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NATIONAL STANDARD OF THE
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GB 10849-1989

Cast aluminum-silicon alloy modification

铸造铝硅合金变质

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Cast aluminum-silicon alloy modification

1 Subject content and scope of application

This standard specifies the classification principle and rating method for cast aluminum-silicon alloy modification.

This standard applies to the evaluation of the metallographic structure of cast aluminum-silicon alloys that have undergone sodium modification and phosphorus modification.

2 Sodium modification of cast aluminum-silicon alloy

2.1 Cutting and preparation of specimen

2.1.1 Metallographic specimens are usually cut from a single cast tensile test bar of the furnace. The metallographic specimens of important castings shall be cut from the additional casting test bars of the castings or as specified in the technical documents.

2.1.2 Metallographic specimens are mechanically polished after fine grinding by the metallographic sandpaper, and manually fine-polished if necessary.

2.1.3 The polished metallographic specimen is etched by the use of a 0.5% aqueous solution of hydrofluoric acid for 5 s ~ 10 s at room temperature.

2.1.4 During the process of cutting and preparing the metallographic specimen, it shall be ensured that the structure is not changed.

2.2 Microscopic examination

2.2.1 Use an optical microscopy to evaluate the metallographic structure of the sodium-modified cast aluminum-silicon alloy; the magnification is 200 times.

2.2.2 During microscopic examination, it shall first look at the entire surface to be inspected and then evaluate it according to the figure of corresponding grades of most fields of view.

2.2.3 The sodium modification of cast aluminum-silicon alloy is divided into no modification, insufficient modification, normal modification, deterioration of modification, mild over-modification, severe over-modification.

2.2.4 For the sodium modification of cast aluminum-silicon alloy, the grading of

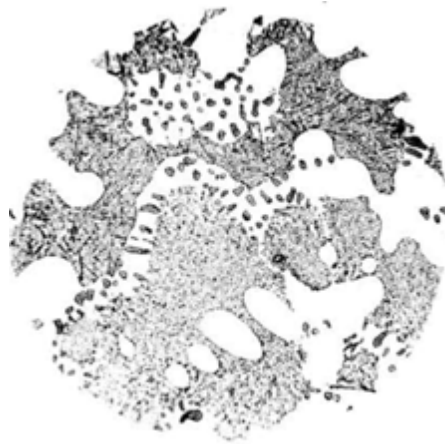


Figure 6 -- Serious over-modification

3 Phosphorus modification of cast aluminum-silicon eutectic alloy

3.1 Cutting and preparation of specimen

3.1.1 Metallographic specimens are usually cut from a single cast tensile test bar of the furnace. The metallographic specimens of important castings shall be cut from the additional casting test bars of the castings or as specified in the technical documents.

3.1.2 Metallographic specimens are mechanically polished after coarse grinding by the metallographic sandpaper and fine grinding, and manually fine-polished if necessary.

3.1.3 The polished metallographic specimen is etched by the use of 0.5% aqueous solution of hydrofluoric acid or a mixed acidic solution which is composed of 0.5 mL of hydrofluoric acid, 1.5 mL of hydrochloric acid, 2.5 mL of nitric acid, 95.5 mL of water at room temperature.

3.1.4 During the process of cutting and preparing the metallographic specimen, it shall be ensured that the structure is not changed.

3.2 Microscopic examination

3.2.1 Use an optical microscopy to evaluate the metallographic structure of the phosphorus-modified cast aluminum-silicon alloy; the magnification is 100 times.

3.2.2 During microscopic examination, it shall first look at the entire surface to be inspected and then evaluate it according to the figure of corresponding grades of most fields of view.

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