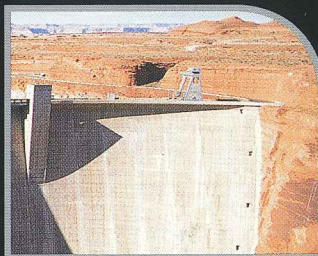
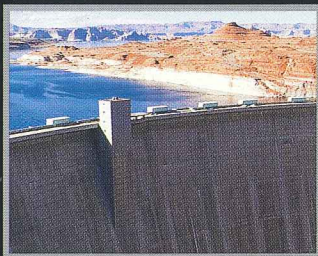
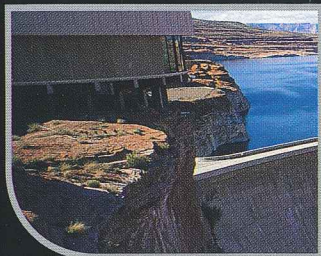


CASTING METHOD COMPARISON

AN APPROACH THAT COSTS YOU LESS YET GIVES YOU MORE



SAND CAST:

Low tool cost, quick tool development, rough as cast finish, selective alloys, unlimited in size & weight, heat treatable and generally low volume. With a special "Hunter" sand cast tooling machine very high volume can be achieved at the expense of the quality of the finished product.

PERMANENT MOLD:

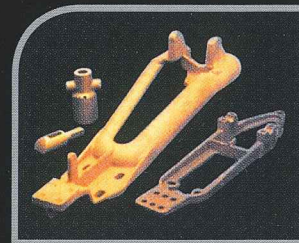
Moderate tool cost, moderate tool development, fine as cast finish, broad alloys, medium in size & weight, heat treatable and generally moderate volume (100-100,000/yr) with long tool life. It also provides a good finish and better metallurgical properties throughout the casting than sand or die-casting.

DIE CAST:

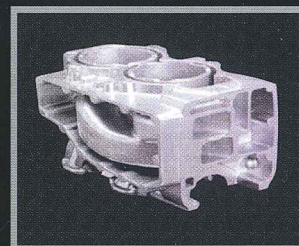
High tool cost, long tool development, best as cast finish, few alloys, small/light part size & weight, not heat treatable and generally high volume. These parts have a nice "shell" but have a porous center, which makes them brittle as compared to other casting methods.

INVESTMENT:

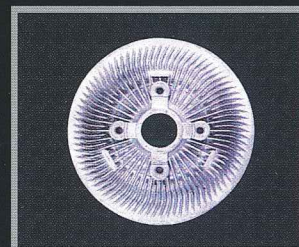
(Lost wax or Precision casting) High tooling cost and development time, strong, good finish, typically for small (<8"), intricate, and highly accurate parts. Generally a consumable pattern is made (of wax, foam, rubber, etc.) and dipped (invested) in ceramic slurry. The coated pattern is baked to set the shell and burnout the pattern. Aluminum is poured into the hot mold and chilled, and then the ceramic mold is shaken free of the part.



Sand Cast



Permanent Mold



Die Cast



Investment

CASTING METHODS TO CONSIDER				
Issues to Address	Permanent Mold	Sand Casting	Die Casting	Investment
Strength	3	1	2	1
Surface Finish	2	1	3	2.5
Complex Shapes	2	1	3	3
Dimensional Accuracy	2	1	3	2.5
Tooling or mold costs	3	3	1	1
Cost per part	3	2	3	1