PTI M-55 Grouting Committee	Ballot-M-55-1901	Ballot Start Date:	April 16, 2019
Document Title: PTI M55.1-19 Public Review Closure		Ballot End Date:	April 30, 2019

#	Name	Item / Section #	Comment	Committee Response
1	Lee	1.5.2	1.5.2 — ASTM International: The edition is not specified. Proposed resolution: The edition need to be specified.	**No change** This section includes "Referenced Standards" that are listed without the specific edition. The latest edition is to be used. This is standard for all mandatory documents.
2	Ohler	2.1	Supplemental cementitious materials and chemical admixtures shall not contain sulfates Proposed resolution: The term "sulfates" is very broad when it comes to defining the amount using various testing methods. Please provide an industry accepted testing method that PTI is determining as the applicable testing method. In addition a list of independent testing laboratories experienced and approved by CCRL for testing the sulfate testing method. As a manufacturer, it is essential that there are independent testing laboratories available to perform the testing.	**No change – New business** The committee discussed more specific proposals and balloted possible limits. There was no consensus on the limits or testing. The language already in M55.1-12(13) remains as no proposal received enough support. It will be addressed in the new edition.
3	Freeby	3.0	"Table 3.1" is referenced in "3.3.3 – Proportions of grout" but did not appear to be included in the draft for review. Assuming Table 3.1 is unchanged from the previous version, we would encourage consideration to clarifying that the table values, particularly the "Water-cementitious material ratio" are "Design Values only and shall not be used at the jobsite." This is particularly important for Class C pre-packaged grouts where the manufacturer stated maximum may be well below 0.45 maximum for design.	**No change – New business** Values in Table 3.1 were added for Class C grout in the 2012 Edition, the same as for Class B grout. This was in reaction to the totally open specification for the proprietary grouts Class C before. It shows maximum limits for all constituents, not implying that those maxima could or should be reached. The language already in M55.1-12(13) remains as no proposal for modification was received during the cycle. It will be addressed in the new edition.
4	Ohler	4.3	Sulfate ion levels of all constituents	**No change – New business**

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			Proposed resolution: Again, a specific testing method must be determined by PTI.	The committee discussed more specific proposals and balloted possible limits. There was no consensus on the limits or testing. The language already in M55.1-12(13) remains as no proposal received enough support. It will be addressed in the new edition.
5	Ohler	4.4.2	The laboratory testing shall be performed at the maximum and minimum water-bagged materials ratios, as well as 1.1 times the maximum ratio, stated on the bag. Proposed resolution: As a manufacturer, we formulate and test the finished product to perform within a range of water contents. The maximum water content posted on our bag and on our technical data sheet is the absolute maximum water content. We are legally bound by the term maximum. How does PTI expect a manufacturer to print maximum water content on our packaging and then turn around and say, through testing that it is ok to exceed out maximum water content by 1.1 times the maximum ratio, stated on the bag. This may be a challenge for manufacturers to supply a grout to this industry. In addition, the annual independent testing costs will significantly increase and will ultimately increase the price of grout to the industry.	**No change – New business** The "robustness test" was discussed repeatedly in the committee and voted on. This "robustness test" was considered a key in avoiding potential occurrences of "soft grout" in the Class C grouts, as sensitivity to water content was demonstrated as one of the main contributing factors. The minimum and maximum water content on the packaging should be the range of water that should produce grouts performing properly within typical ranges of application conditions, with accurate bag weight, etc. The 1.1 times the maximum water content should guarantee grouts perform properly also under more atypical conditions, when too much water is added over the normal stated maximum for whatever reasons. Some grouts have demonstrated very poor results at small amounts of water above the maximum (what can be considered field tolerance or due to residual water) where some grouts have demonstrated "robust" characteristics. If a grout is only pumpable at the maximum water addition, this value can be at the "razor's edge". It will be addressed in the new edition.
6	Ohler	4.4.2	Manufacturer's Quality Program shall be audited once per year by an independent auditor. Proposed resolution:	**No change – New business** Past experience necessitates manufacturers' Quality Program audits.

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			Are there qualifications that the independent auditor needs to comply with or any accreditations that they need to have? This also will lead to an increase cost of grout to the industry.	It will be addressed in the new edition.
7	Freeby	C4.4.4	This section begins with the following sentence. "If it is anticipated that where silica fume will be used in the mixture, the strength levels can readily be attained". This sentence doesn't really add any value so suggest deleting it.	**No change – New business** The language already in M55.1-12(13) remains as no proposal for modification was received during the cycle. It will be addressed in the new edition.
8	Freeby	4.4.8.1	Since the "Modified ASTM C940" testing is a requirement, consideration should be given to moving the description of the modifications from the Commentary to the Specifications side. The first sentence of 4.4.8.1 would then be modified to read "A modification of the ASTM test as outlined below shall be used".	**No change – New business** The first sentence of 4.4.8.1 makes the description of the modifications of ASTM C940 in C.4.4.8.1 part of the mandatory requirement. It will be considered as new business to move it to the mandatory part.
9	Freeby	4.4.10	This section states "A range of wet density shall be established for the optimized grout using the ANSI/API Mud Balance Test at minimum and maximum water dosage by the manufacturer". However, "4.4.2 Prepackaged Grouts" requires laboratory testing to be performed at 1.1 times the maximum ratio as well. It's not clear then if Wet density tests are required a maximum, minimum and 1.1 times maximum or just at the maximum and minimum. Please clarify in 4.4.10 if the 1.1 times the maximum is or is not required.	**No change – New business** See response to #5. The range specified here is for the typical range of application conditions. It will be addressed in the new edition.
10	Freeby	4.4.12	In M50, "8.8 – Cement and grout" states "Ship and store cement and pre-bagged, engineered grout materials on raised platforms covered by properly secured, waterproof tarpaulins." However, M55 "4.4.12 Shelf life test" requires proving material stability when stored "on unprotected pallets for 30 days". This creates	**No change – New business** The committee considered this new provision and voted on it. The Commentary C.4.4.12 qualifies the 4.4.12 requirement in recommendation that the manufacturer

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			great inconsistencies between job site storage requirements and the shelf life determination. It is unlikely that "unprotected pallets" that were subjected to 30 inches or rain will perform the same as those stored with no rain at all. The use of waterproof tarpaulins should not only be a jobsite requirement but also a "shelf life" testing requirement. Otherwise, this inconsistency could be used as a justification for using expired material, "Yeah, but ours have been under a tarp." Suggest wording "4.4.12 Shelf life test" as follows: The manufacturer shall support its shelf-life criteria by testing that demonstrates compliance with all test properties required in this specification at the limiting shelf-life age, assuming the product is stored in open, unprotected pallets on raised platforms covered by properly secured, waterproof tarpaulins for 30 days in the field at 90o F and 50% RH and for the balance of the time at standard laboratory temperature.	includes conditions that would negatively affect the shelf life. This would allow for stating on the packaging that the grout pallets be stored with no exposure to rain, etc. It will be addressed in the new edition.
11	Ohler	4.4.12	The manufacturer shall support its shelf-life criteria by testing that demonstrates compliance with all test properties required in this specification at the limiting shelf life age, assuming the product is stored in open, unprotected pallets for 30 days in the field at 90 degrees F and 50% RH and for the balance of the time at standard laboratory temperature. Proposed resolution: Please provide an industry accepted testing method that PTI is determining as the applicable testing method. In addition a list of independent testing laboratories experienced and approved by CCRL for testing the sulfate testing method. As a manufacturer, it is essential that there are independent testing laboratories available to perform the testing. It is unclear how storage at 90 degrees F and 50% RH simulates being stored in the field on unprotected pallets for 30 days. Temperature swings, varying RH and rain all play a role.	**No change – New business** See response to #10. It will be addressed in the new edition.

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			As a manufacturer, this will lead to new packaging like plastic pails. Although readily available, this will lead to an increase cost of grout to the industry.	
12	Ohler	4.7.3(a)	A minimum of one pressure test (Section 4.4.6) shall be performed per project during the field testing. Additional tests are required for each truck load of prepackaged grout… Proposed resolution: There is a typo. Section 4.4.6 refers to Volume Change Test. I am assuming that this is supposed to be Section 4.4.8.2 Schupack pressure bleed test. Although the Schuck test method states that it can be performed in the field, there are many factors of the testing, very precise pressure control of the air supply, not introducing added moisture in the line from the compressed air, the cost of the specialized equipment, the proper maintenance of this equipment that provide a significant challenge to the personnel actually performing this test in the field. I see no real resolution to this challenge unless a bleed testing method that is more appropriate to filed conditions can be developed. I simply wanted to state the difficulty of performing this test method in the field which can lead to a false positive testing result. These issues surrounding the "field" Schupack bleed testing method can cause significant delays on the project.	**Editorial change** The intended pressure test is indeed Section 4.4.8.2 – Schupack pressure bleed test, ASTM C1741. Modify sentence to read: "(a) A minimum of one Schupack pressure test (Section 4.4.8.2) shall be performed per project during the field testing". In the 2012(13) Edition, Schupack pressure test was required once per day in the production testing. Its use is much reduced in this Edition of the specification. This test can certainly be performed accurately in the field trial testing and gives a good indication of the bleed propensity of the mixture.
13	Ohler	4.7.3(c)	The efflux time shall be within 5 seconds of the values established during laboratory testing. Proposed resolution: Differences between laboratory mixing equipment/conditions and field mixing equipment/conditions could produce efflux time differences greater than 5 seconds. Is there testing data available to support the 5 second requirement?	**No change – New business** The committee extensively discussed and balloted this provision. The consistency of the results is desired with this provision. Within 5 seconds means ± 5 seconds. If the value established during laboratory testing was 15 seconds, the field testing would have to be between 10 and 20 seconds; this seems a reasonably attainable requirement.

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14	Freeby	4.7.3	While we are in agreement with the elimination of strength testing requirements as a production test, "selling" this idea to practitioners will likely prove challenging. We anticipate this will particularly be true for owners who rely on tangible, documented tests as evidence that construction was done in conformance with the specifications. The emphasis will need to be on the increased requirements for wet density testing as a better test for proving compliance over the previously required strength tests.	**No change** The committee extensively discussed and balloted this provision. Strength testing as part of the production testing requirements does not provide any tangible results as they will become available 28 days after the grouting. It is fully agreed that this needs to be communicated to the industry.