

INTERNATIONAL  
STANDARD

ISO  
13322-1

Second edition  
2014-05-15

---

---

---

## Particle size analysis — Image analysis methods —

### Part 1: Static image analysis methods

*Analyse granulométrique — Méthodes par analyse d'images —  
Partie 1: Méthodes par analyse d'images statiques*



Reference number  
ISO 13322-1:2014(E)

© ISO 2014



## **COPYRIGHT PROTECTED DOCUMENT**

© ISO 2014

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  
Case postale 56 • CH-1211 Geneva 20  
Tel. + 41 22 749 01 11  
Fax + 41 22 749 09 47  
E-mail [copyright@iso.org](mailto:copyright@iso.org)  
Web [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 and list of symbols</b>	<b>1</b>
3.1 Terms and definitions	1
3.2 Symbols	4
<b>4 Preparation for image capture</b>	<b>5</b>
4.1 Introduction	5
4.2 Procedures	5
<b>5 Sample preparation demands for method description</b>	<b>6</b>
5.1 Sample splitting and reduction	6
5.2 Touching particles	6
5.3 Particle distribution	6
5.4 Number of particles to be counted	6
5.5 Particle suspending fluid	7
<b>6 Quality of captured images</b>	<b>7</b>
6.1 General	7
6.2 Pixels per particle	7
<b>7 Image analysis</b>	<b>8</b>
7.1 General	8
7.2 Size classes and magnification	8
<b>8 Counting procedure</b>	<b>9</b>
8.1 General	9
8.2 Particle image edges	9
8.3 Particles cut by the edge of the measurement frame	10
8.4 Touching particles	11
8.5 Measurements	12
<b>9 Calculation of the particle size results</b>	<b>12</b>
<b>10 Calibration and traceability</b>	<b>12</b>
10.1 General	12
10.2 Recommendations and requirements	13
<b>11 Accuracy</b>	<b>14</b>
11.1 General	14
11.2 Reference materials	14
11.3 Instrument preparation	14
11.4 Qualification test	15
11.5 Qualification acceptance	15
<b>12 Test report</b>	<b>15</b>
<b>Annex A (informative) Estimation of the number of particles to be counted for a given accuracy</b>	<b>17</b>
<b>Annex B (informative) Common segmentation methods for particle edge detection</b>	<b>22</b>
<b>Annex C (informative) Flow chart showing a typical image analysis method</b>	<b>23</b>
<b>Bibliography</b>	<b>24</b>