

---

---

**Gas cylinders — Guidance for design  
of composite cylinders —**

**Part 2:  
Bonfire test issues**

*Bouteilles à gaz — Recommandations pour la conception des  
bouteilles en matière composite —*

*Partie 2: Aspects concernant les essais à la flamme vive*

*iteh Standards*  
**(<https://standards.iteh.ai>)**  
**Document Preview**

[ISO/TR 13086-2:2017](https://standards.iteh.ai/catalog/standards/iso/bc7cad9a-1040-4beb-9920-332f5077ceea/iso-tr-13086-2-2017)

<https://standards.iteh.ai/catalog/standards/iso/bc7cad9a-1040-4beb-9920-332f5077ceea/iso-tr-13086-2-2017>



**iTeh Standards**  
**(<https://standards.iteh.ai>)**  
**Document Preview**

[ISO/TR 13086-2:2017](https://standards.iteh.ai/catalog/standards/iso/bc7cad9a-1040-4beb-9920-332f5077ceea/iso-tr-13086-2-2017)

<https://standards.iteh.ai/catalog/standards/iso/bc7cad9a-1040-4beb-9920-332f5077ceea/iso-tr-13086-2-2017>



**COPYRIGHT PROTECTED DOCUMENT**

© ISO 2017, Published in Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office  
Ch. de Blandonnet 8 • CP 401  
CH-1214 Vernier, Geneva, Switzerland  
Tel. +41 22 749 01 11  
Fax +41 22 749 09 47  
[copyright@iso.org](mailto:copyright@iso.org)  
[www.iso.org](http://www.iso.org)

# Contents

Page

<b>Foreword</b> .....	<b>iv</b>
<b>Introduction</b> .....	<b>v</b>
<b>1 Scope</b> .....	<b>1</b>
<b>2 Normative references</b> .....	<b>1</b>
<b>3 Terms and definitions</b> .....	<b>1</b>
<b>4 Background</b> .....	<b>1</b>
<b>5 Statement of safety</b> .....	<b>2</b>
<b>6 Components of fire testing</b> .....	<b>2</b>
6.1 Composite materials.....	2
6.2 Fire.....	3
6.2.1 General.....	3
6.2.2 Fire tests in standards.....	5
6.2.3 Standardized fire test.....	7
6.2.4 Considerations for future standardized fire tests.....	8
6.3 Pressure relief devices.....	9
6.4 Venting.....	11
6.5 Interaction.....	12
6.6 Availability of reports.....	16
6.7 Optimized test method using thermally activated pressure relief devices.....	17
6.7.1 Explanation of optimized test method.....	17
6.7.2 Procedures for optimized test method.....	20
<b>7 Summary</b> .....	<b>23</b>
<b>Annex A (informative) Comparison of fire tests in standards and reports</b> .....	<b>24</b>
<b>Annex B (informative) Standardized test requirements using thermally active pressure relief devices</b> .....	<b>28</b>
<b>Bibliography</b> .....	<b>33</b>

## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see [www.iso.org/directives](http://www.iso.org/directives)).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see [www.iso.org/patents](http://www.iso.org/patents)).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html).

This document was prepared by Technical Committee ISO/TC 58, *Gas cylinders*, Subcommittee SC 3, *Cylinder design*.

<https://standards.iteh.ai>  
Document Preview

ISO/TR 13086-2:2017

<https://standards.iteh.ai/catalog/standards/iso/bc7cad9a-1040-4beb-9920-332f5077ceea/iso-tr-13086-2-2017>

## Introduction

Composite reinforced cylinders have been used in commercial service for about 40 years. Common fibres used in composite cylinders include glass, aramid, and carbon. Resin matrix materials are commonly epoxy or vinyl ester.

Composite cylinders are known to be exposed to the action of fire, ranging from radiant heating to full engulfment in the fire. Cylinder performance during exposure to fire might depend on the cylinder materials of construction, size of the fire, dimensions of the cylinder, its orientation, its contents, and the use of temperature or pressure activated relief devices.

Fire exposure tests are often included in composite cylinder standards, sometimes as a mandatory test and sometimes as an optional test. This document addresses issues related to composite cylinders exposed to fire, summarizes test requirements, and offers a new approach to qualifying cylinders with relief devices.

# iTeh Standards (<https://standards.iteh.ai>) Document Preview

[ISO/TR 13086-2:2017](https://standards.iteh.ai/catalog/standards/iso/bc7cad9a-1040-4beb-9920-332f5077ceea/iso-tr-13086-2-2017)

<https://standards.iteh.ai/catalog/standards/iso/bc7cad9a-1040-4beb-9920-332f5077ceea/iso-tr-13086-2-2017>

