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KES

Shot Peening

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Quoted Standard

KIA MOTORS

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1. Scope of Application

This standard specifies the shot peening mainly aims at atting compressive residual stress(improvement of fatigue-resistance) to the parts of machine structure such as the gear box of automobile manufactured by carbonitriding or nitriding (carbonization quenching).

2. Purpose

This standard aims to secure and standardize the adequate quality of shot peening.

Table 1. Classification, Name, and Symbol

Classifications	Name	Symbol				
		shot grain diameter(nominal diameter)				
		0.1	0.3	0.5	0.6	0.8
Class A	Conventional shot peening	-	-	SP-5A	SP-6A	SP-8A
Class B	Semi-hard shot peening	-	SP-3B	SP-5B	SP6B	SP-8B
Class C	Hard shot peening	SP-2C	SP-3C	SP-5C	SP-6C	SP-8C
Class D	Double shot peening	SP-6/2D				
			SP-8/3D			

Remark Meanings of symbol

ex) SP - 6 - C

- SP — Abbreviation of shot speening
- 6 — Applicable shot diameter(6 means ϕ 0.6mm) Regarding dual shot peening, the shot diameter that cna be applied to the first and second shot shall be entered in this order.
- C — Division of Classification (working strength)

SP - 6.2D (for double shot peening)

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4. Compressive Residual Stress and Effective Shotting-Density

4.1 Compressive residual stress

The shot peening shall be performed under operational conditions that satisfy the effective shot-density requirements mentioned in 4.2. Compressive residual stress is shown in Table 2.

Table 2. Compressive Residual Stress and Applicable Divisions

Classification and Symbol		Compressive Residual Stress N/㎟ {kgf/㎟}			Arc Height [Class A] (reference)	Applicable Division
		Under the surface 20±10 μm	Under the surface 40±10 μm	Under the surface 60±10 μm		Gear Module
Class A conventional Shot Peening	SP-5A	588{60} min.	-	-	0.2~0.4	0.1~1.5
	SP-6A					1.5~2.5
	SP-8A	-	490{50} min.	-	0.3~0.5	2.5 min.
Class B Semihard Shot Peening	SP-3B	932{95} min.	-	-	0.2~0.4	0.5~1.0
	SP-5B	-	735{75} min.	-	0.5~0.7	1.0~1.5
	SP-6B					1.5~2.5
	SP-8B	-	-	637{65} min.	0.6~0.8	2.5 min.
Class B Semihard Shot Peening	SP-2C	1177{120} min.	-	-	0.2~0.6	0.5 min.
	SP-3C					0.5~1.0
	SP-5C	-	883{90} min.	-	0.8~1.0	1.0~1.5
	SP-6C					1.5~2.5
	SP-8C	-	-	785{80} min.	0.9~1.1	2.5 min.
Class D double Shot Peening	SP-6/2D	1177{120} min.	883{90} min.	-	0.8~1.0	1.5~2.5
	SP-8/3D	1177{120} min.	-	785{80} min.	0.1~1.1	2.5 min.

Remarks 1. The value of arc height is not always in proportion to the improving effect of fatigue-resisting. However, it is a useful index for working conditions(operation condition) and it shall be entered as a reference value.

2. In the case of an applicable gear module, shot must be injected exactly on the corner of dedendum(root of gear tooth). The relationship between corner R and the shot of other work pieces beside gears is as follows : Shot diameter D ≤ Corner R

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