

Article

**Polymeric materials in art and design: an Italian interdisciplinary experience**

**Cecilia Cecchini<sup>a,\*</sup>, Alice Hansen<sup>b</sup>**

<sup>a</sup> Professor of Design at “Sapienza” University of Rome and Scientific Curator of the *Plart Foundation*, Naples, Italy; [cecilia.cecchini@uniroma1.it](mailto:cecilia.cecchini@uniroma1.it)

<sup>b</sup> Contemporary Art Conservator, Department of Research and Conservation of the *Plart Foundation*, Naples, Italy; [fondazioneplart@gmail.com](mailto:fondazioneplart@gmail.com)

\* Author for correspondence

(Submitted: 1 April, 2014; accepted: 31 March, 2014)

**Abstract:** The *Plart Foundation* is a private museum entirely dedicated to synthetic materials. The main objectives of the institution are the diffusion of the history and the contemporary culture of plastics, the promotion of a conscious use of plastics and the diffusion of conservation practices regarding plastic heritage. The Foundation exhibits one of the richest collections of historical plastics: more than 1800 artefacts comprising jewellery, toys, electrical appliances, furnishings, dating from the late 19<sup>th</sup> Century, up to contemporary design objects and artworks. The traditional museum activities are accompanied by temporary exhibitions of contemporary designers and artists whose common denominator is the use of synthetic polymers; intense educational projects, where the chemistry of synthetic materials and the concept of eco-sustainability are explored by means of advanced multimedia technologies; scientific research activities on the preservation and conservation of the historical and contemporary collections.

**Key words:** Plart Foundation, thematic museums, plastics art, plastics design, conservation of plastics heritage, synthetic polymers, biopolymers

**1. Introduction**

The *Plart Foundation* was inaugurated in 2008, in a historic building in the centre of Naples.

*Plart* (an acronym for Plastics + Art + Research + Technology) is often referred to as the *Plastics Museum*, since its original aim was to exhibit one of the world's largest collections of objects made of polymeric materials. Nevertheless, the definition of “museum” - in its most traditional acceptation - is misleading

because the Foundation has expanded and diversified its activities over the years and today it combines traditional exhibition activities, specialist training, research on eco-sustainable design and - more recently - on the conservation of plastic artefacts. In short, the main objectives of the *Plart Foundation* are to spread the knowledge about the history and the contemporary culture of polymeric art and design, to promote a conscious use of plastics and to study conservation practices regarding plastics heritage.

*Plart* is a complex multi-functional organization representing a unique one on the international scene, and even more in Italy. It can be regarded as a “cultural enterprise” addressing different areas of study and characterized by an interdisciplinary approach to the investigation and the promotion of plastic materials, in line with the recent dissolution of boundaries between *design* and *art* - especially *applied art* - and between *handicraft* and *small-scale industry*, which is deeply affecting the original peculiarities of each sector. *Plart's* unique exhibition and research approach led to the creation of an international network of collaborations. Indeed, internationalization and knowledge exchange are the key objectives of the institution. Such fruitful interdisciplinary synergy is successfully used to carry on not only traditional museum activities but also exhibition, educational and research projects. Only rarely such activities merge into a single institution. And what is even more remarkable is that the *Foundation* is not supported by public institutions and, moreover, it operates in a fascinating but extremely difficult city like Naples. Despite the difficulties, over the course of a few years the *Plart* managed to be included in the network *Rete dei giacimenti del design* of the *Triennale Design Museum* – the most important Italian museum of design, located in Milan - and to be listed as a *Public Interest Museum* by the *Campania Region*.

## 2. The permanent collection

The heart of the *Plart Foundation* is a permanent exhibition of one of the richest collections of historical plastics - comprising more than 1800 artefacts ranging from jewellery, toys, electrical appliances, furnishings (cf. Figure 1, 2, 3, 4, 5) dating from the late 19<sup>th</sup> century up to

contemporary design objects and artworks. These were collected in more than 40 years by Maria Pia Incutti, founder and president of the *Plart Foundation*, with the collaboration of Nunzio Vitale <sup>[1] [2] [3]</sup>. The selection of objects shows the evolution of plastic's technology and material identity: from the first semi-natural plastics to the synthetic polymers that changed our everyday life, till the recently conceived bio plastics; from common use objects to innovative author design and contemporary art.



**Figure 1.** Some objects of *Plart's* collection © *Fondazione Plart*.

The collection doesn't follow a precise classificatory criterion but it has been put together over the years, following the collector's intuition, looking for items in small street markets, shops and auctions from all over the world. The items were selected by shape, design, colour, material, aesthetical and historical meaning. This painstaking work led to the creation of a cross section of the material culture, which represents a testimony of what society has accomplished with the large family of plastic materials over the decades.

The collection is very rich and heterogeneous. It includes objects made

of *bois durci*, vulcanized rubber, celluloid, phenol-formaldehyde resins, urea-formaldehyde resins and so on, and objects manufactured from the most common types of plastics during the '50s and the '60s: from the first historical plastics to contemporary objects - principally conceived by anonymous designers who were able to make the most of the properties of those materials - to objects from the past that show a contiguity between plastics and kitsch.



**Figure 2.** The permanent exhibition © Fondazione Plart (photo: Roberto Pierucci).

The collection comprises several works made by famous designers - e.g. the Castiglioni brothers, Marco Zanuso, Gaetano Pesce, Enzo Mari... - who have contributed to the worldwide popularization of the *Made in Italy* design. Sometimes they are unique examples such as the *Tavolo-prato* designed by Franco Mello.



**Figure 3.** La Sala della Celluloide (the Celluloid Room) © Fondazione Plart.

There are also some prototypes of objects which were later mass-produced, original large-sized works made of polyurethane flexible foam by the historical Italian brand *Gufram* in the '60s and '70s, such as *Pratone*, the informal armchair designed by Giorgio Ceretti, Pietro Derossi and Riccardo Rosso, which features huge, flexible artificial stalks that have now become stiff, vitreous and extremely fragile; *Capitello*, the chaise lounge in the shape of an inclined column capital designed by Studio 65, the coat rack *Cactus* designed by Guido Drocco and Franco Mello, the chair *Farfalla* and the rug *Pavé Piuma* designed by Piero Gilardi [4].



**Figure 4.** The permanent exhibition © Fondazione Plart (photo: Roberto Pierucci).

These objects represent a meeting point between design and pop culture, made possible thanks to the new and soft synthetic materials.





**Figure 5.** The permanent exhibition © Fondazione Plart (photo: Fabio Donato).

The objects, as a whole, record the transformation of tastes and customs of the society, along with the birth and development of new production technologies – like thermoforming and moulding – and the transition from experimental handmade manufacturing processes to the ones concerning the big industry.

A few contemporary artworks are also included in the permanent collection, such as *Crown Jewels*, the evocative installation that Tony Cragg composed using plastic waste collected off Naples' seafront, arranged into a huge crown that is majestic if seen from afar, but unsettling when, looking closer, one can sense the lifeless shards composing it (cf. Figure 6); the two site specific "shelves" by the conceptual artist Heim Steimbach, who selected for this work six items from the Plart's collection (cf. Figure 7); the series of *Ballerine*, the colourful fluctuating figures made of polymethylmethacrylate sheets by Riccardo Dalisi, reinterpreting the popular *Compassi di latta*, i.e. the fictional two-legged figures that are figments of his imagination (cf. Figure 15).



**Figure 6.** *Crown Jewels* by Tony Cragg, 1981 © Fondazione Plart (photo: Antonella Russo).

A selection of contemporary non-industrial unique design objects - which can be practically considered by the same token as artworks - are gradually entering the permanent collection, following the temporary exhibitions (cf. Figure 13, 15, 16, 17, 18, 19).



**Figure 7.** *Un-color becomes alter ego#2* by Haim Steimbach, 1984 © Fondazione Plart (photo: Antonella Russo).

The collection has been progressively enlarged through new acquisitions and donations from private collectors, as in the

case of the 20 splendid combs from the *Antonini collection* made of cellulose nitrate and imitating natural materials, such as ivory, ebony, amber, tortoise shell, onyx.

### 3. Exhibition as a form of narrative: modernity described through the evolution of plastics

Even though the display case includes cold lights and air-conditioning, only a limited number of artefacts are exhibited on a yearly basis, in order to ensure their preservation in the storage rooms when they are not displayed. The periodic change of the items on display is also an occasion to renew the visitors' interest.

The inaugural permanent exhibition – *Vera Plastica. Forms and colours of the first synthetic materials* (2008) - was meant to arouse curiosity and wonder in the public, by inspiring a new perception of plastics, typically considered poor and polluting materials. The exhibition showed the early stages of modernity through fine objects made of early plastics, which often imitated precious and expensive materials – such as ivory, mother-of-pearl, tortoiseshell, ebony, coral, rock crystal - in order to be accepted by the market. Jewellery, powder boxes, small evening bags characterized by a lightness that reveals their synthetic nature; objects that seem sculpted but are actually resulting from the first moulding processes; round-shaped tableware, as a result of the possibilities offered by the new manufacturing technologies; brown electrical equipment, typical of the first phenol formaldehyde resins, next to high and bright-coloured lamps.

The current exhibition (2014) is organized according to different fields of application: playthings, kitchen tools, household electrical appliances, jewellery, personal care instruments, *passé-temps*.



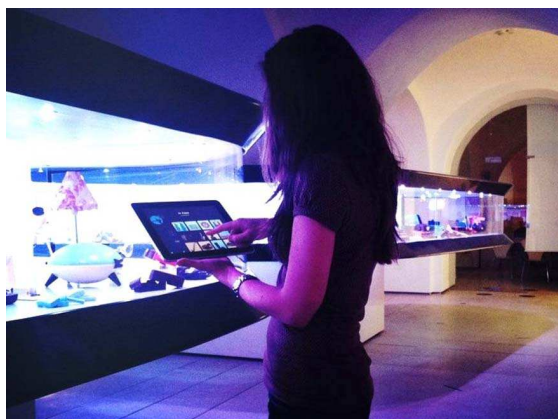
**Figure 8.** The display case © *Fondazione Plart* (photo: *Roberto Pierucci*).

The objects, altogether, show the exceptional versatility of the large family of plastics, which have been playing a leading role in modernity since the beginning. The aim of the exhibitions is to show to a non-specialist public that these materials helped create, over the years, functional, useful and very beautiful objects and that their lack of a formal vocation – unlike wood, stone, metal – made them easily adaptable to create all sorts of forms and, therefore, a wide selection of objects. The rich array of pieces also makes possible the combination of identical objects, only different in colours and sizes, arranging sets that magnify the view of the single pieces.

Since the first steps in planning the permanent set-ups it was clear that, other than the beauty and the rarity of many items, one of the most appealing things about the collection was the heterogeneity of forms, materials, colours and manufacturing processes. That is why, rather than giving prominence to a single object, the items are valued due to their relationship to each other, as a whole.

This consideration affects the choice of *what* will be exhibited, but also of *how* it will be exhibited. Setting up the exhibition space, the visual settings and the lighting, plays an important role in every exhibition, but it does so even more when it comes to objects like the ones under consideration,

that find a purpose in their mutual juxtaposition, even more than in their uniqueness.



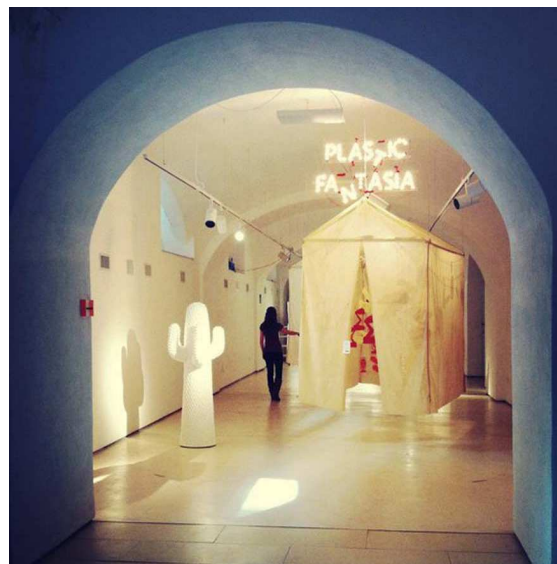
**Figure 9.** A visitor consults the online database © Fondazione Plart (photo: ID LAB).

The set-up is essential to create a homogenous exhibition itinerary (cf. Figure 8, 9). In fact, the objects are not displayed individually, but in an organic structure that emphasizes the idea of a narrative description: a big curved volume hanging among the vaults and characterizing the space, constructed from two black parallel planes made of a composite material thermoformable-polymeric-based, closed on the front by transparent methacrylate [5].

#### **4. Polymers narrated through multimedia**

Plart regularly organises educational projects for schools. Environmental education is indeed one of the central themes of the *Foundation*, pursued through instructive initiatives addressed to children who participate in thematic guided tours with their school classes.

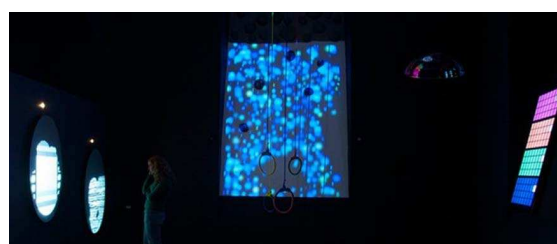
The concepts of art and design and the one of eco-sustainability are explored through creative reuse workshops, where the pupils transform the plastic waste they produce at school in a functional object or in a work of art.



**Figure 10.** The installation *Plastic Fantasia* © Fondazione Plart (photo: ID LAB).



**Figure 11.** Children in the *Multimedia Section* © Fondazione Plart (photo: Antonella Russo).



**Figure 12.** Three installations of the *Multimedia Section* © Fondazione Plart (photo: Antonella Russo).

In 2011 an interactive educational multimedia section has been inaugurated [6], where the history of polymers is presented in a recreational and captivating way - particularly suitable for children - from the first experiments to the recently



conceived bio-plastics, paying particular attention to the communication about the proper use, disposal, reuse and recycling of plastics.

The chemistry of synthetic materials and the concept of eco-sustainability are explored through the use of advanced multimedia technologies (cf. Figure 10, 12, 13).



**Figure 13.** *Plastic poetry*, an installation of the Multimedia Section © Fondazione Plart (photo: ID LAB).

In 2013 the *Multimedia Section* has been enlarged with a new installation called *The Diamond Era* (cf. Figure 11), in reference to the six carbon atoms progenitors of polymeric materials: on the surface of a big structure in the shape of a molecule, a series of video projections immerse visitors in a tale made of colours, forms, names, formulas, objects, and so on <sup>[7]</sup>.

## 5. The temporary exhibitions: synthetic plastics interpreted by contemporary designers

The historical collection is flanked by contemporary displays showcasing designers and artists whose common denominator is the use of synthetic polymers: from silicones, used by Alessandro Ciffo to create soft furniture lying halfway between handicraft and design (cf. Figure 14); to the sinuous, white and sleek sculptures realized by Felix Policastro; to the haute couture jewels created by Chiara Scarpitti in silk,

silver and polymethylmetacrylate; to the “sculpture-costumes” designed by Sonia Biacchi using synthetic sail textiles (cf. Figure 18); to the rings, earrings and necklaces designed by Sandra Dipinto in PVC and semiprecious stones.



**Figure 14.** Alessandro Ciffo, *Silicon D*, 2009, curated by Cecilia Cecchini <sup>[8]</sup> © Fondazione Plart.



**Figure 15.** Riccardo Dalisi, *Ballerine*, 2010 © Fondazione Plart.

Sometimes *Plart* commissions small and unique collections, e.g. the series of “sculpture-combs” that Andrea Branzi designed revisiting such simple products as combs are from a contemporary perspective (cf. Figure 16).



**Figure 16.** Andrea Branzi, *Tutte le epoche vengono al pettine*, 2010, curated by Cecilia Cecchini <sup>[9]</sup> © Fondazione Plart.

A recurring theme of the temporary exhibitions is the reuse and recycling of plastic materials in design, as in the case of Wanda Romano's precious *art nouveau* jewellery, manufactured from reused PET bottles (cf. Figure 17), or the one of Dirk van der Kooij's *Endless Chair*, made of recycled and melted plastics from refrigerators.



**Figure 17.** Wanda Romano, *Inflorescenze plastiche*, 2008, curated by Cecilia Cecchini © Fondazione Plart.

These artists and designers interpret and reflect the “material specificity” of the *Plart Foundation*, getting inspired by it. Therefore, their artworks show the thousands of possible ways of employing plastics.



**Figure 18.** Sonia Biacchi, *Sublime per sempre*, 2008, curated by Cecilia Cecchini © Fondazione Plart.

## 6. The temporary exhibitions: thinking without petroleum

Another essential activity is the scouting for new talents who employ different types of materials in an innovative and eco-compatible way, paying particular

attention to biopolymers. As part of these initiatives, classic examples are two exhibitions that explored the possibility to create objects using experimental materials and technologies not involving petroleum<sup>[10]</sup>.

The first project was called *Botanica* (cf. Figure 19) and it was realized by Andrea Trimarchi and Simone Farresin / *Studio FormaFantasma*, as a response to the *Plart Foundation*'s request to give their personal interpretation on plastics. The designers created a series of vases and bowls acting as if the Age of Oil had never existed, maintaining that society sometimes has to take a step back.



**Figure 19.** Andrea Trimarchi, Simone Farresin, *Botanica*, 2011, curated by Marco Petroni © Fondazione Plart (photo: Antonella Russo).

They worked like those researchers of the 19<sup>th</sup> Century who ventured into the creation of new materials starting from natural polymers, and investigated pre-synthetic polymers nowadays almost forgotten such as *Bois Durci*, using substances like sawdust, egg albumen and animal blood. A peculiar and refined choice that gave life to objects suspended between past and present, and characterized by warm and amber colours conferred by natural materials such as rosin, dammar, copal, natural rubber, shellac<sup>[11]</sup>.

*The Future of Plastic* by Maurizio Montalti / *Officina Corpuscoli* was an experimental research project on growing



design (cf. Figure 20, 21). Montalti designed a series of “cultivated” objects, using particular fungal species as a binder for organic materials, including plastics and agricultural waste. The fungi metabolize the substances they are combined with, developing the *mycelium*, an intricate network of filaments.



**Figure 20.** Maurizio Montalti, *The future of Plastic*, 2014, curated by Marco Petroni © Fondazione Plart (photo: Maurizio Montalti).

This chemical-physical process of deterioration and natural transformation originates different materials, depending on the “ingredients” contained in the starting substratum and on growing conditions: a completely natural “manufacturing” process that resembles an ultra-slow 3D printer, whose speed corresponds to the fungal growth.



**Figure 21.** The set up of *The future of Plastic*, 2014 © Fondazione Plart (Photo: Maurizio Montalti).

The result of this visionary research – suspended between nature and artifice – is a series of vases, stools, bowls and

lamps, characterized by the typical imperfection of natural processes, versus the identical reproducibility of industrial ones <sup>[12]</sup>.

## 7. Cultural activities

Plart also organises different types of cultural events related to the synthetic materials world, such as theatre, musical and artistic performances, thematic guided tours, conferences, workshops, lectures, book presentations and contests. One of the main activities that Plart has undertaken during 2014 and that will last until spring 2015 is the *International Design Festival*, consisting of several events and organized in the frame of the *Universal Forum of Cultures* (cf. Figure 22).



**Figure 22.** A conference organized in the context of the *International Design Festival* © Fondazione Plart (photo: Antonella Russo).

## 8. The Conservation Department

Particular importance is given to the research on the Conservation of the permanent collection's historical and contemporary plastics.

Since the Twentieth Century, artists and designers have borrowed the materials for their creations from the industrial sectors, including the one of synthetic materials. Looking at Contemporary Cultural Heritage in general, materials and techniques have acquired an aesthetical and symbolic

value on the one hand, while on the other artists and designers have left aside the durability of their creation: the unceasing search for innovation and extreme forms of experimentation has caused them to lose their traditional craftsmanship and has led them to use artistic techniques in a less conscious way.

*Plart's* collection has been recognised as a Cultural Heritage by the Italian Authority, because of the great cultural and historical value of the objects it treasures. All together, the objects document the evolution of industry, technology, design, trend and social customs of the modern culture: this entails their preservation for the future generations. Unfortunately, design objects are not usually “designed” to last more than their useful life. Even though plastics are commonly considered to be indestructible materials, *Plart's* historical and contemporary design objects and artworks often show sudden and peculiar signs of degradation (cf. Figure 23, 24) and require specific conservation treatments still to be organically expressed [13].



**Figure 23.** A degraded doll from *Plart's* collection © Fondazione *Plart* (Photo: Antonella Russo).

As is known, from a conservation point of view our knowledge of synthetic materials is still incomplete, also because of the great variety of synthetic polymers and additives. The exact composition can be difficult to identify - especially without a scientific support - since formulations are covered by corporate secrets and might change from one production batch to another. Furthermore, we are often confronted with ‘used’ objects, each having its particular ‘chemical history’. The material peculiarity of a design artefact can depend on: its production technologies and materials; its function, if it has been collected after a first life-phase as a common everyday-use object; its degradation history, which might often not be found in the collection’s documents because of its past outside a museum; its conservation history, if it has been restored or even “repaired”. Hence, It is not easy to identify the ‘chemical situation’ of an object and to set the degradation phenomena and causes into categories.

In general, *Plart* collection’s objects can be classified as multi-material. Most of the objects are made of “non-artistic” and heterogeneous materials and some of them present extremely perishable components: they are composed of a variety of different substances taken by artists and designers from the industrial world or from everyday-life, or even resulting from experimental research projects. So, one of the main causes of degradation is the material’s variety found in the collection, but also in single objects, all with different chemical and physical properties. Hence, the different materials react in different ways with the environment and require specific temperature, light and relative humidity conditions to be properly preserved. Some of them are incompatible with one another. Artworks are usually already rather complex structures. And mostly, the more an object is varied, the faster it will deteriorate.

Another issue we are confronted with concerns the conceptual aspects potentially implied in Contemporary Heritage, which we must always consider before proceeding with a conservation treatment, paying particular attention to the contingent existence of two aspects: the importance given to materials and the message implied in the artwork. Speaking of both historical and contemporary design, the function of the object is to be examined too. Before restoring, these aspects must be identified in order to make sure that the authenticity of the object and the artist's intention are always respected. Most of the contemporary art and design-works of *Plart's* collection carry environmental, social, political, cultural or aesthetical messages - as in the case of the previously mentioned *Botanica* (cf. Figure 19), where the natural materials represent the whole purpose of the project, not having thus to be restored with synthetic products; or as in the case of Tony Cragg's *Crown Jewels* (cf. Figure 6), where the plastic objects were originally assembled as "relics" from the past, to which the artist gave a new life. The cleaning of such objects did not include the original dirt - even though it is a potential degradation agent for the materials themselves - because it is supposed to belong to the artwork itself.



**Figure 24.** *Un-color becomes alter ego 2* by Haim Steinbach - The original degraded Yoda masks, replaced by the artist after degradation occurred © *Fondazione Plart* (Photo: Antonella Russo).

All these issues have led to investigate the collection in its artistic, historical, material, technological, degradation and environmental aspects in order to have an overview of the peculiarities of the artefacts and to develop correct and general conservation procedures. A small library of specialized literature and a scientific laboratory for the identification, the artificial ageing and the study of degradation phenomena of polymers have been set up in 2008 (cf. Figure 25). An interdisciplinary team of experts with specific training on design, contemporary art, synthetic polymers and conservation of contemporary art has been investigating the collection since 2009.

In 2010, the first stage of the study was completed, i.e. the computerized cataloguing of most of the permanent collection items, including historical and artistic information. Technical data were also gathered: the objects were photographed, dimensionally measured, macroscopically observed and described in their colour, odour, weight, and studied in their functional and conceptual aspects.



**Figure 25.** The scientific laboratory © *Fondazione Plart* (photo: Enzo Pascolo).

The specific messages and the original functions of the objects were considered during the investigations, i.e. all elements of authenticity were identified to enable their preservation during conservation procedures and exhibition activities. When facing former everyday-use objects, the study of their origine is also useful in order

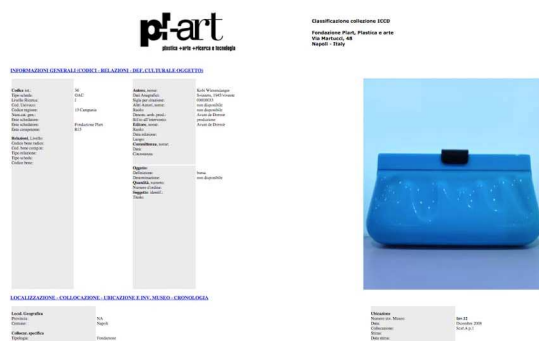


to retrieve information about possible causes of degradation.

The materials were identified using *FTIR* and *Raman* spectroscopy. The project <sup>[14]</sup> outlined a map of the materials present in the collection, such as horn, bois durci, cellulose nitrate, casein formaldehyde, cellulose acetate, phenol formaldehyde, urea formaldehyde, polyacrylonitrile, polybutadiene/styrene, polymethylmethacrylate, polyethylene, polypropylene, aliphatic polyamides, polycarbonate, expanded polyurethane, polyvinylchloride, polystyrene maleic anhydride, polysiloxane.

A brief survey of the preservation state of the artefacts was also carried on. The resulting forms of degradation of the collection appear to be: dust, abrasion, biodegradation, sweating, dirt, odour, shrinkage, yellowing, fading, break, corrosion of metal parts, deformation, crazing, loss of transparency, discolouration, brittleness, crumbling, chalking, bloom, stains.

All this information was organised as an online database, which can be consulted by request. A new model of catalogue card (cf. Figure 26) was designed for and adapted to plastic artefacts, based on the National catalogue card for contemporary artworks <sup>[15]</sup>. The peculiarity of the artefacts required the editing of a new terminology, apt to describe the investigated objects by means of unambiguous and recognisable criteria.

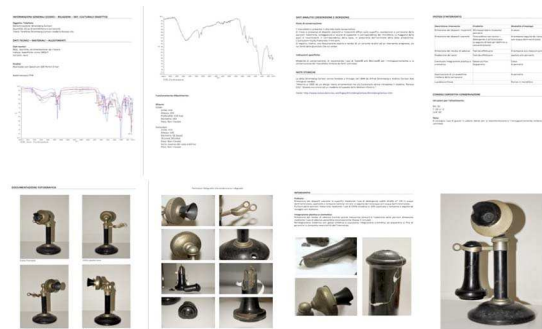


**Figure 26.** An example of Plart's catalogue card © Fondazione Plart.

After the first stage of the project, which included the investigation of the collection at an inventory level, the objects are presently being examined more in detail.

The current state of preservation - observed basing on organoleptic examination - and new *Raman* and *FTIR* spectra are being added to the catalogue cards. The monitoring of the possible variations of the molecular composition (due to the alteration of materials and to the development of degradation products) and of the morphological features of an object (due to physical or chemical processes) can reveal possible changes of the state of preservation, signalling that degradation is occurring. Thus, a planned and periodic documentation of the state of preservation allows identifying degradation symptoms of the single artefacts of the collection.

Conservation history information, general active conservation treatments as well as preventive conservation recommendations are being included in the catalogue cards too (cf. Figure 27).



**Figure 27.** The study of a candlestick telephone © Fondazione Plart (photo: Valentina Mombrini).

Indeed, preventive conservation appears to be for plastic artefacts even more important, if possible, than for "traditional" art. This is due to the short experience we have on the reaction of these materials to restoration products. Consequently, the effects can be unpredictable and risky. *Plart's* preventive

conservation plan includes indirect and direct procedures such as: the daily inspection of the exposed items and the three-monthly inspection of the items in storage; the monitoring of Temperature and Relative Humidity values; the immediate cataloguing of new acquisitions; a yearly update of the state of preservation in the catalogue cards; periodic dust cleaning; handling, transportation and storage protocols; display recommendations; lighting restricted to tours and inspections; isolation of degraded objects, etc.

Particular relevance is attributed to the interaction with contemporary artists and designers regarding the conservation issues of their artworks, as in the case of Piero Gilardi, Maurizio Montalti, Alessandro Ciffo, Andrea Trimarchi and Simone Farresin. Therefore, interviews can also be attached to the catalogue card. Also the temporary exhibitions are accompanied by a quite strict protocol, which is structured basing on a system of interviews to artists and designers, and which helps us to respect minimum conservation standards, sometimes conditioning the set-up. Condition reports expressly fine-tuned with design objects document briefly the conditions of the artworks in all the phases of the exhibitions.

Cataloguing is the first step of the process leading to historical and material knowledge of the surveyed artefact, and it is the premise for any conservation procedure. It allows not only to have a clear perception of the extent of a collection and to prevent its dispersion, but also to safeguard the artwork unity from degradation, by monitoring its state of preservation basing on its material characteristics<sup>[16]</sup>.

Prime example of *Plart's* interdisciplinary approach is *Plastics in Art and for Art*, a series of workshops (cf. Figure 28) organized in collaboration with Italian

Universities, Scientific Research Centres, Museums, private Conservation Centres and international Conservation Scientists and Restorers since 2012.

Main objectives of the master classes are the promotion of a debate among experts and the development of specialised professionals capable of preserving Plastic Heritage. The workshops are mostly open to students, freelancers and experts coming from different professional contexts, such as restorers, conservation scientists, designers, collectors, curators, etc.



**Figure 28.** A degraded *Mickey Mouse*, restored during the workshop *Conservation of plastics. From theory to practice*, held by Thea van Oosten and Anna Laganà © *Fondazione Plart* (photo: Antonella Russo).

The idea of organising courses about the Degradation, Conservation and Restoration of Synthetic Art and Design arose first of all from *Plart's* conservators' need to gain knowledge about the most recent experimental research carried out around Europe and to gather and share information about the tools, the methods and the different approaches used in the field of plastics conservation<sup>[17]</sup>. With plastics being more and more included

into public and private collections - in the second instance - specialist education of the future generation of conservators is extremely important, especially if giving the students the chance to restore real and contextualized objects.



**Figure 29.** Cleaning of phenol-formaldehyde and urea-formaldehyde light switches from the Forties © Fondazione Plart (photo: Antonella Russo).

Thanks to the network of national and international collaborations, the Foundation is finally entering a stage of active conservation (cf. Figure 29, 30, 31, 32, 33). Humanistic, scientific and technical professionals that collaborate with *Plart* are contributing to finding new solutions to the challenges set by this new and particularly fragile kind of Cultural Heritage.



**Figure 30.** Retouching of the prototype vase *Aurora* © Fondazione Plart (photo: Enzo Pascolo).

In this new stage of experimentation, we must respond to specific problems with well-structured answers, always supported by science and well balanced in relation to the original context of the artworks, to their environment, to the chemical and physical characteristics of their components, and to the specific messages they carry.



**Figure 31.** Biological growth on *Incastro* by Franco Mello, *Gufam*, 1972 © Fondazione Plart (photo: Antonella Russo).



**Figure 32.** *Incastro* after the restoration <sup>[18]</sup> © Fondazione Plart (photo: Antonella Russo).

Furthermore, we are planning artificial ageing tests on reference samples and the study of the relation between thermo-hygrometric variations and degradation. Our main aim is to comprehend the causes, the mechanisms and the effects of degradation affecting *Plart's* collection. If the degradation processes are not deeply examined, conservation procedures cannot be properly adjusted, risking to become useless or even dangerous.



It is important to always be aware that the study of synthetic materials from a conservation point of view is still nowadays a very young discipline. The restoration procedures presently feasible are mostly limited to the attempt of slowing down degradation, through the re-establishment of environmental conditions. The development of intervention procedures is restrained by the lack of information on the causes and times of degradation of our artefacts and by the difficulty of applying traditional conservation materials and principles to this kind of artworks. More general, the use of traditional restoration products, not fine-tuned for Plastics Heritage, can have unpredictable consequences on the material aspects of the artefacts. But some of *Plart's* objects at least need cleaning.



**Figure 33.** Cleaning of *Mele* by Piero Gilardi <sup>[19]</sup> © *Fondazione Plart* (photo: Antonella Russo).

Restoration materials and methodologies are being evaluated on *Plart's* artefacts <sup>[20]</sup>, focusing on compatible and reversible ones, and carefully following the precious trails that some restorers and conservation scientists have left in the past decades, leading the way into the conservation ethics and methodologies of the varied and extended family of synthetic materials.

## 9. Summary / Outlook

The key strengths of this Institution are the variety of its areas of study, the local and international network of

cooperations, the interdisciplinary identity of its partnerships, the fact that it relates to both public and private organizations. After a first stage of historical and scientific investigation, and of knowledge-gathering and -exchanging, the *Plart Foundation* is now moving towards a more operational phase, by supporting ultimate design research projects involving synthetic polymers and biopolymers and by participating to the experimentation of active conservation procedures of Plastics Heritage.

## References

- [1] R. De Fusco, *Fondazione Plart. Plastica, arte, artigianato e design*, Quodlibet, Macerata 2014.
- [2] C. Cecchini, *Forme e colori dei primi materiali sintetici*, in *Forme Moderne* n. 4, 2010.
- [3] A. Tecce, N. Vitale, *In Plastica. Forme e colori dei materiali sintetici*, Exhibition catalogue, *Design e arti applicate*, Electa Napoli, Napoli 1990.
- [4] C. Cecchini, *Mo'... Moplen: Plastic materials design in the boom years*, Rdesignpress, Rome 2006.
- [5] The display case was designed by Marco Bevilacqua, Cecilia Cecchini, Massimo d'Alessandro, Paolo Pannocchi; the structure by Andrea Imbrenda; the multimedia set up system by Umberto Paliotto.
- [6] The Multimedia Section was designed by Interactiondesign-Lab. The installation *Plastic Fantasia* was designed by Elio Caccavale (Dundee University) with the collaboration of Xtend3dLab (NABA-Milano).
- [7] *L'era del diamante* was designed by Stefano Gargiulo / *Kaos Produzioni*.
- [8] C. Cecchini (edited by), *Silicon d*, Exhibition catalogue, Arte'm, Naples 2009.
- [9] C. Cecchini (edited by), *Tutte le epoche vengono al pettine. Andrea Branzi*, Exhibition

catalogue, Edizioni Fondazione Plart, Napoli 2010.

[10] C. Cecchini, *Plastiche senza petrolio: dalle lacche cinesi ai bio-polimeri del futuro*, in *Lecturers* n.2, Rdesignpress, Rome 2014.

[11] M. Petroni (edited by), *Botanica. A project by Studio FormaFantasma*, Exhibition catalogue, Napoli 2011.

[12] M. Petroni (edited by), *The future of plastic. Maurizio Montalti / Officina Corpuscoli*, Exhibition catalogue, Edizioni Fondazione Plart, Napoli 2014.

[13] A. Hansen, A. Russo, *Plastics in Art and for Art – Synthetic Polymers as Artistic and Restoration Materials*, in *Modern Materials and Contemporary Art, Triennium 2011-2014*, Newsletter 3 April 2014.

[14] The cataloguing project was coordinated by Pina di Pasqua. The characterization was carried out in collaboration with the *Istituto di Chimica e Tecnologia dei Polimeri del CNR* of Pozzuoli (Naples).

[15] OAC catalogue card for contemporary artworks, developed by ICCD (*Istituto Centrale per il Catalogo e la Documentazione*).

[16] A. Hansen, A. Russo, *Le plastiche nei beni storico-artistici moderni. Un progetto di ricerca per la conservazione*, in L. Campanella, C. Piccioli (edited by), *Diagnosis for the Conservation and Valorization of Cultural Heritage*, Atti del Secondo Convegno Internazionale, 15-16 dicembre 2011, Naples 2011.

[17] L. Campanella, A. Hansen E. Martuscelli, A. Russo (edited by) *La plastica nell'arte e per l'arte*, Materiali e Documenti, Sapienza Università Editrice, Rome 2014.

[18] The restoration was carried out thanks to the kind expert advice of Anna Laganà. The analyses were conducted by Andrea Macchia (*Syremont S.p.a.*), Clara Urzi and Filomena De Leo (*Università degli studi di Messina*).

[19] The restoration project was carried out in collaboration with Marcella Guiso ("*Sapienza*" Università di Roma), Andrea Macchia (*Syremont S.p.a.*), Stella Nunziante Cesaro (*SMATCH, ISMN-CNR*).

[20] With the collaboration of Leonardo Borgioli (*CTS s.r.l.*).

*The two authors have entirely shared the contents of this article but, specifically, the editing of all the paragraphs maybe attributable to Cecilia Cecchini, except for the paragraph "The Conservation Department", attributable to Alice Hansen.*