KES

Methods of Radiographic Test for Circumferential Butt Welds of Aluminum Pipes and Tubes

KES T – L467

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1. Scope of application

This rule is mention about the penetration test method by X-ray of the junction welding part of the side of the circle of aluminum or its alloy pipe(pipe from now).

2. Test apparatus

(1) X-ray generator unit

(2) Modifying meter and penetration ratio meter

(3) Film concentration-meter

(4) Film interpretation device

(5) Film

3. Test sample

Cylindrical welding part of the aluminum pipe.

4. Clarification of photographing methods

Clarification of photographing methods is as follow.

(1) Photographing method of the inner source.

(2) Photographing method of the inner film.

(3) Double walls of one side photographing method.

(4) Double walls of double sides photographing method.

4.1 Photographing method of inner source.

There are two types, one can photograph all direction at the same time, the other can photograph all direction with dividing area, and this method photographs as putting the source of X-ray(Source from now) in the pipe with detaching the film on the outside such as fig. 1.

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(a) Photographing all direction at the same time

(b) Photographing with dividing area

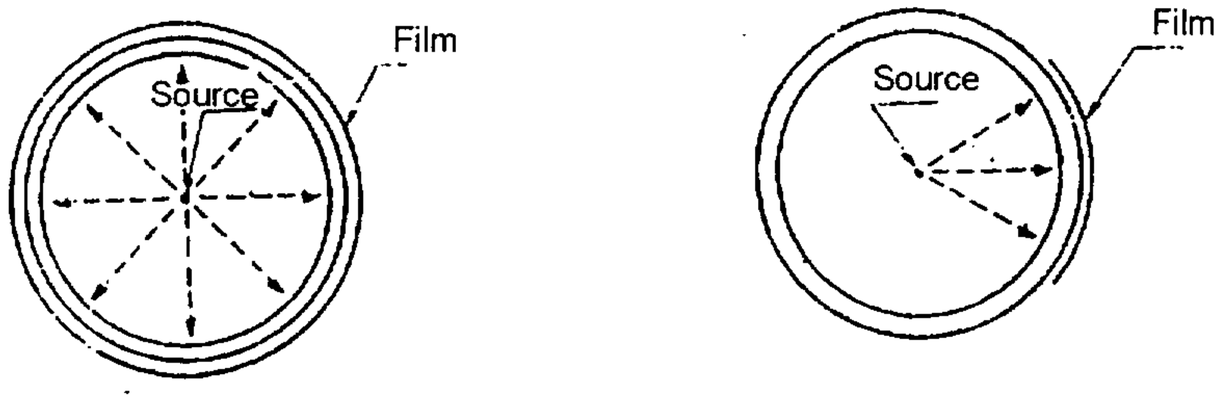

Fig 1. Inner source photographing method

4.2 Inner film photographing method

This method can photograph all direction with dividing area with detaching the film on the inside of pipe, with outside source such as fig 2.

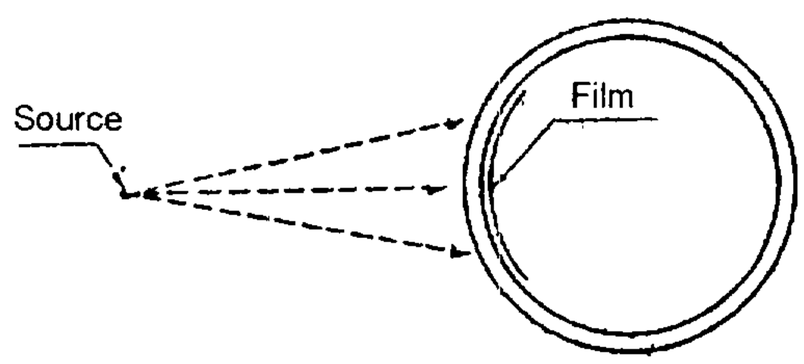

Fig 2. Inner film photographing method

4.3 Double walls of one side photographing method

This method can used when you can not photograph with inner source or with detaching the film on the inside of pipe. Let the source and film be such as fig 3 and photograph as penetrating the double walls and emitting the X-ray with adequate angle α and the surface including the welding part. The test sample is only the welding part of the surface with detaching the film.

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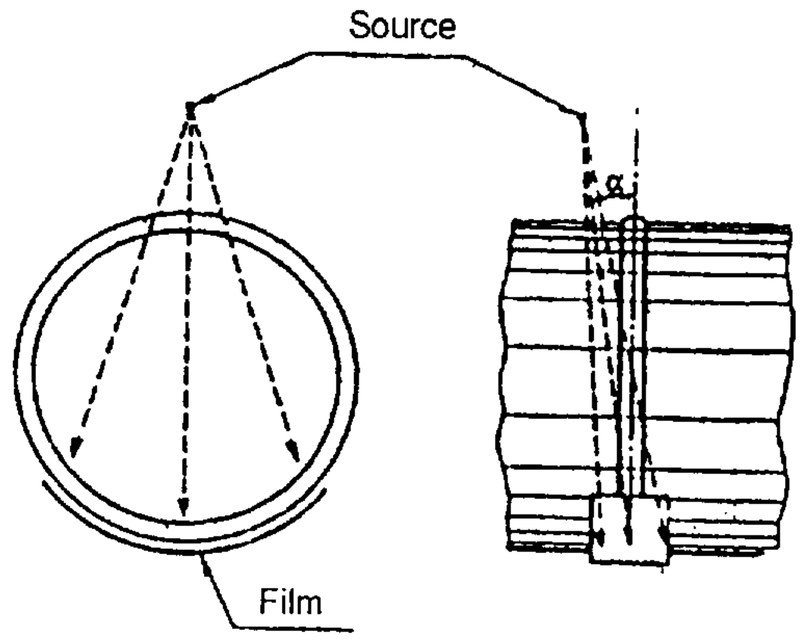

Fig 3. Double walls of one side photographing method

4.4 Double walls of double sides photographing method

This method can be used in the case that the outer diameter of the pipe is relatively small.

Let the source and film be as shown in fig 4. and photograph as penetrating the double walls and emitting the X-ray with adequate angle α and the surface including the welding part.

The test sample is only the welding part of the surface correspond to the welding part of the film surface with detaching the film.

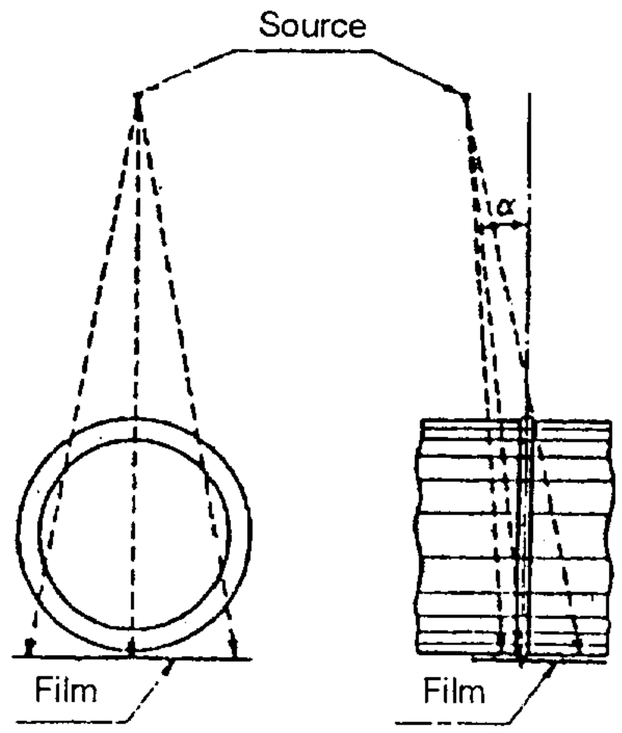

Fig 4. Double walls of double sides photographing method

5. Photographing method of the penetration picture

5.1 Thickness of the pipe and thickness of the material

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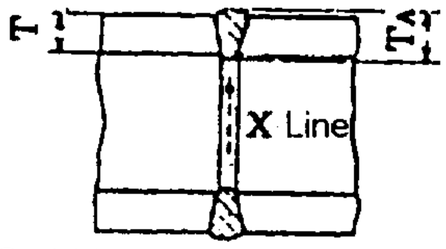
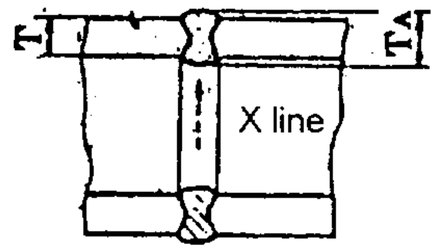
Measure the size of the fig 5 to know the thickness of the pipe and the material. If it is impossible to measure in real, use the number on the table 1.

(a) Inner source photographing method

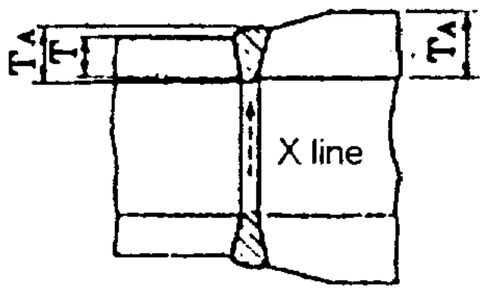
A. One side welding



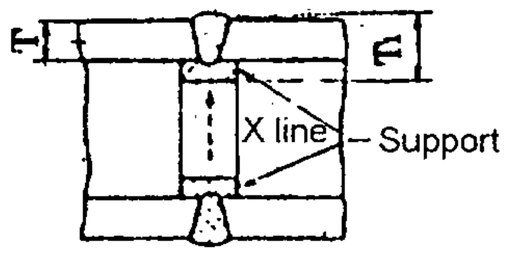
B. Double side welding



C. Welding when the thickness of the pipe is different

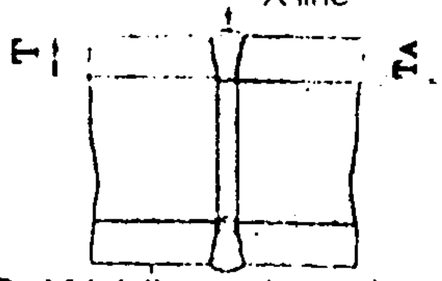


D. Back side welding

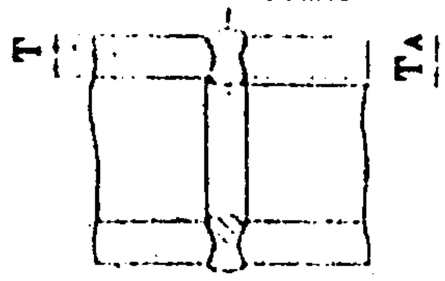


(b) Inner film photographing method

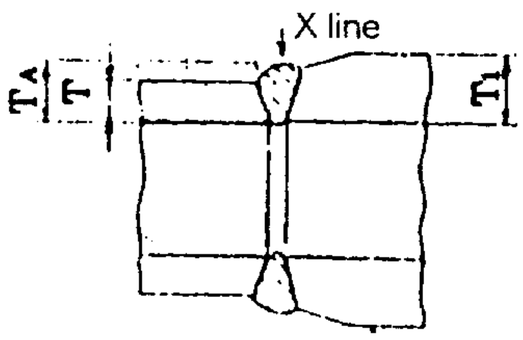
A. One side welding



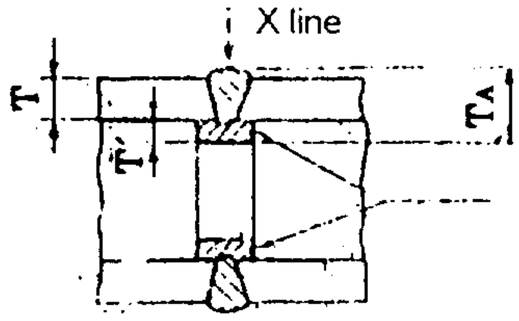
B. Double side welding



C. Welding when the thickness of the pipe is different

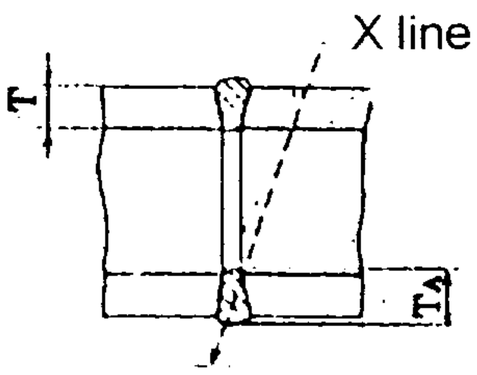


D. Foundation plate welding

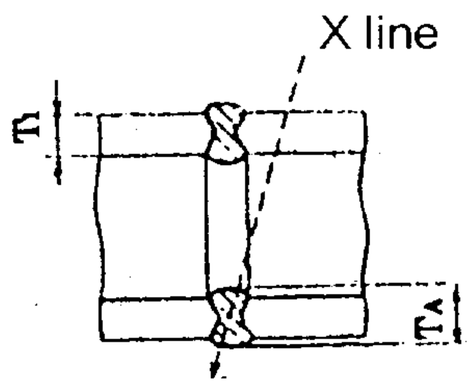


(c) Double walls of one side photographing method

A. One side welding



B. Double side welding



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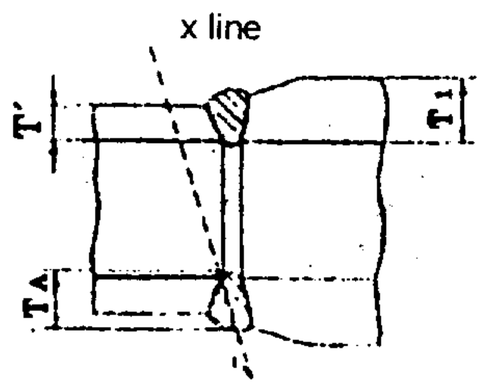
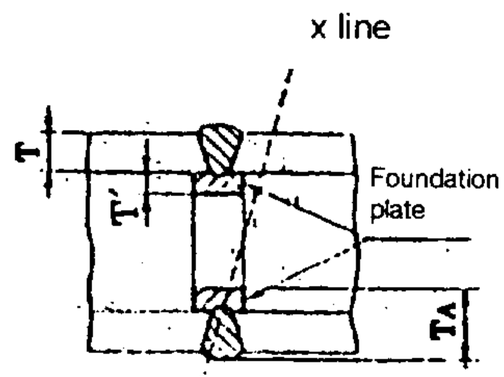
C. Welding when the thickness of the pipe is different

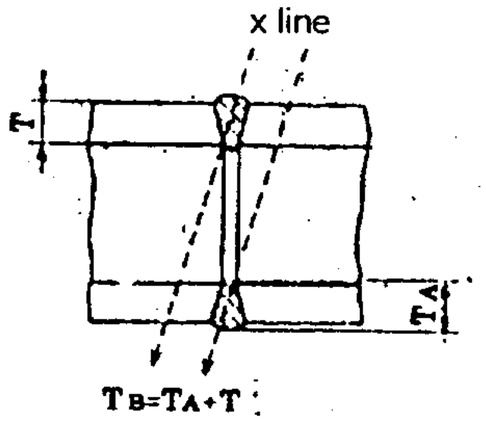


D. Foundation plate weld



(d) Double walls of double side photographing method

A. One side welding



B. Double side welding

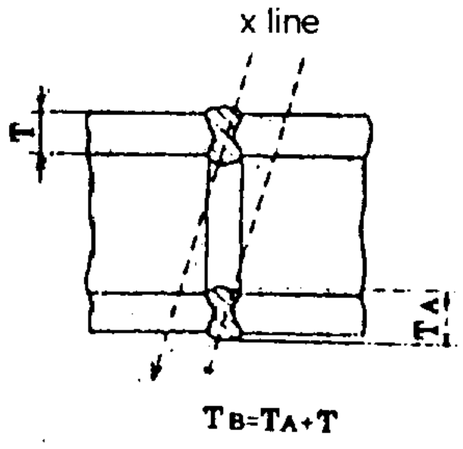


Fig 5. Thickness of the pipe and thickness of the material

Where, T, T_1 : Thickness of the pipe

T_A : Inner source photographing method and thickness of the material of inner film photographing method

T_B : Double walls of one side photographing method and thickness of the material of double walls of double side photographing method

T' : Thickness of the foundation plate

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