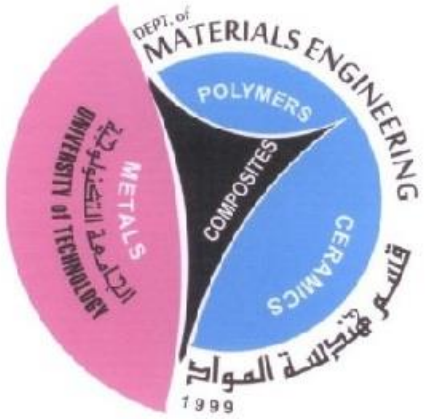


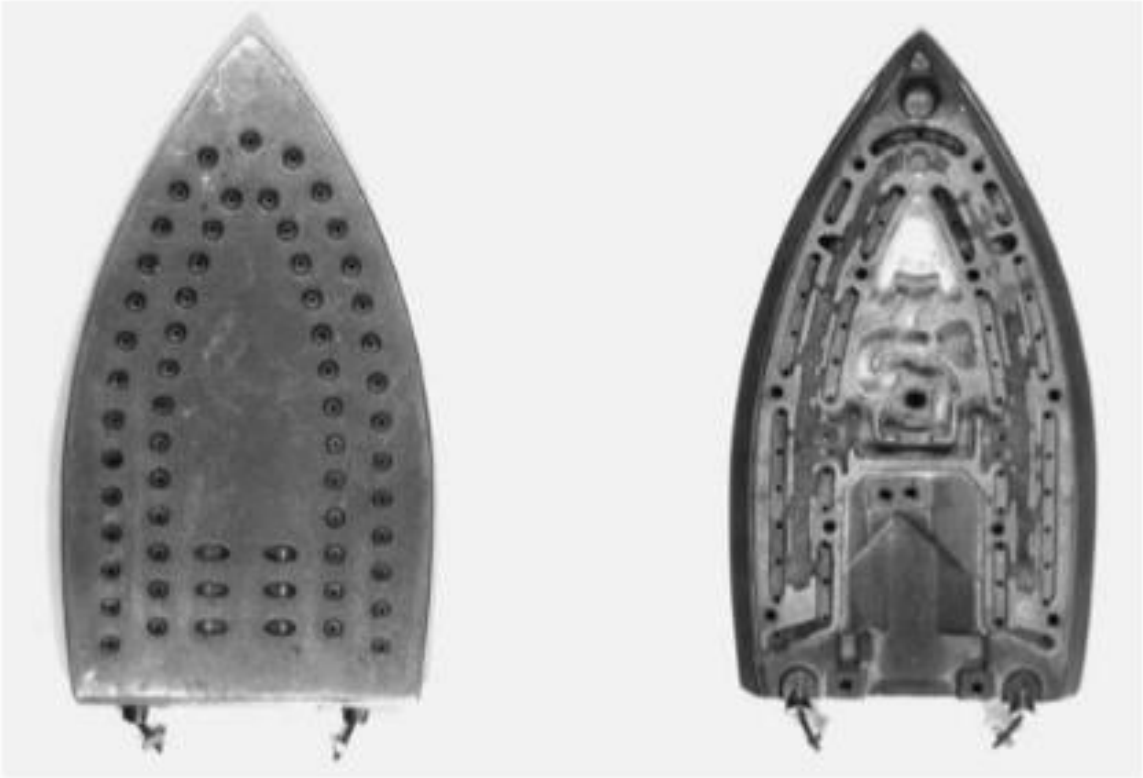
University of Technology
Materials Engineering Department
General Materials Branch

Casting Technology

Fourth Class

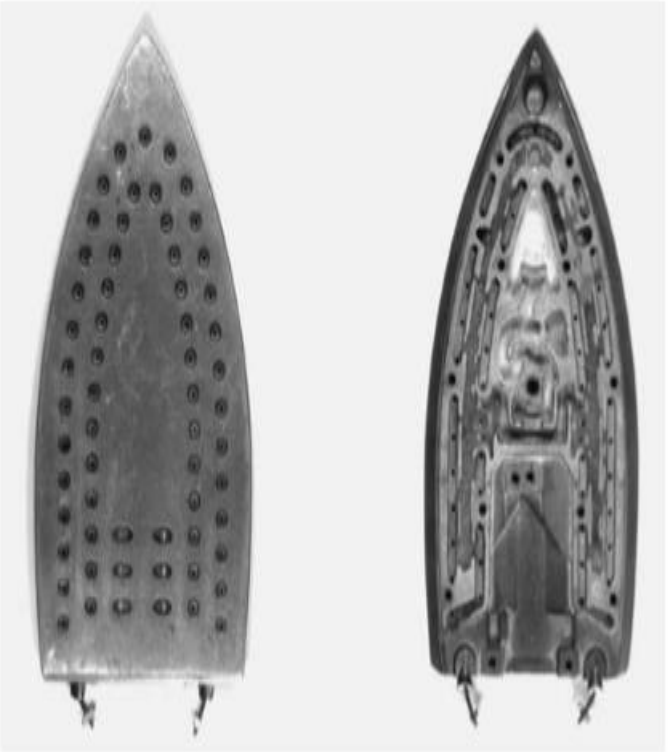
Lecture Four: Case Studies in Casting

Case Study
Baseplate for a Household Steam Iron



Baseplate for a Household Steam Iron

- The item depicted in the figure is the baseplate of a high-quality household steam iron. It is rated for operation at up to 1200 watts and is designed to provide both steady steam and burst of steam features. Incorporated into the design is an integral electrical resistance heating “horseshoe” that must be thermally coupled to the baseplate but remain electrically insulated. (This component often takes the form of a resistance heating wire, surrounded by ceramic insulation, all encased in a metal tube.) The steam emerges through a number of small vent holes in the base, each about 1/16 inch in diameter. There are about a dozen larger threaded recesses, about 1/8 inch in diameter, that are used in assembling the various component



Question for Discussion

1. Discuss the various features that this component must possess in order to function in an adequate fashion. Consider strength, impact resistance, thermal conductivity, corrosion resistance, weight, and other factors
2. What material or materials would appear to be strong candidates?
3. What are some possible means of producing the desired shape? Which would you prefer? Could the heating element assembly be incorporated during manufacture, or does it have to be added as a secondary operation? What are the major advantages of the method you propose

Questions for Discussion

4. Could all of the design features (holes, webs, and recesses) be incorporated in the initial manufacturing operation, or would secondary processing be required? If secondary processing is required, for what features, and how would you recommend that they be produced?
5. Some commercial irons have baseplates for which the bottom surfaces have been finished by a simple buff and polish, while others have a Teflon coating or have been anodized. If your desire is to produce a high-quality product, what form of surface finishing would you recommend?