

# ISO 22705-3:2024-04 (E)

## Springs - Measurement and test parameters - Part 3: Cold formed cylindrical helical torsion springs

<b>Contents</b>	<b>Page</b>
Foreword.....	v
<b>1 Scope.....</b>	<b>1</b>
<b>2 Normative references.....</b>	<b>1</b>
<b>3 Terms, definitions, symbols and abbreviated terms.....</b>	<b>1</b>
3.1 Terms and definitions.....	1
3.2 Symbols and abbreviated terms.....	2
<b>4 Environmental conditions.....</b>	<b>4</b>
<b>5 Qualifications of the person(s) performing the work.....</b>	<b>5</b>
<b>6 Geometries of guiding and supporting devices.....</b>	<b>5</b>
<b>7 Measuring and testing equipment.....</b>	<b>5</b>
<b>8 Measurement and test parameter for technical cold formed cylindrical torsion springs.....</b>	<b>5</b>
8.1 Body length ( $L_B$ ).....	5
8.1.1 General.....	5
8.1.2 Type of characteristic.....	5
8.1.3 Measuring and/or testing equipment.....	5
8.1.4 Conditions of measurement and testing.....	6
8.1.5 Method of measurement and testing.....	6
8.1.6 Test location on the product.....	7
8.2 Outside diameter ( $D_e$ ).....	7
8.2.1 General.....	7
8.2.2 Type of characteristic.....	8
8.2.3 Measurement and/or testing equipment.....	8
8.2.4 Conditions of measurement and testing.....	8
8.2.5 Method of measurement and testing.....	8
8.2.6 Test location on the product.....	10
8.3 Inside diameter ( $D_i$ ).....	10
8.3.1 General.....	10
8.3.2 Type of characteristic.....	11
8.3.3 Measurement and/or testing equipment.....	11
8.3.4 Conditions of measurement and testing.....	11
8.3.5 Method of measurement and testing.....	11
8.3.6 Test location on the product.....	13
8.4 Spring leg length ( $l$ ).....	14
8.4.1 General.....	14
8.4.2 Type of characteristic.....	14
8.4.3 Measurement and/or testing equipment.....	14
8.4.4 Conditions of measurement and testing.....	15
8.4.5 Method of measurement and testing.....	15
8.4.6 Test location on the product.....	15
8.5 Number of coils ( $n$ ) and coil direction.....	15
8.5.1 General.....	15
8.5.2 Type of characteristic.....	16
8.5.3 Measurement and/or testing equipment.....	16
8.5.4 Conditions of measurement and testing.....	16
8.5.5 Method of measurement and testing.....	16
8.5.6 Test location on the product.....	17
8.6 Bending radius on legs ( $r$ ).....	17

8.6.1	General	17
8.6.2	Type of characteristic	17
8.6.3	Measurement and/or testing equipment	17
8.6.4	Conditions of measurement and testing	18
8.6.5	Method of measurement and testing	18
8.6.6	Test location on the product	18
8.7	Angle of bend on legs ( $\varphi$ )	18
8.7.1	General	18
8.7.2	Type of characteristic	18
8.7.3	Measurement and/or testing equipment	19
8.7.4	Conditions of measurement and testing	19
8.7.5	Method of measurement and testing	19
8.7.6	Test location on the product	20
8.8	Spring pitch ( $p$ )/distance between the coils ( $u$ )	20
8.8.1	General	20
8.8.2	Type of characteristic	20
8.8.3	Measurement and/or testing equipment	21
8.8.4	Conditions of measurement and testing	21
8.8.5	Method of measurement and testing	21
8.8.6	Test location on the product	21
8.9	Spring torque ( $M$ )	21
8.9.1	General	21
8.9.2	Type of characteristic	21
8.9.3	Measurement equipment	22
8.9.4	Conditions of measurement	22
8.9.5	Method of measurement	22
8.9.6	Test location on the product	23
8.10	Free angle ( $\gamma_0$ )	23
8.10.1	General	23
8.10.2	Type of characteristic	23
8.10.3	Measurement and/or testing equipment	24
8.10.4	Conditions of measurement and testing	24
8.10.5	Method of measurement and testing	24
8.10.6	Test location on the product	24
8.11	Shear-off burr	24
8.11.1	General	24
8.11.2	Type of characteristic	24
8.11.3	Test equipment	25
8.11.4	Conditions of testing	25
8.11.5	Method of testing	25
8.11.6	Test location on the product	25
<b>Annex A (informative) Calculation of spring rate <math>R_M</math></b>		<b>26</b>
<b>Annex B (informative) Type of legs</b>		<b>27</b>
<b>Annex C (informative) Measurement of the length of leg <math>l</math></b>		<b>28</b>
<b>Annex D (informative) Offset of leg <math>c</math></b>		<b>29</b>
<b>Bibliography</b>		<b>30</b>