

# PGA

from page 28

## INVESTMENT CASTING - THE LOST WAX PROCESS

The Lost Wax process of investment casting is a procedure for manufacturing stainless steel heads from molten metal. The finished clubhead is an exact reproduction of the original master die. The process dates back many thousands of years, but has only recently been sophisticated; now it is used in making jet engine blades for the aircraft industry because it can hold great tolerances both by dimension and weight.

The first step is to make a master die. The master die contains all engravings, scoring lines and hosel hole built into

it. Semi-fluid wax is injected into the die. The wax pieces are exact replicas of what the finished stainless steel piece will be. It takes a minute or so for the wax to solidify and harden to the point that it can be removed from the mold. The piece of wax is then dipped in an adhesive, and ceramic sand is sprinkled over the entire area. This dipping process requires a drying time of 24 hours and is followed by a second dipping and sprinkling of sand. Seven dippings are required in all, so there is a total time of seven days from the first dipping to the

final dipping.

This results in a shell with wax inside. This shell is then heated to a point where the wax is melted out. This is the reason the process is called Lost Wax. Molten stainless steel is then poured into this empty shell. When the metal settles, the shell is taken to a cooling area where it is carefully broken away leaving only the golf head. There can be no shell wear because an individual shell for every golf head is produced and then destroyed. (Information courtesy of Northwestern Golf Company, Chicago.)

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