

Survey Report on Mold for Compression Molding Stored in Celluloid House

Isao Sato

1. Overview

The Celluloid House Yokohama Museum investigates and researches the industry, technology, and culture related to celluloid. As a part of this research, various molds used for molding celluloid products are also stored. Molds are considered as intermediate between production facilities and tools, and the focus toward molds was not so much. However, due to their characteristics, the following related fields are awaited to elucidate their actual conditions.

This time the outline was clarified for the molds for compression molding (for the molding method, see appendix)⁽¹⁾ so it will be reported as below.

(1) Product shape information:

Celluloids are organic polymer compounds which is flammable, making long-term storage of the products difficult. Molds made of metal and able to maintain the shape for a long period of time as long as they are in an appropriate environment.

(2) Molding technology:

The mold is filled with production know-how and craftsmanship which are difficult to be written. It provides a clue to the technical historical analysis. Especially, the decorative mold took over the skills of processing workers from precious metals, gemstones, corals, and dentin which were conventional materials, and handed down to the plastic molding mold. Therefore, by clarifying the celluloid processing technology, it is possible to contribute to elucidation of related production technology and the appearance of technology transfer.

(3) Contribution to industrial history

Molds are assets from the accounting aspect, but they have a very short depreciation period. For this reason, they are sensitive to economic trends, business conditions, and business decisions. If quantitative data and chronological data are obtained, industrial history and management knowledge may be acquired.

2. Collection overview

Molds for compression molding stored in our celluloid houses are mainly those which were transferred at the time when Kansai Kosan (celluloid processing company) closed their business. At the same time, products and work-in products are also available. As the company was transferred after closing the business, only little information barely remains for the manufacturing data and utilization status.

This time all of the molds with celluloid houses stores that were supposed to be used for internal compression molding were surveyed, so it is possible that those that were diverted to other molding methods and those used outside the company maybe included.

From the history of such storage, our collection has the following features.

- (1) Most of the molds are for molding jewelry such as brooches.
- (2) The manufacturing history and utilization status of each mold are not known.
- (3) Materials for molds, things considered to be in the process of manufacture, damaged molds, discarded molds, jigs and tools similar to molds are also included.
- (4) Rust preventive oil adhered with wastes, and cleaning was necessary.

(5) Molded articles and products molded by molds are stored at the same time.

As a result of the investigation, it was proven that there were 2476 retained molds including unfinished molds and discarded molds.

3. Investigation history

Based on the mold survey planning ⁽²⁾, there was a progress with the survey and the data base was completed on the compression mold this time.

The collection has no mark of previous survey, and there were no record left such as drawings, specifications, lists, etc. In addition, since it was left for a long period of time, contamination was severe. Fortunately, because it is made of gun metal, corrosion which infiltrates the shape is not recognized. Considered contamination include deteriorated molding material produced during molding, oxide films produced by thermal history, and rust-preventive oils. The cleaning was mainly carried out by brushing with an organic cleaning agent. However, cleaning is limited to an area where investigation is possible, and the inside of the cavity is not sufficiently cleaned.

A list was prepared as a starting point for the survey. Specifically

- ① Unique number is added to each mold (random).
- ② Measurement and recording of external dimensions (width, depth, and thickness), type of dies, number of molds taken, name of molded articles, character information, and other photographs were recorded.
- ③ Table 1 shows an example of data for each mold.

Table 1: Individual data example

| No. | 概要 | | 写真・注記 |
|-----|------|-----------|--|
| | 品名 | 花、葉 | |
| 500 | サイズ | 43.4X43.6 |  |
| | 型厚 | 13.1 | |
| | 取り数 | | |
| | 位置決め | | |
| | 銘 | 18841 | |

4. Data and mold storage

(1) Database

It is stored as a excel file according to the format shown in Table 1.

(2) Mold

Since the number of compression molds is large, it took contrivance to store them. First, all molds were stored in trays in width 30cm and depth 45cm in order of arrangement numbers as shown in Fig. 1. Since the number of molds that can be stored in one tray is about 20 to 30, there are about 100 trays.

It is stored in 3 racks in order of number. As shown in Fig. 2, the storage method consists of 3 stacks of each shelf, 3 rows, and 9 boxes/shelf. There are 36 trays per rack with 4 racks, and 3 racks hold all molds (Fig. 2). Thus, the mold storage position is immediately known by the mold number of the database.

Figure 1: Molds stored inside the tray



Figure 2: Tray stored in the rack



5. Conclusion:

We were able to list compression molds. Through this work, we realized a huge number and its diversity. This is an unprecedented collection, and at the same time, it seems to contain valuable information in the history of industrial technology. It is hoped that more in-depth studies will be conducted, and we hope that this survey will serve as an opportunity to do so.

6. References

- (1) Compression molded celluloid mold, Isao Sato,

Edited by Museum of Local History and Astronomy of Katsushika City, Celluloid Town Katsushika

Museum of Local History and Astronomy of Katsushika City (2016) P70

Compression molds, Isao Sato, Mold Archaeology No. 1, mold technic Vol.33, No.1, P78 (2018)

- (2) Isao Sato, Initiative for investigation of celluloid molds, Celluloid House Yokohama Museum

[Research and Survey Report No. 18 \(celluloidhouse.com\)](https://www.celluloidhouse.com) (2015)

(Additional remark) About compression molding

The compression molding described in this paper was widely used in the era of celluloid, bakelite, but it has hardly been seen recently, so the outline is briefly explained.

The compression forming method is formed by pushing a celluloid mass softened by heating into a mold by a press as shown in the Figure. Mounting of dies, opening and closing of presses, setting of materials, unloading of products, and etc. are all carried out manually. In addition, mold was not actively cooled, but it was taken out after waiting for it to solidify by natural cooling.

An extra amount of material is added, and the excess material protrudes from the mold surface and is removed later (deburring).

