KES

Standard of Observation Test of Steel Plate used in Pressurized Vessel by Ultrasonic waves

KES T – L434

(EST.) 1991 – 05 – 01

Contents

1. General Rules
2. Observing Device
3. Observing Method
4. Observing Place
5. Injecting Method
6. Classification of Faults
7. Evaluating Method
8. Standard of Judgment
9. Welding and Repair
10. Appendix < I >
   (1) Scope of Application
   (2) Material
   (3) Shape and Dimension
11. Appendix < II >
   (1) Scope of Application
   (2) Performance of Observer
   (3) Indication

Additional Rule

KIA MOTORS

Full document details: KIA KES T-L434 1991

Documents
Document Sharing Hub

1. General rules

(1) Scope of applications

This standard shall specify the observation test by ultrasonic waves of high quality steep plate, which is used in a boiler of atomic reactor and a pressurized vessel and its thickness is over 6mm. The general particulars except this standard follow KS B 0817(Method of observation test by the pulse reflecting method for metallic materials).

(2) Observing method

(3) The observing method can be the pulse reflecting method by the perpendicular method or the observer of table 1 as to the thickness of steel plate.

Table 1 Observer

Thickness of steel plate, mm	Observer
More than 6 and less than 13	Divided perpendicular observer
More than 13 and less than 20	Divided perpendicular observer or perpendicular observer
Over 20	Perpendicular observer(divided perpendicular observer is excluded)

2. Observing device

2.1 Performance of observing device

The observing device which is used should be the pulse reflecting type and have the following performances.

(1) Amplifying straight

The amplifying straight of observing device should be the first class regulated from KSB 0817 appendix 1 as to the used frequency.

(2) Long-distance resolution

The long-distance resolution of observing device should be A or B class regulated from KSB 0817 appendix 3 as to the testing frequency in table 2.

Full document details: KIA KES T-L434 1991

Documents
Document Sharing Hub

Table 2 Long-distance resolution

Testing frequency MHz	Class of long-distance resolution
2	A or B
5	A

(3) Dead zone

(4) The dead zone of observing device should be under 10mm at 5MHz, under 15mm at 2MHz.

The dead zone is measured from the following method. Adjust the measuring range at time axis to 50mm, observe STB-T1 regulated from KS B 0828 [Sensitivity, N1-type standard specimen (STB-T1) for observing the steel plate by ultrasonic waves] and adjust the height of echo of the standard hole to 20% of scale. And then, increase the sensitivity by 14DbB, read the length between the zero-point and the point where the transmitting pulse is 20% finally by the strong-middle distance and regard this length as the dead zone.

2.2 Observing method

The observing method is the water pillow method(this include the locally water pillow method the gap method or the directly contacting method.

2.3 Contacting medium

In principal, water is used as the contacting medium.

2.4 Standard specimen and comparing specimen

(1) In case of the divided perpendicular observer, D-type comparing specimen(RB-D) for the divided perpendicular observer regulated from KS B 0827 can be used.

(2) In case of the perpendicular observer, STB-G regulated from KS B 0827 [Sensitivity, G-type standard specimen (STB-T1) for observation by ultrasonic waves] or STB-N1 regulated from KS B 0828 can be used.

Full document details: KIA KES T-L434 1991

Documents
Document Sharing Hub

2.5 Observer

Use the divided perpendicular observer with the performance regulated from appendix 2.

3. Observing method

(1) Observing time

In principal, the observing is executed during the final test of steel pipe at a factory manufacturing steel pipe

(2) Observing face

In principal, the observing face is the rolled face or the heat-treat face and, if necessary, the flatted face by grinding can be used as the observing face.

(3) Observing sensitivity, testing frequency and dimension of vibrator

The Observing sensitivity, testing frequency and dimension of vibrator are as table 3 and 4.

Table 3 In case of a divided vertical observer

Thickness of plate, mm	Observing sensitivity	Testing frequency, MHz
More than 6 & less than 20	Use RB-D as to appendix 1, adjust the height of bottom echo at the first try of t_0 which indicate the maximum height of echo to 50% and then, increase 10 dB in sensitivity by an attenuator.	5

Full document details: KIA KES T-L434 1991

Table 4 In case of a vertical observer

Thickness of plate, mm	Observing sensitivity	Testing frequency, MHz	Effective radius of a vibrator, mm
More than 13 & less than 20	STB-N1 : 25%	5	20
More than 20 & less than 40	STB-N1 : 50%	5	20
More than 40 & less than 60	STB-N1 : 70%	2	30
More than 60 & less than 100	STB-GV15-4 : 50%	2	30
More than 100 & less than 160	STB-GV15-4 : 80%	2	30
More than 160 & less than 200	STB-GV15-2.8 : 50%	2	30

Remark : When the thickness of steel plate is over 200mm, follow as the particulars between an orderer and a manufacturer

(4) Setting of the comparing line

In a divided vertical observer, draw the comparing lines as follows on the scale (Refer to figure 1)

Regard the 50% height of scale as the comparing line, DM, the line over 6dB as the comparing line, DH, the line under 6dB as the comparing line, DL and the line under 12dB as the comparing line DC.

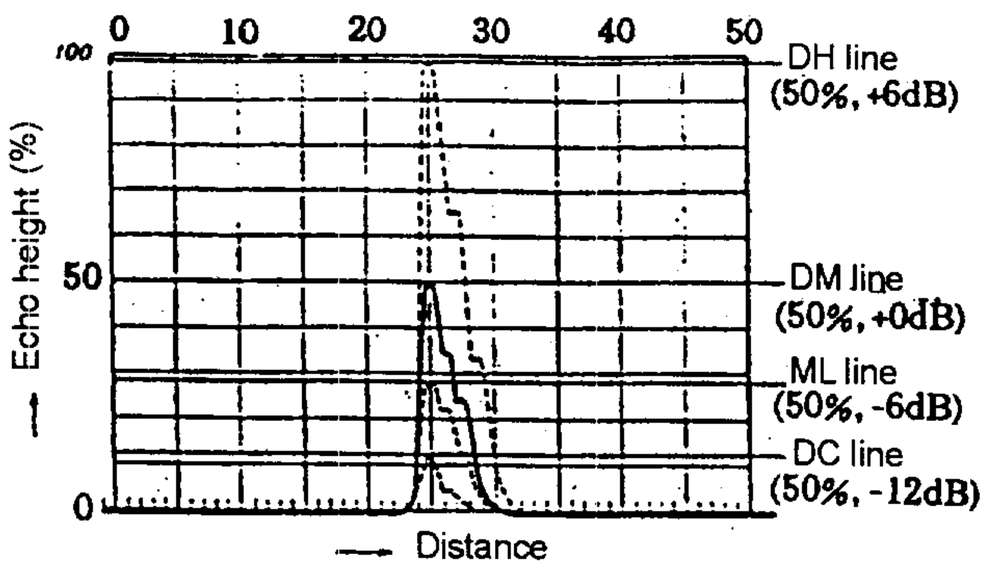

Figure 1 Comparing lines in the divided vertical observer.

Full document details: KIA KES T-L434 1991