

Standard Microstructure Group 6 Surface Modification of Metals

25types

- Recently, there have been remarkable advances in surface modification and surface heat-treatment technologies for metallic materials. A variety of such technologies are becoming increasingly available to achieve metallic materials with desired qualities by modifying a material's surface or its adjacent properties. This trend presents unprecedented challenges to the people involved in the materials industry.
- Under the guidance of the MS Committee, the Study Group of Material Technology Education, YSTL has developed "Standard Microstructure Group 6," a set of standard microstructure samples of metallic materials subject to 25 major surface modification or heat treatment technologies, as described below.
- Group 6 addresses the 25 most popular combinations of materials and surface treatment technologies. Following deliberations of the MS Committee, it was determined what the most representative microstructures of the materials should look like when they are surface treated, and YSTL produced standard samples of those microstructures. The attached booklet provides detailed descriptions of material, treatment and microstructure, aided by a photograph of each sample's microstructure and an explanatory CD-ROM, to ensure a better understanding of the samples.
- Combined use with the previously released Group 1 to Group 7 sets of standard microstructure samples is recommended.

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No.	Surface Modification Technology	Material (JIS)	Intended Quality		
			Abrasion resistance	Fatigue resistance	Corrosion resistance
601	Induction Hardening	SCM435	△	○	
602	Flame Hardening	FCD700	○	△	
603	Laser Hardening	SCM435	○		
604	Vacuum Carburizing	SCM415	○	○	
605	Carbide Dispersion Curburizing	MAC14 (Mitsubishi Steel)	○	○	
606	Plasma Nitriding (I)	S45C	○	○	△
607	Plasma Nitriding (II)	SCM435	○	○	△
608	Liquid Nitriding	S45C	○	○	△
609	Oxinitriding	S45C	○	△	△
610	Gas Nitrocurburizing	SPCC	○	○	△
611	Sulpho-Nitriding (Low sulphur)	SCM435	○	△	
612	Sulpho-Nitriding (High sulphur)	SCM435	○	△	
613	Boronizing (Boriding)	S35C	○	△	
614	Steam Treatment	S45C	○		△
615	Low-Temperature Sulphurizing	SCM415	○	○	
616	Carbide Coating (TD treatment)	SKD11	○		
617	Thermal CVD (chemical vapor deposition)	SKD11	○		○
618	Plasma CVD	SKD11	○		○
619	PVD (physical vapor deposition)	SKD11	○		○
620	Aluminum Diffusion Coating (alminizing)	S10C	△		○
621	Chromium Diffusion Coating	S10C	○		○
622	Hardness Chromium Plating	SWY11	○		
623	Electroless Nickel Plating	SWY11	○		
624	Spraying	S10C	○		○
625	Aluminum Anodization	A5052 (Al-Mg alloy)	○		○

The ○ and △ marks represent the intended quality.