Stainless steel moulded to the goldsmith's imagination

Andrew Nyce is a retired metallurgist with a PhD in material sciences. Formerly the owner of an R&D company specialized in high-performance metals and ceramics, he now fashions rings and pendants with Types 304 and 316 stainless steel rods and flat bars.

As we follow the guiding theme of Andrew Nyce's creations, there is no room for doubt: he's a man of metal! Holding a PhD in material sciences and metallurgy, Andrew Nyce founded and headed for 43 years a research and development company in high-performance metals and ceramics, Gorham Advanced Materials Institute (GAMI). Though retired since 2003, Andrew is busier than ever, working with his hands to design and create original jewelry – made of metal, naturally!

New applications for an ancient technique

Andrew Nyce qualified as a goldsmith after receiving a thorough training at the Portland College of Arts (Maine, USA) and carrying out hundreds of hours of practical work in the shop. Thanks to his initial training and career entirely dedicated to metals, he naturally turned to the materials he knew best for his creations: precious metals like gold, silver or platinum, and also industrial alloys processed from powder metallurgy, in particular different grades of austenitic and martensitic stainless steels.

Andrew combines knowledge of modern alloys with a fascination for Damascus steel (see box below), an ancient process, originally from India and later widely adopted in the Middle East, for fabricating high-carbon (1.5–2%) steels into swords, knives, tools and the like. To make his jewelry, he procures Damascus stainless steel in rods and bars made in Sweden by Erasteel Kloster and Damasteel. After machining the steel billets, he subjects the rough shapes – rings and bracelets – to acid etching to obtain the desired effect. Then he circles the rings with gold, silver or platinum. "The molybdenum present in 316 stainless steel," he says, "is a key component of this grade, which forms the best possible combination in terms of corrosion resistance and durability. This is particularly important for bracelets and rings that would otherwise risk oxidizing in contact with skin and detergents."

A growing craft

While he has identified only four or five specialists in his field throughout the world, Andrew Nyce underscores that other applications are developing, for example for musical instruments (saxophones), clasps and leather accessories (suitcases, handbags etc.). Not only have the variety and elegance of his artwork attracted many buyers, they are also inspiring young people to seek training in his workshop.

About Damascus steel

Damascus steel was brought to Europe by the European crusaders, who admired the swords of the Sultan's troops. The original Damascus pattern is obtained by fusing together bits of iron, steel and carbon in a ceramic crucible. Carbides resulting from the precipitation of the high carbon content form lines on the surface of the steel, creating a specific pattern, the famous "watering effect". After they have been twisted, cut or coiled by the smith, the objects obtained can be etched with acid which attacks the hard and soft steels to different degrees, thus creating spectacular coloured motifs of networks and surfaces.

Today, Damascus steel is obtained from powder metallurgy, whereby alternating layers of two different kinds of stainless steel powders (304 and 316) are hot isostatically pressed. This technology allows the welding together of multiple layers, varying from a few dozen to a few hundred, depending on the effects sought. Etching then reveals the distinctive patterns of the layers.
For more information, see **www.andrewnycedesigns.com** and **www.damasteel.com**

Tiered Sea Breeze Damascus Stainless Steel Ring circled with gold or silver. Photo: Andrew Nyce Designs.