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Plastics and product aesthetics

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Protohistory of Plastic Materials

A lot of people think that plastic (polymeric) materials are present in the man's life only since '50 of the last century. They are wrong; natural polymeric materials have been used even before writing. Let's mention just two such materials:

- amber;
- tortoiseshell.

Natural vs. synthetic plastics

Natural plastics:

- heterogeneous;
- processed by craftmanship;
- no correlation between material and a certain aesthetic.

Synthetic plastics:

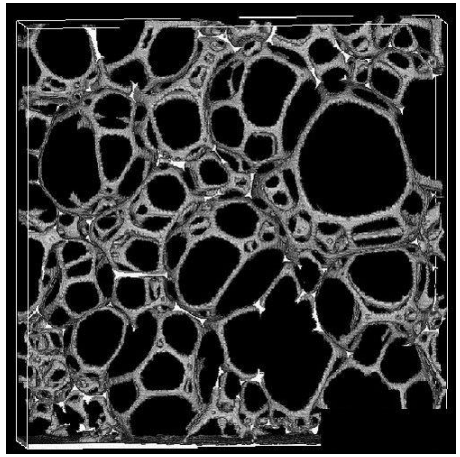
- homogeneous;
- processed in mass-production;
- clear conditioning between product material, technology and aesthetics.

Turtoiseshell scutes

Crafting turtoiseshell

Thermosets – the first synthetic plastics

- mixing substances in a liquid state, resulting an irreversible hardening ("curing");
- permanent shape;
- remarkable and useful properties:
  - good strength;
  - electrical and thermal insulation;
  - relative good heat resistance;
  - total opacity.



Polyurethane structure

Thermosets – the first synthetic plastics

- appeared at the beginning of 20th century;
- some of the most common thermosets: bakelite; polyester; polyurethane; melamine.
- any shape that could be obtained by casting;
- technological requirements:
  - existence of a separation plane;
  - minimum wall thickness;
  - slight inclination of the walls.

Cast iron (1900)

Products made from thermosets

- ordinary and unpretentious products;
- simple aesthetics;
- people was reluctant to accept new materials for valuable products;
- excellent electrical insulator properties;
- simple and geometric shapes;
- colour: mostly **black**.

Bakelite switches

Products made from thermosets

Thermoplastic materials

- invented in the first half of 20th century and perfected after WWII.

Most used thermoplasts are:

- Polyethylene (PE);
- Polypropylene (PP);
- Polyvinyl chloride (PVC);
- Polystyrene (PS);
- Polycarbonate (PC);
- Acrylonitrile butadiene styrene (ABS)

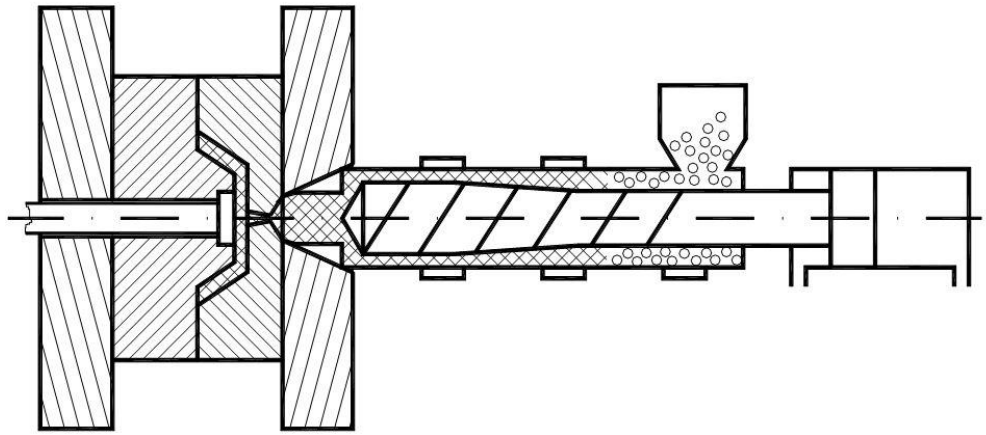
Thermoplastic pellets

Properties of thermoplastic materials

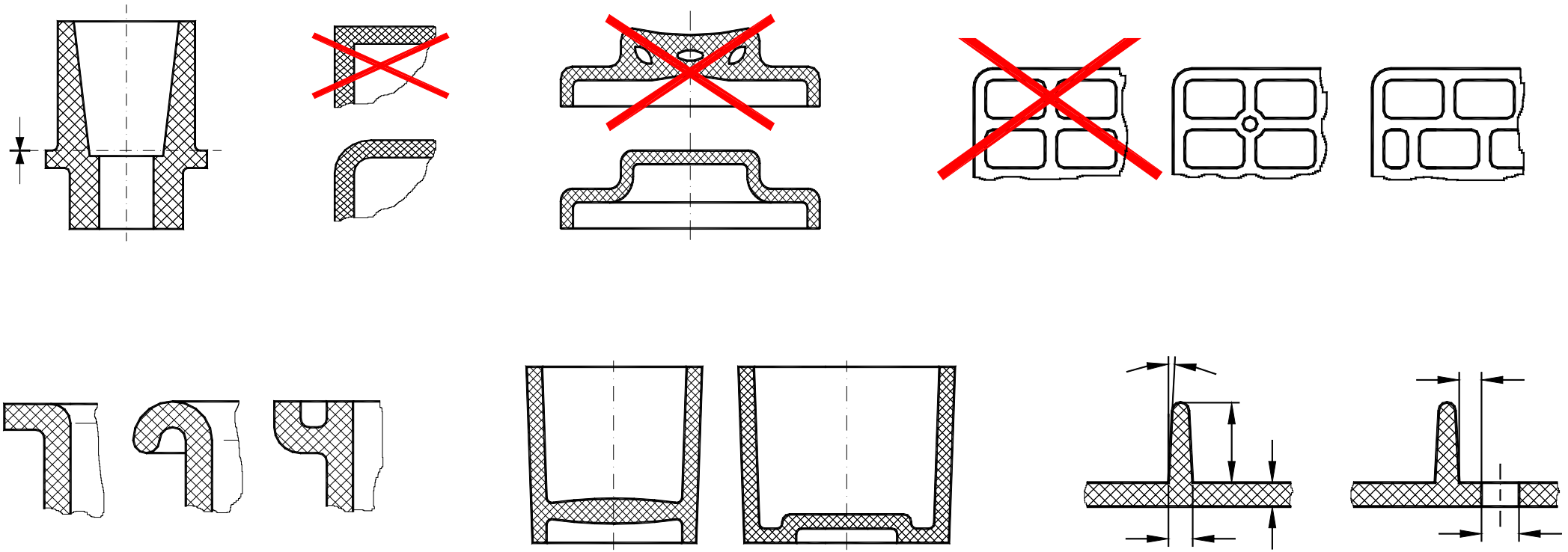
- easy to process;
- allow obtaining a wide range of shapes and dimensions;
- can be coloured in any possible shade;
- temporary gloss;
- optical properties: opacity, transparency; translucence;
- optical conductivity;
- allow reinforcement with fibbers made of glass, carbon, etc.
- limited elasticity;
- warm to the touch;
- cheap.

Processing of thermoplastic materials

- INJECTION MOULDING;
- ADDITIVE MANUFACTURING;
- plastic extrusion;
- blow moulding;
- thermoforming;
- vacuum casting;
- cutting, etc.



Technological constraints for injection moulding



Industrial design after the WWII

- economic boom;
- increasing family welfare;
- reforms at social and moral levels;
- product aesthetics became a general criterion in purchasing;
- society (as a whole) “welcomed” the new plastics;
- industrial designers discovered and experimented with new plastics;
- design awards were established (like Compasso d’oro).

Compasso d'oro ("The golden Compass")

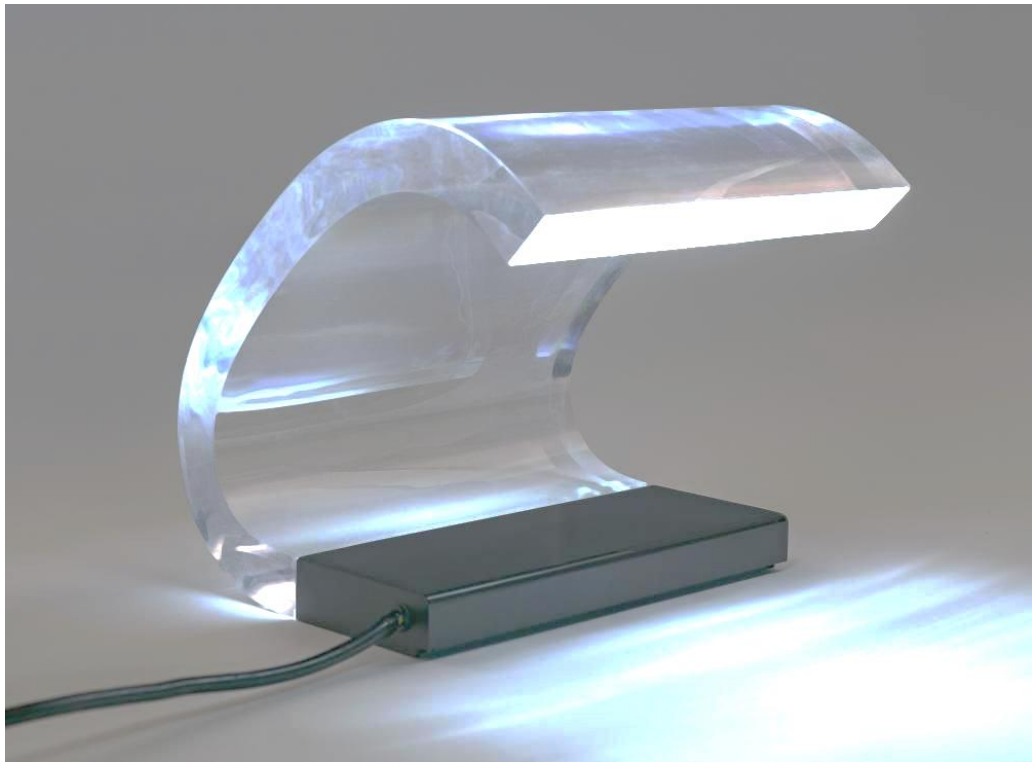
- name inspired by the compass that draw two circles in golden ratio;
- launched in 1954 and still awarded today;
- goal:
  - to reward great Italian designers;
  - to promote the aesthetically innovative products.
- similar to cinema's Oscar;
- Its peak: 50s to 70s.

Premio Compasso d'Oro ADI

Ralph Lysell – Ericofon (1954)

Gino Colombini - KS 1146 (1955)

Marcello Nizzoli – Mirella Sewing Machine (1957)



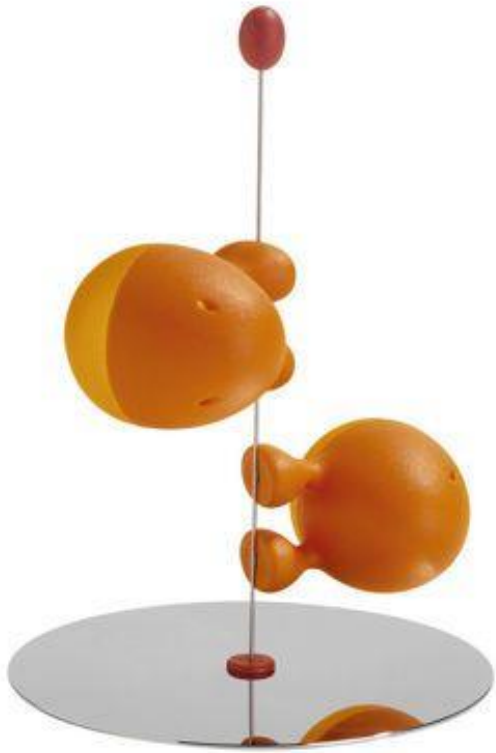
Joe and Gianni Colombo – Oluce 281 Acrylica Lamp (1962)

Marco Zanuso & Richard Sapper - Grillo telephone (1967)

Gatti, Paolini, Teodoro – Sacco Chair (1968)

Toot-a-Loop Radio (Panasonic) (1972)

Mario Bellini - Divisumma 18 calculator (1973)



Stefano Giovannoni – Lilliput Salt and Pepper (1993)

Jonathan Ive – iMac (1998)

Ferruccio Laviani - Bourgie Lamp (2004)

Decreased Interest in Plastics Aesthetics

Since the 70s, the golden era of plastic products with remarkable aesthetics ended. The main three causes were:

- Oil price “exploded” in the 70s. Plastics became more expensive.
- A lot of cheaper and low-quality plastic materials appeared on the market.
- Environmental concern grew.

However, plastic reformation is possible.

Thank you for your kind attention!

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