KES

Inspection Standard for Dry Process Cylinder Liner (For Casting)

KES R – I011C

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Additional Rule

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1. Purpose

This standard is to determine the inspection method to make it sure to guarantee the quality of production process that is regulated by international standard of cylinder liner for internal combustion engines.

2. Scope of Application

This standard determines the quality warranty on casting process (Dry) of liner.

3. Material

Liner material shall be FCH 5A of KES B-H006 (iron casting (cylinder liner)).

4. Inspection Items and Inspection Method for each Process

Inspection Items and Inspection Method for each Process shall be as table 1.

Table 1

Process name	Inspection items	Inspection method			Remarks
		Responsible manufacturing department	Responsible inspection	Department	
			Everyday inspection	Regular inspection	
Insertion	Insertion temperature	Once/ladle			
	Hardness		Once/4 ladles	Once / 3 months	
	Tensile strength Microscopic structure				
Afterward process (Exclusion sand, cutting)	Dimension				
	External appearance	All product inspection			

5. Inspection Lot and Sample Size

Inspection Lot and Sample Size shall be as table 2.

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Table 2

Inspection Items	Inspection lot	Sample size
Insertion temperature	Every ladle shall be as a lot.	n = 1 (ladle)
Hardness	Every 4 ladles shall be as a lot.	
Tensile strength	Amount of 3 months Manufacturing shall be As a lot.	
Microscopic structure		
Dimension		
External appearance	All product inspection	

6. Sample Picking Method

Sample picking method shall be as table 3.

Table 3

Classification	Sample picking term and picking method
Insertion temperature	1. For the sample picking term, every ladle shall be an inspection object. Remark : 1 ladle: when distributing 1 charge to a ladle, each amount.
Hardness	1. For the sample picking term, pick up 1 sample per 4 ladles after completing insertion. The first mold inserted in ladle shall be a sample. Remark: 1 mold: When inserting 1 ladle to each mold, each mold
Tensile strength	Choose most hardened ladle, and pick up gate once for every 3 months, and process it as a specimen
Dimension	Follow pick inspection standard.
External appearance	Inspect all products at the afterward process line.

7. Inspection and Test Method

7.1 Insertion Temperature

Using temperature scale, when liquid iron falls into the mold from ladle, measure the temperature with 1 m distance and record it.

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7.2 Hardness

(1) Measurement Spot

After grinding the both ends of liner first, choose upper side for the measurement spot, and choose the middle to get rid of test errors.

(2) Measurement Method

Measure according to KS B 5524(Brinell hardness testing machine) and KES T-L 003(Brinell hardness testing method).

(3) Data Indication Method

For Brinell hardness, measure it as 10 m/m ball and load 1500kg(Dry), indicate it with BHD.

7.3 Microscopic Structure of Tensile Strength

Inspect it according to material checking standard.

7.4 Dimension Inspection

Inspect it according to pick inspection standard.

7.5 External Inspection

Inspect it according to limit sample.

8. Pass/Fail Decision Standard

Pass/Fail Decision Standard shall be as table 4.

9. Management of Lot Failed

Management of Lot Failed shall be as table 5.

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