

ICS 21.160
CCS J 26



**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 45870.3-2026

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

弹簧 测量和试验参数 第3部分：冷成形圆柱螺旋扭转弹簧

(English Translation)

Issued on: April 30, 2026

Implemented on: August 1, 2026

Issued by: State Administration for Market Regulation

Table of Contents

Preface	
Introduction	
1 Scope	
2 Normative References	
3 Terms and Definitions	
4 Symbols, Units, and Explanations	
5 Environmental conditions	
6 Staff Qualifications	
7 Geometric characteristics of guiding and supporting devices	
8 Measuring and testing instruments	
9 Measurement and test parameters	
9.1 Spring body length (LB)	
9.2 Spring outer diameter (De)	
9.3 Spring inner diameter (Di)	
9.4 Spring torsion arm length (l)	
9.5 Effective number of spring coils (n) and direction of rotation	
9.6 Torsion arm bending radius (r)	
9.7 Torsion arm bending angle (ϕ)	
9.8 Spring pitch (p)/(helical pitch) (u)	
9.9 Nm of torque (M)	
9.10 Free angle (γ_0)	
9.11 Burrs	
Appendix A (Informative) Torsion Arm Offset c	
Appendix B (Informative) Measurement of Torsion Arm Length l	
Appendix C (Informative) Calculation, Measurement and Testing of Spring Stiffness RM	
C.1 Overview	
C.2 Feature Type	
C.3 Measuring Instruments	
C.4 Measurement Conditions	
C.5 Measurement Method	
C.6 Product Testing Location	
Appendix D (Informative) Torsion Arm Type	

References

Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part 1: Structure and Drafting Rules of Standardization Documents".

Drafting.

This document is Part 3 of GB/T 45870 "Measurement and Test Parameters of Springs". GB/T 45870 has published the following parts.

---Part 1: Cold-formed cylindrical helical compression springs;

---Part 2: Cold-formed cylindrical helical tension springs;

---Part 3: Cold-formed cylindrical helical torsion springs.

This document is modified to adopt ISO 22705-3:2024 "Measurement and test parameters of springs - Part 3: Cold-formed cylindrical helical torsion".

spring".

This document has undergone the following structural adjustments compared to ISO 22705-3:2024.

---Chapter 3 of this document corresponds to section 3.1 of ISO 22705-3:2024;

---Chapter 4 of this document corresponds to section 3.2 of ISO 22705-3:2024;

---Chapter 5 of this document corresponds to Chapter 4 of ISO 22705-3:2024;

---Chapter 6 of this document corresponds to Chapter 5 of ISO 22705-3:2024;

---Chapter 7 of this document corresponds to Chapter 6 of ISO 22705-3:2024;

---Chapter 8 of this document corresponds to Chapter 7 of ISO 22705-3:2024;

---Chapter 9 of this document corresponds to Chapter 8 of ISO 22705-3:2024;

---Appendix A of this document corresponds to Appendix D in ISO 22705-3:2024;

---Appendix B of this document corresponds to Appendix C in ISO 22705-3:2024;

---Appendix C of this document corresponds to Appendix A in ISO 22705-3:2024;

---Appendix D of this document corresponds to Appendix B of ISO 22705-3:2024.

The technical differences between this document and ISO 22705-3:2024, and the reasons therefor, are as follows.

---The scope has been changed (see Chapter 1) to adapt to the technological development

in our country;

---The term "cylindrical helical torsion spring" has been changed (see 3.3, 3.1.4 in ISO 22705-3:2024); the term "helical spring" has been deleted.

(See 3.1.3 in ISO 22705-3:2024) and "cold-formed springs" (see 3.1.5 in ISO 22705-3:2024); these terms have been added.

"Flexibility" (see 3.9) is used to help users correctly understand the standard content;

---The symbols, units, and descriptions have been changed (see Chapter 4) for ease of use;

---The environmental conditions have been modified (see Chapter 5) to suit my country's actual conditions;

---The measuring and testing instruments have been changed (see Chapter 8), and normative references for outside micrometers and vernier calipers have been added.

GB/T 1216 and GB/T 21389 are to conform to the actual situation in my country;

---Measurement and testing parameters have been changed (see Chapter 9), and normative reference GB/T 23935 for mandrel diameter calculation has been added.

(See 9.9.4) to conform to my country's actual situation.

The following editorial changes have been made to this document.

---Editorial changes were made to Figures 1, 8, 11, 12, 14, and 15 to conform to cartographic standards;

Appendix C has been improved to adapt to my country's technical conditions.

Please note that some content in this document may involve patents. The issuing organization of this document assumes no responsibility for identifying patents.

This document was proposed and is under the jurisdiction of the National Technical Committee on Standardization of Springs (SAC/TC235).

The main drafting units of this document are. China Machinery Productivity Promotion Center Co., Ltd., Zhejiang Meili Technology Co., Ltd., and Fujian Shunchang Hongrun.

Precision Instruments Co., Ltd., Dongguan Dushi Chengfa Precision Spring Co., Ltd., Guangzhou Huade Automotive Spring Co., Ltd., and Huawai Technology Co., Ltd.

Limited Liability Company, Guangzhou Aotu Spring Co., Ltd., Ningbo Mingli Spring Co., Ltd., Hubei Xinbaoma Spring Co., Ltd., and Daerdao Technology Co., Ltd.

Limited Liability Company, Zhejiang Jinchang Spring Co., Ltd., Zhejiang Yisiling Shuangdi Spring Co., Ltd., Xiamen Lizhou Precision Technology Co., Ltd., Jinan Kailai Precision Instruments Co., Ltd., Hangzhou Fuchun Spring Co., Ltd., Fuzhou Changrong Spring Co.,

Ltd., Xi'an Hangguang Elastic Model Device Co., Ltd.

Company, China FAW Group Corporation, Wenzhou Heli Spring Manufacturing Co., Ltd.,
Xi'an Yilihua Spring Technology Co., Ltd., Jiaxing Saijie Spring Manufacturing Co., Ltd.

Introduction

Cold-formed cylindrical helical springs are a commonly used elastic element, widely used in industries such as machinery, chemical, aerospace, and construction.

GB/T 45870 "Measurement and Test Parameters of Springs" is proposed to consist of three parts.

---Part 1: Cold-formed cylindrical helical compression springs. This section presents the general characteristics of cold-formed cylindrical helical compression springs, excluding dynamic testing.

The parameters are described, along with the associated measurement and testing methods.

---Part 2: Cold-formed cylindrical helical tension springs. This section presents the general characteristics of cold-formed cylindrical helical tension springs, excluding dynamic testing.

The parameters are described, along with the associated measurement and testing methods.

---Part 3: Cold-formed cylindrical helical torsion springs. This section presents the general characteristics of cold-formed cylindrical helical torsion springs, excluding dynamic testing.

The parameters are described, along with the associated measurement and testing methods.

Spring measurement and test parameters Part 3: Cold-formed cylindrical helical torsion springs

1 Scope

This document describes the measurement and testing methods for the general characteristic parameters of cold-formed cylindrical helical torsion springs, excluding dynamic testing.

This document applies to cold-formed cylindrical helical torsion springs with round cross-sections that have not undergone quenching and tempering (e.g., tangential torsion arm springs and radial outward torsion springs).

Side-mounted torsion arm springs and parallel double torsion springs). Cold-formed cylindrical helical torsion springs with other cross-sections are used in the same manner.