Description

Image

Image caption

(1) Hydrographics (printing) © PeteRichards at Wikimedia Commons (CC BY 3.0) (2) A car wheel hub decorated by cubic printing, hydrographics (printing) © Deeppaint at Wikimedia Commons (CC BY 3.0)

The process

Transfers are familiar to every child - a painless way of applying images to paper, to products and even to yourself. The image is printed on a thin, water-soluble film; when floated on water, the image floats free and can be transferred to the product to which it sticks. CUBIC PRINTING uses the same principle, scaled-up and made commercially viable. The film and its image are floated on the surface of a water tank. The product is immersed in the tank, where the pressure of the water presses the image onto the surface of the component.

Process schematic

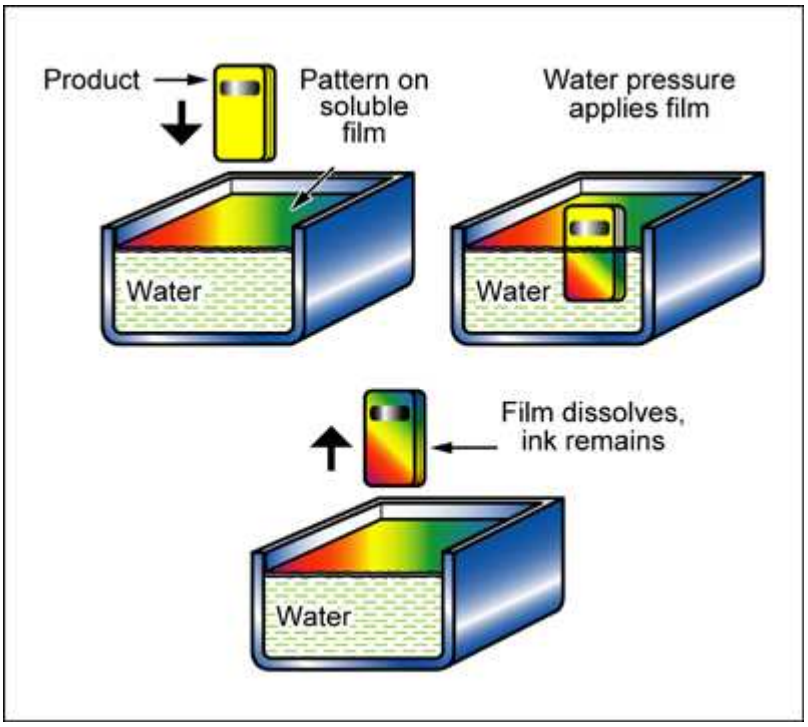

Figure caption

Cubic printing allows a patterned film to be applied to an object of complex shape

Material compatibility

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

Function of treatment

Decoration	✓
Color	✓
Reflectivity	✓

Economic compatibility

Relative tooling cost	low
Relative equipment cost	low
Labor intensity	medium

Physical and quality attributes

Surface roughness (A=v. smooth)	A			
Curved surface coverage	Very good			
Coating thickness	0.236	-	0.394	mil
Surface hardness	5	-	10	Vickers
Processing temperature	62.3	-	98.3	℉

Process characteristics

Discrete	✓

Supporting information

Design guidelines

Cubic printing is very versatile; complex, curved shapes can be printed and the image can be multi-colored. Registration is difficult, so the image is usually applied in a single operation, and designed so that precise registry is not necessary.

Technical notes

The pattern or design is printed on a water-soluble film. The film, specially treated to activate the inks, is floated onto the water where it dissolves, leaving the decoration inks on the water surface. The component to be decorated is pressed down into the water to effect the transfer. The inks flow on the surface of the object, decorating it in three dimensions. A transparent topcoat is applied to protect the printed surface. Polymer, ceramic, glass, metal and wood products can all be printed. Printing on 3D and irregular shapes is possible.

Typical uses

Automotive: dash panels, console, steering wheel, shift knobs, spoilers, bumpers, visor. Sports equipment: tennis racket, fishing reels, gun stocks, helmets, golf clubs, sunglasses, bikes. Computers products: monitor panel, keyboards, mice, PC notebooks, digital cameras, printers. Appliances: TV, refrigerators, washer-dryer, coffee maker, microwave, stereo equipment. Kitchen Products: canisters, silverware, glass stems, bowls, pitchers, salt-peppers shakers. Furniture: end tables, coffee tables, door knobs, picture frames, tissue holders, clocks.

The economics

Capital and tooling costs are low. The component must be dried and given a finishing coat, making it relatively

The environment

Cubic printing presents no significant environmental problems.

Links

MaterialUniverse

Reference