

Øje for, by Kunstfabriken. Outdoor art at the building site of Copenhagen metro. Organic solvents present in cleaning agents, coatings and adhesives dissolve plastics. Newer artworks containing plastics thus cannot be restored using the same methods as for older works.



Cultural heritage to be resc

There is a big risk of many recent artworks not still being there in a hundred years. Plastics materials used in paintings and sculptures age rapidly, and restoration is not possible using the same methods as for older works.

During a three-year EU project the problem is to be tackled using new nanomaterials and nanotechnology. AkzoNobel is taking part together with researchers from universities and museums throughout Europe.

The Nanorestart project (Nanomaterials for the restoration of works of art) began this June, and the EU is investing 85 million Swedish kronor as part of the research program Horizon 2020. Around 30 research groups are involved in the project, which is being coordinated by the Centre for Colloid and Surface Science at the University of Florence, Italy.

Nanorestart's objective is to use nanotechnology to produce customized, sustainable and non-damaging materials to conserve contemporary artworks. New tools are to be developed for controlled cleaning, and to strengthen and protect the surface of materials.

"The expertise of most of the researchers taking part in the project is in the field of surface and colloid chemistry," says Professor Krister Holmberg, Chalmers University of Technology, Gothenburg.

Collaboration already established

Nanotechnology is one of Chalmers' areas of strength, and its collaboration with AkzoNobel is well established.

Chalmers have already started using the EU grant for Nanorestart:

"We are in the progress of appointing three post-doctoral students who are to work on solutions to the sub-project for which Chalmers is responsible. In that sub-project we will be collaborating closely

with AkzoNobel's researchers," says Krister, who is a member of PPC's Scientific Board.

The participants in the project include the Tate in London, the Rijksmuseum in Amsterdam and the National Museum of Denmark. There is such interest in the EU project that universities and museums in Brazil, Mexico and the USA are also taking part, at their own expense.

An obligation to preserve

"Museums have an obligation to look after our art and cultural heritage for future generations, but it's not so easy with objects made of plastics. We also have an ethical responsibility not to damage the artwork. We can't use just any material for the restoration process," says Yvonne Shashoua, Senior Researcher at the National Museum of Denmark.

She confirms that plastics pose a particular problem:

"It was not until the mid-1980s that museums understood that nothing made of plastics will live for ever. Before that, even the plastics industry was in denial. Plastics may last for a long time from an environmental standpoint – but in terms of art they have a short shelf life."

The museums' remit will be to test the new nanomaterials that are to be produced. Yvonne finds it positive that two companies (AkzoNobel and the French company Arkema) are involved in the project.



ued using nanotechnology

“This is a great partnership. Most industrial scientists make nanomaterials for other areas. I’m sure AkzoNobel’s normal customers are not museums. We now want to apply their innovations to a new area, so as to preserve art for our customers – the public,” she says.

Non-invasive methods of cleaning

One of the challenges the project faces is finding non-harmful methods of cleaning art that has been vandalized with graffiti, e.g. ‘tags’.

“It’s a big problem for us. If they use a spray paint that contains the same solvent as the painting, then we will damage the original outdoor painting, sculpture or building surfaces in trying to remove the graffiti. We need a new method that will selectively remove the tags,” Yvonne explains.



What happens to the plastics in artworks when they age?

“The plastic cracks, and we need to find a way of filling in the cracks – rather like a skin cream that evens out facial wrinkles. But when we restore various artworks we must not change their appearance because the artists’ intentions must be respected. We cannot cover the surface with something that makes them shinier, for example. It is thus important to test all the new materials,” says Yvonne.

Krister Holmberg from Chalmers explains what he sees as the big challenges the project faces:

“The challenge is to produce concrete solutions in a short time and test them together with museum conservators. But I think it’s possible to find new solutions. The ideas already exist, and we can apply much of what AkzoNobel PPC has

already done in the field of silica technology.

Prof. Michael Persson, PPC’s Innovation Manager, is enthusiastic that AkzoNobel has been selected as a participant in Nanorestart:

“Nanotechnology can be used for many excellent purposes, and the issue here is to preserve the European cultural heritage for posterity. We will be calling on the help of more parts of AkzoNobel – not just PPC,” he says, and adds:

“This is an incredibly exciting project involving an unusual mixture of participants, including chemists, materials researchers and museums.

The participants in Nanorestart will be gathering for one major conference a year. The next one will be in June 2016, at Chalmers in Gothenburg.”

Monica Rossing

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