



Cut stone samples of
FORMICA Nanogems

FORMICA Nanogems: Giving colour to trendy jewellery



FORMICA Group (Rough Synthetic
Stones Co Ltd) CEO Karen Avakyan,
far right, with his staff

FORMICA Ltd (Rough Synthetic Stones Co Ltd) has a unique business advantage that makes it shine in the jewellery industry. It has developed the technology to produce FORMICA Nanogems, glass-ceramic materials that completely imitate the brightness, colours, hardness and density of gemstones.

Nanogems are the ultimate substitutes for natural gemstones, and because they are relatively affordable, consumers everywhere now have the opportunity to enjoy the simulated beauty of gemstones for a fraction of the cost of genuine stones, according to company CEO Karen Avakyan.

In this interview, Avakyan talks about the origins of Nanogems and their unique properties that make them ideal materials for jewellery manufacturing.

In the last three years, demand for FORMICA Nanogems has been strong. What is so special about this material?

Karen Avakyan: Indeed, we at FORMICA Group were the first in the world to develop and patent this technology, and the first to produce this new colour material for the jewellery industry.

Nanogem or Nanocrystal, which is another patented name of the same material, refers to a class of transparent glass-ceramics. Nanogems chemically are the high-temperature aluminosilicates (the chemical composition is a mixture of oxides: SiO₂, Al₂O₃, MgO, Li₂O). This so-called hybrid material is composed of nanosized (about 10⁻⁷ mm in dimensions) crystals of spinel, sapphirine, cordierite, garnet, quartz and other crystals that are homogeneously distributed in the amorphous matrix. These crystals also occur in nature and can therefore be called created nanosized crystals of naturally existing gemstones – Nanocrystals, Nanogems or Nanogemstones. The analogue of the glass-ceramics in nature is obsidian, an effusive volcanic rock composed mainly of natural volcanic glass with abundant nucleation crystals (crystallites) and microlites.

The popularity of nanogems can easily be explained by its unique physical and optical properties: Hardness = 7 - 7.5; Refractive Index = 1.61 - 1.64; Density = 3.0 - 3.3g /cm³; Melting Temperature 1600 to 1750°C; Lustre and Colour are maximally close to many natural minerals; and homogeneous and even colour. Moreover, their high thermal shock resistance makes them ideally compatible with wax casting technology.



A necklace layout consisting of Emerald green FORMICA Nanogems

What is the origin of this material? How and when did it all start?

Avakyan: In the former USSR, nanocrystalline materials were synthesized exclusively for military and industrial purposes. We managed to find a new application for this material. The first sample of the emerald green Nanogem was produced in Moscow back in 1993 in one of the secret government institutions of the Russian military complex. Already in 1995, I personally handed over one of these samples to Mr. Helmut Swarovski, but then it was just purely laboratory production. As you can see, the path from the laboratory sample to industrial production has been very difficult and time-consuming.

What are your most popular Nanogems in terms of colour? What are the synthetic materials that this material competes with?

Avakyan: Currently, FORMICA manufactures transparent, translucent (opaline) and opaque Nanogems that completely imitate the colours, brightness, hardness and density of gemstones such as emerald; sapphire; Sky, Swiss and London blue topaz; peridot; yellow and golden citrines; red garnet; blue, pink and black spinels; grey and smoky quartzes; and beige-cream turquoise; and aqua blue opal. In total, we have more than 25 different colours and shades. The full range can be found on our website, www.nano-gem.com.

Nanogem competes with almost all imitations of natural coloured gemstones. It is well-established

that the major problem in the production of colour CZ and many other synthetic crystals is the unevenness of colours. The most common materials with uneven colour are: Green, Blue, Brown, Amethyst and other CZ; Synthetic Blue Sapphire and many others. In addition, green and blue CZ has excessively high gloss (for natural emerald and sapphire) and is not suitable for wax setting technology. In contrast to the crystal, the glasses are quite uniform in colour, but lack of lustre and low hardness do not make them suitable for wax setting.

As you can see Nanogem advantages are obvious: Colour uniformity over the entire volume, relatively high hardness and density, colour and lustre that are as close to natural analogues, and the ability to use in wax setting.

How and where do you sell your products?

Avakyan: Currently, we prefer not to sell rough materials, but cut stones, produced by our partners. Preciosa a.s. (Czech Republic), manufacturer of high-precision machine-cut fashion jewellery stones, is our long-standing partner. We have been supplying rough material to them for many years. At the same time, we sell their products in Thailand and Russia. We also cut big fancy-shaped stones with the help of our partners in China, Thailand and India. Sales of Nanogem cut stones carried out through our own main sales offices in Bangkok (Rough Synthetic Stones Co Ltd) and Moscow (Formica Ltd), as well as through our dealers and partners in Hong Kong, China, Italy, Russia and Armenia. **JNA**