



U.S. Department
of Transportation

Pipeline and Hazardous
Materials Safety
Administration

1200 New Jersey Avenue, SE
Washington, DC 20590

AUG 03 2018

Mr. Stephen Burton
Easytek Engineering Services Co. Ltd.
62/277-278 Moo 12, Soi Theprasit 6, Theprasit Rd.
Nongprue, Banglamung
Chonburi 20150
Thailand

Reference No. 18-0010

Dear Mr. Burton:

This letter is in response to your January 13, 2018, email requesting clarification of the Hazardous Materials Regulations (HMR; 49 CFR Parts 171-180) applicable to the qualification and testing of cylinders. Specifically, you ask whether the elastic expansion (EE) and permanent expansion (PE) percentage ratio pass/fail limits are per test or cumulative. In your email, you provide the following example—

A cylinder is presented for inspection that has a 5-year requalification period and a maximum 5% PE-to-EE ratio, as illustrated in the following table:

Inspection Timeline	Per Test PE/EE	Cumulative PE/EE	Per Test Pass/Fail Decision	Cumulative Pass/Fail Decision
First inspection	1.5%	1.5%	PASS	PASS
5-year inspection	1.1%	2.6%	PASS	PASS
10-year inspection	1.8%	4.4%	PASS	PASS
15-year inspection	1.4%	5.8%	PASS	FAIL
20-year inspection	1.2%	7.0%	PASS	FAIL

To answer your question, the EE and PE percentage ratio pass/fail limits are *per test* and not cumulative. Therefore, the cylinder in your example would also pass the 15-year and 20-year tests.

I hope this information is helpful. Please contact us if we can be of further assistance.

Sincerely,

T. Glenn Foster
Chief, Regulatory Review and Reinvention Branch
Standards and Rulemaking Division

Stevens
\$178.45
Pulse-Echo (PE)
18-0010

Dodd, Alice (PHMSA)

From: INFOCNTR (PHMSA)
Sent: Monday, January 22, 2018 11:15 AM
To: Hazmat Interps
Subject: FW: Hydrostatic testing - PE measurements - cumulative or non-cumulative

Hello all,

Please see the interp request below. The inquirer has been in contact with Approvals & Permits.

Regards,

-Breanna

From: Stephen Burton [mailto:scubaengineer@gmail.com]
Sent: Saturday, January 20, 2018 3:33 AM
To: INFOCNTR (PHMSA) <INFOCNTR.INFOCNTR@dot.gov>
Cc: 'John Fox' <nitroxfox1@comcast.net>
Subject: Hydrostatic testing - PE measurements - cumulative or non-cumulative

Dear Breanna,

Thank you very much for your response.

Our company's engineering workshop official mailing address is:-

**Easytek Engineering Services Co. Ltd.,
62/277-278 Moo 12, Soi Thepprasit 6, Thepprasit Rd.
Nongprue, Banglamung
Chonburi 20150
Thailand**

Tel/Fax +66-38-197-429
Mob +66-81-652-3197
Email scubaengineer@gmail.com

Regards,

Steve Burton BSc(hons) C.Eng., MIET Easytek Engineering Services Co.Ltd
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SKYPE, FACEBOOK, LINKEDIN:>> **scubaengineer**

From: INFOCNTR (PHMSA) [mailto:INFOCNTR.INFOCNTR@dot.gov]
Sent: 19 January, 2018 00:49
To: Stephen Burton <scubaengineer@gmail.com>
Subject: RE: Hydrostatic testing - PE measurements - cumulative or non-cumulative

Dear Steve,

We have received your request for a written letter of interpretation regarding the hazardous materials regulations (49 CFR Parts 171-180). The hazardous materials regulations are available at the following URL:

<http://phmsa.dot.gov/regulations>

In order for us to complete your request, please provide us a physical mailing address for us to send your completed letter.

Sincerely,

Breanna, Hazardous Materials Specialist

An e-mail response from this office is considered informal guidance. Formal guidance may be requested in accordance with 49 CFR 105.20. <http://phmsa.dot.gov/hazmat/regs/interps>

From: Stephen Burton [<mailto:scubaengineer@gmail.com>]
Sent: Saturday, January 13, 2018 12:28 AM
To: INFOCNTR (PHMSA) <INFOCNTR.INFOCNTR@dot.gov>
Cc: 'John Fox' <nitroxfox1@comcast.net>
Subject: RE: Hydrostatic testing - PE measurements - cumulative or non-cumulative

Dear Sirs,

///
Ref: Cylinder Hydrostatic testing - PE measurements - cumulative or non-cumulative
Question referred for 'Interpretation request' via recommendation from Andrew Eckenrode, (PHMSA)
[\[mailto:andrew.eckenrode@dot.gov\]](mailto:andrew.eckenrode@dot.gov)
///

I was asked by a client recently for a reference for the PE/EE percentage being a 'per test' measurement instead of it being a cumulative measurement.

For example – let's say a cylinder is presented for inspection with 5 year periodicity and with a maximum 5% PE/EE ratio permitted.

INSPECTION TIMELINE	PE/EE	CUMULATIVE PE/EE	PASS/FAIL DECISION	CUMULATIVE PASS FAIL DECISION
First inspection	1.5%	1.5%	PASS	PASS
5 year inspection	1.1%	2.6%	PASS	PASS
10 year inspection	1.8%	4.4%	PASS	PASS
15 year inspection	1.4%	5.8%	PASS	FAIL
20 year inspection.	1.2%	7.0%	PASS	FAIL

I have been unable to locate the clarifying statement in either the CFR or CGA wording that the PE/EE% fail limits are based on a single test or on an accumulation of all the historic PE/EE% results going back to when the cylinder was manufactured.

- Please issue an 'interpretation' on if the Pass/Fail decision for PE/EE% is based on a 'one-off' or 'cumulative' PE/EE% test result history.

Thank you for your help.

Yours sincerely,

Steve Burton BSc(hons) C.Eng., MIET Easytek Engineering Services Co.Ltd
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 Tel/Fax +66-38-197429, Mob(SMS,MMS) +66-81-652-3197 , GMT+7
 SKYPE, FACEBOOK, LINKEDIN:>> **scubaengineer**

From: Eckenrode, Andrew (PHMSA) [<mailto:andrew.eckenrode@dot.gov>]
Sent: 12 January, 2018 23:26
To: Stephen Burton <scubaengineer@gmail.com>
Cc: 'John Fox' <nitroxfox1@comcast.net>
Subject: RE: Hydrostatic testing - PE measurements - cumulative or non-cumulative

Steve,

You will want to send your interpretation request to infocntr@dot.gov. Let me know if you need anything else.

Regards.

Andrew

From: Stephen Burton [<mailto:scubaengineer@gmail.com>]
Sent: Friday, January 12, 2018 10:55 AM
To: Eckenrode, Andrew (PHMSA) <andrew.eckenrode@dot.gov>
Cc: 'John Fox' <nitroxfox1@comcast.net>
Subject: RE: Hydrostatic testing - PE measurements - cumulative or non-cumulative

Hi Andrew,

Thank you very much for your prompt reply.

The figures given below in the table are theoretical expansion values only, used to clarify my question.

Please refer me to a contact in your Standards and Rulemaking Division for me to request a formal interpretation.

Regards,

Steve Burton BSc(hons) C.Eng., MIET Easytek Engineering Services Co.Ltd
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 SKYPE, FACEBOOK, LINKEDIN:>> **scubaengineer**

From: Eckenrode, Andrew (PHMSA) [<mailto:andrew.eckenrode@dot.gov>]
Sent: 12 January, 2018 22:14
To: Stephen Burton <scubaengineer@gmail.com>

Cc: 'John Fox' <nitroxfox1@comcast.net>

Subject: RE: Hydrostatic testing - PE measurements - cumulative or non-cumulative

Mr. Burton:

This would be a question for our Standards and Rulemaking Division, possibly via a formal request for interpretation. That said, I was wondering if the below numbers were theoretical or actual numbers that have been experienced during hydro testing. It would seem reasonable to expect that the material would not have significant permanent expansion when requalified at the same test pressure, but I could be mistaken.

Back to your original question, I do not believe we have a regulation that clarifies this, thus the recommendation to request an interpretation if a definitive answer is needed.

Regards,

Andrew Eckenrode
Transportation Specialist

General Approvals and Permits, PHH-31
Office of Hazardous Materials Safety
Pipeline and Hazardous Materials Safety Administration
U.S. Department of Transportation
1200 New Jersey Avenue, SE, East Building, Room E23-439
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Telephone: 202-366-5869
Email: andrew.eckenrode@dot.gov
Website: hazmat.dot.gov

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From: Stephen Burton [<mailto:scubaengineer@gmail.com>]

Sent: Friday, January 12, 2018 7:31 AM

To: Special Permits (PHMSA) <specialpermits@dot.gov>

Cc: 'John Fox' <nitroxfox1@comcast.net>

Subject: Hydrostatic testing - PE measurements - cumulative or non-cumulative

Dear Sirs,

I was asked by a client recently for a reference for the PE/EE percentage being a 'per test' measurement instead of it being a cumulative measurement.

For example – let's say a cylinder is presented for inspection with 5 year periodicity and with a maximum 5% PE/EE ratio permitted.

INSPECTION TIMELINE	PE/EE	CUMULATIVE PE/EE	PASS/FAIL DECISION	CUMULATIVE PASS FAIL DECISION
First inspection	1.5%	1.5%	PASS	PASS
5 year inspection	1.1%	2.6%	PASS	PASS
10 year inspection	1.8%	4.4%	PASS	PASS

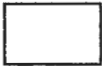
15 year inspection	1.4%	5.8%	PASS	FAIL
20 year inspection.	1.2%	7.0%	PASS	FAIL

- Can you clarify where in the CFR it states that the PE/EE% measurement is always on a per test basis and not a cumulative result.
- I have been unable to locate the clarifying statement in either the CFR or CGA wording.

Thank you for your help.

Yours sincerely,

Steve Burton BSc(hons) C.Eng., MIET Easytek Engineering Services Co.Ltd
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