



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

GB/T 23901.5-2019

**Non-destructive testing -- Image quality of radiographs -- Part 5:
Determination of the image quality unsharpness and basic spatial
resolution value using duplex wire-type image quality indicators**

Issued on: June 4, 2019

Implemented on: January 1, 2020

Issued by: SAMR; SAC

Table of Contents

Foreword	
1 Scope	
2 Normative references	
3 Terms and definitions	
4 double wire image quality specification	
4.1 Image quality composition, manufacturing, marking	
4.2 Quality Assurance	
5 use of double wire type image quality meter	
5.1 General	
5.2 Visual determination	
5.3 Determination of digital image modulation transfer function curve	
5.4 Determination of digital image modulation transfer function curve	
5.5 Image quality requirements	
5.6 Use of double wire type image quality meter	
6 High resolution image quality meter with larger measurement range	
7 records	
8 accuracy and deviation	

Foreword

GB/T 23901 "Non-destructive testing radiographic inspection image quality" is divided into five parts.

- Part 1. Determination of the image quality of the silk-type image quality meter;
- Part 2. Determination of image quality values of stepped hole image quality meters;
- Part 3. Image quality classification;
- Part 4. Experimental evaluation of image quality and image quality table;
- Part 5. Determination of image clarity of double-filament image quality.

This part is the fifth part of GB/T 23901.

This part is drafted in accordance with the rules given in GB/T 1.1-2009.

This part replaces GB/T 23901.5-2009 "Non-destructive testing of radiographic film quality - Part 5. Two-line image quality

Like the determination of unsharpness, compared with GB/T 23901.5-2009, the main changes are as follows.

- Revised the normative reference document (see Chapter 2, Chapter 2 of the.2009 edition);
- Modified terms and definitions (see Chapter 3, Chapter 3 of the.2009 edition);
- " Radiographic film quality" was changed to "radiography to detect image quality";
- "film" changed to "detector";
- "Linear image quality meter" was changed to "wire type image quality meter";
- Modified the writing order of the double-wire type image quality meter number (see 4.1.3);
- Added high resolution twin wire image quality meter (see Chapter 6);
- Expanded the narrative of the dual-wire image quality application (see Chapters 5 and 6).

This section uses the translation method equivalent to ISO 19232-5:2018 "Non-destructive testing radiographic inspection image quality Part 5. Double

Determination of the unsharpness of the silk image quality image.

The documents of our country that have a consistent correspondence with the international documents referenced in this part are as follows.

- GB/T 12604.2-2005 Non-destructive testing term radiographic testing (ISO 5576:1997, IDT)
- GB/T 27050.1-2006 Conformity assessment supplier's declaration of conformance Part 1. General requirements (ISO /IEC 17050-1:2004, IDT)

This part is proposed and managed by the National Non-Destructive Testing Standardization Technical Committee (SAC/TC56).

This section drafted by. Shanghai Aerospace Power Technology Engineering Co., Ltd., Shanghai Space Propulsion Research Institute, Shanghai Materials Research Institute, Hubei III

Jiang Aerospace Jiangbei Mechanical Engineering Co., Ltd., Zhejiang Jinyun Image Quality Meter Factory, Matrix Science and Technology Testing Technology (Beijing) Co., Ltd., China Guangdong Nuclear Power Engineering

Co., Ltd., Sichuan Aerospace Chuanan Fire Technology Co., Ltd., Shanghai Aerospace Precision Machinery Research Institute, Shanghai Aerospace Equipment Manufacturing

Plant Co., Ltd.

Division, Shanghai Satellite Equipment Research Institute, Institute of Acoustics, Chinese Academy of Sciences, Donghai Research Station, Zhejiang Special Equipment Inspection and Research Institute, Shanghai Feitianzhong

Zhi Technology Co., Ltd., Aerospace Materials and Technology Research Institute, CITIC Daika Co., Ltd., Ningbo Special Equipment Inspection and Research Institute, Shanghai Airlines

Tiantian Control Technology Research Institute, Aintik Testing Technology (Shanghai) Co., Ltd.

1 Scope

This part of GB/T 23901 specifies the method for determining the unsharpness and spatial resolution of radiographic images.

The two-wire type image quality meter for the 13 pairs of wire pairs specified in this section can be used up to 600kV, and more than 13 pairs of wire pairs

The tube voltage range for the image quality meter is less than 225kV. When using high-energy radiographic detection of more than 1 MeV, refer to the use of this part.

The split wire type image quality meter, but the measurement results may have large deviations.

2 Normative references

The following documents are indispensable for the application of this document. For dated references, only dated versions apply to this article.

Pieces. For undated references, the latest edition (including all amendments) applies to this document.

ISO 5576 non-destructive testing ray detection terminology (Non-destructive testing-IndustrialX-rayandgamma-rayradiology-Vocabulary)

ISO /IEC 17050-1 Conformity Assessment Suppliers - Conformity Assessment Part 1. General (Conformityassessment-

Supplier'sdeclarationofconformity-Part 1.Generalrequirements)

3 Terms and definitions

The following terms and definitions as defined by ISO 5576 apply to this document.

3.1

Double wire image quality detector duplex wire-type image quality indicator

Double wire type IQI

An image quality meter consisting of a series of pairs of high density wires for determining the unsharpness and spatial resolution of radiographic images.

3.2

Total unsharpness image total image unsharpness value

UT

The value is equal to the sum of the wire diameter and the wire pitch of the pair, and the pair of the smallest numbered pairs of the spaced double-wire type image quality meter cannot be effectively identified.

Note 1. The corresponding unsharpness values are shown in Table 1.

Note 2. UT can be UT_{visual}, UT_{20%} or iUT_{20%}.

3.3

Visually determine the total unsharpness of the image
total image unsharpness value determined visually

UT_{visual}

The line number of the smallest number of the double-wire type image quality meter which cannot recognize the interval was visually observed on the radiographic inspection image.

3.4

Digital image modulation transfer function curve determination image total unsharpness
total image unsharpness value determined from

A profile function in a digital image

UT_{20%}

On the modulation transfer function curve of the digital image, the minimum number of the two-wire type image quality meter whose modulation degree is less than 20% and the interval cannot be recognized

Line pair.

3.5

Interpolation method to determine the total unsharpness of the image
interpolated total image unsharpness value