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|--|---|
| Meeting (Annual or Mid-Year) | Annual |
| Date | Tuesday, August 6, 2019 |
| Scheduled Time | 3:15 – 5:00 |
| Technical Subcommittee & Name | TS 3a, Hydraulic Cement and Lime |
| Chair Name and (State) | John Staton (MI) |
| Vice Chair Name and (State) | Brett Trautman (MO) |
| Research Liaison Name and (State) | Don Streeter – Recently retired (NY) |

I. Introduction and Housekeeping – Trautman

II. Call to Order and Opening Remarks – Trautman

A. Brief Summary of Activities

III. Roll Call of Voting Members - Trautman

| Present | Member Name | State | Present | Member Name | State |
|--------------------------|--------------------|-------|--------------------------|---------------------|-------|
| <input type="checkbox"/> | John Staton | MI | <input type="checkbox"/> | Don Streeter (Ret.) | NY |
| <input type="checkbox"/> | Brett Trautman | MO | <input type="checkbox"/> | James Williams III | MS |
| <input type="checkbox"/> | Brian Egan | TN | <input type="checkbox"/> | John Grieco | MA |
| <input type="checkbox"/> | Richard Barezinsky | KS | <input type="checkbox"/> | Kurt Williams | WA |
| <input type="checkbox"/> | Scott George | AL | <input type="checkbox"/> | Paul Farley | WV |
| <input type="checkbox"/> | Daniel Miller | OH | <input type="checkbox"/> | Brian Ikehara | HI |
| <input type="checkbox"/> | Jose Lima | RI | <input type="checkbox"/> | Curt Turgeon | MN |
| <input type="checkbox"/> | Kenny Seward | OK | <input type="checkbox"/> | Harvey DeFord | FL |
| <input type="checkbox"/> | Robert Lauzon | CT | <input type="checkbox"/> | Richard Bradbury | ME |
| <input type="checkbox"/> | Mladen Gagulic | VT | <input type="checkbox"/> | Christopher Peoples | NC |
| <input type="checkbox"/> | Joseph Robinson | PA | <input type="checkbox"/> | Becca Lane | ON |
| <input type="checkbox"/> | Darin Tedford | NV | <input type="checkbox"/> | Andy Naranjo | TX |
| <input type="checkbox"/> | Charles Babish | VA | <input type="checkbox"/> | James Krstulovich | IL |

Quorum Rules Met? ____ of 26

Annual Meeting: Simple majority of voting members (☐y/ ☐n)

A. Review of Membership (New members, exiting members, etc.)

IV. Approval of Technical Subcommittee Mid-Year Minutes – Attachment A

V. Old Business

A. COMP Ballot Items

1. Outstanding items from Mid-Year Meeting

B. TS Ballots (April 16 – May 7, 2019) - Attachment B

1. M85 – Item 1 – *Early Stiffening Requirements*
2. M240 – Item 2 – *Chloride Content Reporting*
3. M240 – Item 3 – *Revise Table 3 Footnote D*

| TS Ballot # | Item | Standard | Results (<i>neg/affirm/No Vote</i>) | Comments/Negatives | Action |
|-------------|------|----------|---------------------------------------|--------------------|--|
| TS3A-19-01 | 1 | M85 | 0/22/4 | No Comments | |
| TS3A-19-01 | 2 | M240 | 0/22/4 | No Comments | |
| TS3A-19-01 | 3 | M240 | 0/22/4 | No Comments | Per JAAHTG, ASTM ballot yielded (persuasive) negative vote not in favor of changing footnote D |

C. Task Force Reports

1. TF 09 – 1 – Harmonization Task Group Update – Naranjo (TX)

VI. New Business

A. Research Proposals – Streeter (retired)

1. Quick Turnaround RPS
2. Full NCHRP RPS

B. NCHRP Issues – Hannah (NAS)

C. AASHTO re:source/CCRL/NTPEP,TC3 Update

D. Revisions/Work on Standards for Coming Year

E. Proposed New Standards

F. Proposed New Task Forces

G. Proposed New TS Ballots

H. Correspondence, calls, meetings

I. Review Stewardship List – Attachment C

J. Standards Requiring Revision or Reconfirmation – 2019 TS/COMP Ballots. Upcoming Reconfirmation Standards (4-year cycle, current publication date 2016)

1. M 152 – Flow Table for Use in Tests of Hydraulic Cement
2. M 201 – Mixing Room, Moist Rooms, Moist Cabinets, and Water Storage Tanks Used in The Testing of Hydraulic Cement and Concretes
3. R 71– Sampling and Amount of Testing of Hydraulic Cement
4. T 98 – Fineness of Portland Cement by the Turbidimeter
5. T 105 – Chemical Analysis of Hydraulic Cement
6. T 131 – Time of Setting of Hydraulic Cement by Vicat Needle
7. T 137 – Air Content of Hydraulic Cement Mortar
8. T 162 – Mechanical Mixing of Hydraulic Cement Paste and Mortar of Plastic Consistency

2017 Annual Meeting (cont.)

9. T 185 – Early Stiffening of Hydraulic Cement (Mortar Method)
 10. T 186 – Early Stiffening of Hydraulic Cement (Paste Method)
- K. COMP Ballot Items (including any ASTM changes/equivalencies) –
1. M 216/C977 – Quick Lime and Hydrated Lime for Soil Stabilization
 2. T 105/C114 – Chemical Analysis of Hydraulic Cement
 3. T 131/C191 – Time of Setting of Hydraulic Cement by Vicat Needle
 4. T 153/C204 – Fineness of Hydraulic Cement by Air Permeability Apparatus
 5. T 186/C451 – Early Stiffening of Hydraulic Cement (Paste Method)
- L. Presentation by Industry/Academia –
1. *“Equivalent Alkalies in Portland Cement: Everything You (N)Ever Want to Know”* – Paul Tennis, Portland Cement Association

VII. Open Discussion

1. Awards and Accomplishments
2. Performance Engineered Concrete Mixtures (PEM) Pooled Fund update – Ahlstrom (FHWA)
3. Volunteer for Research Liaison
4. Other

VIII. Adjourn

TS Meeting Summary

| Meeting Summary | | |
|--|-----------------------------|---|
| Items Approved by the TS for Ballot (Include reconfirmations.) | | |
| Standard Designation | Summary of Changes Proposed | Ballot Type |
| | | <input type="checkbox"/> TS <input type="checkbox"/> COMP <input type="checkbox"/> CONCURRENT |
| | | <input type="checkbox"/> TS <input type="checkbox"/> COMP <input type="checkbox"/> CONCURRENT |
| | | <input type="checkbox"/> TS <input type="checkbox"/> COMP <input type="checkbox"/> CONCURRENT |
| | | <input type="checkbox"/> TS <input type="checkbox"/> COMP <input type="checkbox"/> CONCURRENT |
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| | | <input type="checkbox"/> TS <input type="checkbox"/> COMP <input type="checkbox"/> CONCURRENT |
| | | <input type="checkbox"/> TS <input type="checkbox"/> COMP <input type="checkbox"/> CONCURRENT |
| | | <input type="checkbox"/> TS <input type="checkbox"/> COMP <input type="checkbox"/> CONCURRENT |
| New Task Forces Formed | | |
| Task Force Name | Summary of Task | TF Member Names and (States) |
| | | |
| | | |
| | | |

| | | |
|---|--|--|
| Meeting Summary | | |
| | | |
| Research Proposals (Include number/title/states interested.) | | |
| | | |
| | | |
| | | |
| Other Action Items | | |
| | | |
| | | |
| | | |



Attachment A

COMMITTEE ON MATERIALS & PAVEMENTS

Mid-Year Web Meeting (Webinar)

Monday, November 19, 2018

2:00 - 4:00 PM EST

TECHNICAL SUBCOMMITTEE 3a

Hydraulic Cement and Lime

- **Call to Order and Opening Remarks – C. Soneira**

John Staton (MI) Chair and Brett Trautman (MO) Vice Chair

AASHTO Liaison – Casey Soneira

Sergeant at Arms – Lyndi Blackburn (AL)

- **Roll Call – B. Trautman**

| Member | Agency | Member | Agency |
|-----------------------------|-------------------|-----------------|----------------------|
| John Staton - Chair | Michigan DOT | Darin Tedford | Nevada DOT |
| Brett Trautman – Vice Chair | Missouri DOT | Don Streeter | New York DOT |
| Lyndi Blackburn | Alabama DOT | Chris Peoples | North Carolina DOT |
| Robert Lauzon | Connecticut DOT | Daniel Miller | Ohio DOT |
| Harvey Deford | Florida DOT | Kenny Seward | Oklahoma DOT |
| Brian Ikehara | Hawaii DOT | Joseph Robinson | Pennsylvania DOT |
| James Krstulovich | Illinois DOT | Jose Lima | Rhode Island DOT |
| Richard Barezinsky | Kansas DOT | Brian Egan | Tennessee DOT |
| Rick Blackbury | Maine DOT | Mladen Gagulic | Vermont DOT |
| John Grieco | Massachusetts DOT | Charles Babish | Virginia DOT |
| Curt Turgeon | Minnesota DOT | Kurt Williams | Washington State DOT |
| James Williams III | Mississippi DOT | Paul Farley | West Virginia DOT |
| | | Becca Lane | Ontario MOT |

Web meeting attendees

| | | |
|-------------|---------|---|
| Barezinsky | Rick | rick.barezinsky@ks.gov |
| DeFord | Harvey | harvey.deford@dot.state.fl.us |
| Egan | Brian | brian.egan@tn.gov |
| Holt | Anne | anne.holt@ontario.ca |
| Hunter | Brian | bhunter@ncdot.gov |
| Ikehara | Brian | brian.ikehara@hawaii.gov |
| Krstulovich | James | James.Krstulovich@illinois.gov |
| Melander | John | jmelander@cement.org |
| Miller | Dan | daniel.miller@dot.ohio.gov |
| Naranjo | Andy | andy.naranjo@txdot.gov |
| Peoples | Chris | cpeoples@ncdot.gov |
| Prowell | Jan | jprowell@astm.org |
| Ramirez | Timothy | tramirez@pa.gov |
| Staton | John | statonj@michigan.gov (Chair) |
| Streeter | Don | donald.streeter@dot.ny.gov |
| Tennis | Paul | ptennis@cement.org |
| Trautman | Brett | Brett.Trautman@modot.mo.gov (Vice Chair) |
| Babish | Andy | andy.babish@vdot.virginia.gov |

- **Approval of Technical Subcommittee Minutes Annual Meeting 2018**

- The Chair highlighted some of the presentations and discussion points from the 2018 Annual Meeting of Technical Subcommittee 3a. Motion to approve minutes by NY and seconded by NC. Minutes were approved.

- **Old Business**

- A. *Rolling Ballot Group 1 – COMP Ballot Items:*

1. Item 1 – COMP ballot to Replace Low-Alkali Definition in M85. (Affirmative 39, Negative 0, No Vote 13)
2. Item 2 – COMP ballot to Modify Heat of Hydration Requirements in M85. (Affirmative 39, Negative 0, No Vote 13)
3. Item 3 – COMP ballot to Remove Reference to T98M/T98 Turbidimeter Fineness in M85. (Affirmative 39, Negative 0, No Vote 13)
4. Item 4 – COMP ballot to Revise Figure X1.1 in M85. (Affirmative 39, Negative 0, No Vote 13)
5. Item 5 – COMP ballot to Completion of Option R Removal in M240. (Affirmative 39, Negative 0, No Vote 13)
6. Item 6 – COMP ballot to Revise Type MH and LH Heat of Hydration Provisions in M240. (Affirmative 39, Negative 0, No Vote 13)

7. Item 7 – COMP ballot to Remove Section 9.3, 11.1.13 and Referenced Information in Table 4 in M240. (Affirmative 39, Negative 0, No Vote 13)

B. Rolling Ballot Group 1 – Concurrent Ballot Items:

1. Item 8 – Concurrent ballot to Revise M327/C465. Modify Fineness Requirement for Companion Cements. (Affirmative 39, Negative 0, No Vote 13)
2. Item 9 – Concurrent ballot for T133 Updates for ASTM Equivalency. (Affirmative 39, **Negative 0**, No Vote 13) **Editorial comments: Section 2.2 includes reference to C604 twice. Note that the introduction method of the cement in the Le Chatelier flash is not as specific in T133 as C188. If the amount of cement is accurately determined, the method used should not impact the results.**
3. Item 10 – Concurrent ballot for T192 Updates for ASTM Equivalency. (Affirmative 39, Negative 0, No Vote 13)

C. Rolling Ballot Group 1 – Reconfirmation Ballot Item:

- M303 Standard Specification for Lime for Asphalt Mixtures (Affirmative 20, Negative 0, No Vote 5)
- In summary, all 11 Rolling Ballot items passed with no negatives and only one minor comment.

A. Task Force Reports

1. TF 09 – 1 – Harmonization Task Force Report – Naranjo/Melander
- Andy Naranjo gave a brief update on the harmonization task group. All ballots developed by the task group have passed AAHSTO balloting. There was a negative on the ASTM Ballot for ASTM C465 that will be discussed at the December ASTM meeting. During the November harmonization call, Toy Poole discussed new proposal for adding early stiffing requirement to ASTM C595. The group will consider this proposal for future balloting.

- **New Business – J. Staton**

A. Research Proposals – Streeter

1. 20-7 (quick turnaround) RPS
 2. Full NCHRP RPS
- Don Streeter provided a brief synopsis of the current and upcoming NCHRP projects, which included the six projects previously presented by Amir Hanna at the Annual Meeting, plus a new addition, NCHRP Project Number 18-18; “*Design and Construction of Deck Bulb Tee Girder Bridges with UHPC*.” Don also mentioned that the upcoming Annual Meeting of the TRB will include a full day workshop on concrete technologies.

- A. *Re:source/CCRL – Re:source Rep.* - none
- B. *NCHRP Issues – Amir Hanna* – none
- C. *Correspondence, calls, meetings/Presentation by Industry/Academia* - none
- D. *Proposed New Standards* - none
- E. *Proposed New Task Forces* - none
- F. *Standards Requiring Reconfirmation – 2019 TS/COMP Ballots*
 - 1. Upcoming Reconfirmation Standards (4-year cycle)
 - a. M 152 – Flow Table for Use in Tests of Hydraulic Cement
 - b. M 201 – Mixing Room, Moist Rooms, Moist Cabinets, and Water Storage Tanks Used in The Testing of Hydraulic Cement and Concretes
 - c. R 71– Sampling and Amount of Testing of Hydraulic Cement
 - d. T 98 – Fineness of Portland Cement by the Turbidimeter
 - e. T 105 – Chemical Analysis of Hydraulic Cement
 - f. T 131 – Time of Setting of Hydraulic Cement by Vicat Needle
 - g. T 137 – Air Content of Hydraulic Cement Mortar
 - h. T 162 – Mechanical Mixing of Hydraulic Cement Paste and Mortar of Plastic Consistency
 - i. T 185 – Early Stiffening of Hydraulic Cement (Mortar Method)
 - j. T 186 – Early Stiffening of Hydraulic Cement (Paste Method)

G. *COMP Ballot Items (including any ASTM changes/equivalencies) – 2019 TS/COMP Ballots*

- 1. Upcoming AASHTO/ASTM Equivalency Standards
 - a. M 216/C977 – Quick Lime and Hydrated Lime for Soil Stabilization
 - b. T 105/C114 – Chemical Analysis of Hydraulic Cement
 - c. T 131/C191 – Time of Setting of Hydraulic Cement by Vicat Needle
 - d. T 153/C204 – Fineness of Hydraulic Cement by Air Permeability Apparatus
 - e. T 186/C451 – Early Stiffening of Hydraulic Cement (Paste Method)
- The Chair requested volunteers to be stewards for the 28 AASHTO standards under the jurisdiction of TS 3a. The Chair will send the group the list of 3a AASHTO standards along with a description of steward duties.

- **Open Discussion - Group**

- No additional items were discussed.

- **Adjourn** The meeting adjourned at 2:30 pm EST.

Ballot Number: COMP TS3A-19-01

Ballot Name: Technical Subcommittee 3a – 2019 Ballot #1

Item # 1

TS Ballot Results:

| | |
|---------------------------|-------------|
| Voting Members: 26 | |
| Affirmative | 22 |
| Negative | 0 |
| No Vote | 4 |
| Comments | None |

Ballot Action: Revision of M 85, Standard Specification for Portland Cement

Description: Early Stiffening Requirement

Rationale: This proposal would change a row heading in Table 4 to more accurately reflect the results of T 186 testing. Since either false setting or flash setting can be indicated by a low final penetration result, it is more appropriate to refer to “Early stiffening” in optional requirement in Table 4 based on T 186 results.

This proposal does not propose any changes to the requirement, but does propose changing the text from “false set” to “early stiffening” throughout the standard. The item includes a correction to indicate that the early stiffening final penetration requirement is a “minimum” requirement in percent of final penetration compared to initial penetration, rather than the current “minutes, percent.”

This ballot item is based on AAHSTO M 85-19. Only additions to text shown in underline and deletions shown in ~~strikethrough font~~ are being balloted. Other text is included for information only. Where necessary, tables, figures, notes, footnotes, and section numbers will be renumbered editorially.

This proposal has been developed by TS 3a TF09-1, the Joint AASHTO-ASTM Harmonization Task Force, and a parallel proposal is being considered by ASTM Committee C01 for ASTM C150.

Please note this proposal has 3 pages.

Detailed Changes:

Table 4—Optional Physical Requirements^a

| Cement Type | Applicable Test Method | I and II | IA and IIA | II(MH) | II(MH)A | III and IIIA | IV | V |
|---|------------------------|----------------|----------------|-----------------------|-----------------------|--------------|-----------------------|-------|
| False-set <u>Early stiffening</u> , final penetration, minutes <u>minimum</u> , percent | T 186 | 50 | 50 | 50 | 50 | 50 | 50 | 50 |
| Heat of hydration | | | | | | | | |
| Isothermal conduction calorimetry: | ASTM C1702 | | | | | | | |
| 3 days, max, kJ/kg (cal/g) | | — | — | 355 (80) ^b | 355 (80) ^b | — | 200 (50) ^c | — |
| 7 days, max, kJ/kg (cal/g) | | — | — | — | — | — | 225 (55) ^c | — |
| Strength, not less than values shown: | | | | | | | | |
| Compressive strength, MPa (psi), 28 days | T 106M/ T 106 | 28.0 (4060) | 22.0 (3190) | 28.0 (4060) | 22.0 (3190) | — | — | — |
| Sulfate resistance, 14 days, max, % expansion ^d | ASTM C452/ C452M | — ^e | — ^e | — ^e | — ^e | — | — | 0.040 |

^a These optional requirements apply only if specifically requested. Availability should be verified. See Note 2 in Section 4.

^b The limit for the sum of C₃S + 4.75C₃A in Table 1 shall not apply when the cement complies with this limit.

^c The limits of C₃S, C₂S, C₃A, and Fe₂O₃ in Table 1 shall not apply when the cement complies with this limit.

^d When the sulfate resistance is specified, it shall be used instead of the limits of C₃A, C₄AF + 2(C₃A), and Fe₂O₃ listed in Table 1.

^e Cement meeting the high sulfate resistance limit for Type V is deemed to meet the moderate sulfate resistance required of Type II and Type II (MH).

9. TEST METHODS

- 9.1. *Determine the applicable properties enumerated in this specification in accordance with the following methods:*
 - 9.1.1. *Air Content of Mortar—T 137;*
 - 9.1.2. *Chemical Analysis—T 105;*
 - 9.1.3. *Strength—T 106M/T 106;*
 - 9.1.4. ~~*False Set*~~ *Early Stiffening—T 186;*
 - 9.1.5. *Fineness by Air Permeability—T 153;*
 - 9.1.6. *Heat of Hydration—ASTM C1702;*
 - 9.1.7. *Autoclave Expansion—T 107M/T 107;*
 - 9.1.8. *Time of Setting by Gillmore Needles—T 154;*
 - 9.1.9. *Time of Setting by Vicat Needles—T 131;*
 - 9.1.10. *Sulfate Expansion—ASTM C452/C452M; and*
 - 9.1.11. *Calcium Sulfate (Expansion of) Mortar—ASTM C1038/C1038M.*

X1. MANUFACTURER'S CERTIFICATION (MILL TEST REPORT)

- X1.1. To provide uniformity for reporting the results of tests performed on cements under this specification, as required by Section 15 of M 85, Manufacturer's Certification, an example Mill Test Report is shown in Figure X1.1.

ABC Portland Cement Company
Qualitytown, NJ

Plant: Example

Cement Type: II(MH)

Date: March 9, 20xx

Production Period: March 2, 20xx–March 8, 20xx

STANDARD REQUIREMENTS

M 85

| CHEMICAL | | | PHYSICAL | | |
|--|--------------|-------------|-------------------------------------|------------------|--------------------|
| Item | Spec. Limit | Test Result | Item | Spec. Limit | Test Result |
| SiO ₂ (%) | ^a | 20.6 | Air content of mortar (volume %) | 12 max | 8 |
| Al ₂ O ₃ (%) | 6.0 max | 4.4 | Fineness (m ² /kg) | 260 min | 377 |
| | | | (Air permeability) | 430 max | |
| Fe ₂ O ₃ (%) | 6.0 max | 3.3 | Autoclave expansion (%) | 0.80 max | 0.04 |
| CaO (%) | ^a | 62.9 | Compressive strength (MPa) | Min: | |
| MgO (%) | 6.0 max | 2.2 | 1 day | ^a | |
| SO ₃ (%) | 3.0 max | 3.2 | 3 days | 7.0 | 23.4 |
| Loss on ignition (%) | 3.5 max | 2.7 | 7 days | 12.0 | 29.8 |
| Na ₂ O (%) | ^a | 0.19 | 28 days | ^a | |
| K ₂ O (%) | ^a | 0.50 | | | |
| Equivalent alkalis, Na ₂ Oeq (%) | ^a | 0.52 | Time of setting (minutes) | | |
| Insoluble residue (%) | 1.5 max | 0.27 | (Vicat) | | |
| CO ₂ (%) | ^a | 1.2 | Initial | Not less than 45 | 124 |
| Limestone (%) | 5.0 max | 3.5 | | Not more than | |
| CaCO ₃ in limestone (%) | 70 min | 79 | | 375 | |
| Inorganic processing addition (ground, granulated blast-furnace slag) | 5.0 max | 3.0 | | | |
| Potential phase compositions (%) ^b | | | Heat of hydration (kJ/kg) | | |
| C ₃ S | ^a | 59 | ASTM C1702 | | |
| C ₂ S | ^a | 10 | 3 days | ^c | 245 |
| C ₃ A | 8 max | 5 | ASTM C1038 mortar bar expansion (%) | ^d | 0.010 ^e |
| C ₄ AF | ^a | 10 | | | |
| C ₄ AF + 2(C ₃ A) | ^a | 20 | | | |
| C ₃ S + 4.75 C ₃ A, (%) | 100 max | 83 | | | |

^a Not applicable.

^b Adjusted per Annex A1.6.

^c Test result represents most recent value and is provided for information only.

^d Required only if percent SO₃ exceeds the limit in Table 1, in which case expansion shall not exceed 0.020 percent at 14 days.

^e Test result for this production period not available. Most recent test result provided.

OPTIONAL REQUIREMENTS

M 85

| CHEMICAL | | | PHYSICAL | | |
|--------------|--------------|-------------|---|-------------|-------------------|
| Item | Spec. Limit | Test Result | Item | Spec. Limit | Test Result |
| Chloride (%) | ^f | 0.020 | False-set Early Stiffening (%) | 50 min | 82 |
| | | | Compressive strength (MPa) | | |
| | | | 28 days | 28.0 min | 39.7 ^e |

^f Limit not specified by purchaser. Test result provided for information only.

We certify that the above-described cement, at the time of shipment, meets the chemical and physical requirements of
M 85-xx or (other) _____ specification.

Signature: _____

Title: _____

Figure X1.1—Example Mill Test Report

Ballot Number: COMP TS3A-19-01

Ballot Name: Technical Subcommittee 3a – 2019 Ballot #1

Item # 2

TS Ballot Results:

| Voting Members: 26 | |
|--------------------|------|
| Affirmative | 22 |
| Negative | 0 |
| No Vote | 4 |
| Comments | None |

Ballot Action: Revision of M240, Standard Specification for Blended Hydraulic Cement,

Description: Chloride Content Reporting

Rationale: Concrete often contains several potential sources of chloride and appropriate guidance on concrete chloride limits is provided in ACI 318, other building codes, and other standards. This proposal adds language to note that the chloride content of a cement is available upon request, as it may be needed to estimate the chloride content of concrete. T 105 includes a reference method for chloride content determination. The proposed language is consistent with that in M 85.

This ballot item is based on AASHTO M 240-19. Only additions to text shown in **underline** and deletions shown in **strikethrough font** are being balloted. Other text is included for information only. Where necessary, tables, figures, notes, footnotes, and section numbers will be renumbered editorially.

This proposal has been developed by TS 3a TF09-1, the Joint AASHTO-ASTM Harmonization Task Force, and a parallel proposal is being considered by ASTM Committee C01 for ASTM C595.

Detailed Changes

15 CERTIFICATION

15.5

Upon request of the purchaser in the contract or order, the manufacturer shall report the following characteristics of constituents of the blended cement: the equivalent alkali content ($\text{Na}_2\text{Oe} = \% \text{Na}_2\text{O} + 0.658 \times \% \text{K}_2\text{O}$) of any portland cement, slag, fly ash, natural pozzolan, or silica fume; the CaO content of any fly ash; and the SiO_2 content of any silica fume. (See Note 14.)

Note 14—The characteristics listed in Section 15.5 may be requested in order to follow guidance provided in R 80 to reduce the risk of deleterious expansion due to alkali–silica reaction in concrete.

15.6

Upon request of the purchaser, the manufacturer shall report the chloride content as determined using C114, in percent by mass of the blended cement, in the manufacturer's report (see Note 15).

Note 15— Chlorides in concrete come from multiple ingredients and blended cement chloride content may be required to estimate concrete chloride content. Requirements for concrete chloride content are provided in building codes and other documents.

Ballot Number: COMP TS3A-19-01

Ballot Name: Technical Subcommittee 3a – 2019 Ballot #1

Item # 3

TS Ballot Results:

| Voting Members: 26 | |
|--------------------|------|
| Affirmative | 22 |
| Negative | 0 |
| No Vote | 4 |
| Comments | None |

Ballot Action: Revision of M 240, Standard Specification for Blended Hydraulic Cements,

Description: Revise Table 3 Footnote D

Rationale: This ballot would simplify Footnote D of Table 3, related to sulfate resistance of HS-designated cements. The intent of the revised text is to more simply state the requirements in the table and to be consistent with the code. No technical change is made in the requirements, the proposed text is simply a clearer statement of existing requirements.

Since ASTM C1012 refers to “6 months” and “12 months” testing as standard testing intervals, the description of the ages at which the limits are applied in Table 3 of M 240 are also proposed to be changed for consistency.

This ballot item is based on AASHTO M 240-19. Only additions to text shown in underline and deletions shown in ~~strikethrough font~~ are being balloted. Other text is included for information only. Where necessary, tables, figures, notes, footnotes, and section numbers will be renumbered editorially.

This proposal has been developed by TS 3a TF09-1, the Joint AASHTO-ASTM Harmonization Task Force, and a parallel proposal is being considered by ASTM Committee C01 for ASTM C595.

Detailed Changes:

Table 3—Physical Requirements for Blended Cements with Special Properties

| Special Property Designation ^a | Applicable Test Method | A | MS | HS | MH | LH |
|--|------------------------|-----------------|-------------|-------------|-------------|-------------|
| Air content of mortar: | T 137 | | | | | |
| min, volume % | | 16 ^b | — | — | — | — |
| max, volume % | | 22 ^b | 12 | 12 | 12 | 12 |
| Compressive strength, ^c min, MPa [psi]: | T 106M/ T 106 | | | | | |
| 3 days | | 10.0 [1450] | 13.0 [1890] | 13.0 [1890] | 10.0 [1450] | — |
| 7 days | | 16.0 [2320] | 20.0 [2900] | 20.0 [2900] | 17.0 [2470] | 11.0 [1600] |
| 28 days | | 22.0 [3190] | 25.0 [3620] | 25.0 [3620] | 22.0 [3190] | 21.0 [3050] |
| Heat of hydration, max, kJ/kg [cal/g]: | | | | | | |
| 3 days | ASTM | — | — | — | 335 [80] | 200 [50] |
| 7 days | C1702 | — | — | — | — | 225[55] |
| Water requirement, max weight % of cement | T 106M/ T 106 | — | — | — | — | 64 |

| Special Property Designation ^a | Applicable Test Method | A | MS | HS | MH | LH |
|--|------------------------|---|------|-------------------|----|----|
| Sulfate resistance, max, %: | ASTM | | | | | |
| Expansion at 6 months 180 days | C1012 | — | 0.10 | 0.05 ^d | — | — |
| Expansion at 12 months 1 year | | — | — | 0.10 ^d | — | — |

^a These requirements apply only if specified and are designated by suffixes A, MS, HS, MH, or LH as appropriate to type designations IL, IP, IS(<70), or IT(S<70). See Section 4.3. Requirements for fineness, autoclave expansion, autoclave contraction, and time of setting shall conform to Table 2.

^b These air content requirements apply to cements with multiple special property designations when one of those designations is (A).

^c When multiple special property designations are applied, the set of strength requirements for the special property designation with the lowest 7-day minimum strength requirement shall apply.

^d ~~Testing at 1 year shall not be required when the cement meets the 180-day limit. A cement failing the 180-day limit shall not be rejected unless it also fails the 1-year limit. Meeting either the 6-month or 12-month expansion limit indicates specification compliance.~~

**TECHNICAL SUBCOMMITTEE 3A, HYDRAULIC CEMENT LIME
AASHTO STEWARDS**

Attachment C

| TITLE | AASHTO # | ASTM # | AASHTO COMP Steward |
|---|---------------------------|----------------------|--|
| PORTLAND+A3:K50 CEMENT | M 85-16 | C150/C150M-16 | Texas - Andy Naranjo |
| FLOW TABLE FOR USE IN TESTING HYD. C. | M 152M/M 152 - 16 | C230/C230M-14 | Oklahoma - Kenny Seward |
| MOIST CAB, ROOMS, ETC. USED IN TESTING CEM. & CONCRETE | M 201-15 | C511-13 | Re:source - Pete Holter; Tennessee - Brian Egan |
| LIME FOR SOIL STAB. | M 216-13 | C977-10 | North Carolina - Chris Peoples; Tennessee - Brian Egan |
| BLENDED HYDRAULIC CEMENTS | M 240M/M 240- 16* | C 595/C 595M-16 | Texas - Andy Naranjo |
| LIME FOR ASPHALT MIXTURES | M 303-89 (2014) | NONE | |
| PROCESSING ADDITIONS | M 327-11(2015) | ASTM C 465-10 | Texas - Andy Naranjo |
| APP. FOR MEAS. LENGTH CHANGE OF PASTE, MORTAR, CONCRETE | R 70-16 | C490/C 490M- 11e1 | |
| SAMPLING HYDRAULIC CEMENT | R 71 - 16* | C 183-15 | |
| FINENESS OF PC BY THE TURBIDIMETER | T 98-12(16)* | C 115-10e1 | |
| CHEMICAL ANALYSIS HYDRAULIC CEMENT | T 105-16* | C 114-15 | Missouri - Brett Trautman |
| COM. STRENGTH OF HYDRAULIC CEMENT OF MORTAR CUBES | T 106M/T 106 - 15 | C 109/C109M-13 | Kansas - Rick Barezinski |
| AUTOCLAVE EXPANSION OF PORTLAND CEMENT | T 107M/T 107- 11(2015) | C 151/C151M-09 | Oklahoma - Kenny Seward; Kansas - Rick Barezinski |

**TECHNICAL SUBCOMMITTEE 3A, HYDRAULIC CEMENT LIME
AASHTO STEWARDS**

| | | | |
|--|-----------------|------------|------------------------------|
| NORMAL CONSISTENCY OF HYDRAULIC | T 129-14 | C 187-11e1 | |
| TIME OF SETTING OF HYDRAULIC CEMENT BY VICAT NEEDLE | T 131-15 | C 191-13 | |
| TENSILE STRENGTH OF HYDRAULIC CEMENT MORTARS | T 132-87 (2013) | NONE | |
| DENSITY OF HYDRAULIC CEMENT | T 133-16 | C 188-14 | |
| AIR CONTENT OF HYDRAULIC CEMENT MORTAR | T 137-12 (16) | C 185-08 | |
| FINENESS OF P.C. BY AIR PERM. APPARATUS | T 153-13 | C 204-11e1 | Illinois - James Krstulovich |
| TIME OF SETTING OF HYDRAULIC CEMENT BY GILLMORE NEEDLES | T 154-15 | C 266-13 | |
| MECHANICAL MIXING OF HYDRAULIC CEMENT PASTES AND MORTARS | T 162-16 | C305-14 | |
| EARLY STIFFENING OF PORTLAND CEMENT (MORTAR METHOD) | T 185-15 | C 359-13 | |
| EARLY STIFFENING OF PORTLAND CEMENT (PASTE METHOD) | T 186-15* | C 451-13 | |
| FINENESS OF HYDRAULIC CEMENT BY THE NO. 325 SIEVE | T 192-11(2015) | C 430-08 | |
| SAMPLING HYDRATED LIME | T 218-86 (2013) | NONE | |
| TESTING LIME FOR CHEM. CON. AND PART. SIZES | T 219-87 (2013) | NONE | |
| DET. OF LIME CONTENT BY TITRATION | T 232-90 (2013) | NONE | |
| PARTICLE SIZE BY LIGHT SCATTERING | T 353-14 | NONE | |