

## High-tech Textiles for a Material World

**Voice-over:**

Five hundred kilometres north of the quake's epicentre, in the countryside near Venice, engineers are weaving a tangled web of the 21st century.

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The European research project Polytect is working on the multifunctional textiles of the future. These materials are intended to protect structures during - or after - earthquakes, landslides and other natural disasters. With sensors built in, they'll be able to see, hear and smell trouble before it happens.

**Thomas B. Messervey:**

The idea is simply to make structures more like the human body, and to build a skin for the structures. By assessing pairings of sensors, we can build a relationship with the structure over time. And to ideally conduct what's called 'structural health monitoring' which, er, hopes to answer four questions. Those four questions are: Is there damage present? Er, where is that damage on the structure? How severe is that damage? And then lastly what does this damage mean? What is the life of the structure after this damage has occurred?

**Voice-over:**

And they're already well advanced with some prototypes.

**Thomas B. Messervey:**

So here is a very nice example of a textile that's intended for a masonry structure. As you can see, the glass fibres go in many different directions, because the stresses and the loads in a structure go in many different directions. And here we have a fibre-optic cable that we can send light through to assess the health or the status of a structure. For our geotechnical products, we can use a filter-type structure or we can use a grid-like type of material to both strengthen the soil, or to filter water and still be able to pass light through our sensors to interrogate whether or not that soil is moving.

**Thomas B. Messervey:**

Another very interesting application are these 3-D rope-like structures with fibre-optic cables inside and we can make these fibre-optic cables sensitive to chemicals. So using this technique, we can detect whether or not a chemical is present or not in a landfill, and the temperature of that landfill.

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