

# From the Workbench The Watch Case: Materials and Methods Part 2

by Theodore Diehl



Case production has been a specialist “industry within an industry” for centuries. Even today, only a handful of manufacturers have their own in-house case-making departments, while the majority are happy to have their cases made to order from outside. Even the term “in-house” refers only to ownership of the case-making factory – the actual operation is usually in another village or at least down the street.



The reason behind this separation is simple: everything to do with cases is in exact opposition to watchmaking. During the case-making process, metal ingots must first be milled to the correct thicknesses, then inserted into machines able to exert tremendous forces upon the metal, literally forcing the material into all the nooks and crannies of the final shape. The harder the material and the more complex the shape, the more steps are required to achieve the final form, with each step taking away less metal and creating more fine detail. Ingots being cut, milled and then pounded into shape with hammer blows do not make good neighbours for watchmakers wanting to preserve their benches from the slightest breeze.

### Shaping up

The shapes of wristwatch cases are as numerous and fantastic as the materials they can be made of, and range from wood to high-tech ceramics, from round to 12-sided, sculpted, modelled, flat or fat. Every year, something new is developed and presented by the industry. But in the end, a few basic shapes remain leaders in the field: the circle, the square and the various rectangular forms such as the tonneau, which has been taking an ever-larger share of the market over the past 10 years or so. This proportion depends on definition though – some auction houses describe the standard Rolex Oyster case as a tonneau-shaped case. They are

technically correct: the lugs have grown so chubby that they melt into the case sides, giving a tonneau-like shape – think the round dial away and you can see what they mean.

### Lugs

Lugs (where the watch-band attaches) are one of the most subtly expressive and comfort-delineating parts of the watch case. Just a small curve or flair in a lug can lend an air of elegance to a simple case. Lugs that quickly “turn down” to the case back will look and feel better on smaller wrists, with the opposite being true for larger wrist types. When choosing a watch to buy, most people are unaware of this aspect of the design, yet it has a large impact on both looks and comfort. Those with finicky wrists on which nothing ever seems to feel right should check for comfortably shaped lugs in combination with preshaped watchbands that fit the watch and wrist more naturally. Together with a curved case design, this will offer the highest degree of comfort for those who do not like wearing something on their wrist.

### Parting of the ways

Cases can be made with varying numbers of components, and the way in which they are constructed is usually directly connected to the necessity (or lack thereof) for water resistance. In a one-piece case, the movement is assembled from the front (bezel) side and the watch glass actually seals everything off. More popular are two- and three-piece constructions (the two-piece case usually has a snap-on back and the movement goes in from behind).

The most common arrangement consists of the bezel with its glass, the case proper and the back, allowing the movement to be inserted and removed in various ways. In addition, this type allows more freedom as regards waterproofing and the construction of different shapes, since the bezel, case, lugs and back can all be milled separately and even given different shapes. Closure in this type is usually via screws or by applying a thread to the case back, which is then screwed into the main body.

### Water resistance

There is nothing magical about keeping water out of a watch. Just like a good piece of plumbing, a watch requires gaskets, sealers, glues and rings to keep water out – it is therefore not surprising that watch designers devote much attention (as well as a lot of worry) to these aspects. Water resistance is also the most incomprehensible aspect of watch manufacture for many owners.

All the gaskets and sealants lose their elasticity during all of those trips into and out of the sauna and the cold pool, in the hot sun at the beach and even over the course of time. The extremes of environment that these watches have to put up with should make this degradation unsurprising. It is not uncommon for the temperature of a watch to be 45°C inside the case in direct sunlight, followed immediately by 9°C as the owner dives into the cold sea. As this happens the case and sealants all contract at different speeds.

Swimming, even if you are not diving in deep water, creates motion, which in turn causes rapid and repeated variations in the ambient pressure on the watch case. For this reason, a watch with 30m water resistance will not even happily survive a swim on the surface of the water. Even 100m-rated watches can suffer the same fate after a few years of regular wear in the shower or sauna. The advantage of the bigger, more robust diver's watches with over 1,000m water resistance is not so much their raw rating as the safety margin that it implies. Three years of abuse can simply be soaked up by the reserve of capability. In this case, bigger is better.

### My kingdom for a crown

In terms of being a cause of accidental damage to a watch's water resistance, the crown takes first prize. The crown is the place where water can most easily get in, since it is a moving part that works through a hole in the case side. Despite all of the internal protective rings avail-

able to it, it can easily be bent by getting caught on a thread from clothing, when the time is being set, during winding, or through a scrape with a wall or doorknob. Such a bend is a possible entry point for water.

The screwed-in variety, used by all the major brands for their true sporting watches, alleviates this problem to a certain extent by making the crown more secure against knocks and blows – so long as it is actually screwed in! Even where water resistance is not an issue, the crown's delicacy is also the reason that some brands – such as Patek Philippe in their Calatrava series and their Travel Time watch – have added shoulders either side of the crown to protect it. ○



**Next Issue:** Part 3 will cover dials, subdials and hands.