**Materials and Manufacturing:**

**Part No. 2 Edge Piece Frame**

**Part Description**

The Edge Piece Frame fits between the two corner pieces on each face of the cube, with four Edge Piece Frames per face. The part has square mounts for two colored tiles on its two outer faces, and has a curved locking mechanism on the inner face which interfaces with the surrounding pieces to hold it in place within the cube.

**Part Material**

The part is formed from a single piece of black injection-molded ABS, or acrylonitrile butadiene styrene, plastic. This material was likely chosen for cost effectiveness and ease of manufacturing, as well as its high durability relative to its low weight and density.

**Manufacturing Process**

The manufacturing process used to create this part is injection molding. Small, colored pellets of ABS plastic are loaded into the hopper of an injection molding machine, where they are heated until soft and malleable and forced via a heated screw into the two halves of a closed mold, which has a cavity in the shape of the part. The plastic is then allowed to cool and harden, after which the two halves of the mold are separated and small metal pins eject the finished part from the mold.

**References**

Gale Research, *How Products are Made*, http://www.madehow.com, 1994. (TS 145 H67)

Chabot, J. F. *The Development of Plastics Processing Machinery and Methods.* Brookfield: Society of Plastics Engineers, 1992.

**Materials and Manufacturing:**

**Part No. 6 Screw**

**Part Description**

A screw is a threaded piece of metal that is used in manufacturing. It is used to hold two objects together and can hold them together tighter than a nail is able to.

**Part Material**

Screws are typically made from low to medium carbon steel wire, however, they are sometimes made from other metals that are tough and inexpensive. Steel is the most commonly used because it is a high-quality metal that prevents the screw from cracking and ferrous screws are magnetic making them slightly easier to remove when necessary.

**Manufacturing Process**

The most common manufacturing process used in the creation of screws is the thread rolling method since it efficiently produces a bulk amount of screws. To create a screw blank, steel wire is put into a pre-straightening machine. From there, it is put into a machine that cuts the wire into a specified size and shape. From there, the wire is put into a heading machine which creates the screw head. Once the screw blank is created, the thread rolling method can begin. The screw blanks are fed from a hopper to thread cutting dies which can cut in a variety of ways. The most productive technique is the planetary rotary die method in which the blank is held still while multiple die- cutting machines roll around it. This creates a high-quality screw that had no material loss minimizing the weakness of the metal.

**References**

Gale Research, How Products are Made, http://www.madehow.com, 1994. (TS 145 H67)

Fix-It Club "Screws" 21 March 2007. HowStuffWorks.com. <https://home.howstuffworks.com/screws.htm> 27 November 2018