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Introduction by the School of Design of Politecnico di Milano

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Resumen: En el panorama contemporáneo del diseño, los materiales ganan un papel preponderante. Somos testigos de una increíble aceleración en la evolución de las prácticas de diseño y de los procesos relacionados con los desarrollos de materiales y aplicaciones. En este paper queremos introducir y formalizar el concepto de "materialidad difusa", con el objetivo de describir estos cambios significativos en el campo de los materiales para el diseño. De hecho, todas las clases de materiales se están transformando en algo diferente: los plásticos se convierten en bio, los materiales compuestos se convierten en inteligentes, los residuos agrícolas se convierten en materiales de cultivo, los de producción industrial en materiales avanzados y el material orgánico se convierte en frontera del diseño futuro. Para definir el concepto de materialidad difusa nos hemos centrado en el contexto europeo, y hemos recogido varias contribuciones de los académicos que describen su perspectiva personal acerca de los materiales. En la siguiente introducción, hay una breve descripción de todos estos artículos.

Palabras clave: materialidad - diseño - materiales - tendencias de diseño - prácticas de diseño - experiencia en materiales - significación de los materiales.

[Resúmenes en inglés y portugués en las páginas 65-66]

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(**) Designer, PhD in Industrial Design and assistant professor at the Design Department of the Politecnico di Milano. She has been working in the field of materials for design for almost twenty years gaining expertise on this topic both in research and education. She has always been interested on the expressive-sensorial dimension of materials and their emotional aspects. Currently, her research and education activities are focusing on emerging materials experiences, Materials Driven Design (MDD) method, materials interactions, DIY Materials, tinkering with materials, CMF (colour, material and finishing) design, repairing and imperfection.

The twenty-first century has shown an unprecedented speed of evolution of materials that modified the concept of materiality forever. The designers learnt that the design activities and practices could influence the materials development.
The raw material is transformed, shaped and processed following quantity and quality that have no precedent in human history: the traditional materials gain new forms and performances. Plastics become bio, composite materials change into smart, agricultural wastes transform into growing materials and those of industrial production in advanced materials, and the organic material becomes the border of the future design.
While the contemporary design is challenging with new material qualities and properties, considering these as key elements for innovation in expressive languages and success of artefacts, the design research helps define the new features and performance of materials capable of giving life to new experiences in everyday objects.
These extensive activities "on" and "with" materials are strongly influencing the imagery of design, and they become powerful tools that can generate new trends, can affect the human senses and culture, only changing the appearance, behaviour and essence of daily artefacts.
Considering this, the number 70 of Cuadernos del Centro de Estudios en Diseño y Comunicación, produced in partnership between Facultad de Diseño y Comunicación de la Universidad de Palermo and the School of Design of Politecnico di Milano, offers a framework for research and design practice in which materials and manufacturing processes are elements of inspiration and reflection on the meanings of innovation in the field of design.
The aim of the issue is to compose a reasoned collection of original and unpublished contributions that address the reflection on the materials and their applications in many areas of design: product, communication, interior, fashion.
This part, edited by Marinella Ferrara and Valentina Rognoli, is constituted with different contributions selected to shape the editors' personal idea of "diffuse materiality". In general, it is an overview of the material research in Europe, especially in Italy, where the scientific community agrees that materials are the key elements in the design process because materials participate in the creation of the sensorial-expressive dimension of products enhancing unique experiences.
Each contribution offers a different thematic approach, and a diverse research aspect, both for the amplitude of the context and for the deepness of the analysis.
Marinella Ferrara and **Anna Cecilia Russo** highlight on the idea of a Design-driven approach as the "Italian way" for product innovation, which is based on subtle and historical dialogue between materials and aesthetics, and on the focus of designers on the communicative and symbolic value of materials. This design model has led to the generation of products that still marvel for their unsettling and sophisticated use of materials and techniques, as well as the elaboration of ideas that have enhanced consolidated knowledge by introducing elements of discontinuity with respect to current thinking, anticipating aspirations social and working with the sprouting of new lifestyles.
Linda Worbin focused on the idea of temporality as a design variable, which is an alternative dimension towards products sustainability through changeability. Using new potentials in material and production, she crafts colours that evolve over times for her textiles design showing a possible new direction for textiles and products.

Manuel Kretzer's article presents a didactic model for integrative and explorative smart material education as a means to enrich existing educational frameworks. Rather than prescribing a particular method or predefined solution, the idea is providing open access to information and suggests a broad range of relevant possibilities, encouraging students to learn "how-to-do" by offering a stable and reliable framework for independent self-development.
From smart materials, we move to biomimetic materials, thanks to the article by **Murat Bengisu** that elaborates on five biomimetic approaches: imitation, inspiration, functional, process-based, and ecosystem-based. For all these approaches, the case studies explain how biomimetic research can help solve different problems in design.
After this series of article concentrated on new technologies and emerging materials, we turn to what the authors indicated as the hybrid scenarios between design and technology called Material Activism. **Valentina Rognoli** and **Camilo Ayala** present here the concept of Material Activism as a way to understand the growing phenomena that are allowing materials to democratize through a bottom-up approach.
It is time to focus on applications and correct context. In fact, **Giulia Gerosa** and **Laura Daglio** have developed a contribution for discussing the innovative use of traditional materials or the use of new materials in public spaces design, highlighting two possible trends in the search for the quality enhancement of urban places: expressiveness and performance. Selected case studies are disclosed to present how new forms, with attention on perceptual values and the environmental impact and comfort, as well as durability, are the primary goals of material innovation in this field.
As a new contemporary design scenario, we considered the **Giovanni Conti's** contribution about the materials for knitwear, where knitwear design is defined as a complex process, combining ancient techniques of traditional knowledge with experimentation and technological innovation.
With **Giulio Ceppi's** intention to transfer of the "slow" approach into design practice, coining the expression of Sustainable Sensoriality to combine the worlds of sensoriality with sustainability. Using conceptual and operational dimensions of design, this new concept would contribute in the field of systems and steer the transformations underway towards sustainable ways of living and producing.
With this hope our recognition about the diffuse materiality, edited by Marinella Ferrara e Valentina Rognoli, closes.

Abstract: In the contemporary panorama of design, materials are gained an important role. We are the witnesses of an incredible acceleration in the evolution of the design practices and processes related to materials developments and applications.
In the present issue, we want to introduce and formalised the concept of "diffuse materiality" for describing these significant changes in the field of materials for design. In fact, all the classes of materials are transforming in something different: plastics become bio, composite materials change into smart, agricultural wastes turn into growing

materials and those of industrial production in advanced materials, and the organic material becomes the border of the future design.
For defining the concept of diffuse materiality we focused on the European context, and we collected various contributions from scholars describing their personal approach to materials. In the following introduction, there is a short description of all these articles.

Key words: materiality - design - materials - design trends - design practices - innovation through materials - materials experience - materials meanings.

Resumo: No panorama contemporâneo do design, materiais adquiriram um papel de liderança. Somos testemunhos de uma aceleração incrível na evolução das práticas de design e processos relacionados com o desenvolvimento de materiais e aplicações.
Neste artigo apresentamos e formalizamos o conceito de "materialidade difusa" para descrever essas mudanças significativas no campo de materiais para o projeto. Na verdade, todos os tipos de materiais estão sendo transformados em algo diferente: plásticos são transformados em bio; materiais compostos em inteligentes; resíduos agrícolas em materiais de cultivo; aqueles de produção industrial em materiais avançados; e o material orgânico no futuro do design.
Para definir o conceito de materialidade difusa focamos no contexto europeu, e recolhamos várias contribuições de estudiosos que descrevem a sua perspectiva pessoal sobre os materiais. Na seguinte introdução, há uma breve descrição de todos esses itens.

Palavras chave: materialidade - design - materiais - tendências de design - práticas de design - experiência com materiais - significância de materiais.