

---

---

**Fine bubble technology — General principles for usage and measurement of fine bubbles —**

**Part 3:  
Methods for generating fine bubbles**

*Technologie des fines bulles — Principes généraux pour l'utilisation et la mesure des fines bulles —*

*Partie 3: Méthodes pour générer des fines bulles*

**Document Preview**

[ISO 20480-3:2021](https://standards.iteh.ai/catalog/standards/iso/337fdcff-5ae0-4afe-86a6-4a790128a9e9/iso-20480-3-2021)

<https://standards.iteh.ai/catalog/standards/iso/337fdcff-5ae0-4afe-86a6-4a790128a9e9/iso-20480-3-2021>



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

[ISO 20480-3:2021](https://standards.iteh.ai/catalog/standards/iso/337fdcff-5ae0-4afe-86a6-4a790128a9e9/iso-20480-3-2021)

<https://standards.iteh.ai/catalog/standards/iso/337fdcff-5ae0-4afe-86a6-4a790128a9e9/iso-20480-3-2021>



**COPYRIGHT PROTECTED DOCUMENT**

© ISO 2021

All rights reserved. Unless otherwise specified, or required in the context of its implementation, 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  
CP 401 • Ch. de Blandonnet 8  
CH-1214 Vernier, Geneva  
Phone: +41 22 749 01 11  
Email: [copyright@iso.org](mailto:copyright@iso.org)  
Website: [www.iso.org](http://www.iso.org)

Published in Switzerland

# 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 Examples of methods for generating fine bubbles</b> .....	<b>3</b>
4.1 Swirling flow system (for microbubble generation).....	3
4.2 Static mixer system (for microbubble generation).....	3
4.3 Ejector system.....	4
4.4 Venturi system.....	5
4.5 Pressurized dissolution system (for microbubble generation).....	6
4.6 Mechanical shear system.....	7
4.7 Micropore system.....	8
4.8 Surfactant addition micropore system.....	8
4.9 Microporous shear system.....	9
4.10 Heat separation system.....	10
4.11 Mixed vapor condensation system.....	11
4.12 Swirling flow system (for ultra fine bubble generation).....	11
4.13 Pressurized dissolution system (for ultra fine bubble generation).....	12
4.14 Static mixer system (for ultra fine bubble generation).....	13
4.15 Electrolytic system.....	14
4.16 Ultrasound (cavitation) system.....	15
4.17 Other methods.....	15
<b>Annex A (informative) Other examples of methods for generating fine bubbles</b> .....	<b>16</b>
<b>Bibliography</b> .....	<b>17</b>
<b>Index</b> .....	<b>18</b>

<https://standards.itech.ai/catalog/standards/iso/337fdcff-5ae0-4afe-86a6-4a790128a9e9/iso-20480-3-2021>

## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The preparation work for International Standards is typically carried out through ISO technical committees. Each member body interested in the subject which involves a technical committee established has the right to be represented in that committee. International organizations, the governmental and the non-governmental, in liaison with ISO, also take part in the work. ISO closely collaborates with the International Electrotechnical Commission (IEC) on all the matters related to 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 elements of this document may include patent rights. ISO shall not be responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be described 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 mere information given for the convenience of users and does not constitute an endorsement.

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

This document was prepared by ISO/TC 281, *Fine bubble technology*.

Any feedback or questions on this document should be directed to the user's national standards body. The complete list of these bodies is available at [www.iso.org/members.html](http://www.iso.org/members.html).

A list of all the parts in ISO 20480 series can be found on the ISO website.