KES

10% Oxalic Acid Erosion Test Standard of Stainless Steel

KES T – L198

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1. Scope of Application

This standard shall regulate discriminating method whether it needs to execute long term heated acid test of sulfate acid-2nd ferrite sulfate, 65 % nitric acid test or hydride fluoric acid test and etc through observing tissue with microscope after electrolysis etching of ohostnite group stainless steel in oxalic acid solution.

2. Purpose

It shall intend to figure out state of crystal particle of stainless steel and state of pit.

3. Test Equipment

(1) Test equipment shall use DC power source being able to supply current of capacity sufficient to etching specimen and variable resistance and current meter to control current of etching circuit.

(2) Anode pole shall use small particle made with ohostnite group stainless steel.

(3) Etching solution shall make 10 % oxalic acid solution by dissolving 100 g of special grade good defined in KS M 8019 [Oxalic aid (Reagent)] to 900 mℓ of distilled water or defect-ion water.

Remark : In case that single phase tissue as molybdenum contained steel is disappeared with it broken, it is possible to use 10 % exceed sulfate ammonium solution as a substitute for 10 % oxalic acid solution too. Solution at this time shall make 10 % exceed sulfate acid ammonium solution by dissolving 100 g of special grade good defined in KS M 8026 [Exceed sulfate acid ammonium (Reagent)] to 900 mℓ of distilled water or defect-ion water.

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4. Specimen

(1) Let face to take microscope examination by etching specimen section perpendicular to cutting direction when it is rolling good or forging good. Let specimen containing welded part section containing the parent metal, heat effected area and fusing tightly metal.

(2) Cutting method of specimen shall cut by saw principally. In case of executing cut, take finishing again by cutting or grinding cut face and eliminate effected part by shear.

(3) Execute buffe grinding on face to take microscope examination by etching.

(4) Make face going through etching solution except for face to take microscope examination on specimen be isolated from solution by nonconductive material.

(5) Execute sensitive heat treatment of specimen only on extremely low carbon steel. Heat treatment shall execute before grinding and condition of heat treatment shall be to heat at 650 °C for 2 hours and take air cooling.

5. Testing method

(1) Temperature of etching solution shall be 20 ~ 50 °C.

(2) Let etching face of specimen anode pole and put in 10 % oxalic acid etching solution and take etching for 90 minutes by adjusting current per 1 cm^2 of etching area to 1 A.

Remark In case of using by making 10 % exceed sulfate acid ammonium solution etching solution, take etching for 5 ~ 10 minutes by adjusting current per 1 cm^2 of etching area to 1 A.

(3) Put out specimen from etching solution after etching and wash with warm water and dry it and thereafter observe front face of etching face with microscope and discriminate and evaluate etching tissue according to table 1, 2 and figure 1, 7. At this time magnification of microscope of etching face shall be 200 ~ 500 magnifications for forging goods and approximately 250 magnifications for casting steel good, welded part

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