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Test methods for adhesion of thin films on glass substrate

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In the event of any doubts arising as to the contents, the original JIS is to be the final authority.

Test methods for adhesion of thin films on glass substrate

1 Scope This Japanese Industrial Standard specifies the test methods for adhesion of flat thin films of metal, metal oxide or metal nitride of 1 μm or under in thickness formed on glass substrate.

2 Definitions The definitions for main terms used in this Standard shall be as follows.

(1) **semi-spherical stylus** The stylus consisting of rigid material of which the tip is ground in a semi-spherical shape.

(2) **load of stylus** The force added to the surface of a specimen via the stylus.

(3) **loading rate** The rate wherein a load of stylus increases per unit of time.

(4) **scratch speed** The speed wherein a stylus is pushed onto a specimen, and to move it straightly parallel to that surface.

(5) **method of scratch test** The method wherein a stylus is pushed onto a specimen at a specific loading rate and a specific scratch speed, and the adhesion of a thin film is tested from the load by which a damage is generated.

(6) **method of micro-scratch test** The method wherein a scratch test is carried out while a stylus is horizontally micro-vibrated, and the adhesion of a thin film is tested in high sensitivity.

(7) **method of micro-indentation test** The method wherein a stylus is pushed into a slant specimen at a specific speed, and the adhesion of a thin film is tested in high sensitivity from the abnormal fluctuation of a load of stylus.

(8) **critical damage** The state wherein peeling off of a film is generated for the first time in a test area.

(9) **complete damage** The state wherein 100 % peeling off is generated in the test area.

(10) **load for critical damage** The load of stylus which causes critical damage.

(11) **load for complete damage** The load of stylus which causes complete damage.

(12) **adhesive force of thin film** The adhesion of a thin film to glass substrate is expressed by the shear stress calculated based on the load of critical damage, the load of complete damage, or critical load.

Informative reference : It is also called adhesion force or bond strength.

3 Classification of test method The test methods shall be classified as follows.

(1) Method of micro-scratch test

(2) Method of micro-indentation test