

---

---

**Fine ceramics (advanced ceramics,  
advanced technical ceramics) — Test  
method for determining thermal  
expansion coefficient and residual  
stress of CVD ceramic coatings**





**COPYRIGHT PROTECTED DOCUMENT**

© ISO 2020

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  
Fax: +41 22 749 09 47  
Email: [copyright@iso.org](mailto:copyright@iso.org)  
Website: [www.iso.org](http://www.iso.org)

Published in Switzerland

# Contents

	Page
Foreword .....	iv
<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 Principle</b> .....	<b>2</b>
<b>5 Apparatus</b> .....	<b>2</b>
5.1 General .....	2
5.2 Heating and cooling device .....	3
5.3 Temperature measurement .....	3
5.4 Test piece mounting .....	3
5.5 Data recording system .....	4
5.6 Dimensional measuring devices .....	4
<b>6 Specimens</b> .....	<b>4</b>
6.1 Test piece .....	4
6.2 Dimensions .....	5
6.3 Test piece preparation .....	6
6.3.1 General .....	6
6.3.2 Test piece handling and storage .....	6
6.3.3 Number of test pieces .....	6
<b>7 Test procedure</b> .....	<b>6</b>
7.1 Measurement of the test piece dimensions .....	6
7.2 Measurement of the elastic modulus .....	6
7.3 Measurement of the thermal expansion coefficient of CVD coatings .....	6
7.4 Calculation of the residual stress in CVD coatings .....	7
<b>8 Calculation</b> .....	<b>7</b>
8.1 Thermal expansion coefficient of the CVD ceramic coatings, $\alpha_c$ .....	7
8.2 Residual stress in CVD coatings, $\sigma_c$ .....	7
<b>9 Test report</b> .....	<b>8</b>
<b>Bibliography</b> .....	<b>9</b>