CASE STUDY

HITACHI
Inspire the Next

X-MET8000 Expert

OBJECTIVES

- Quality control of metals, plastics and glass in production and R&D
- Ease of use for many users

RESULTS

- Determines the chemical composition and alloy grades
- In-house testing and research

Suunto trusts the X-MET8000 Expert to deliver quality control at every stage of process

High product quality, durability and aesthetics of end products demand high quality and correct raw materials. For Suunto, one of the leading manufacturers of sport watches, diving computers and orienteering compasses, the wrong materials in components can cause issues in product assembly during production. That's why they turned to Hitachi High-Tech's X-MET8000 Expert X-ray fluorescence (XRF) handheld analyser when they needed to investigate why during the laser printing process the laser print on the back of watch cases was by way of exception inadequate both in terms of quality and finishing, hence not meeting up to Suunto's strict quality standards. Now the X-MET is used daily at different phases of the production process to manage quality control.

RELIABLE RESULTS WHEN YOU NEED IT

Suunto was founded over 80 years ago in Finland, where its headquarters and production are still located. Suunto's products are used in extreme conditions from mountain tops to 200 metre depths where 20 bar pressure is present. In extreme conditions, it's critical that the materials meet the specifications from several perspectives including RoHS (Restriction of Hazardous Substances) and REACH (Registration, Evaluation, Authorisation and Restriction of Chemicals) safety regulations which define prohibited materials or limits to materials which may cause harm at high levels.

> **"We use Hitachi High-Tech's handheld X-MET XRF analyser when we need answers immediately. It's a fast way to get trustworthy results without a third-party test laboratory"**

The plastic parts of Suunto sport watches are made by mixing different kind of additives to a basic plastic matrix from which the parts are then injection moulded. Additives added to the matrix include different kinds of metal salts, which give the plastic specific properties such as colour, durability and laser printability. To achieve certain property, the amount of the metal salt based pigments needed in the plastic matrix can vary only a little. Too little pigment and the property doesn't exist or it's too weak. Too much, and the plastic matrix can become fragile or lose some important properties such as strength.

A few years ago, during the laser printing process it was noticed that the laser print on the back of the watch cases was uneven and quality was inadequate. On closer inspection, the cases didn't reveal what was wrong and there weren't any variations on the cases that could be noticed by an eye.

Suunto worked with Hitachi to analyse the cases with the X-MET for a more in-depth investigation. The X-MET results showed that the amount of pigments needed for laser printing were lower than in those cases where the laser print was even and good quality. It could also be seen that the pigments were uneven in the case matrix, which indicated that the injection moulding process needed to be adjusted to provide uniform quality.

Suunto's watch cases are manufactured by a subcontractor. Based on the findings with the X-MET, the subcontractor's injection moulding process was adjusted to get their final product requirements to meet Suunto's strict quality requirements.

VERSATILE ANALYSIS WITH THE X-MET8000

The X-MET8000 has been a part of the Suunto's analysis equipment for some years. The X-MET8000 is widely used in in-house testing for different applications in multiple departments. As Suunto's products have metal, plastic and glass components, the X-MET8000 enables versatile analysis of all components. That's why the X-MET8000 is used in different phases of production, from incoming quality control, positive material identification (PMI) to research and development.

For metal components, the X-MET8000 is an easy tool to check that metal grades are to specification. Also, if there's a metal coating, it can be recognised. For plastic components, the X-MET8000 can analyse colour pigments and other metal additives. Colours are first visually inspected and measured by colour meter. The correct colour can also be verified by analysing the fingerprint of the colour pigments and comparing that to the master sample's fingerprint. Also RoHS screening can be done for plastic and metal components.

The X-MET8000 is also used to separate mineral and sapphire glass from one another due to their different elemental composition to avoid mix-ups. Visually the glasses look the same, but they have different durability properties and that's why they are used in different sport watch models.

With the X-MET, Suunto has effectively and efficiently managed the quality of their products right through the production cycle, from raw material quality assurance to limiting variations in material composition during production. As Tuomo Nousiainen, Quality Manager at Suunto Oy, concludes, "We use Hitachi High-Tech's handheld X-MET8000 Expert when we need answers immediately. It's a fast way to get trustworthy results without a third-party test laboratory."

If you would like to see the X-MET8000 analyser in action visit www.hitachi-hightech.com/hha or email contact@hitachi-hightech-as.com to book a demo.

X-MET8000 RANGE

Our range of handheld XRF analysers, the X-MET8000 series, delivers the speed and performance required even in the most demanding applications. Suitable for all analysis needs from scrap metal analysis, precious metals and jewellery analysis to positive material identification (PMI) for inspection and manufacturing applications, and regulatory compliance screening.

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