lab 33C is a very warm lab? Check reference – it appears to be related to concrete? 	Check	
KCC	323-324				Note does not add anything to the definition	Delete note	
KCC	334-338			ED	This is an instruction. This should be included within the test method and not in the definitions section.	Remove and move to appropriate method(s)	
KCC	340-341			TE	Poor definition. Rayon is a brand name. Viscose is a process used	Find alternate definition	

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KCC	All lines where it occurs			Ge	Amend the word standard to guideline throughout to stop any confusion on behalf of the reader that these documents are standards created under the multi stakeholder processes of the International Standards Organization (ISO)	Change the word standard to guideline throughout	
KCC		Forward			Forward should be Foreword https://www.merriam-webster.com/dictionary/foreword	Correct	
KCC	56-59			Ed	“The goal of the IWSC is not to ban the production and/or use of these products, but to encourage manufacturers to identify those products that do not meet the established IWSFG standards as not being “flushable” and to encourage users to dispose the products after use in a more appropriate manner.” This paragraph is disingenuous knowing that many US Toilet Papers cannot pass any of the 3 disintegration tests.		
KCC	94	7.1		GE	If a substance is banned in the country where a product is being sold, then that substance is not allowed to be in that product. It is unnecessary to include a section that prohibits banned substances from products.	Section 7.1 should be removed.	
KCC	101-102	7.2.1		TE	The term plastic is generic and used in this context is not correct. IUPAC (International Union of Pure and Applied Chemistry), provides more clarification around the term plastic and polymer. However since cellulose is also a polymeric material, an alternative word or phrase should be used. The definition that was	An alternative word or phrase should be used.	

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					developed in ISO TC224 WG10 could serve.		
KCC	103-105			TE	Can TAPPI/ANSI 401 om-15 method be used for full quantitative analysis of regenerated cellulose in nonwoven samples?	Do all the accredited third party labs qualified by IWSFG have capability to run this test and has any controlled gage RR study been run between lab on controlled samples of known fiber composition to determine capability.	
KCC		7.2.2			<p>IWSFG deciding to have a moratorium on Regenerated Cellulose is premature and without any sound scientific basis which is shown in the reference [2] provided.</p> <p>Regenerated cellulose fibers readily degrade in both aerobic and anaerobic media within wastewater treatment, often at a faster rate than wood pulp fibers due to low crystallinity.</p> <p>Flushable wipes produced with regenerated cellulose are designed to sink and upon entering wastewater should be consumed in the treatment process. It is unlikely that free regenerated cellulose fibers will be release in effluent.</p> <p>If any regenerated cellulose fibers did leave in effluent we need to consider if they are toxic and persistent which is dealt with by reference [2] provided.</p> <p>In respect of the concern for “potential take up in the food chain” and Reference: [2] When Microplastic is Not Plastic: The Ingestion of Artificial Cellulose Fibres by Macrofauna Living in Seagrass Macrophytodetritus, Environmental Science and Technology, 2015, 49, 11158-11166, American Chemical Society.</p> <p>This paper observes that the regenerated cellulose fibers do not accumulate in the guts of the invertebrates.</p> <p>It also notes that “The observed viscose fibers thus</p>	Delete section 7.2.2	

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					<p>do not seem to be transmitted from lower to higher trophic levels via predation.”</p> <p>And finally, the report states: “cellulose, even of artificial origin like viscose, is more digestible and degradable⁵² than plastic. Some marine invertebrates are known to be able to digest cellulose, and this could explain both the faster digestive transit of the fibers⁴⁵⁻⁴⁷ and the absence of accumulation. The small average amount of AFs found in the invertebrates’ gut contents also seems to favor this non accumulation or transmission.”</p> <p>Clearly, this study supports both the biodegradation and lack of bioaccumulation of regenerated cellulose</p>		
KCC	106-117			TE	<p>There is no data available that can link regenerated cellulose type fibers found in the marine environment to flushable wipes, or any other wipe substrate</p> <p>Cellulose is found in all plant based life in the ocean, it is a natural chemistry.</p> <p>There is data and evidence that regenerated cellulose fibers decompose fully in biodegradation tests using wastewater sludges.</p>	<p>Delete 106-117</p> <p>Remove note and all references to regenerated cellulose from document.</p>	
KCC	124-125			TE	<p>Is zero tolerance for synthetic fibers feasible for the third party labs?</p>		
KCC	137	Section 7.5			<p>This entire sub section does not belong in this ‘standard’, it is managed by other laws, regulations and is beyond the scope of IWSFG and these documents. It is an over reach and should be deleted in its entirety</p>	<p>Delete 7.5</p>	

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KCC	187	Annex 1		TE	<p>Attempting to list the regulated chemicals across the world in an Annex is ridiculous.</p> <p>It is beyond the scope of this document to do this.</p> <p>Providing links to government agencies charged with chemical regulations would be a better approach, but even that is a burden</p>	Annex 1 should be struck	

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KCC	All lines where it occurs			Ge	Amend the word standard to guideline throughout to stop any confusion on behalf of the reader that these documents are standards created under the multi stakeholder processes of the International Standards Organization (ISO)	Change the word standard to guideline throughout	
KCC		Forward			Forward should be Foreword https://www.merriam-webster.com/dictionary/foreword	Correct	
KCC	68-71			Ed	<p>“The application of these these test methods and the provision of the appropriate advice to the product users regarding their after use disposal will ultimately lead to the long-term sustainability of wastewater systems and the minimization of potential problems such as pipe blockages and equipment failures in sewer networks.”</p> <p><u>Many US Toilet Papers and no flushable wipes can pass this test. Thus, the most like likely outcome of the IWSFG guidelines is the complete opposite of what IWSFG aspire for.</u></p> <p>As drafted, these IWSFG ‘standards’ could eliminate an entire flushable wipes category and promote a very significant increase in the amount of baby wipes being flushed as consumers switch wipes to maintain their established cleaning regimen.</p> <p>Today in USA it is estimated that half as many Baby Wipes are flushed as Flushable Wipes.</p>	Repeated word These	
KCC	72-75			Ed	“The goal of the IWSC is not to ban the production and/or use of these products, but to encourage manufacturers to identify those products that do not meet the established IWSFG standards as not		

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					being “flushable” and to encourage users to dispose the products after use in a more appropriate manner.” This paragraph is disingenuous knowing that many US Toilet Papers cannot pass any of the 3 disintegration tests.		
KCC	6	Principles		Ed	Simplify the language, make clear that the test assesses potential a product to clear toilet when flushed without any other product in the bowl.	Rewrite and make clear	
KCC				Ge	Manufacturers may not sell in the country in which the test lab is located. This is impractical and unnecessary burden on test labs	Material acquisition requirements in your test methods need to be reconsidered – this is not manageable.	
KCC	128-130			Ge/Te	Many flushable wipes by design are used in conjunction with bowel movements and flushed with toilet paper and fecal matter, is there data to support that it is safe to extrapolate from this 10 flush test to actual in use performance	Please provide data to substantiate this short 10 flush test as safe, reliable predictor of flushing performance in the real world.	
KCC	131			Te/Ge	How would I ever flush a toilet with wastewater – not sure this is necessary	Delete note	
KCC	138				A 4.5L siphonic toilet is not a standard toilet US is 4.8L siphon UK is 4.5L washdown What should labs be doing?	Please clarify the toilet spec, manufacturer,model # to be one which can be purchased in store or provide guidance on how to safely adjust flush volume. Also clarify if a washdown toilet can be substituted for a siphon toilet	
KCC	153			Ge	Manufacturers may not sell in the country in which the test lab is located. This is impractical and unnecessary burden on test labs	Material acquisition requirements in your test methods need to be reconsidered – this is not manageable.	
KCC	253			Ed/Te	It has always been the practice to carry out Bowl Clearance and Drainline Clearance together as one	Combine 2A and 2B and streamline method	

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					test . In notes (line 253) this is alluded to and offers an alternate wait time. <u>It would cleaner and simpler for labs if PAS 2A and PAS 2B were written up as a single method</u> Labs will not want to run as separate tests, that makes no sense.		
KCC	171			Ed	“Specimens must be removed immediately before testing” This is inconsistent with instruction in 8.3.2 and 9.1 and 9.2 Confusing for lab	Make clearer	
KCC	184			Ed	Labs would only remove the lotion if instructed to, there is no instruction to this	Unnecessary - delete	
KCC	195			Ed	Missing word	Add volume Baseline flush <u>volume</u> for the toilet	
KCC	201			Ed	What does periodically mean	Change language and be clear on requirement if important else delete	
KCC	263			Te	In the event of a product getting held in a toilet for 5 flushes it would be useful to provide guidance to check what has caused the hold up, if it is an equipment problem, then the test should be re run with fault remedied	Consider guidance	
KCC		Table 1 2b			What is the container? Not clear	This needs clarification/re wording	
KCC	280-282			TE	Cleaning of the test toilet and drainline apparatus is part of good lab housekeeping irrespective of what products are being tested, a simple note to that effect would suffice.		

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KCC	284-287			GE	Calculation is redundant 10 = pass, 9 = fail	Remove calculation.	
KCC	294-295			Ed	Note is redundant	Delete note	
KCC	308			Ed	Test report requires flush volume at start at and of test. Add this to the test termination at line 279		
KCC	311-312			Ed	Since calculation is redundant, this bullet is redundant	Delete bullet 1	
KCC	338			Ed	Bibliography reference 7 not relevant in this method – no use of SFM in the method		
KCC	352			Ge	4.5L Siphon toilet is <u>NOT readily available in hardware stores in USA or UK</u>	Toilet spec needs clarification see earlier note.	
KCC	353			Ge	What national standard does 4.5L Siphon toilet conform to? This note is redundant given the single toilet spec which is without any country of origin.		

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KCC	All lines where it occurs			Ge	Amend the word standard to guideline throughout to stop any confusion on behalf of the reader that these documents are standards created under the multi stakeholder processes of the International Standards Organization (ISO)	Change the word standard to guideline throughout	
KCC		Forward			Forward should be Foreword https://www.merriam-webster.com/dictionary/foreword	Correct	
KCC	63-65			Ed	<u>Many US Toilet Papers and no flushable wipes can pass this test. Thus, the most like likely outcome of the IWSFG guidelines is the complete opposite of what IWSFG aspire for.</u> As drafted, these IWSFG 'standards' could eliminate an entire flushable wipes category and promote a very significant increase in the amount of baby wipes being flushed as consumers switch wipes to maintain their established cleaning regimen. Today in USA it is estimated that half as many Baby Wipes are flushed as Flushable Wipes.		
KCC	69-72			Ed	As drafted, these IWSFG 'standards' could eliminate an entire flushable wipes category and promote a very significant increase in the amount of baby wipes being flushed as consumers switch wipes to maintain their established cleaning regimen. <u>Many US Toilet Papers and no flushable wipes can pass this test. Thus, the most like likely outcome of the IWSFG guidelines is the complete opposite of what IWSFG aspire for.</u>		

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					<p>As drafted, these IWSFG 'standard' could eliminate an entire flushable wipes category and promote a very significant increase in the amount of baby wipes being flushed as consumers switch wipes to maintain their established cleaning regimen.</p> <p>Today in USA it is estimated that half as many Baby Wipes are flushed as Flushable Wipes.</p>		
KCC	73-75			Ed	<p>"The goal of the IWSC is not to ban the production and/or use of these products, but to encourage manufacturers to identify those products that do not meet the established IWSFG standards as not being "flushable" and to encourage users to dispose the products after use in a more appropriate manner."</p> <p>This paragraph is disingenuous knowing that many US Toilet Papers cannot pass any of the 3 disintegration tests.</p>		
KCC	77-79				Verbose and complicated, no reason to have i.e in a purpose statement.	Simplify/rewrite	
KCC	83				Can PAS2B be used in countries other than UK – this is odd for an international document?	Clarification please for other countries	
KCC		Fig 1			No attribution for figure	Source is INDA. Please confirm appropriate permissions have been granted.	
KCC	122-123				Rather than just recommend that PAS2A and 2B be run together, write one combined method and the labs will thank you	Combine PAS2A and PAS2B – keep it simple	
KCC	131				If this is a UK test only, the toilet is not typical of UK toilets which are mostly washdown.	How was the toilet spec chosen?	
KCC	134				Clear pipes are a good idea when observing product	Specify clear PVC pipe	

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KCC	136				Read bullet d and tell me what it means?	Re write to make sense	
KCC	137				Missing photo	Go find the missing photo	
KCC		8.1		Ge	Manufacturers may not sell in the country in which the test lab is located. This is impractical and unnecessary burden on test labs	Material acquisition requirements in your test methods need to be reconsidered – this is not manageable.	
KCC	181-183			GE	Inconsistent with section 8.2. Removing wipes, separating into piles will leave the wipes exposed and then contradicts requirement “Specimens must be removed just before the start of testing.”	Be consistent Section 8 Preparation.	
KCC	192				Add word drain to be consistent with rest of document	“The drain line” “Vacuum in the drain line”	
KCC	199				Many labs have existing drain lines marked in feet (0.3048m) which is with greater resolution. Remarking in meters will be confusing to the lab tech, including the imperial option would be helpful		
KCC	213				“from time to time” – what is meant by this?	Be specific	
KCC	265			Te	In the event of a product getting held in a toilet for 5 flushes it would be useful to provide guidance to check what has caused the hold up, if it is an equipment problem, then the test should be re run with fault remedied	Suggest : If a product requires 5 flushes to clear the toilet bowl, it would be wise to stop the test and inspect the toilet and its connection to the drain line in case there is a misaligned joint or other fault, if this is the case, the set up should be remedied and the test restarted.	
KCC		Table 1			3 minutes Note 1 of PAS2A (ine 252-254 suggested that the time between flushes should be 5 minutes when running 2B	Which is correct	
KCC		Table 1			Very confusing. A flow chart may simplify this.	Make simpler to follow, consider a flow chart	
KCC	280-282				Flasks and sieves in the toilet drainline – not making sense	Delete	
KCC	284-288				Surely the test is designed to assess if a product		

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					passes . All specimen take less than 5 flushes to clear the drainline without any specimen stranded for 3 flushes.		
KCC	297				Simplify language in accept criteria	Example : To pass, all 10 specimens must clear the drainline in less than 5 flushes, with no specimen stranded in the drainline for 3 consecutive flushes	
KCC	290-294				Calculations are redundant, this is simply pass/fail. Any specimen that gets stranded is a fail Any specimen that takes 5 flushes to clear is a fail	Delete	
KCC	312/284-294				312 calls for calculation of the average number of flushes – this is not captured in section 10.4	Check for consistency	
KCC	327				Method calls for 2% slope this is not the same as 1 degree (typo) – it would be 1.15 degrees	Be consistent and keep slope in %	
KCC	327				Insure - typo	ensure	

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KCC	All lines where it occurs			Ge	Amend the word standard to guideline throughout to stop any confusion on behalf of the reader that these documents are standards created under the multi stakeholder processes of the International Standards Organization (ISO)	Change the word standard to guideline throughout	
KCC	87-89			Ed	<p>The systematic study of clogs in UK, influents at UK and US treatment plants provide clear data to support that the burden of clogging by quantity is not due to wipes labelled flushable.</p> <p>In classic risk assessment terms, wipes labelled flushable are low occurrence, and low impact based on materials and their design to break up.</p> <p>Non flushable baby, cleaning wipes are high occurrence, super high impact based on material properties and design to not break up</p> <p>Any mitigation plan should mitigate high/high risks not the low/low</p>		
KCC	93-95			Ed	<p>“By adhering to these test methods and providing the appropriate advice to the product users regarding the after use disposal of such products will ultimately lead to long-term sustainability of wastewater systems and the minimization of potential problems such as pipe blockages and equipment failures in sewer networks.”</p> <p><u>Many US Toilet Papers and no flushable wipes can pass this test. Thus, the most like likely outcome of the IWSFG guidelines is the complete opposite of what IWSFG aspire for.</u></p> <p>As drafted, these IWSFG ‘standards’ could eliminate an entire flushable wipes category and promote a very significant increase in the amount of baby wipes being flushed as consumers switch wipes to maintain their established cleaning regimen.</p>		

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					Today in USA it is estimated that half as many Baby Wipes are flushed as Flushable Wipes.		
KCC	97-100			Ed	<p>“The goal of the IWSC is not to ban the production and/or use of these products, but to encourage manufacturers to identify those products that do not meet the established IWSFG standards as not being “flushable” and to encourage users to dispose the products after use in a more appropriate manner.”</p> <p>This paragraph is highly questionable given that many US Toilet Papers cannot pass any of the 3 disintegration tests.</p>		
KCC	102				Add “extreme”	Becomes “under <u>extreme</u> snagging”	
KCC				Ed	A home drainline with 3 self-tapping screws poking up from the bottom of the pipe represents a compromised drainline in need of remediation		
KCC	102			Ed	Do tree roots penetrate up into a pipe or down?		
KCC	105			Ed/Te	Replace will with may	Becomes “This test <u>may</u> demonstrate”	
KCC	106-107			Ed/Te	The obstruction is simulated by either a misaligned pipe joint, a root intrusion, or burrs, which are commonly found in cut and re-assembled pipe	<p>Not true.</p> <p>The obstruction is simulated by 3 screws</p> <p>Correct sentence</p>	
KCC	108			Ed/Te	Optimistic and absolute language	<p>Change sentence</p> <p>The test method <u>attempts to determine the potential for a product in the absence of any other solids to clear a seriously compromised drainline</u></p>	
KCC		Fig 1			Attribution to INDA needed		
KCC		Principles		Ge/Ed	Unless significant field study data exists to validate this approach, it is inconceivable that a test like this		

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					be used for pass/fail.		
KCC		Principles		Ed	Snagging is caused by a host of different imperfection in the plumbing system – using 3 screws to accurately predict behavior against all these different conditions is a stretch	Please provide study results where a residential drainline was modified with 3 screws, protruding 12mm at 4m, 12m and 20m from the toilet and how the drainline performed with different toilet, papers and flushable and non flushable wipes.	
KCC		Principles		Ed	In the real world toilet paper/tissue/flushable wipes are flushed into a drainline with solids from bowel movements which significantly alter the speed of movement in the pipe, the forces and changes in water level. This test does not capture this dynamic. Flushing just water cannot tell you the full story.	Please provide study results where a residential drainline was modified with 3 screws, protruding 12mm at 4m, 12m and 20m from the toilet and how the drainline performed with different toilet, papers and flushable and non flushable wipes.	
KCC		Principles		Ed	Customers experiencing and snagging in the drainline will always call the manufacturer. The incidence of clogging which this test may be attempting to delineate is in the sub parts per million range	Please provide study results where a residential drainline was modified with 3 screws, protruding 12mm at 4m, 12m and 20m from the toilet and how the drainline performed with different toilet, papers and flushable and non flushable wipes.	
KCC		Principles		Ed/Te	Do all snags lead to clogs, this test assumes that to be true	Please provide study results where a residential drainline was modified with 3 screws, protruding 12mm at 4m, 12m and 20m from the toilet and how the drainline performed with different toilet, papers and flushable and non flushable wipes.	
KCC		Principles		Ed/Te	This test uses one configuration of toilet and drainline. Pipe diameters of 3” and slopes down to 1% are also common along with washdown toilet flushes of 4.5L	Please provide study data to confirm that the specified set up is representative of the broader range of set ups found globally	
KCC	149			Ed	Change demonstrate to predict		
KCC				Ed	Add residential	Exit a “residential drainline”	
KCC	150			Ed	Add multiple extreme	With multiple extreme snag	
KCC	154			Ge	The testers are lab technicians, how many have knowledge of building drainline conditions	Re write	
KCC				Ge/Ed	Labs will need to set up a dedicated drainline for this method to avoid causing issues in the regular		

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					test drainline. Running the test with PAS 3A is not likely.		
KCC	159			Ed/Te	Who flushes wastewater down a toilet in a testing lab?		
KCC	166			Te	Please provide details of any 4.5L siphonic toilet available in USA. Most low volume US siphonic toilets are ~4.85L or 1.28gpf		
KCC	169			Te	Clear PVC pipe should be specified		
KCC	170			Ed	Slope should be 2%	Correct	
KCC	172			Ed/Ge	What is a common galvanized self-tapping screw	Specify, size, thread, point and finish	
KCC			8.1	Te/Ge	Manufacturers may not sell in the country in which the test lab is located. This is impractical and unnecessary burden on test labs	Material acquisition requirements in your test methods need to be reconsidered – this is not manageable.	
KCC	237/238			Ed/Ge	What is a common galvanized self-tapping screw	Specify, size, thread, point and finish	
KCC	237/238			ED	Where in the flow path? Centerline or at 8pm/4pm when viewed down the pipe		
KCC	239			Ed	Shouldn't the screws be penetrating from above leaving a 12mm clearance?		
KCC	241-243			Ed/Te	Depending on lab and available space the distances of 4m, 12m, 1m from end could occur in a 90 degree bend.	Guidance needed on this. Ok in bend, go before or after bend Provide a range of distances e.g. 4-6m from toilet 10-12m from toilet, 1-3 from end	
KCC	255			Ed	From time to time...	Be specific	
KCC			10.2	Te	Using either pouring with a 4.5l jug or flushing form a toilet is adding uncertainty	Use only a toilet to flush test specimen	
KCC	300			Te	5 minutes	Change to 15-30 minutes	

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					If this test wants to have any grounding in reality, extending the time to at least 15-30 minutes would make sense, 5 minutes is too short. This is another reason why it would not be sensible to combine with PAS 3A		
KCC	300			ED	5 minutes does not agree with procedure in table 1		
KCC			10.4	Ed	All that is required is to measure the weight of retained material, passing the retained mass into retained mass of fibers makes no sense since all the fibers are in the snag?	Remove 6.3mm requirement, weigh only. Conflicts with criteria	
KCC			11 Acceptance Criteria	Te	Criteria b is a subset of a , Criteria a is redundant	Delete criteria a	
KCC	403			Ed	It is not possible to purchase the specified toilet in hardware stores in US		
KCC	404			Ed	If drain lines comply to applicable national standards, then we will need alternate slopes and pipe diameters to be allowed	Provide alternates or delete this sentence	
KCC	415			Ed	Worksheet is not complete, it would not be possible to use this for a 10 specimen test	Update/complete or delete	
KCC	517			Ed	Photo source incorrectly attributed	Source is INDA. Please confirm appropriate permissions have been granted.	
KCC	552			ED	When did equipment include samples?		
KCC	592			Ed	Worksheet is not complete, it would not be possible to use this for a 10 specimen test	Update/complete or delete	

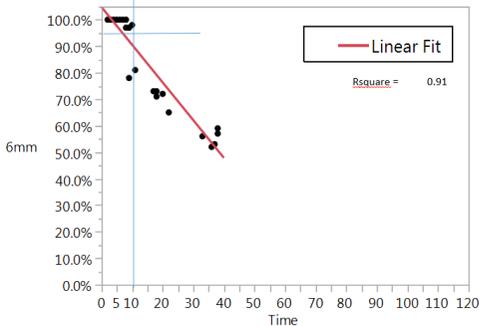
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KCC	All lines where it occurs			Ge	Amend the word standard to guideline throughout to stop any confusion on behalf of the reader that these documents are standards created under the multi stakeholder processes of the International Standards Organization (ISO)	Change the word standard to guideline throughout	
KCC		Forward			Forward should be Foreword https://www.merriam-webster.com/dictionary/foreword	Correct	
KCC	83-95				Introduction lines 83-95 is quick to point out that Toilet Paper is compatible with wastewater infrastructure and that is the more recent advent of wipes which have created problems. It would be normal in a toilet paper 'standard' that any toilet paper should pass this test with a safety factor of 2 or 3. While many toilet paper do pass, there is a significant number of toilet papers that do not pass all 3 disintegration tests. The standard does not appear to work as a toilet paper standard?		
KCC	86-88			Ed	The systematic study of clogs in UK, and the materials found in influent stream entering UK and US treatment plants provide clear data to support that the burden of clogging is not due to wipes labelled flushable. In classic risk assessment terms wipes labelled flushable are low occurrence, low impact based on materials and design to break up Non flushable baby, cleaning wipes are high occurrence, high impact based on material properties and design to not break up Any mitigation plan should mitigate high/high risks not the low/low risks.		
KCC	92-95			Ed	"By adhering to these test methods and providing the appropriate advice to the product users		

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					<p>regarding the after use disposal of such products will ultimately lead to long-term sustainability of wastewater systems and the minimization of potential problems such as pipe blockages and equipment failures in sewer networks.”</p> <p><u>Many US Toilet Papers and no flushable wipes can pass this test. Thus, the most like likely outcome of the IWSFG guidelines is the complete opposite of what IWSFG aspire for.</u></p> <p>As drafted, these IWSFG ‘standards’ could eliminate an entire flushable wipes category and promote a very significant increase in the amount of baby wipes being flushed as consumers switch wipes to maintain their established cleaning regimen.</p> <p>Today in USA it is estimated that half as many Baby Wipes are flushed as Flushable Wipes.</p>		
KCC	96-99			Ed	<p>“The goal of the IWSC is not to ban the production and/or use of these products, but to encourage manufacturers to identify those products that do not meet the established IWSFG standards as not being “flushable” and to encourage users to dispose the products after use in a more appropriate manner.”</p> <p>This paragraph is disingenuous knowing that many US Toilet Papers cannot pass any of the 3 disintegration tests.</p>		
KCC	104-107				<p>The note very clearly indicates that IWSFG has benchmarked /reverse engineered this test for toilet paper. So it would be reasonable to expect any toilet paper should pass “since toilet papers have not caused clogging, or plugging wastewater</p>		

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					<p>systems”</p> <p>Based on simple testing, it is clear that this ‘standard’ does not appear to work as a toilet paper standard?</p>		
KCC					<p>The French Norm Q 34-020, August 1998 from which this was taken, the accept criteria was a visual assessment of “full disintegration” within 120 seconds.</p> <p>By adopting a 6mm sieve endpoint with pass criteria >95% pass through it is necessary for materials to reach “full disintegration” in less than 10seconds. <u>Making this test a full order of magnitude more conservative than the French Norm (based on time)</u></p> <p>Below is a regression of “full disintegration time” vs % passing 6mm sieve at 2 minutes for assorted dry TP from US,UK,Aus tested at KC Labs</p> 		
KCC	100-103	Purpose			<p>“The purpose of this test is to assess the performance, i.e. disintegration, of a product when it is subjected to the hydraulic forces generated by</p>		

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					<p>mechanical forces over a short duration.”</p> <p>Using a short duration high energy test of materials which are subject to much longer duration and variable forces is hard to do. The work that was done in 2016 would suggest that this as a safe predictive test is questionable and required further work.</p> <p>The predictive power of the French Norm was investigated in 2016 by ISOTC224WG10 and Members of GD4 and demonstrated both false negative and false positive results</p> <p>When trying to use this test method to predict disintegration of product in an 8” pipe flowing at close to self-cleansing velocity (Reynolds number ~20,000*) Frank Dick, City of Vancouver on August 10,2016 demonstrated contradictory results for 3 Ply Toilet Paper and Cottonelle Flushable Wipes when compared to this method.</p> <p>* See PAS3B and PAS3C</p>		
KCC					In the Standard Document, IWSFG requires that “Note: A product is considered to be flushable only if it has been tested to and certified by a third-party certifier as meeting the criteria set down in this standard.”	Please provide a full list of all accredited third – party certifiers who have been trained and validated to run the IWSFG test methods.	
KCC					In the Standard Document, IWSFG requires that “Note: A product is considered to be flushable only if it has been tested to and certified by a third-party certifier as meeting the criteria set down in this standard.”	Please provide any interlab studies carried out for PAS 3A with different toilet papers to validate the different labs/certifiers	
KCC	136				6.3mm is a very fine sieve for the purpose of determining if a product has disintegrated.		

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					<p>In context of the Purpose given(104-107), “NOTE: This test resembles two existing toilet paper tests [1], [2], which have been traditionally used to test toilet papers. Since toilet papers historically have not caused clogging, or plugging, problems in wastewater systems, the IWSFG has benchmarked its tests for flushability to toilet paper performance, particularly in respect to its disintegration.”</p> <p>Based on simple testing, it is clear that this ‘standard’ does not appear to work as a toilet paper standard?</p>		
KCC	148			TE	Unclear how a pourer spout could to hold liquid.	Check meaning	
KCC	159-160			Ge	Manufacturers may not sell in the country in which the test lab is located. This is impractical and unnecessary burden on test labs	Material acquisition requirements in your test methods need to be reconsidered – this is not manageable.	
KCC	167-170			GE	<p>Unclear/inconsistent.</p> <p>Unsure about the number of samples needed from each package and for what purpose, and the need for 5 or 10 samples and from a single or multiple packages.</p>	Clarification in text needed	
KCC	176-178			TE	<p>Which airborne particles in the ambient air have been shown to alter the result of this test?</p> <p>Removing just before testing contradicts preparation in Section 8.2.</p>	Guidance on particles or strike	
KCC		8.3 Sample Preparation			<p>The round robin testing of the method by 5 member labs as part of ISO TC224 WG10, clearly showed that the outcome of this method was dependent on sample Area for a 3 ply US Toilet Paper</p> <p>Samples cut to 100mmx100mm that fit into the base of the flask, interact differently with the screw-</p>	Beaker and Stirrer need to be made larger to accommodate full size products which may fall in scope (e.g. ostomy bag/liners)	

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					<p>propeller and produce statistically different results when 3ply Toilet Paper was tested by TC224 WG10</p> <p>Tukey HSD analysis of 3 ply Toilet Paper (100mmx 100mm Cut sheet vs 250mm strip- % clearing 6 mm sieves below</p> <p>Missing Rows: TP 3-06mm sieve-Cut-CTP 5 Excluded Rows: TP 3-06mm sieve-Cut-JP 1800</p> <p>Means Comparisons</p> <p>Comparisons for all pairs using Tukey-Kramer HSD</p> <p>Confidence Quantile</p> <table border="1"> <thead> <tr> <th>q*</th> <th>Alpha</th> </tr> </thead> <tbody> <tr> <td>3.17213</td> <td>0.05</td> </tr> </tbody> </table> <p>HSD Threshold Matrix</p> <p>Connecting Letters Report</p> <table border="1"> <thead> <tr> <th>Level</th> <th>Mean</th> </tr> </thead> <tbody> <tr> <td>TP 3-06mm sieve-Cut-CTP</td> <td>A 100.00000</td> </tr> <tr> <td>TP 3-06mm sieve-Cut-JP</td> <td>A 100.00000</td> </tr> <tr> <td>TP 3-06mm sieve-Cut-PG</td> <td>A 100.00000</td> </tr> <tr> <td>TP 3-06mm sieve-Full-PG</td> <td>B 61.36000</td> </tr> <tr> <td>TP 3-06mm sieve-Full-JP</td> <td>B C 45.36000</td> </tr> <tr> <td>TP 3-06mm sieve-Full-CTP</td> <td>C 40.50000</td> </tr> <tr> <td>TP 3-06mm sieve-Full-KC</td> <td>C 32.62000</td> </tr> </tbody> </table> <p>Levels not connected by same letter are significantly different.</p> <p>Ordered Differences Report</p>	q*	Alpha	3.17213	0.05	Level	Mean	TP 3-06mm sieve-Cut-CTP	A 100.00000	TP 3-06mm sieve-Cut-JP	A 100.00000	TP 3-06mm sieve-Cut-PG	A 100.00000	TP 3-06mm sieve-Full-PG	B 61.36000	TP 3-06mm sieve-Full-JP	B C 45.36000	TP 3-06mm sieve-Full-CTP	C 40.50000	TP 3-06mm sieve-Full-KC	C 32.62000		
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					<p>PAS 3A by using 2 sheets of toilet paper (1/6th of TP used with Bowel Movement) and 1 flushable wipe (1/2 of amount used in Bowel Movement) this test is comparing apples and oranges. The test to be useful for predicting Disintegration in a sewer needs to be capable of testing products in quantities</p>																						

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					<p>as used.</p> <p>Given the extremely broad scope of products for which this test could be envisioned – below.</p> <p>The capability and utility of this test method using such a small beaker with immersed stirrer is clearly uncertain. To be capable of working with the broad product scope required by this standard the method needs retooling of the beaker/stirrer to accept samples representative of product as used, without impacting the test outcome.</p> <p>“3 Scope</p> <p><i>This standard applies to all products that a manufacturer or distributor may wish to identify as being flushable, or by reason of the location of their use and likely contamination by human excreta are likely to be flushed through a toilet into a drain line and a wastewater conveyance and treatment system.”</i></p>		
KCC	188-189			ED	Check reference to Section 8.2 – nothing relevant in 8.2		
KCC	191-192			ED	No reference to Facial Tissue in Section 8.2		
KCC	195-197			ED	Ensure references to 8.1 and 8.2 are relevant		
KCC	205-206			ED	Section 8.2 only references toilet tissue and moist wipes. No “other products” are mentioned.	Clarify.	
KCC	208-209				May be easier to measure the mass of a solid sample than volume.	Provide guidance for labs on how to measure volume of a solid sample of delete	
KCC	216	9.1		GE	Storage of samples precludes removing the samples from the (original) packages just before testing. In addition, if soft packages are cut open to remove a stack and separate it into 5 ... the soft	The IWSFG needs to rethink the sample strategies within these documents. Alternative procedures need to be developed if all of the	

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					package is no longer available for storage.	various options are to be consistent.	
KCC	216,233			Ed	Duplicate 9.1's		
KCC	233				Consistency is necessary across methods, PAS3B includes a 15min precondition step	Include preconditioning step from PAS 3B (section 10.1) to be consistent	
KCC	233			ED	Two section 9.1's. Again ... verbiage that requires "immediate" use of samples.	See previous comment.	
KCC	253				"Less than 5 secs" Does this need guidance on lower limit? Is 1 second too fast	Guidance	
KCC	253-254			TE	What is the action if the sample is not driven under the screw-propellor	There is no procedure given if action has not occurred. Provide procedure.	
KCC	292			ED	The test must be repeated with 5 specimens? All at once??	Wording choice issue? Clarify.	
KCC	293-294			GE	Redundancy in 2 criteria, if a sample can have a 95% pass-thru and be Pass the tests, then 100% pass-thru is also a pass.	Delete(a)	
KCC	305-306			GE	Per previous comment.	Remove.	
KCC	318-321			GE	Per previous comments.	Remove.	
KCC	325			Ed	120 minutes?	Typo, correct	
KCC	341						
KCC	347	13.Precision			To have a 1 minute shower step on a 2 minute test seems far too long. The showering is 50% of test. In other similar methods the showering phase may only be 1-2% of the test time. The showering of fine suspensions through a 6mm sieve is a very delicate procedure and will be affected by shower flow, height, angle of attack and the operator. The risk of 'blasting' fibers (1-2mm)	1. A fuller discussion of precision is required given the choice of fine sieve. Please share any gage R&R studies 2. Please provide studies which show the Inter and Intra lab variability IWSFG measured during the selection of this method. 3. Please provide details of any studies on impact of time between stopping test and sieving	

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					<p>through a 6mm sieve is high</p> <p>There will be significant variability between operators and labs before any product variability is considered</p> <p>It is highly likely that fine suspensions of fibers will agglomerate in the beaker if left to stand – studies to understand this are needed to add guidance to labs on standing time before sieving.</p>		
KCC	347	13.Precision			<p>The predictive power of the French Norm was investigated in 2016 by ISOW WG10 and Members of GD4 and demonstrated both false negative and false positive results</p> <p>When trying to use this test method to predict disintegration of product in an 8" pipe flowing at close to self-cleansing velocity (Reynolds number ~20,000*) Frank Dick, City of Vancouver on August 10,2016 demonstrated contradictory results for 3 Ply Toilet Paper and COTTONELLE Flushable Wipes when compared to results predicated with this method.</p> <p>* See PAS3B and PAS3C</p>		
KCC	347	13.Precision			<p>1. Having a stirrer immersed in a small beaker which can variably interact with the test sample is an uncontrolled source of variability which will affect precision.</p> <p>2.</p>	Please share details of any Gage RR study which IWSFG undertook to establish that 5 samples was appropriate	
KCC	347	Precision		Te/Ge	In order to evaluate the disintegration potential of a flushed product to assess compatibility with wastewater infrastructure it is unnecessary to use such fine sieves with such high pass through criteria. Fine sieves with aggressive criteria may exacerbate the risk of type I and type II errors.		
KCC	347	Precision		Te	Using 6mm sieves with fine dispersions of pulp fibers and a very high pass criteria of >95% pass		

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					through exposes the problem of fiber blinding, or clumping of fibers on the sieve face which can lead to variable and lower pass through rates in turn delivering a false negative result (Type II error).		
KCC	347	Precision		Te	Unlike when using sieves with larger openings, using 6mm sieves with fine dispersions of pulp fibers also leads to an increased risk of showering variability whereby small pieces and fine fibers are broken up by the showering force and are forced through the sieve., this could lead to intralab and interlab variability driving false positive results (Type I error)		
KCC	377	Fig 1			Drawing is incorrect, needs to be redrawn with appropriate tolerance before any labs can manufacture the screw propeller and be sure the part is the same. Precision is required in the manufacture of this screw propeller to ensure a standard height to the ribs is maintained. As drawn with the tolerances given , the height of the rib could vary from 4.5mm +/- 2mm	New drawing required	
KCC	381				Incomplete reference	Add reference number of French Standard	
KCC	493			Ed	Incorrect attribution of photo	Source is INDA not IWSFG member. Please confirm appropriate permissions have been granted.	
KCC	519			ED	Photo and caption do not appear clear or related	Provide clearer photo flow regulator/shower apparatus	
KCC	553			ED	section A.3.3 is missing from Annex 3?		

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KCC	All lines where it occurs			Ge	Amend the word standard to guideline throughout to stop any confusion on behalf of the reader that these documents are standards created under the multi stakeholder processes of the International Standards Organization (ISO)	Change the word standard to guideline throughout	
KCC		Forward			Forward should be Foreword https://www.merriam-webster.com/dictionary/foreword	Correct	
KCC	102-105			Ed	The systematic study of clogs in UK, and the materials found in influent stream entering UK and US treatment plants provide clear data to support that the burden of clogging is not due to wipes labelled flushable. In classic risk assessment terms wipes labelled flushable are low occurrence, low impact based on materials and design to break up Non flushable baby, cleaning wipes are high occurrence, high impact based on material properties and design to not break up Any mitigation plan should mitigate high/high risks not the low/low risks.		
KCC	108-111			Ed	“By adhering to these test methods and providing the appropriate advice to the product users regarding the after use disposal of such products will ultimately lead to long-term sustainability of wastewater systems and the minimization of potential problems such as pipe blockages and equipment failures in sewer networks.” <u>Many US Toilet Papers and no US flushable wipes can pass this test. Thus, the most like likely outcome of the IWSFG guidelines is the complete opposite of what IWSFG aspire for.</u>		

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					<p>As drafted, these IWSFG 'standards' could eliminate an entire flushable wipes category and promote a very significant increase in the amount of baby wipes being flushed as consumers switch wipes to maintain their established cleaning regimen.</p> <p>Today in USA it is estimated that half as many Baby Wipes are flushed as Flushable Wipes.</p>		
KCC	112-115				<p>"The goal of the IWSC is not to ban the production and/or use of these products, but to encourage manufacturers to identify those products that do not meet the established IWSFG standards as not being "flushable" and to encourage users to dispose the products after use in a more appropriate manner."</p> <p>This paragraph is disingenuous knowing that many US Toilet Papers cannot pass any of the 3 disintegration tests.</p>		
KCC	118-120			TE	Please provide data that indicates the parameters suggested for the slosh box, 13rpm and 4 liters is equivalent to a Reynolds number of 20,000		
KCC	118-120			TE	What part of collection systems is this test protecting – everything within 2 hours of a residence?	Please provide justification for 2hr test time in context of system impact and protection thereof	
KCC	118-120			Ge	<p>Reynolds numbers of 20,000 can occur in 8" pipes flowing half full at velocities close to the self-scouring velocity of 2ft/sec</p> <p>It is very unlikely any product in a sewer would see 20,000 for a full 2hrs, instead the Reynolds number would be stepping up significantly as different</p>		

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					<p>laterals combine into larger and larger diameter pipes whilst maintaining self-scouring velocity of 2ft/min</p> <p>20,000 may represent the minimum Reynolds number seen for the early portion of the 2hr transit, an average for the 2 hrs could easily be 2x and peak 3x the 20,000</p> <p>Examples of range Reynolds number by pipe size for 10% and 60% pipe fill</p> <table border="1"> <thead> <tr> <th rowspan="2">Pipe Diameter (inch - cm)</th> <th colspan="2">Re Number (dimensionless)</th> </tr> <tr> <th>Minimum</th> <th>Maximum</th> </tr> </thead> <tbody> <tr> <td>6 – 15</td> <td>8840</td> <td>29209</td> </tr> <tr> <td>8 – 20</td> <td>10070</td> <td>39582</td> </tr> <tr> <td>12 – 30</td> <td>16562</td> <td>56283</td> </tr> <tr> <td>15 – 40</td> <td>23485</td> <td>75138</td> </tr> <tr> <td>18 – 45</td> <td>25572</td> <td>81814</td> </tr> <tr> <td>20 – 50</td> <td>27484</td> <td>89054</td> </tr> <tr> <td>24 – 60</td> <td>34280</td> <td>106643</td> </tr> <tr> <td>28 – 70</td> <td>41211</td> <td>125934</td> </tr> <tr> <td>32 – 80</td> <td>47265</td> <td>148678</td> </tr> </tbody> </table> <p>Source : DISINTEGRATION OF FLUSHABLE WET WIPES IN WASTEWATER SYSTEMS. Fatih KARADAGLI, Ph.D.,Associate Professor,Department of Environmental Engineering.Sakarya University, Turkey. Presented at "TOILETS ARE NOT GARBAGE CANS" Workshop May 5, 2015</p>	Pipe Diameter (inch - cm)	Re Number (dimensionless)		Minimum	Maximum	6 – 15	8840	29209	8 – 20	10070	39582	12 – 30	16562	56283	15 – 40	23485	75138	18 – 45	25572	81814	20 – 50	27484	89054	24 – 60	34280	106643	28 – 70	41211	125934	32 – 80	47265	148678		
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					at the Wolf Auditorium, Downtown Library 252 Dundas Street, London, Ontario, Canada		
KCC	118-120			Te	<p>Significant work by K-C was presented to ISO TC224 WG10 in 2016 which attempted to match up the disintegration of 5 US toilet papers (1,2,3 plys) in a half full flowing 10" pipe (SMPT) set for 1.2ft/sec flow which was calculated to be Reynolds Number of 20,000 versus slosh boxes running under 3 different conditions of volume and speed.</p> <p>The closest analogue was the 20rpm and 4L set up, using a 15min flush and hold in drainline before running the test, followed by 9L and 26 rpm.</p>  <p>The charts show disintegration results for three toilet paper types (1, 2, 3 ply) under six conditions: No Flush - Mod Slosh, No Flush - SMPT, 15 Min Hold - Mod Slosh, 15 Min Hold - SMPT, 30 Min Hold - Mod Slosh, and 30 Min Hold - SMPT. Each chart compares three flow rates: 4L 20rpm, 4L 26rpm, and 4L 33rpm. The y-axis represents disintegration percentage (0-70), and the x-axis represents flow rate. The 15 Min Hold - SMPT chart is highlighted with a blue arrow.</p> <p>This work confirmed that 13rpm and 4L behaved the least like the flowing pipe(SMPT) at 20,000 Reynolds Number.</p> <p>The energy in the 13rpm and 4L slosh box was too low to be a proxy for a 10" pipe with 20,000</p>	<p>Test set up at 4l 13 rpm is too low in energy to be a proxy for Nr ~20,000.</p> <p>Alternate set ups of 4L 20 or 9L 26 rpm should be considered in place of 4l 13rpm, if Nr ~20,000 is the system design</p>	

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					<u>Reynolds number</u> .		
KCC	168-173			ED	The rock angle can measured, but not adjusted. The angle is set with the design and fabrication of the equipment by the manufacturer.	Please share that the angle spec of 11 degrees+/-1 0.5 degrees meets the manufacturing spec and tolerances of the 2 equipment manufacturers listed in A1.1	
KCC	169			Ed	Angle is against horizontal not vertical?	Check	
KCC	186-187			Te/Ge	Manufacturers may not sell in the country in which the test lab is located. This is impractical and unnecessary burden on test labs	Material acquisition requirements in your test methods need to be reconsidered – this is not manageable.	
KCC	193-197			GE	Instructions are inconsistent. Need to clarify the number of samples required from each package and for what purpose.	The wording is confusing between the need for 5 or 10 samples and from a single or multiple packages. Please add clarifying language.	
KCC	207			Te	A slosh box is large enough to accommodate a 6 sheet implement of toilet paper	Clarify rationale for 2 sheets which is a smaller sample than typically flushed, why not 6 sheet implement?	
KCC	222			Te	Minimize evaporation of moisturizing chemicals?	Guidance on time would be prudent if this is of concern	
KCC	221-222			GE	Sample preparation described in Section 8.2 is incompatible with “as soon as they are removed from the packaging”.	Removing just before testing is not consistent with preparation in Section 8.2.	
KCC	229	9.1		GE	Storage of samples precludes removing the samples from the (original) packages just before testing. In addition, if soft packages are cut open to remove a stack and separate it into 5 ... the soft package is no longer available for storage.	The IWSFG needs to rethink the sample strategies within these documents. Alternative procedures need to be developed if all of the various options are to be consistent.	
KCC	269			Ge	Hold where? In the drainline? In the basket, somewhere else?	Clarify	
KCC	273			TE	Choosing a water temperature spec outside ambient tappi lab temperature range will require	Suggest to standardize at 22 ± 3 °C	

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					additional provision for climate control in labs		
KCC	289-294			TE	Steps 2,3 Estimating 1" pieces in a slosh box is an art form, estimating ¼" pieces in a moving box would be way more difficult to do reproducibly.	The 6mm x 6mm observation is a subjective step and should be removed.	
KCC	295-302			TE	Simplify and use hand sieve for collection of all materials	Delete a, keep b	
KCC	333			ED	The test must be repeated with 5 specimens ? All in one box?	Improve sentence	
KCC	334-335			GE	(a) is a redundant criteria.	Remove (a).	
KCC	363-368			Ge	(a) is a redundant criteria.	Remove per previous comment. Redundant.	
KCC	397	Precision		Te/Ge	In order to evaluate the disintegration potential of a flushed product to assess compatibility with wastewater infrastructure it is unnecessary to use such fine sieves with such high pass through criteria. Fine sieves with aggressive criteria may exacerbate the risk of type I and type II errors.		
KCC	397	Precision		Te	Using 6mm sieves with fine dispersions of pulp fibers and a very high pass criteria of >95% pass through exposes the problem of fiber blinding, or clumping of fibers on the sieve face which can lead to variable and lower pass through rates in turn delivering a false negative result (Type II error).		
KCC	397	Precision		Te	Unlike when using sieves with larger openings, using 6mm sieves with fine dispersions of pulp fibers also leads to an increased risk of showering variability whereby small pieces and fine fibers are broken up by the showering force and are forced through the sieve., this could lead to intralab and interlab variability driving false positive results (Type I error)		

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KCC	400-401			Ed	Rock angle is fixed, the only way to change it is to purchase new		
KCC	424-449			Ed	Photo source incorrectly attributed	Source is INDA. Please confirm appropriate permissions have been granted.	
KCC	545-557			Ed	Photo source incorrectly attributed	Source is INDA. Please confirm appropriate permissions have been granted.	
KCC	583			Ed	Need a much clearer picture – unable to make out items in caption		
KCC	615			Ed	5 pictures. Photo source incorrectly attributed	Source is INDA. Please confirm appropriate permissions have been granted.	
KCC	722			Ed	5 pictures. Photo source incorrectly attributed	Source is INDA. Please confirm appropriate permissions have been granted.	
KCC	460			Ed	Were any adjustments required? Only speed can be adjusted. This is redundant, since no adjustment short of purchasing a new piece of equipment can change the rock angle – it is designed into the equipment	Delete	
KCC		A 3.2		Ed	Calibration implies checking and adjustment, there is no adjustment possible	Delete A3.2	

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KCC	All lines where it occurs			Ge	Amend the word standard to guideline throughout to stop any confusion on behalf of the reader that these documents are standards created under the multi stakeholder processes of the International Standards Organization (ISO)	Change the word standard to guideline throughout	
KCC		Forward			Forward should be Foreword https://www.merriam-webster.com/dictionary/foreword	Correct	
KCC	87			Ed	The systematic study of clogs in UK, and the materials found in influent stream entering UK and US treatment plants provide clear data to support that the burden of clogging is not due to wipes labelled flushable. In classic risk assessment terms wipes labelled flushable are low occurrence, low impact based on materials and design to break up Non flushable baby, cleaning wipes are high occurrence, high impact based on material properties and design to not break up Any mitigation plan should mitigate high/high risks not the low/low risks.		
KCC	85-87			Ed	“By adhering to these test methods and providing the appropriate advice to the product users regarding the after use disposal of such products will ultimately lead to long-term sustainability of wastewater systems and the minimization of potential problems such as pipe blockages and equipment failures in sewer networks.” <u>Many US Toilet Papers and no US Flushable wipes can pass this test. Thus, the most like likely outcome of the IWSFG guidelines is the complete opposite of what IWSFG aspire for.</u>		

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					<p>As drafted, these IWSFG 'standards' could eliminate an entire flushable wipes category and promote a very significant increase in the amount of baby wipes being flushed as consumers switch wipes to maintain their established cleaning regimen.</p> <p>Today in USA it is estimated that half as many Baby Wipes are flushed as Flushable Wipes.</p>		
KCC	91-93			Ed	<p>"By adhering to these test methods and providing the appropriate advice to the product users regarding the after use disposal of such products will ultimately lead to long-term sustainability of wastewater systems and the minimization of potential problems such as pipe blockages and equipment failures in sewer networks."</p> <p><u>Many US Toilet Papers and no flushable wipes can pass this test. Thus, the most like likely outcome of the IWSFG guidelines is the complete opposite of what IWSFG aspire for.</u></p> <p>As drafted, these IWSFG 'standards' could eliminate an entire flushable wipes category and promote a very significant increase in the amount of baby wipes being flushed as consumers switch wipes to maintain their established cleaning regimen.</p> <p>Today in USA it is estimated that half as many Baby Wipes are flushed as Flushable Wipes.</p>		
KCC	95-98			Ed	<p>"The goal of the IWSC is not to ban the production and/or use of these products, but to encourage manufacturers to identify those products that do not meet the established IWSFG standards as not being "flushable" and to encourage users to dispose</p>		

¹ Adapted from the ISO/IEC Commenting template. ² Te = Technical, Ge = General, Ed=Editorial

Initials	Line number (e.g. 17)	Clause/ Subclause (e.g. 3.1)	Paragraph/ Figure/ Table/ (e.g. Table 1)	Type of comment ²	Comments	Proposed change	Observations of the secretariat
					<p>the products after use in a more appropriate manner.”</p> <p>This paragraph is disingenuous knowing that many US Toilet Papers cannot pass any of the 3 disintegration tests.</p>		
KCC	100-103			TE	Please provide the CFD reports using bottom baffled flasks on a 1” orbital shaker table results in a Reynolds number of 20,000		
KCC	100-103			TE	What part of collection systems is this test protecting – everything within 2 hours of a residence?	Please provide justification for 2hr test time in context of system impact and protection thereof	
KCC	100-103			Ge/TE	<p>Reynolds numbers of 20,000 can occur in 8” pipes flowing half full at velocities close to the self-scouring velocity of 2ft/sec</p> <p>It is very unlikely any product in a sewer would see 20,000 for a full 2hrs, instead the Reynolds number would be stepping up significantly as different laterals combine into larger and larger diameter pipes whilst maintaining self-scouring velocity of 2ft/min</p> <p>20,000 may represent the minimum Reynolds number seen for the early portion of the 2hr transit, an average for the 2 hrs could easily be 2x and peak 3x the 20,000</p> <p>Examples of range Reynolds number by pipe size for 10% and 60% pipe fill</p>		

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					<table border="1"> <thead> <tr> <th rowspan="2">Pipe Diameter (inch - cm)</th> <th colspan="2">Re Number (dimensionless)</th> </tr> <tr> <th>Minimum</th> <th>Maximum</th> </tr> </thead> <tbody> <tr> <td>6 – 15</td> <td>8840</td> <td>29209</td> </tr> <tr> <td>8 – 20</td> <td>10070</td> <td>39582</td> </tr> <tr> <td>12 – 30</td> <td>16562</td> <td>56283</td> </tr> <tr> <td>15 – 40</td> <td>23485</td> <td>75138</td> </tr> <tr> <td>18 – 45</td> <td>25572</td> <td>81814</td> </tr> <tr> <td>20 – 50</td> <td>27484</td> <td>89054</td> </tr> <tr> <td>24 – 60</td> <td>34280</td> <td>106643</td> </tr> <tr> <td>28 – 70</td> <td>41211</td> <td>125934</td> </tr> <tr> <td>32 – 80</td> <td>47265</td> <td>148678</td> </tr> </tbody> </table> <p>Source : DISINTEGRATION OF FLUSHABLE WET WIPES IN WASTEWATER SYSTEMS. Fatih KARADAGLI, Ph.D.,Associate Professor,Department of Environmental Engineering,Sakarya University, Turkey. Presented at “TOILETS ARE NOT GARBAGE CANS” Workshop May 5, 2015 at the Wolf Auditorium, Downtown Library 252 Dundas Street, London, Ontario, Canada</p>	Pipe Diameter (inch - cm)	Re Number (dimensionless)		Minimum	Maximum	6 – 15	8840	29209	8 – 20	10070	39582	12 – 30	16562	56283	15 – 40	23485	75138	18 – 45	25572	81814	20 – 50	27484	89054	24 – 60	34280	106643	28 – 70	41211	125934	32 – 80	47265	148678		
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KCC	100-103			TE	<p>When this same test was introduced into ISO TC224 WG10, the shaker table speed was 150rpm and the test 3hrs.</p> <p>The CFD modelling for the flask used to justify the test were using side baffled flasks from Bellco 4423-2XL. These flasks generate a completely different and more turbulent flow regime than the bottom</p>	Please share any new CFD modelling which provides details of Reynolds number generated with the set up in PAS 3C																																	

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					baffled flask in this method Given the reduction in speed, it is not possible that this test set up is a proxy for 20,000 Reynolds number		
KCC	100-103			TE	Flasks with baffles on base generate a dead spot in the center of the flask during this test	Does CFD modelling predict this behavior	
KCC		8.1		Te/Ge	Manufacturers may not sell in the country in which the test lab is located. This is impractical and unnecessary burden on test labs	Material acquisition requirements in your test methods need to be reconsidered – this is not manageable.	
KCC		8.3.1		TE	Flask could accommodate a full 6 sheet implement – why such a small sample?	Provide rationale for not using representative quantity of TP	
KCC	192			GE	Hard to measure volume, mass is better	Delete volume	
KCC		9.2		GE	Make pre conditioning consistent to PAS3B 10.1		
KCC	237-238			TE	How can I spot irregular movement, what can I do to alter it – surely this is what happens, why stop the test? These flask do generate a dead spot for turbulence in the center of the flask. If a wipe stalls/hangs up in this dead spot should the test be stopped and restarted?	Provide guidance on dead spot issue in method	
KCC	240			TE	Photos of samples inside are hard to take and do not provide as much information as a photo in a slosh box		
KCC	275			Ed	A lab would test all 5 samples at the same time		
KCC	10.4			ED	This describes criteria, not sure how this is a discussion of test results		
KCC	306-320			TE	(a) Is redundant criteria	Delete (A)	
KCC	341-345	Precision		TE	Glassware is a significant source of variability within batches and between maunfcuatrers	Please share the gage RR study for the 2 specs of glassware in Annex A	
KCC	341-345	Precision		TE	Glassware is a significant source of variability within	Numbering flasks and keeping flasks in the same	

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					batches and between manufacturers	table location is a wise precaution to minimize standard error	
KCC	341-345	Precision		Te/Ge	In order to evaluate the disintegration potential of a flushed product to assess compatibility with wastewater infrastructure it is unnecessary to use such fine sieves with such high pass through criteria. Fine sieves with aggressive criteria may exacerbate the risk of type I and type II errors.		
KCC	341-345	Precision		Te	Using 6mm sieves with fine dispersions of pulp fibers and a very high pass criteria of >95% pass through exposes the problem of fiber blinding, or clumping of fibers on the sieve face which can lead to variable and lower pass through rates in turn delivering a false negative result (Type II error).		
KCC	341-345	Precision		Te	Unlike when using sieves with larger openings, using 6mm sieves with fine dispersions of pulp fibers also leads to an increased risk of showering variability whereby small pieces and fine fibers are broken up by the showering force and are forced through the sieve., this could lead to intralab and interlab variability driving false positive results (Type I error)		
KCC		a.4.2		Ed	Photo source incorrectly attributed	Source is INDA. Please confirm appropriate permissions have been granted.	
KCC	551			ED	Poor quality photo, not clear what is in the picture		
KCC		A.5.1		ED	When was a specimen part of equipment		

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KCC	All lines where it occurs			Ge	Amend the word standard to guideline throughout to stop any confusion on behalf of the reader that these documents are standards created under the multi stakeholder processes of the International Standards Organization (ISO)	Change the word standard to guideline throughout	
KCC		Forward			Forward should be Foreword https://www.merriam-webster.com/dictionary/foreword	Correct	
KCC				Ed	This test is concerned with Settle the verb Settlement is a noun https://en.oxforddictionaries.com/definition/settlement	Change Settlement to Settling throughout so it makes sense	
KCC	71-72			Ed	The systematic study of clogs in UK, and the materials found in influent stream entering UK and US treatment plants provide clear data to support that the burden of clogging is not due to wipes labelled flushable. In classic risk assessment terms wipes labelled flushable are low occurrence, low impact based on materials and design to break up Non flushable baby, cleaning wipes are high occurrence, high impact based on material properties and design to not break up Any mitigation plan should mitigate high/high risks not the low/low risks.		
KCC	77-80			Ed	"By adhering to these test methods and providing the appropriate advice to the product users regarding the after use disposal of such products will ultimately lead to long-term sustainability of wastewater systems and the minimization of potential problems such as pipe blockages and equipment failures in sewer networks."		

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					<p><u>Many US Toilet Papers and no flushable wipes can pass this test. Thus, the most like likely outcome of the IWSFG guidelines is the complete opposite of what IWSFG aspire for.</u></p> <p>As drafted, these IWSFG 'standards' could eliminate an entire flushable wipes category and promote a very significant increase in the amount of baby wipes being flushed as consumers switch wipes to maintain their established cleaning regimen.</p> <p>Today in USA it is estimated that half as many Baby Wipes are flushed as Flushable Wipes.</p>		
KCC	81-84			Ed	<p>"The goal of the IWSC is not to ban the production and/or use of these products, but to encourage manufacturers to identify those products that do not meet the established IWSFG standards as not being "flushable" and to encourage users to dispose the products after use in a more appropriate manner."</p> <p>This paragraph is highly questionable given that many US Toilet Papers cannot pass any of the 3 disintegration tests.</p>		
KCC	109			Te	Sinking or Settling does not represent a loss of buoyancy	Correct	
KCC	87-88			Te	The test is not limited to assessing settling in just those situations stated.	Included Septic Tanks, Pump Wet Well	
KCC	134			Ed	Sentence needs changing	Change The to this	
KCC		Fig1		Ed	No attributions	Source is INDA. Please confirm appropriate permissions have been granted.	

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IWSFG Template for Reviewer comments and IWSFG secretariat observations¹

Document reviewed: IWSFG-PAS-4-Settlement-Test-2017-07-21

Due Date: 2017-09-01

Initials	Line number (e.g. 17)	Clause/ Subclause (e.g. 3.1)	Paragraph/ Figure/ Table/ (e.g. Table 1)	Type of comment ²	Comments	Proposed change	Observations of the secretariat
KCC	140-141			Ed	Unreadable sentence		
KCC		8.1.2		Ge	Manufacturers may not sell in the country in which the test lab is located. This is impractical and unnecessary burden on test labs	Material acquisition requirements in your test methods need to be reconsidered – this is not manageable.	
KCC	259			Ed	8.1 is not about storage - confused	Clarify	
KCC		9.2		Ed	Confusing. Simpler to tell lab to flush the sample before putting it into the column?	Needs to be cleaned up	
KCC	322			Ed/Te	C is Redundant, a and b are already both required.	Delete c	
KCC	230			Te	6 hours may not be sufficient 10 years of running this test has taught us to fill the column the night before is the best approach	Change 6 to 12	

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IWSFG Template for Reviewer comments and IWSFG secretariat observations¹

Document reviewed: IWSFG-PAS-5A-Aerobic-Biodisintegration-Test-2017-07-21

Due Date: 2017-09-01

Initials	Line number (e.g. 17)	Clause/ Subclause (e.g. 3.1)	Paragraph/ Figure/ Table/ (e.g. Table 1)	Type of comment ²	Comments	Proposed change	Observations of the secretariat
KCC	All lines where it occurs			Ge	Amend the word standard to guideline throughout to stop any confusion on behalf of the reader that these documents are standards created under the multi stakeholder processes of the International Standards Organization (ISO)	Change the word standard to guideline throughout	
KCC		Forward			Forward should be Foreword https://www.merriam-webster.com/dictionary/foreword	Correct	
KCC	84-86			Ed	The systematic study of clogs in UK, and the materials found in influent stream entering UK and US treatment plants provide clear data to support that the burden of clogging is not due to wipes labelled flushable. In classic risk assessment terms wipes labelled flushable are low occurrence, low impact based on materials and design to break up Non flushable baby, cleaning wipes are high occurrence, high impact based on material properties and design to not break up Any mitigation plan should mitigate high/high risks not the low/low risks.		
KCC	90-93			Ed	“By adhering to these test methods and providing the appropriate advice to the product users regarding the after use disposal of such products will ultimately lead to long-term sustainability of wastewater systems and the minimization of potential problems such as pipe blockages and equipment failures in sewer networks.” <u>Many US Toilet Papers and no flushable wipes can pass this test. Thus, the most like likely outcome of the IWSFG guidelines is the complete opposite of what IWSFG aspire for.</u>		

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					<p>As drafted, these IWSFG 'standards' could eliminate an entire flushable wipes category and promote a very significant increase in the amount of baby wipes being flushed as consumers switch wipes to maintain their established cleaning regimen.</p> <p>Today in USA it is estimated that half as many Baby Wipes are flushed as Flushable Wipes.</p>		
KCC	94-97			Ed	<p>"The goal of the IWSC is not to ban the production and/or use of these products, but to encourage manufacturers to identify those products that do not meet the established IWSFG standards as not being "flushable" and to encourage users to dispose the products after use in a more appropriate manner."</p> <p>This paragraph is highly questionable given that many US Toilet Papers cannot pass any of the 3 disintegration tests.</p>		
KCC	75			Ed	<p>Change word order to improve sentence</p> <p>Wastewater process systems are designed to receive, treat, and convey sanitary discharges that, after treatment, are subsequently disposed of as:</p>	<p>Change to</p> <p>Wastewater process systems are designed to receive, convey and treat sanitary discharges that, after treatment, are subsequently disposed of as:</p>	
KCC				Te/Ge	<p>This is an adaptation of INDA method FG505A which has been used since 2013. Two key changes have been made to the method without any discussion of why the changes were made.</p> <p>1) The incubation time has been changed from 14 to 21 days with no discussion as to why. FG505 was reduced from 28 to 14 days when published in 2013 to more closely align test incubation to process time. Please provide explanation why the timing has changed.</p>	<p>Please provide explanation of changes</p>	

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					3) The sieve size has been reduced to 0.6 mm as compared to FG506A which uses 1mm. Please provide an explanation why a smaller sieve size was deemed necessary.		
KCC				Te/Ge	Use of 600micron sieves does not improve the capability of the F505 method, but does make for more works sieving the sludge samples – add cost and complexity	Please provide reason to change	
KCC	145-146			TE	Please provide details of recommended dissolved oxygen probe and TSS analyzer	Provide in annex 1	
KCC	152-153			GE	Manufacturers may not sell in the country in which the test lab is located. This is impractical and unnecessary burden on test labs	Material acquisition requirements in your test methods need to be reconsidered – this is not manageable.	
KCC	160-165			TE	For consistency all dry weight samples should use the same sample quantity. 3 seems too low.	Standardize on sample size of 5	
KCC	188			TE	Only need one metric to quantify sample	Delete volume, use weight	
KCC		8.3.4		TE	Clarify at what point in time the 4 characteristics should be considered. At collection, in lab?	Confusing	
KCC		8.3.4		TE	More detail needed for labs on how/when to harvest Digester sludge. How to transport, ppe		
KCC		Section 8,10		TE	There is no cellulose control used in this method, how does the laboratory know if the media is active? DO measurement alone does not guarantee good sludge	Add control sample with and associated procedure into method	
KCC							
KCC	237			TE	Volume of sludge reduced to 750ml from 1000ml used in FG505A	Please explain rationale for change	
KCC	238-240			ED	Order makes no sense	Read the order of 2 and 3 and correct so it makes sense	

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KCC	238			TE	Why would you stopper the flask in an aerobic test? For splash control place a loose fitting top over the neck	Do away with stopper and delete step 7	
KCC	244			TE	Labs will require guidance on how to measure the DO level – there will be differences in DO level when the flask is moving to stopped. When to measure? Should they check all the flask and work on an average?	Provide clear instruction for labs on how to measure DO level in the flasks.	
KCC	248-249			ED/TE	Step 8 is an entirely new test method and set up	Delete or provide full instructions on test along with data which provide validation that both methods are the same	
KCC	291			ED	Check how many annexes you have and correct		
KCC	292			ED	Typo	1 should read 11	
KCC	292-303			TE	Redundancy on criteria. Only need one	Delete criteria 1 and keep criteria 2. This is then consistent with A.4.4	
KCC	453			ED	Photo source incorrectly attributed	Source is INDA. Please confirm appropriate permissions have been granted.	
KCC	479			ED	Photo needs to be clearer/larger – it is not easy to see what is described?	New picture or enlarge	
KCC	492			ED	Specimens	What is this?	
KCC	327-329			TE	Is there an upper bound to DO level which can be used?	Please include clarification for lab	
KCC	325-326			ED	Not relevant, does not help the lab perform the test	Delete	

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KCC	All lines where it occurs			Ge	Amend the word standard to guideline throughout to stop any confusion on behalf of the reader that these documents are standards created under the multi stakeholder processes of the International Standards Organization (ISO)	Change the word standard to guideline throughout	
KCC		Forward			Forward should be Foreword https://www.merriam-webster.com/dictionary/foreword	Correct	
KCC	85-87			Ed	The systematic study of clogs in UK, and the materials found in influent stream entering UK and US treatment plants provide clear data to support that the burden of clogging is not due to wipes labelled flushable. In classic risk assessment terms wipes labelled flushable are low occurrence, low impact based on materials and design to break up Non flushable baby, cleaning wipes are high occurrence, high impact based on material properties and design to not break up Any mitigation plan should mitigate high/high risks not the low/low risks.		
KCC	90-93			Ed	“By adhering to these test methods and providing the appropriate advice to the product users regarding the after use disposal of such products will ultimately lead to long-term sustainability of wastewater systems and the minimization of potential problems such as pipe blockages and equipment failures in sewer networks.” <u>Many US Toilet Papers and no flushable wipes can pass this test. Thus, the most like likely outcome of the IWSFG guidelines is the complete opposite of what IWSFG aspire for.</u>		

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					<p>As drafted, these IWSFG 'standards' could eliminate an entire flushable wipes category and promote a very significant increase in the amount of baby wipes being flushed as consumers switch wipes to maintain their established cleaning regimen.</p> <p>Today in USA it is estimated that half as many Baby Wipes are flushed as Flushable Wipes.</p>		
KCC	94-97			Ed	<p>"The goal of the IWSC is not to ban the production and/or use of these products, but to encourage manufacturers to identify those products that do not meet the established IWSFG standards as not being "flushable" and to encourage users to dispose the products after use in a more appropriate manner."</p> <p>This paragraph is highly questionable given that many US Toilet Papers cannot pass any of the 3 disintegration tests.</p>		
KCC	102			ED	What about onsite septic systems?		
KCC	133-136			ED	What about onsite septic systems?		
KCC	148			TE	Please advise reference of sieve – and proper description. Description is not helpful.	8" (20cm) sieves are standard, is this what you mean or something different?	
KCC	75			Ed	<p>Change word order to improve sentence</p> <p>Wastewater process systems are designed to receive, treat, and convey sanitary discharges that, after treatment, are subsequently disposed of as:</p>	<p>Change to</p> <p>Wastewater process systems are designed to receive, convey and treat sanitary discharges that, after treatment, are subsequently disposed of as:</p>	
KCC				Te	<p>This is an adaptation of INDA method FG506A which has been used since 2013. Two key changes have been made to the method without any discussion of why the changes were made.</p> <p>1) The TSS range of the digester sludge used is extremely low, at levels more typical of activated</p>	Please provide explanation of changes and report validating reduced test time	

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					<p>sludge .Please provide explanation why the TSS range has changed.</p> <p>2) The test time has been reduced from 28days in FG506 to 21 days – no explanation given</p> <p>3) The sieve size has been reduced to 0.6 mm as compared to FG506A which uses 1mm.</p> <p>Please provide an explanation why a smaller sieve size was deemed necessary. This was studied at length as part of ISO TC224 WG10 and the finer sieve offered no benefit for the method or change to outcome, in fact it made the method worse for the lab to run</p>		
KCC	152-153			GE	Manufacturers may not sell in the country in which the test lab is located. This is impractical and unnecessary burden on test labs	Material acquisition requirements in your test methods need to be reconsidered – this is not manageable.	
KCC	160-165			TE	For consistency all dry weight samples should use the same sample quantity. 3 seems too low.	Standardize on sample size of 5	
KCC	188			TE	Only need one metric to quantify sample	Delete volume, use weight	
KCC		8.3.4		TE	More detail needed for labs on how/when to harvest Anaerobic sludge. How to transport, PPE to use and guidance on how to keep and handle sludge to prevent exposure to air.		
KCC		Section 8,10		TE	There is no cellulose control used in this method, how does the laboratory know if the media is active?	Add control sample with and associated procedure into method	
KCC	228-233			ED/TE	Is 21 days a typo – copy and paste error from 5A?	Change 21days to 28 days or provide reports validating the reduction in test period	
KCC	237			TE	<p>Excellent – we have a positive control in 5A</p> <p>Please provide proper reference for cotton wool it cannot just be any old cotton wool</p> <p>Unfortunately there is no procedure on how to run</p>	<p>Provide cotton wool reference</p> <p>Modify procedure to include control</p>	

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					the control and enable the lab to validate the test		
KCC	246-248			TE	Need to fit an airlock on top of flask to keep oxygen from entering flask		
KCC	256			ED/TE	Is 21 days a typo – copy and paste error from 5A?		
KCC	192-193				Not sure it is possible to have 1 and 2 at the same time, would be simpler and make more sense to use TSS only	Delete Total solids and keep TSS	
KCC	301-312			TE	Redundancy on criteria. Only need one	Delete criteria 1 and keep criteria 2. This is then consistent with A.4.4 (which needs correcting btw)	
KCC				TE	Use of 600micron sieves does not improve the capability of the F506 method, but does make for more work sieving the sludge samples – adds cost and complexity		
KCC	336-337			TE	Is it the intention of this method to have samples monitored 24/7.	Provide clarification, if yes then this would require additional monitoring equipment	
KCC	447-458			ED	Photo source incorrectly attributed	Source is INDA. Please confirm appropriate permissions have been granted.	
KCC	447-458			DE/TE	What is a fine mesh sieve – photo or reference needed		
KCC	487			ED	Photo is not clear , does not illustrate the equipment well	Enlarge, new image	
KCC	545			ED	How can specimens be part of equipment?	Delete?	

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