

ICS 19.100
CCS J 04



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

GB/T 25758.1-2010

**Non-destructive testing -- Characteristics of focal spots in
industrial X-ray systems for use in non-destructive testing --
Part 1: Scanning method**

无损检测 工业X射线系统焦点特性 第1部分：扫描方法
(English Translation)

Issued on: December 23, 2010

Implemented on: October 1, 2011

Issued by: Standardization Administration of China

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Foreword

GB/T 25758 "non-destructive testing of industrial X-ray system focus feature" is divided into five parts.

- Part 1. Scanning method;
- Part 2. Pinhole camera radiographic method;
- Part 3. Slit camera radiographic method;
- Part 4. Edge method;
- Part 5. Measurement of the effective focal spot size smaller focus and micro focus X-ray tube.

This section GB/T 25758 Part 1.

This section identical with EN12543-1:1999 "Non-destructive testing of industrial X-ray system focus characteristics - Part 1. Scanning method" (In English).

This section is equivalent translation EN12543-1:1999.

For ease of use, this section made the following editorial changes.

- "This European standard" be replaced by "this section";
- Remove the EN standard foreword;
- With a decimal point "." Instead of a comma as the decimal point "." Appendix A of this section is an informative annex.

This part of the National NDT Standardization Technical Committee (SAC/TC56) and focal points.

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Introduction

In order to meet the needs of different focal spot size measured in GB/T 25758.1 ~ 25758.5, the five different methods are described.

Scanning method (GB/T 25758.1) applies constant focal spot size and intensity distribution of the occasion, for example, for calibration and image processing process.

Radiographic methods (GB/T 25758.2 and GB/T 25758.3) is a conventional technique, in order to verify that the primary purpose for the highest to 200kV occasions.

When the pinhole camera can not be used and slit edge method (GB/T 25758.4) may be effective, this method is suitable for simple Occasions.

In order to take into account micro-focus system, GB/T 25758.5 proposes a special approach.

Non-destructive testing of industrial X-ray system focus feature Part 1. Scanning method

1 Scope

This section GB/T 25758 specifies the method for measuring tube voltage up to industrial X-ray systems focus size of 500kV.

This section describes the use of collimated receiver to focus more than 0.1mm for direct mechanical scanning methods.

X-ray image of the image quality and resolution depends largely on the characteristics of focus, in particular, the size and two-dimensional intensity distribution.

Commercial X-ray tube type (for example, in advertising or trade) characteristics, should first consider the maximum value given in Appendix A.

2 Terms and definitions

The following terms and definitions apply to this part of the GB/T 25758 of.

Focus focalspot

X-ray emission from the region to see the measuring device X-ray tube anode.

Test Method 3

3.1 Principle and equipment

This chapter describes the process for obtaining the focus and size distribution of the radiation intensity and performs focus scan. Coarsely pre-collimated X-ray Central beam tube through one pair of the slit collimator, using a scintillation counter to measure the radiation beam. Forming a collimator size $h \times h$ hole. Width h depending on the size of the focal spot size d should be selected according to the corresponding values in Table 1.

Table 1 relationship collimator aperture size and focal spot size d of h

d/mm h

$0.1 \sim 0.2 \leq 10\mu\text{m}$

$0.2 \sim 0.3 \leq 15\mu\text{m}$

$0.3 \sim 1.0 \leq 20\mu\text{m}$

$> 1.0 \leq 0.025d$

Pre-collimator slit collimator and double-ray detector should be used as a whole xy scanning table mounted. Detector input Signal to be input to the data acquisition device (Figure 1, Figure 2). Data collection should be able to work well synchronized with the xy scanning stage.

Data collected by certain steps were complete line scan (Figure 3). Step depends on the resolution of claims, but should not exceed 0.1mm.

Application of pre-collimator lead to production, including a hole diameter of about 5mm. The thickness depends on the maximum X-ray voltage, it should be to with a value of at least one per cent level considerably.

Measured by the two collimator slits vertically formed as shown in Figure 4. Each slit and placed face to face with two thicknesses of metal block is L it is formed at the edge of the metal block with a width of the separator to maintain the spacing h . Thickness L is satisfied.

$L > 20 \times (a/d) \times h$ (1) Wherein, a is the distance between the focal point of the collimator surface (source side), d is the size of the focus is to be measured. Because penetrating collimator material, the minimum thickness of the collimator should be determined by measuring a signal strength through the aperture obtained in at least 100 times greater than the background noise. Slit Surface roughness R_a of less than $2\mu\text{m}$, flatness and parallelism of less than $h/5$. The material should be selected piece of metal tungsten or other similar tools