

Description

Image

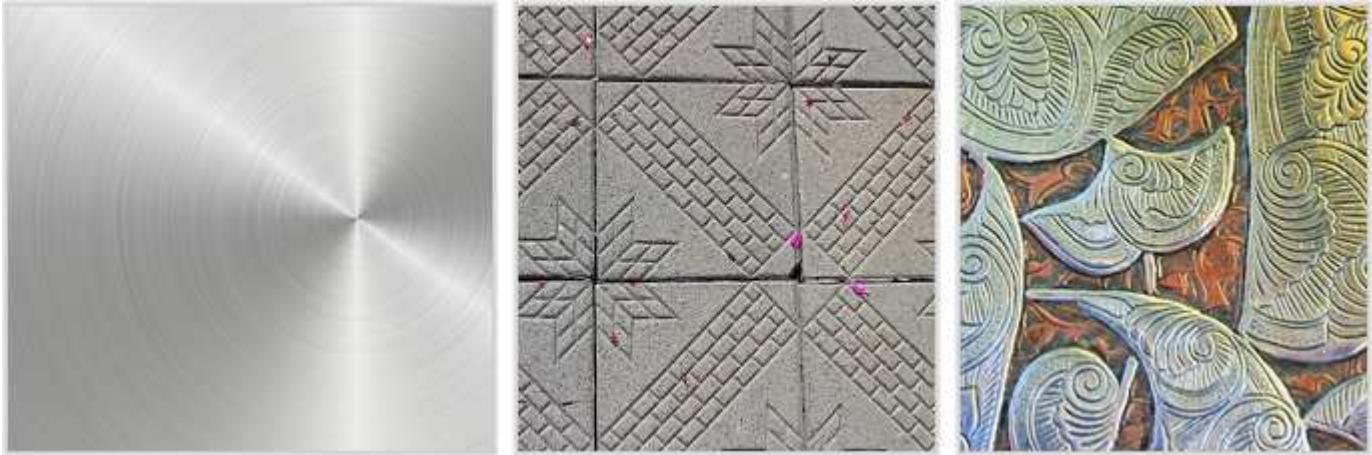


Image caption

(1) Metal surface with swirled pattern © Artbaggage at Pixabay [Public domain] (2) Textured stones' floor © Antranias at Pixabay [Public domain] (3) Decorative texturing in a metallic platter © Bluesnap at Pixabay [Public domain]

The process

Texture can be created in many ways. By CASTING or MOLDING in a patterned tool; but the draft angle must be increased with the depth of texture. By ROLLING between patterned rolls. 'Diamond plate', used for stair treads, is made in this way. By CRIMPING, pressing of sheet between patterned dies. Pre-plated sheet, up to 0.8mm thick, can be crimped to give sparkling reflective patterns; it is used, too, to increase bending stiffness and strength, allowing lighter gauge material for boxes and cans. By SAND BLASTING, or abrasive polishing, the microscopic roughening of the surface in a random or patterned way (as in 'brushed aluminum'). By LASER TEXTURING, usually applied to rolls or dies; the pulsed laser beam creates minute craters on the roll surface in a precisely controlled pattern that is then transferred to the component during the rolling operation. By ELECTRO-TEXTURING, a process like electro-discharge machining (EDM), but using shaped graphite electrodes to smooth or give texture to the surface of the component. By CHEMICAL ENGRAVING ('etching' and 'chemical polishing') either of molds, rolls and dies, or of the component itself.

Process schematic

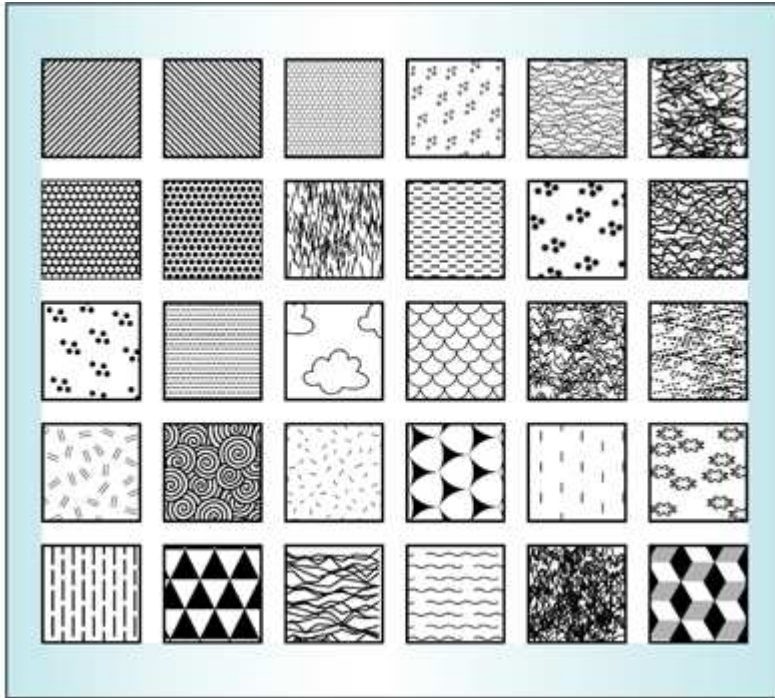


Figure caption

Textures

Material compatibility

Ceramics	✓
Composites	✓
Glasses	✓
Metals - ferrous	✓
Metals - non-ferrous	✓
Natural materials	✓
Polymers - thermoplastics	✓
Polymers - thermosets	✓

Function of treatment

Wear resistance	✓
Friction control	✓
Decoration	✓
Reflectivity	✓
Surface texture	✓

Economic compatibility

Relative tooling cost	low
Relative equipment cost	low
Labor intensity	medium

Physical and quality attributes

Surface roughness (A=v. smooth)	C
Curved surface coverage	Average
Processing temperature	26.9 - 76.9 °C

Process characteristics

Discrete	✓
Continuous	✓

Supporting information

Design guidelines

Texturing is important in design for both technical and aesthetic reasons. It can improve product appearance, giving a visually interesting surface as well as hiding minor flaws, scratches and sink-marks. It can improve grip and it contributes to the tactile qualities of a product.

Technical notes

Virtually any material can be textured by one or another of the methods described above. Texturing by patterned rolls or crimping is limited to simple shapes (like sheet); electro-texturing, chemical engraving and patterned tool methods allow greater freedom of shape.

Typical uses

There are two very broad classes of application: texturing for visual purposes, and texturing to impart tactile qualities -- grips and non-slip surfaces.

The economics

The cost depends on the process. Some, like sand blasting and patterned rolls are fast and cheap. Others, like laser texturing and chemical engraving are slower, and consequently more expensive.

The environment

Texturing processes do not present any particular environmental hazards.

Links

MaterialUniverse

Reference