

## Plastic Components in Modern Buildings. Researchers and Practitioners Discussed History and Conservation at TU Delft

isc/Technology Seminar  
TU Delft, the Netherlands, 23 October 2017

The degradation of plastic building components — and claddings in particular — is an increasing challenge in heritage buildings. Research and the development of appropriate strategies for the architectural conservation, restoration and replacement of synthetic building components is still in its infancy. This was reason enough to stage a one-day international seminar, *Plastics in Modern Movement Buildings. Conservation and (Re-)design of Synthetic Building Components* focusing on the exterior applications in the building envelope and as prefabricated elements. The seminar took place on October 23<sup>rd</sup>, 2017, at the Faculty of Architecture and the Built Environment at TU Delft, the Netherlands.

The event was organized in collaboration between the *docomomo* International Specialist Committee on Technology (isc/τ), *docomomo* Netherlands and the Section of Heritage & Architecture of TU Delft. The seminar brought together material scientists, art conservators, architectural historians, heritage specialists, designers, consultants and students. Wido Quist, hosting Chair of *docomomo* Netherlands, welcomed participants from ten different countries, and particularly the attending experts from the plastics industry, before introducing a range of Dutch

examples. He proposed the results of the meeting be published as the 14<sup>th</sup> *docomomo Preservation Technology Dossier*.

The morning session “Exploring the Field” was moderated by Uta Pottgiesser (UAntwerp), Chair of the isc/τ. She gave an overview of the aspects for consideration in the conservation and (re-)design of synthetic materials: “We will highlight the history and the impacts of petroleum-based materials: architecturally in aesthetic and constructive terms, globally and locally related to urban and economic development, and technically taking into account the chemistry, manufacturing and sustainability. It is important to develop strategies as an interdisciplinary approach.”

The architect Wessel de Jonge, TU Delft Chair of Heritage & Design, kicked off with an overview of synthetic building components since the early 20<sup>th</sup> century, referring to Anthony Walker’s seminal research of the 1990s. He explained how early thermoset and thermoplastic building materials were primarily fit for interior use. In order to promote the use of plastics several producers developed prototypes of single family houses, such as the Monsanto “House of the Future” in 1957.

In her talk on “Petroleumsapes”, Carola Hein, TU Delft Chair of History of Architecture and Urban Planning, showed how the international petroleum industry has been instrumental in the promotion of synthetic building materials in their search for new markets. Pointing at various social parameters such as the implications of the employment of women in the war industry, requiring efficiency in housekeeping and easy-to-clean materials, she claimed that the introduction of plastics was driven by stakeholders from the industry rather than by consumers and designers.

The conservation of plastics in art works was presented by Thea van Oosten, who has worked as a senior conservation scientist with the Dutch National Heritage Agency RCE. She has been involved in the conservation of many plastic art objects coping with various material configurations. She underlined the importance for the conservationist to have detailed information about the original manufacturing of the object, as this has a key impact on the material properties and specifications. Minor components such as gaskets and sealants can pose particular conservation challenges.

In the afternoon a series of case studies presented various conservation approaches, new synthetic components and work methods, mostly dealing with glassfiber reinforced polyester (GRP). Sami Supply, conservator in Helsinki, presented the preservation of two “Futuro” holiday homes of the 1960s, one preserved as an outdoor object and the other as an artefact for a museum in Rotterdam<sup>1</sup>. The company Poly Products of Werkendam (NL)



01 The restored Futuro featuring serial number 001 resides in the outdoor collection of the WeeGee Museum in Espoo, close to Helsinki, Finland. © Wessel de Jonge.



02 Poly Products' director Jan Schrama show how it's made during the factory visit that was part of the seminar program. © Wessel de Jonge.

03 Benthem Crowwel Architekten, Stedelijk Museum extension, Amsterdam, The Netherlands, 2014. It features an innovative synthetic skin that is almost seamless. © Janne Linders.



05 Nio Architects, bus station, Hoofddorp, The Netherlands, 2003. The polyester skin was made on site by Poly Products. © Wessel de Jonge.

04 Architect Mels Crowwel during the seminar excursion, explaining the design challenges related to the 2014 extension of the Stedelijk Museum in Amsterdam. © Wessel de Jonge.



has been involved in the preservation of the latter, which is actually the first prototype. The firm's director Jan Schrama explained the manufacturing of plastics in practice and gave insights into the production processes in the factory that was visited the next day<sup>2</sup>.

The conservation of the GRP façade panels of the Herman Miller Factory in Bath was the focus of research for Elyse Howell-Price of Nicholas Grimshaw architects (UK). Introducing a methodology for mapping anomalies and defects in the GPR components she underlined the importance of the orientation towards the sun and the impact of shading by neighboring buildings and trees. The project is aimed at the preservation of the panels rather than the replacement thereof<sup>3</sup>.

Pamela Voigt, conservation consultant with BAKU – *Bauen mit Kunststoffen* – in Germany, advocated her approach of "Saving Yesterday's Dreams". As a practicing architect in Leipzig she engaged herself with the refurbishment of some remaining copies of the Feierbach House, another late 1960s prototype of which five were actually produced. Her inspiring talk offered an insight in the careful way in which these structures have been repaired and polished by hand and brought back to life<sup>4</sup>.

The innovative synthetic building skin for the recent extension of the Amsterdam Stedelijk Museum was discussed by Mels Crowwel of Benthem Crowwel Architekten. In the design phase much attention has been given to the future maintenance and preservation of the material qualities over time. A particular challenge has been how to deal with thermal expansion while the skin was designed to feature few dilatation joints<sup>5</sup>.

"The conference covered quite well how the rise and fall of plastics in modern buildings can be explained", concluded Wessel de Jonge after moderating the afternoon sessions. "After the mid-1970s oil crisis, plastics became expensive and most demonstration houses were taken off the market, while the use of plastics in buildings in general dropped as well. This explains why few such buildings survived and there is little experience with their preservation. The seminar covered a variety of aspects addressing 'resilience' both globally and in terms of urban, local and cultural development, as well as the technical and economical aspects. It was good to see how intensively designers, researchers and students exchanged knowledge and experiences on the topic."

The next day's excursion included a factory-visit to Poly Products at Werkendam; the

Hoofddorp bus station by Nio Architects, made by Poly Products (2003); Aldo van Eyck's 1960 Orphanage, restored by Wessel de Jonge Architects (2017); and the Amsterdam Stedelijk Museum Extension by Benthem Crowwel Architekten for which Holland Composites supplied the synthetic finish (2014).

A second seminar on plastics in 20<sup>th</sup> century architecture will be organized on March 5<sup>th</sup>, 2018 at the University of Antwerp, Belgium, focusing on interior applications. Entitled *Plastics in Modern Movement Interiors. Conservation and (Re-)design of Synthetic Finishes, Furniture and Products*, it is a collaboration between **docomomo** Belgium and the **docomomo** ISCs on Interiors (ISC/I) and Technology (ISC/T).

Uta Pottgiesser and Wessel de Jonge

#### Notes

- 1 <https://www.kultuurriespoo.fi/en/node/906>.
- 2 [www.polyproducts.nl](http://www.polyproducts.nl).
- 3 <https://grimshaw.global/projects/herman-miller-factory>.
- 4 <http://kunststoffbauten.de/de>.
- 5 <http://benthemcrowwel.com>.