

INDUSTRY STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

JJG 46-2018

Replacing JJG 46-2004

Torsion Balance **(English Translation)**

Issued on: December 25, 2018

Implemented on: June 25, 2019

Issued by: State Administration for Market Regulation

Table of Contents

Introduction	
1 Scope	
2 References	
3 Terms and units of measurement	
3.1 Term	
3.2 Unit of measurement	
4 Overview	
5 Metrology performance requirements	
5.1 Basic parameters	
5.2 Metrology performance	
6 General technical requirements	
6.1 Appearance	
6.2 Structural requirements	
7 Measuring instrument control	
7.1 Verification conditions	
7.2 Verification project	
7.3 Verification method	
7.4 Processing of verification results	
7.5 Verification cycle	
Appendix A Torque Balance Verification Original Record Format	
Appendix B Torque Balance Verification Certificate Page	
Appendix C Torque Balance Verification Result Notice Page Format	

1 Scope 1

2 References 1	
3 terms and units of measurement 1	
3.1 Term 1	
3.2 Unit of measurement 1	
4 Overview 1	
5 Metrology performance requirements 2	

5.1 Basic parameters	2
5.2 Metrology performance	2
6 General technical requirements	3
6.1 Appearance	3
6.2 Structural requirements	3
7 measuring instrument control	3
7.1 Verification conditions	3
7.2 Verification project	4
7.3 Verification method	4
7.4 Processing of verification results	5
7.5 Verification cycle	5
Appendix A Torque Balance Verification Original Record Format	6
Appendix B Torque Balance Verification Certificate Page	7
Appendix C Torque Balance Verification Result Notice Page Format	8

Introduction

JJG 46 "Torque Balance" adopts the accuracy level in the current JJG 98 "Mechanical Balance", retaining the original Level, and refer to its technical indicators and requirements, modify JJG 46-2004 "Torsion Balance".

Compared with JJG 46-2004, in addition to editorial changes, the main technical changes are as follows.

- Add "cited literature" and "terms and units of measurement" section;
- Added a map of the torsion balance in the overview;
- Modified 3.1 basic parameters;
- Removed the 3.3 accuracy level;
- Deleted Table 1, changed to text description Table 1 content;
- Modified the "maximum allowable error" table for the "no-load indication repeatability" requirement, changed from " $\leq 0.5e$ " to " $\leq 1e$ ";
- Deleted Table 4, changed to a general description of the calibration scale weight;
- Modify "loading and unloading value repeatability" to "full load indication repeatability";
- According to the description of the text, the corresponding record form and the format of

the certificate page are modified.

The previous versions of this procedure are released as follows.

---JJG 46-2004;

---JJG 46-1976.

Torque balance verification procedure

1 Scope

This procedure applies to the first verification, subsequent verification and use of precision torsion balances (hereinafter referred to as "balances").

an examination.

2 reference files

JJG 98 mechanical balance JJF1229 Quality Densitometry Terms and Definitions
OIMLR76-1.2006 Non-automatic weighing instruments - Part 1. Measurements and technical requirements test (Non-auto-maticweighinginstruments-Part 1: Metroologicalandtechnicalrequirements-Tests) for dated references, only the dated version applies to this Code; any undated quotation the latest version (including all amendments) applies to this procedure.

3 terms and units of measure

3.1 Terms

3.1.1 Sensitivity when the reading pointer moves a verification index value e , the deviation between the verification pointer and the verification mark is verified.

3.1.2 weight conversion quality value conventionalmassvalueofweight when the weight is balanced with a standard weight of a predetermined density in the air of the agreed temperature and the agreed density, the standard the quality of the standard weight.

3.1.3 actual scale value (d) actualscaleinterval the difference between the values corresponding to the two adjacent ruler marks.

3.1.4 verification scale value (e) verificationscaleinterval the value expressed in mass units used to characterize and classify the instrument.

3.1.5 Verification of the number of divisions (n) numberofverificationscaleintervals Measure the ratio of the maximum weighing Max of the instrument to the verification index value e ,
 $n = \text{Max}$

3.2 Unit of measurement the mass unit used for the balance is. milligrams (mg).

4 Overview

The main structure of the balance is composed of a single-arm lever and a combination of two elastic elements, a flat coil spring and a leaf spring.

The weight is simply rotated by the reading knob and the balance torque generated by the deflection angle of the elastic element is used for the measurement. In the horizontal One end of the beam is equipped with a quick stop damper, so that the beam swing can be stopped in a few seconds, so that it can be quickly read and measured.

Value.