



**TWCO**

## The materials used for your **TWCO**.

Reading through watch specs often makes you wonder what it means and why a specific material is used. Sometimes it's nonsense and sometimes just incomprehensible jargon. Time for some education!

### About the Crystal

Most commonly used in the watch industry are Sapphire Crystal and Mineral Crystal, both have their Pro and Cons as you see here below.

### Sapphire versus Mineral crystal.

Sapphire and mineral glass are both tested by dropping a 2.25 ounce (approx. 63 grams) steel ball on a representative crystal from varying heights until the crystal breaks and the total amount of energy needed to break the glass can be calculated. According to ISO 14368, Part 3, mineral glass must absorb 1600 to  $2100 \times 10^{-4}$  Newton-Meters, sapphire is only required to 800 to  $1800 \times 10^{-4}$  NM. So sapphire can be more brittle

You can hardly tell the difference between regular mineral crystal and sapphire crystal, except when you attempt a scratch test. Mineral crystal is break resistant but scratches relatively easily; whereas sapphire crystal measures very high at 9 on the Mohs scale (hardness), a rating measure of the relative hardness of various materials. Watches are often marked as scratch resistant when fitted with sapphire crystal.

### AR (Anti-Reflective) coating.

First of all, sapphire crystal is more reflective than mineral crystal due to its higher index of refraction. (1,8 compared to 1,47). Applying one or more layers of AR coating will limit this reflection to a very low level. Very often, lines and marks on sapphire crystal are mistaken for scratches, which is actually the scratched AR or just AR coating fading off after time. Obviously an AR coating on the outside makes the crystal look vulnerable (the sapphire crystal is highly scratch resistant but the coating itself is NOT).

### Pro and Cons.

Sapphire is extremely scratch resistant and this kind of crystal will look like new for years. However, its hardness makes it easier to shatter than mineral crystals. This is usually only an issue if you wear your watch while engaged in very physical activities. In that case, you may want to look for a domed mineral crystal. The major drawback of mineral crystals is that they scratch much easier than sapphire crystals. Some say they also look "cheaper" in the way they reflect light.

### Nice to know.

A further distinguishing characteristic of sapphire vs mineral is how the droplet behaves if the watch is tilted off the horizontal. On the mineral glass the droplet will cling and elongate as it starts to drip, leaving a streak. On the sapphire, the droplet remains a ball shape. You can tilt the watch and rotate it and the droplet looks like a little clear ball rolling around on the surface of the crystal.

### Our choice.

**A TWCO is fitted with Sapphire Crystal and has a double AR coating.**