



Construction of a “Soft” Profile Gauge

Introduction

A profile gauge provides a practical way to trace contoured or unevenly shaped objects in order to produce accurate form-fitting supports and mounts for them (see Figure 1). Commercially available profile gauges typically consist of a row of metal wires or plastic slats in a friction-fit holder. When pressed against an object, the wires or slats are pushed in incrementally, producing a reverse profile on the gauge. The exactness of the profile (outline), or resolution, depends on the thickness of the gauge elements.

Commercial profile gauges are designed to reproduce the curves of firm, stable materials such as wood, stone, plaster, and metal on, for example, architectural mouldings. The stiffness of these gauges and their weight pose a threat to museum artifacts that are soft or fragile, or that may easily be marked by the pressure required to move the wires or rods.

As an alternative, a “soft” profile gauge can be constructed using supplies commonly found in museum workshops. The “soft” profile gauge is not as accurate as a fine wire metal profile type, but its degree of accuracy is sufficient for most mount-making applications.

Soft profile gauges have many advantages over stiff, commercial gauges:

- They are gentle. Because the rods require only a very light tap to move and conform to the shape of the object, soft profile gauges can be used on very delicate surfaces (see Figure 2).

- They are inexpensive and easy to construct.
- They are ultra-light. For example, the gauge described below weighs only 50 g.
- They can be made longer than commercial gauges, which are typically 20 cm. In contrast, a soft profile gauge can be 30, 50, or even 80 cm, depending on the size of the piece of fluted plastic used.

Materials

- Scrap piece of 3-mm-thick ($1/8$ "") fluted plastic sheet (Coroplast or Cor-X), for example 7.5 cm x 30 cm (see Figure 3). Note that the flutes on a 5-mm-thick ($3/16$ "") sheet will be too large to hold the sticks tightly. Make sure the flutes are running perpendicular to the length of the plastic sheet (see Figure 4).



Figure 1. The soft profile gauge is used to measure the contour of an Egyptian cartonnage in order to build its storage support.



Figure 2. The soft profile gauge is used to measure the correct angle of the damaged baleen boning on this 18th-century silk robe.



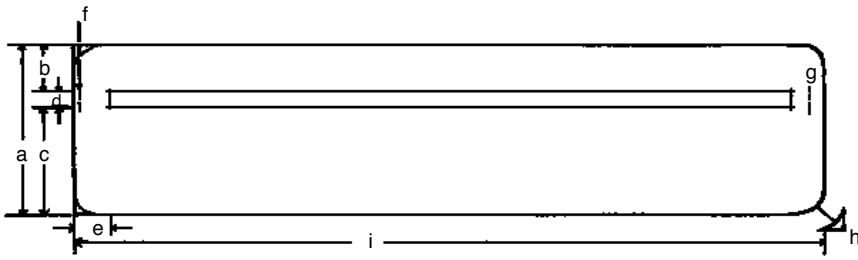


Figure 3. Schematic of a soft profile gauge

- | | | | |
|----------|---|----|--|
| a. | 66 mm | h. | rounded corners |
| b. | 20 mm | i. | 11.25 cm (this length can vary, depending on the size of the curves that need to be reproduced, but 11.25 cm is a convenient size) |
| c. | 40 mm | | |
| d. | 6 mm | | |
| e. | 2.5 channels wide | | |
| f and g. | 7 mm slit through the top layer of the fluted plastic | | |

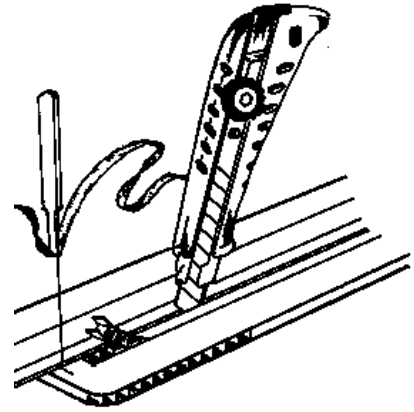


Figure 4. A channel is cut through the length of the piece of fluted plastic, across its flutes. A slit is cut through one layer of the plastic sheet, and one end of the twill tape is secured into the channel.

- Cotton tape, 6 mm wide. Choose a smooth, plain weave cotton tape that is not likely to snag on the wooden sticks. Cut a strip at least twice as long as the piece of fluted plastic.
- Straight hardwood applicator sticks, 145 mm long x 2 mm in diameter. (Bamboo skewers of a similar diameter can be used as an alternative. However, they have a slippery surface that causes the sticks to fall out of the weave. They also need careful trimming to length.) Rolling the sticks on a flat surface will determine which ones are straight. Warped sticks do not roll well. Reject warped and splintered sticks. Be sure that the sticks are exactly the same length; this will give you the option of using either the negative or the positive profile created by the sticks.

Instructions

1. Round off the corners of the fluted plastic sheet (see Figure 3, h) because sharp corners on a measuring tool can damage museum objects.
2. Cut out a 6-mm-wide slot in the piece of fluted plastic using a sharp utility knife and a straightedge (see Figures 3 and 4).
3. Cut a 7-mm slit through the top layer of the plastic sheet (see Figure 3, f).
4. Secure one end of the cotton twill tape into the slit produced in Step 3 (see Figures 5a and 5b) with a sharpened flat wooden slat (e.g. a Popsicle stick), and glue the twill tape into the slit with hot-melt glue. To ensure that the twill tape is long enough to weave down the whole length, measure out at least twice the length of the piece of fluted plastic.
5. Weave the twill tape in between two applicator sticks per flute (see Figures 5c and 6). The tension exerted on the weave end is critical to the proper movement of the wooden sticks and to the stiffness of the resulting gauge. It is best to practice until an even, light tension is maintained. If the correct tape tension is created, the sticks will move easily, but will not fall out during normal use.
6. After the weaving is complete, cut another 7-mm slit through the top layer of the sheet (see Figure 3, g), then insert several loops of tape inside the slit, and glue the end inside the slit as done previously. As an alternative to glueing the tape at the end, run it through one or two additional flutes. This provides a method of increasing the weave tension at a later date if required.



Figure 5a. The twill tape is inserted into the slit using a sharpened Popsicle stick.

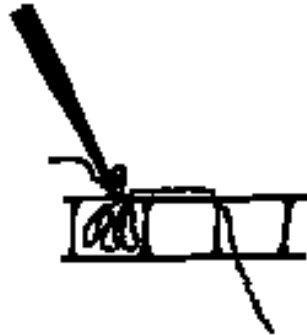


Figure 5b. The twill tape is secured by inserting several loops inside the slit.



Figure 5c. The twill tape is woven between two applicator sticks per flute. **The starting order is important.** Begin the stick weave as shown here (*): under, then over; not over, then under.

Large Gauge

A large gauge can be useful when taking profiles to build supports for large objects such as canoe hulls. Such a gauge can be made by using 8-mm Hi-Core fluted plastic. In this case, it is not necessary to use cotton tape. Instead, choose dowels thick

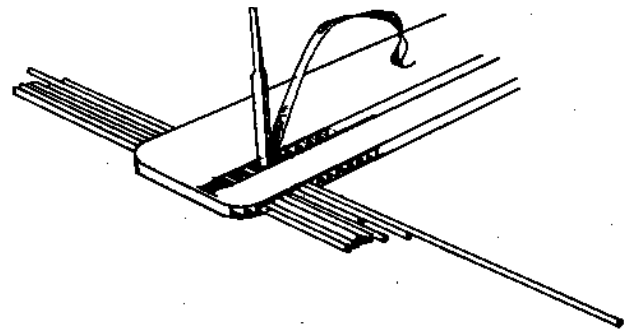


Figure 6. Weaving the twill tape between the applicator sticks into the flutes.

enough to fit the width of the channels. The dowels should slide down the channels easily and smoothly, yet with enough friction to prevent them from sliding out when the gauge is held vertically.

Suppliers

Applicator or swab sticks (hardwood dowels, 2-mm diameter):

scientific supply stores

Fluted plastic (Coroplast, Cor-X, Hi-Core), dowels, hot-melt glue, Popsicle sticks:

hardware stores

Bamboo skewers (if scientific supply dowels are not available, see note in text):

grocery stores

Cotton tape:

fabric stores

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