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

JB/T 7349-2002

**Stainless steel blade castings for welded construction runner
for Francis hydraulic turbines**

混流式水轮机焊接转轮不锈钢叶片铸件

(English Translation)

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1 Scope

This standard specifies the ordering requirements, technical requirements, test methods and inspection rules of stainless steel blade castings for welded construction runner for Francis hydraulic turbines.

This standard is applicable to the ordering, manufacturing and inspection of stainless steel blade for Francis hydraulic turbines in various specifications; it is also the basis of the delivery by the supplier in workblank or after rough grinding or rough machining.

2 Normative References

The following standards contain provisions which, by reference in this text, constitute provisions of this standard. For dated reference, subsequent amendments (excluding corrigendum), or revisions of, any of these publications do not apply. However, all parties

coming to an agreement according to this standard are encouraged to study whether the latest edition of these documents is applicable. For undated references, the latest edition of the normative document applies.

GB/T 222 Method of Sampling Steel for Determination of Chemical Composition and Permissible Variations for Product Analysis

GB/T 223.3~78 Methods for Chemical Analysis of Iron, Steel and Alloy

GB/T 228 Tensile Test Method for Metal

GB/T 229 Metallic Materials - Charpy Notch Impact Test (GB/T 229-1994, eqv ISO 148:1983)

GB/T 231 Metallic Materials - Brinell Hardness Test

GB/T 6397 Metallic Materials - Test Pieces for Tensile Testing

GB/T 7233 Methods for Ultrasonic Testing and for Specifying Quality Levels of Steel Castings (GB/T 7233-1987, neq BS 6208:1982)

GB/T 9443 Methods of Liquid Penetrant Testing and Classification of Indication for Steel Castings

GB/T 9444 The Methods for Magnetic Particle Testing and for Specifying Quality Levels of Steel Castings

GB/T 11352 Carbon Steel Castings for General Engineering Purpose (GB/T 11352-1989, neq ISO 3755:1975)

3.1

The purchaser shall describe the adopted standard, material designation, relevant technical requirements, inspection items and other additional information in the order contract or order agreement.

3.2

When placing order, the purchaser shall provide order drawing for the supplier and indicate the product dimension, tolerance, surface roughness requirements and the quantity, position and dimension of test blocks.

4.1.1 Smelting

The steel for blade shall be smelted with electric arc furnace or refining furnace. Other smelting method may also be adopted as agreed by the purchaser.

4.1.2 Casting

Internal chill is not permissible in casting, and the process feeding material shall be cleared prior to the final heat treatment.

4.1.3 Heat treatment

The castings shall be subject to heat treatment, and normalizing plus tempering is adopted as their property heat treatment.

4.1.4.1

The repair welding for casting defect shall be conducted by eligible operation personnel according to the requirements of repair welding process prior to the final heat treatment of castings, the welding electrode shall be similar with the casting material.

4.1.4.2

The defect, with depth exceeding 25mm or exceeding 20% the thickness of the located section (20mm is taken if the casting thickness is less than 20mm) or the single area exceeding 6500mm², shall be considered as major defect, of which, the repair welding shall be recorded.

4.1.4.3

The defect shall be cleared away prior to repair welding, and magnetic powder or dye penetrant inspection shall be conducted to confirm whether the defect is totally cleared away.

4.1.4.4

The major defect shall be subject to stress-relief heat treatment after repair welding. The temperature of stress-relief heat treatment shall be less than the tempering temperature in property heat treatment. The repair welding area is detected according to the former detection standard after being polished flatly and smoothly to confirm whether the quality of repair welding is qualified.

4.1.5.1

The supplier shall conduct rough machining or rough grinding for castings in accordance with the order agreement if required by the purchaser.

4.1.5.2

The finish machining and refining margin of castings shall be determined through negotiation between the supplier and the purchaser.