Understanding Custom Castings

While many variables come into play in determining costs, ultimately the project is a success if end user needs are met at an acceptable price.

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Custom designed aluminum casting can be produced in a wide range of sizes, weights, and shapes for any type of ornamental application. The front end cost of creating the master pattern and the production tooling are an important consideration to the project's total cost and can range from 3 percent to 90 percent of that total. These costs are typically overcome by the customer's desire for a product that is unique and aesthetically pleasing.

This article will outline some of the extremes that we have encountered in custom designed castings. We have completed jobs that range from 1 inch by 1 inch by 2 inches to 48 inches by 48 inches by 2 inches and from weights of .2 pounds to 250 pounds, and from 4 pieces to 10,000 pieces.

These jobs have had tooling charges of 3 percent to 90 percent of the total project cost. In all cases the casting was original and achieved the cost-beauty relationship the fabricator needed to please the customer.

Custom casting projects arrive at the foundry in many forms, including a sketch on an envelope, an engineered drawing, a miniature model, or a full scale model. In each case, the foundry was able to use wood carvers, pattern makers, and shop personnel to create the master patterns and production tooling.

Figure 1 shows some of the small items that we've custom produced. Typically these small aluminum castings are in the range of .2 to .5 pounds. The length of the production run heavily influences the cost of the individual item because the tooling cost must be amortized over the entire run. In these small items tooling costs have ranged from a low of 10 percent for a 10,000 piece run to a high of 90 percent for a 200 unit run. Figure 2 shows some of the unique long baluster castings. The lengths go up to 49 inches and weights range from 3 pounds to 5 pounds. Tooling charges have varied from 3 percent to 50 percent of the total project cost. The 3 percent tooling charge was a result of the fabricator providing a dimensionally correct master pattern for a large, 3,100 piece production run.

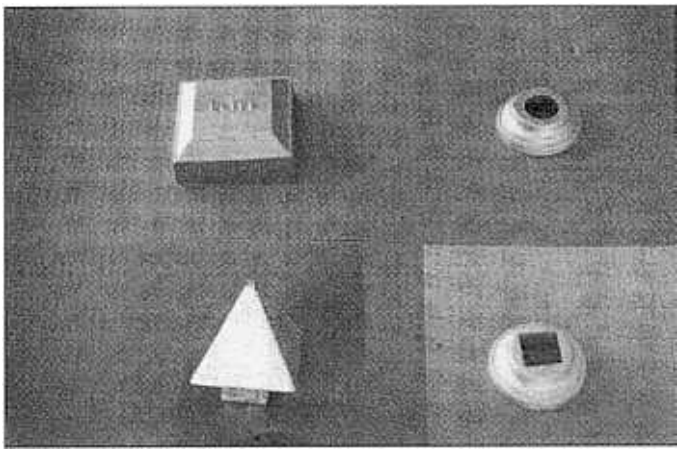


FIGURE 1 shows that even the smallest elements can be custom produced

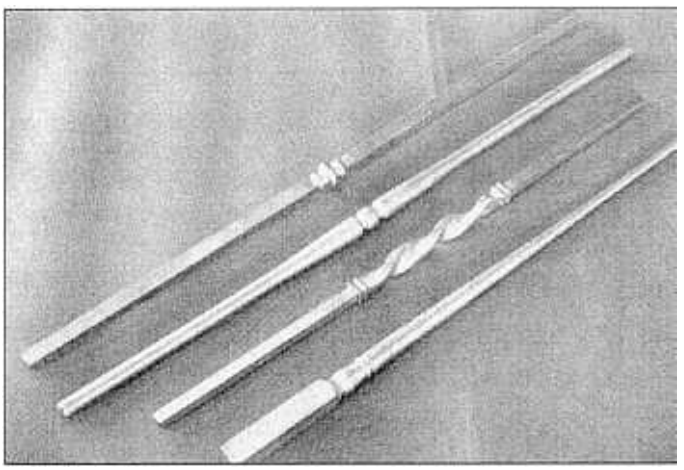
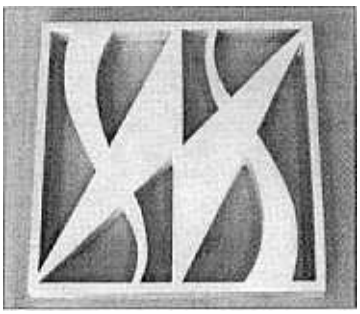


FIGURE 2 illustrates various long baluster castings

The items in figures 3 and 4 are mid-size castings with weights of 5 pounds to 20 pounds,. The tooling charges were 5 percent to 8 percent of the total project. The low tooling charges are again related to the high production run of the Hawaiian hotel pineapple plaque in figure 4 and the simplicity of the contemporary plaque in figure 3. In both of these cases the foundry was provided with an engineering drawing. The wood carver used the drawings to provide an



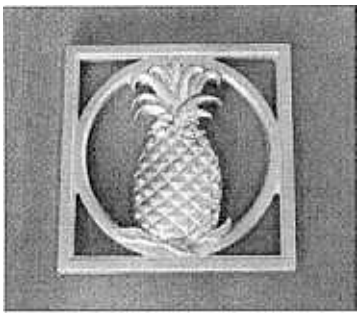


FIGURE 3 (top) depicts a mid-sized casting. FIGURE 4 (below) shows a pineapple used in a Hawaiian hotel project. Because the run was large, tooling cost per unit was low.

oversized dimensionally correct master pattern before the match plate maker created the production tooling.

The picture frame shown in figure 5 is 44 inches by 54 inches and weighs 42 pounds. The tooling charges are only 10 percent on this total project cost because the customer provided a master pattern that was single face and had the correct dimensions, drafts, smoothness, and tolerance.

The sea shell shown in figure 6 and figure 7 first came to the foundry as the 4-inch plaster miniature shown in figure 6. The wood carver used the plaster miniature to extrapolate the size to a 2 foot by 2 foot pattern and a 4 foot by 4 foot pattern. The final 2 foot casting weighed 50 pounds (figure 6) and the 4 foot casting weighed 250 pounds. The unit is shown here on location at a Florida bay front development (figure 7).

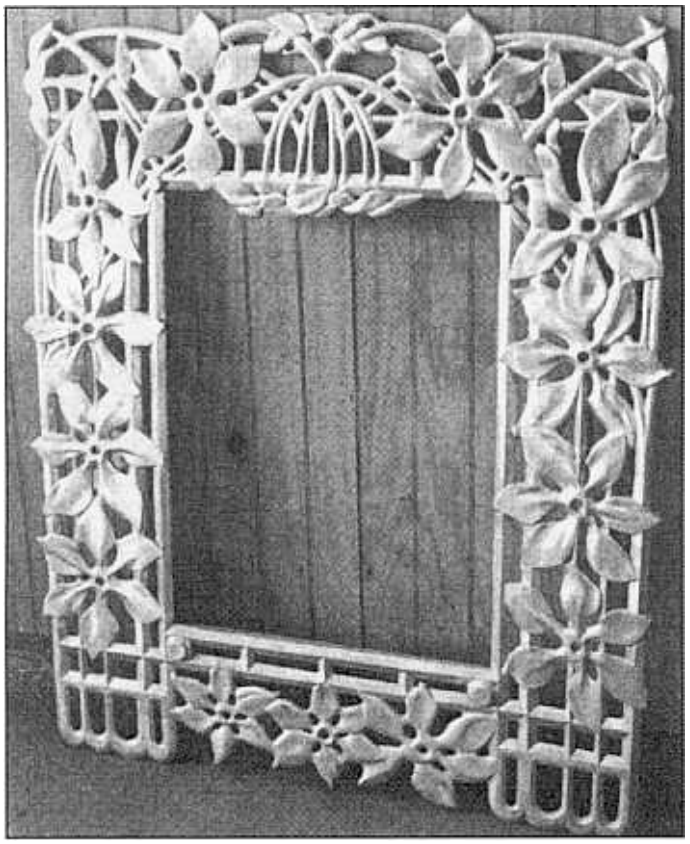


FIGURE 5 is an elaborate picture frame.

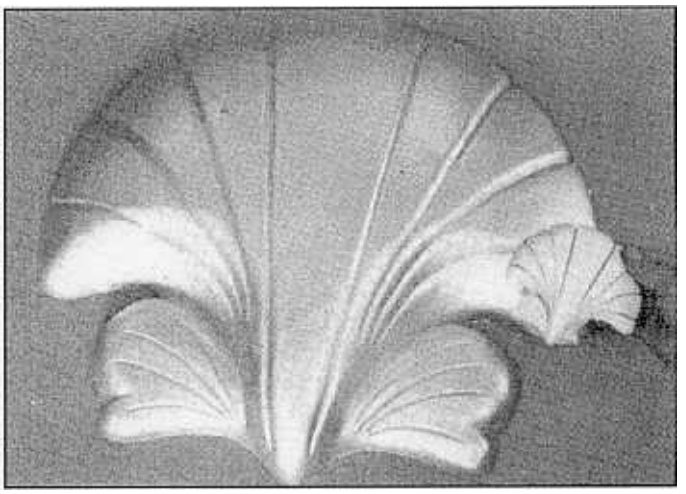


FIGURE 6 shows the plaster miniature and the final product

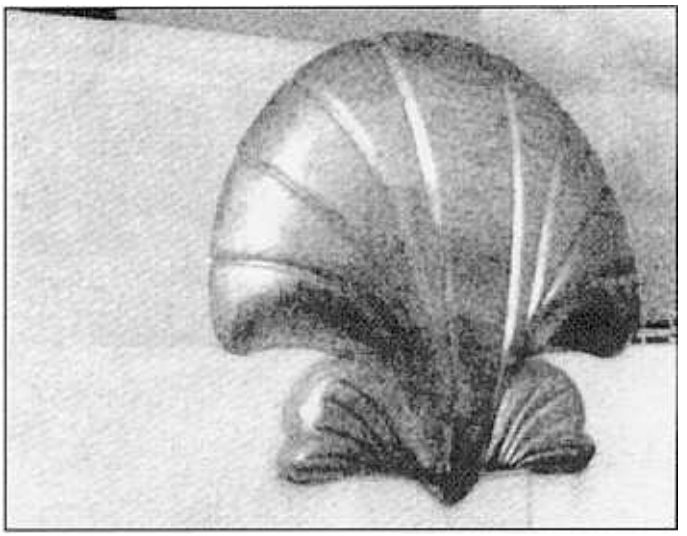


FIGURE 7 shows the complete shell, which was used in a beach front development in Florida

Another option in the quest for uniqueness and originality is to modify existing patterns. Figure 8 shows a common ornamental aluminum bench end customized to accept varying logos and symbols. Typically adjustments can be made by adding to (epoxy) or taking away (machining) existing patterns. Tooling charges for this approach are commonly on the low side because the starting master pattern is already available as a sample of the full size original casting. The concept of adding symbols or letters to existing patterns can give a fabricator a chance to sell a common theme to developers of malls, townhouses, or

parks. In this way, trash containers, park benches, tables, tree grates, and entry areas can easily have a common logo or symbol.

Table I is a summary of the technical data for the items pictured in this article. Each of these aluminum castings started as an original idea and was the creation of a homeowner, architect, or fabricator. In all cases the foundry's job was to help the fabricator implement each custom project to the cost-aesthetic satisfaction of the end user.

An earlier article I wrote in the May-June 1987 Fabricator discusses the technical aspects of "custom-designed aluminum casting patterns." If you would like a reprint of the article, please contact Alloy Casting Co.

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TABLE I

Fig.	Item	Size (in.)	Wt. (lbs.)	Single/ Double Face	Prod. Run Pieces	%Tool Cost
1	3" Fence Top	3x3x1	.25	DF	10,000	10
1	Round Collar	2 dia. x 1	.20	DF	200	90
1	Pyramid Spear	1x1x2	.20	DF	400	56
1	Square Collar	2 dia. x 1	.2	DF	200	90
2	49" Sq.	1x1x49	4.5	DF	240	50
2	49" Rd.	1x1x49	4.5	DF	240	50
2	Twist	1x1x42	2.75	DF	3,100	3
2	39" Sq. Rd.	1x1x39	3.5	DF	248	30
3	Plaque	16x16x2	19	SF	171	5
4	Pineapple	11x11x1	4.5	DF	2,600	8
5	Picture Frame	44x54x1	42	SF	600	10
6	2' Sea Shell	24x24x3	50	SF	6	70
7	4' Sea Shell	48x48x2	250	DF	4	50
8	Bench End	26x30x1	19	DF	1400	5

Source: Alloy Casting Co.

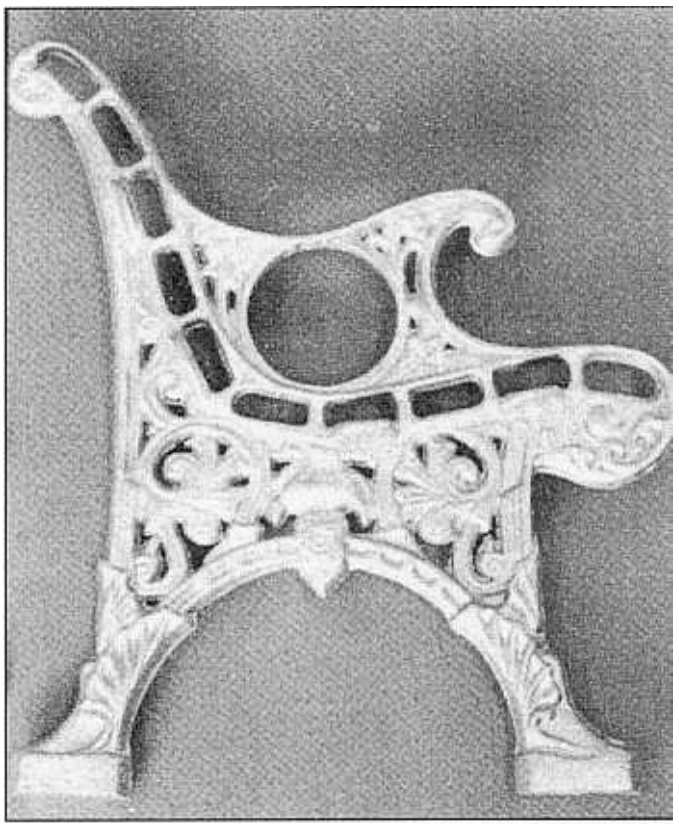

FIGURE 8: A common bench end