Record of Letter Ballot Review by TC Chapter for Procedural Review

Region/Locale: North America
Global Technical Committee: Gases
TC Chapter Cochairs: Mohamed Saleem/Brooks Instrument
Standards Staff: Laura Nguyen

	Scheduled in Background Statement	Actual
Date	07/11/2017	07/11/2017
Location	San Francisco, CA	San Francisco, CA
Reason for Change of Date and/or Location (if changed)		

Note: See *Regulations* ¶ 9.5 Exception for allowable reason to change.

I. Document Number and Title

Document Number	Document Title
6056B	Revision to SEMI E28-1110: Guide for Pressure Specifications of the Mass Flow Controller, with Title Change to, Guide for Pressure Parameters of the Mass Flow Controller

II. Tally

Standards staff to fill in.

Voting Tally: As-cast tally after close of voting period

Note: A minimum of 60% of the Voting Interests that have TC Members within the global technical committee that issued the Letter Ballot must return Votes. (*Regulations* ¶ 9.7.1.1)

Voting Tally (with example values):

Voting Interest:	Returned Votes		Distribution		Return Rate	
Letter Ballot	40	÷	66	=	60.6%	≥60%
Intercommittee Ballot	14					
Voting Interest Reject(s)	1		Total Voters with Rejects		1	
Voting Interest Accept(s)	23					

Note: See *Regulations* § 3.2.1 for definition of Voting Interest.

III. Rejects

Voting Interest Reject 1 (Voting Interest Name: Tokyo Electron)

Voter Reject 1 (Voter: Supika Mashiro/TEL)

Negative 1

Negative	Referenced Section/ Paragraph	Section 4.2.1					
	Negative Text	Negative/ Delete 4.2.1 and use those non SI units in parenthesis where appropriate.					
		JUSTIFICATION: Section 4.2.1 is still inappropriate for terminology section. Although not reccomended, a discussioncould be appended to each term defined. 4.2.1, however describes as if Pa is mere preferred units of pressure, and not acceptable. primaryy unit system in SEMI Standard is the SI Unit, anything other can be added as a reference in parethesis, but should not given equivalent treatment as suggested in 4.2.1.					
TF input (optional)							
Withdrawal (check one)		X	No Negative withdrawal made by Voter.				GO TO "Related" subsection
Related	Motion and Reason (check one)	X	'Related' is mutually agreed upon. (Needs no motion.)				GO TO "Persuasive" subsection
Persuasive	Motion and Reason (check one)	X	Negative is related and persuasive. (Needs >1/3 votes to pass.)				
	Motion by/ 2nd by	Thomas Fritz (WIKA) / Bill Kiikvee (AP Tech)					
	Discussion	None					
	Result of Vote (check one)	17 **Y** 0 **N**; Motion passed.					
		X	[Negative is related and persuasive.] > 1/3	Is a technical change recommended? (check one)	X	Y	GO TO "Address by Technical Change Option" subsection
			[Negative is related and not persuasive.] < 2/3			N	GO TO "Final" subsection → (E)
Address by Technical Change Option	Technical Change Recommendations Delete 4.2.1 and put Non-SI units in parenthesis in Sections 4.1.4 (differential pressure), 4.1.5 (gauge pressure), and 4.2.2 (Absolute pressure).						
	Technical Changes	1	**FROM: Section/Paragraph 4/4.1.4** 4.1.4 *differential pressure* — the difference in absolute pressure between two points of measurement in a system (see Figure 3). NOTE 1: To indicate unambiguously that a pressure measurement is differential, the following abbreviations should be used: • Pa (d) — Pascal, differential • psi (d) — Pounds per square inch, differential • Torr (d) — Torr, differential • kg/cm^2(d) — Kilograms per square centimeter, differential • bar (d) — bar, differential				

TO: Section/Paragraph 4/4.2.1

4.1.4 *differential pressure* — the difference in absolute pressure between two points of measurement in a system (see Figure 3).

NOTE 1: To indicate unambiguously that a pressure measurement is differential, the following abbreviations should be used:

- Pa (d) — Pascal, differential (Other units may include the following: psi (d) – pounds per square inch, differential; Torr (d) – Torr, differential; kg/cm^2(d) – kilograms per square centimeter, differential; bar (d) - bar, differential)
- ~~psi (d) — Pounds per square inch, differential~~
- ~~Torr (d) — Torr, differential~~
- ~~kg/cm^2(d) — Kilograms per square centimeter, differential~~
- ~~bar (d) — bar, differential~~

Justification (If necessary)

SI unit is the primary unit system used in SEMI Standard. The SI unit for pressure is Pa. All other pressure units which are non-SI units should be written in parenthesis as they are not the primary units.

FROM: Section/Paragraph 4/4.1.5

4.1.5 *gauge pressure* — the differential pressure measured relative to ambient pressure. For example, when the pressure within a system equals the prevailing ambient pressure, the gauge pressure equals zero (see Figure 1).

NOTE 2: To indicate unambiguously that a pressure measurement is gauge, the following abbreviations should be used:

- Pa (g) — Pascal, gauge
- psi (g) — Pounds per square inch, gauge
- Torr (g) — Torr, gauge
- kg/cm^2 — Kilograms per square centimeter, gauge
- bar (g) —bar, gauge

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TO: Section/Paragraph 4/4.1.5

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NOTE 2: To indicate unambiguously that a pressure measurement is gauge, the following abbreviations should be used:

- Pa (g) — Pascal, gauge (Other units of pressure may include the following: psi (g) – Pounds per square inch, gauge; Torr (g) – Torr, gauge; kg/cm^2 – kilograms per square centimeter, gauge; bar (g) – bar, gauge)
- ~~psi (g) — Pounds per square inch, gauge~~
- ~~Torr (g) — Torr, gauge~~
- ~~kg/cm^2 — Kilograms per square centimeter, gauge~~
- ~~bar (g) — bar, gauge~~

Justification (If necessary)

SI unit is the primary unit system used in SEMI Standard. The SI unit for pressure is Pa. All other pressure units which are non-SI units should be written in parenthesis as they are not the primary units.

FROM: Section/Paragraph 4/4.2.1

4.2.1 *units of pressure* — several units of pressure are commonly used in conjunction with MFCs. The Pascal is the preferred unit of pressure for use within the semiconductor industry. Units of pressure include the following:

- Pascal (Pa)
- Pounds per square inch (psi)
- Torr (T)
- Kilograms per square centimeter (kg/cm^2)
- bar (B)

NOTE 6: Units of pressure are sometimes expressed as an equivalent height of a column of some liquid, such as millimeters of mercury or inches of water. These units require correction to some standard for liquid density and gravity. As these corrections are neither broadly standardized nor often even addressed, their use should be avoided.

TO: Section/Paragraph 4/4.2.1

3

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- ~~Pascal (Pa)~~
- ~~Pounds per square inch (psi)~~
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- ~~Kilograms per square centimeter (kg/cm^2)~~
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~~NOTE 7: Units of pressure are sometimes expressed as an equivalent height of a column of some liquid, such as millimeters of mercury or inches of water. These units require correction to some standard for liquid density and gravity. As these corrections are neither broadly standardized nor often even addressed, their use should be avoided.~~

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SI unit is the primary unit system used in SEMI Standard. The SI unit for pressure is Pa. All other pressure units which are non-SI units should be written in parenthesis as they are not the primary units.

4

FROM: Section/Paragraph 4/4.2.2

4.2.2 Absolute pressure is the pressure illustrated by the ideal gas law, PV = nRT. For example, when the number of moles, n, equals zero (no molecules), absolute pressure, P, equals zero. To indicate unambiguously that a pressure measurement is absolute, the following abbreviations should be used:

- Pa — Pascal (absolute assumed)
- psi (a) — Pounds per square inch, absolute
- Torr — Torr (absolute assumed)
- $kg/cm^2(a)$ — Kilograms per square centimeter, absolute
- bar (a) — bar, absolute

4.2.2.1 Units such as Pascal and Torr are customarily absolute units.

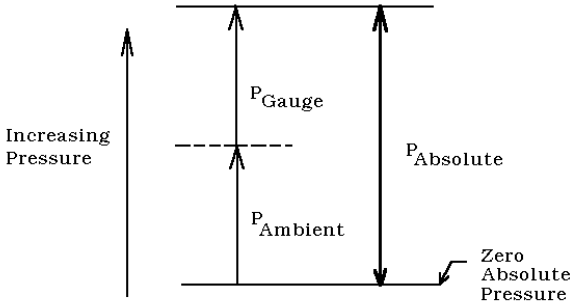

Figure 2
Pressure Definitions for MFCs
Relationship Between Absolute, Gauge, and Ambient Pressure

4.2.2.2 Gauge pressures may also be used in the differential pressure calculation if consistency is maintained. A common error would be to take the difference between an inlet gauge pressure and an outlet absolute pressure without first converting to common units.

4.2.2.3 As it applies to an MFC, differential pressure is usually the measured difference in pressures between the gas inlet and outlet fittings of the MFC.

TO: Section/Paragraph 4/4.2.1

~~4.2.2~~ 4.2.1 Absolute pressure is the pressure illustrated by the ideal gas law, PV = nRT. For example, when the number of moles, n, equals zero (no molecules), absolute pressure, P, equals zero. To indicate unambiguously that a pressure measurement is absolute, the following abbreviations should be used:

- Pa — Pascal (absolute assumed) (Other units of pressure may include the following: psi (a) – Pounds per square inch, absolute; Torr – Torr (absolute assumed); kg/cm^2(a) – kilograms per square centimeter, absolute; bar (a) – bar, absolute)
- ~~psi (a) — Pounds per square inch, absolute~~
- ~~Torr — Torr (absolute assumed)~~
- ~~kg/cm^2(a) — Kilograms per square centimeter, absolute~~
- ~~bar (a) — bar, absolute~~

~~4.2.2.1~~ 4.2.1.1 Units such as Pascal and Torr are customarily absolute units.

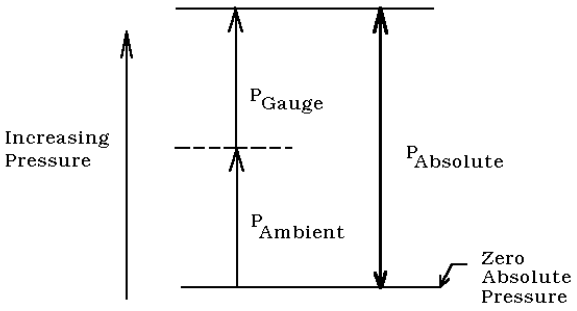

Figure 2

Pressure Definitions for MFCs
Relationship Between Absolute, Gauge, and Ambient Pressure

~~4.2.2.2~~ 4.2.1.2 Gauge pressures may also be used in the differential pressure calculation if consistency is maintained. A common error would be to take the difference between an inlet gauge pressure and an outlet absolute pressure without first converting to common units.

~~4.2.2.3~~ 4.2.1.3 As it applies to an MFC, differential pressure is usually the measured difference in pressures between the gas inlet and outlet fittings of the MFC.

Justification (If necessary)
SI unit is the primary unit system used in SEMI Standard. The SI unit for pressure is Pa. All other pressure units which are non-SI units should be written in parenthesis as they are not the primary units.

Motion		Negative is addressed by the technical change(s).	
Motion by/2nd by		Jeff Christian (WIKA) / Bill Kiikvee (AP Tech)	
Discussion		None.	
Result of Vote (check one)		17 **Y** 0 **N**; Motion passed.	
		X 2/3 ≤ [Negative is addressed by the technical change(s).]	**GO TO "Incorporation of the Technical Change" subsection**
Incorporation of	**Motion**	To incorporate the technical change(s).	
	Motion by/2nd by	Bill Kiikvee (AP Tech) / Jeff Christian (WIKA)	
	Discussion	None.	

		Result of Vote (check one)	18 **Y** 0 **N**; Motion passed.		
			X	90% ≤ [Agree to incorporate.]	**GO TO "Final" subsection → (F)**
				[Disagree to incorporate.]>10%	**GO TO "Final" subsection → (E)**

Final	**(check if applicable)**		**(A)**	Withdrawn **(counted under h in disposition)**	
			(B)	Not related **(counted under i in disposition)**	
			(C)	Related and not persuasive (significant)	
			(D)	Not significant **(counted under j in disposition)**	
			(E)	Related and persuasive and not addressed by technical change	**DOCUMENT FAILS**
		X	**(F)**	Addressed by technical change **(counted under k disposition)**	

Check only when the Document has not been failed.

1	Original number (#) of Negatives			**(g)**
0	Number of Negatives withdrawn			**(h)**
0	Number of Negatives found not related			**(i)**
0	Number of Negatives found not significant			**(j)**
1	Number of Negatives addressed by technical change **(Negative becomes not significant)**			**(k)**
Final	**X**	**g** - (**h** + **i** +**j** + **k**) = 0	**Reject is Not Valid and is not included in the denominator of § VI. *Approval Conditions Check***	
		g - (**h** + **i** +**j** + **k**) >0	**Reject is included in the denominator of § VI. *Approval Conditions Check***	
		Reject without a Negative	**Not Valid**	

Note: If all of the Negatives included with a Reject Vote are withdrawn, determined to be not related, or determined to be not significant, the Reject Vote is not valid. (*Regulations* ¶ 9.4.3.3)
Note: A Negative addressed by a technical change is automatically considered to be not significant. (*Regulations* ¶ 9.6.4.4.2)

IV. Other Technical Issues

None

V. Comments

V- (i) Voters' Comments

None

V-(ii) Comments Created by Handling Negative

None

VI. Editorial Changes Other than Those Voted on in § V

None

VII. Approval Conditions Check

VII. - (i). Approval Rate

APPROVAL CONDITION 1: All Negatives have been discussed and were withdrawn, found not related, found not persuasive, or addressed by a technical change. (*Regulations* ¶ 9.7.1.2)

APPROVAL CONDITION 2: At least 90% of the sum of valid Voting Interest Accept and Voting Interest Reject Votes must be Accept. (*Regulations* ¶ 9.7.1.3)

Note: If both approval conditions are not satisfied, the Document fails.

		Accepts		(Accepts + Valid Rejects)				
Approval Rate	=	23	/	23	=	100.0%		≥90%

VII. – (ii) Approval Level (check one)

Note: See *Regulations* § 9.7.2 for further information.

	Globally Approved (No Ratification Ballot needed): The Letter Ballot meets the Letter Ballot approval conditions for the global technical committee.
X	**Need a Ratification Ballot:** The Letter Ballot meets the Letter Ballot approval conditions for the TC Chapter and a Ratification Ballot will be issued to validate technical changes.

VIII. Safety Check

Note: See *Regulations* § 15 for further information.

Motion		
	X	**This is not a Safety Document**, when all safety-related information is removed, the Document is still technically sound and complete. (*Regulations* ¶ 8.7.1)
		This is a Safety Document, when all safety-related information is removed, the Document is not technically sound and complete. (*Regulations* ¶ 8.7.2)
		Safety Checklist (*Regulations* ¶ 15.3) is complete and has been included with the Document throughout the balloting process. (*Regulations* ¶ 15.1.2)
Motion by/2nd by		Thomas Fritz (WIKA) / Jeff Christian (WIKA)
Discussion		None
Vote		15 **Y** 0 **N**; Motion passed.

IX. Intellectual Property (IP) Check

Note: This Letter Ballot may cover all or part of a Standard or Safety Guideline. This IP check applies to the entire Standard or Safety Guideline. See *Regulations* § 16 for further information.

X	The TC Chapter meeting chair asked those participating, if they were aware of any potentially material patented technology or copyrighted items* in the Standard or Guideline. (*Regulations* ¶ 8.8.1)		
	X	No potentially material patented technology or reproduction of copyrighted items is known.	GO TO SECTION X.

*** Note: Such potentially material patented technology or copyrighted items might have become known since the Standard or Safety Guideline was last reviewed, or might become relevant due to this Letter Ballot.**

X. Action for This Document

	X	This Document passed TC Chapter review with technical changes and with or without editorial changes and will be forwarded to the ISC A&R SC for procedural review. A Ratification Ballot will be issued to verify the technical changes.
Motion by/ 2nd by		Bill Kiikvee (AP Tech) / Bala Mohammed (AMAT)
Discussion		None
Vote		19 **Y** 0 **N**
Final Action	X	Motion passed
		Motion failed

Standards staff to record the result of the A&R procedural review here:

A&R		**Approved for publication**
		Approved pending acceptance of the Ratification Ballot
		Not approved
	Reason:	