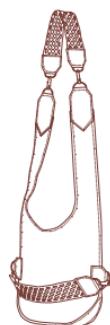
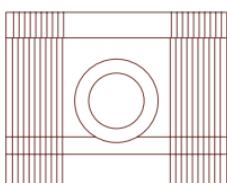
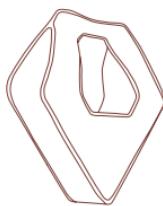
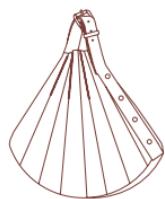
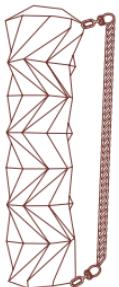


Cu²⁹ | fibra

paper bags from Chile

our future lies in our past

Chile 2023



Cu²⁹ | fibra

paper bags from Chile

Cada día son más los factores que acrecientan la **crisis climática y social en el mundo**, por lo cual, las diferentes naciones que integramos el planeta estamos llamadas a reflexionar.

Reflexionar, porque los cambios que nos están afectando son responsabilidad de todos, no únicamente de nuestros líderes. Reflexionar, también, porque ya tenemos suficientes estudios publicados con las escalofriantes cifras que avalan el calentamiento global; la escasez de agua; la contaminación en los océanos, principalmente ocasionada por los residuos plásticos, solo por mencionar algunos. Reflexionar porque, en general, salvo muy pocas excepciones, el llamado es a tomar conciencia de dichas cifras, pero no a promover la acción.

Por otro lado, **el diseño se ha ido posicionando cada vez más como una disciplina capaz de catalizar el cambio** y responder a problemas sociales complejos o “perversos”, también denominados *wicked problems*, término descrito por Rittel y Webber en 1973, para identificar problemas complejos, interconectados y siempre cambiantes, para los cuales una solución única es imposible. Hoy tenemos una **disciplina más comprometida política y socialmente con el desarrollo sostenible**, ampliando el campo tradicional de trabajo de los diseñadores profesionales.

¿Cómo Diseño UDD hace frente a este escenario desde Chile?

Desde sus inicios, la Facultad se ha propuesto ser un ente articulador entre la Academia, la Empresa y el Estado, teniendo en el centro las necesidades de la sociedad y el medioambiente.

Es así como la formación que entrega **Diseño UDD** a las nuevas generaciones, **se centra en promover el trabajo con propósito, interdisciplinario y con responsabilidad pública**, de tal manera de proponer nuevas soluciones a los desafíos globales y construir un mundo mejor para todos.

Every day more factors increase **the climatic and social crisis in the world**; therefore, the different nations that make up the planet are called to reflect.

Reflect, because the changes affecting us are everyone's responsibility, not just our leaders. Reflect, also, because we already have enough studies published with chilling figures that support global warming. Reflect because, in general, except for very few exceptions, the call is to become aware of these figures rather than to promote action.

On the other hand, **design has been increasingly positioned as a discipline capable of catalysing change** and responding to complex or wicked social problems, as defined by Rittel y Webber in 1973. These interconnected problems are constantly changing, making a unique solution impossible. Today our discipline is more politically and socially committed to sustainable development, expanding the traditional work scope of professional designers.

How does UDD design confront this scenario from Chile?

Since its inception, our Design School has aimed to be an articulating entity between Academia, Businesses and the State, centred on society's and the environment's needs.

This is how the design training that new generations of designers receive at **UDD is focused on promoting interdisciplinary and public** responsible work to propose new solutions to global challenges and build a better world for all.

Buscando nuevas soluciones, el equipo de investigación de Diseño UDD, liderado por su **decano Alejandra Amenábar, su directora de Investigación, Paulina Contreras, junto al colaborador y co-investigador Víctor Apablaza**, desarrolló en 2015 el **primer papel con cobre del mundo**. Patentado con el nombre de **Cu-paper**, esta innovadora tecnología –que todavía se encuentra en desarrollo y que ha contado con el importante apoyo de la empresa **Forestal y Papelera Concepción S.A. (FPC)** para las primeras pruebas industriales– une dos de las materias primas más importantes de Chile: **la celulosa y el cobre**.

Los resultados del equipo, al cual se sumó en 2019 la investigadora Nataly Silva, han permitido optimizar el proceso de incorporación de las micropartículas de cobre entre las fibras de celulosa y **validar su efectividad antibacteriana, antifúngica, e incluso, antiviral frente a SARS-Cov 2**. Convirtiéndose así en una tecnología que limita la transmisión fómite y con ello ofrece la posibilidad de ser aplicado en diversos rubros donde el papel es el principal componente. Destacando su potencial inmersión en el área de la construcción, la salud, el diseño, el packaging, en filtros, sensores, en la industria de la moda, el mobiliario, entre muchas otras.

Looking for new solutions, in 2015, the UDD design team led by its **dean Alejandra Amenábar, and its research director, Paulina Contreras, together with the collaborator and co-investigator Víctor Apablaza**, developed the first paper roll with copper in the world. Patented under the name of **Cu-paper**, this innovative technology is still under development and has had the important support of the **company Forestal y Papelera Concepción S.A. (FPC)** for the first industrial tests. It unites two of Chile's most important raw materials: **cellulose and copper**.

The results of the team, to which the researcher Nataly Silva joined in 2019, have made it possible to optimise the process of incorporating copper microparticles between the cellulose fibres and **validate their antibacterial, antifungal and even antiviral effectiveness against SARS-Cov 2**. The technology limits fomite transmission and offers the possibility of being applied in various areas where paper is the main component. Results highlight its potential immersion in construction, health, design, packaging, filters, sensors, the fashion industry, and furniture, among many others.



Cu²⁹ fibra

paper bags from Chile

Sample analysis results

Milestone

Analysis

Objective
Generate research with high and transferable impact in companies and productive areas, and provide solutions to global problems using local resources.

2015

Concept test development #1



Hypothesis

To obtain a paper with antimicrobial properties viability to integrate copper microparticles inside of a cellulose matrix.

SOURCE
Paper and cardboard manufacture company (CMPC Celulose S.A.)

Cellulose
Chile occupies the 5° place as cellulose world



2016

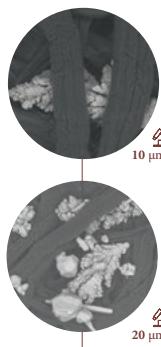
Analysis test of concept #1
UNIVERSIDAD DEL DESARROLLO SCHOOL OF MEDICINE + CMPC I+D CENTER

Concept test development #2



Cu-paper

We obtained the first examples of sheets of antibacterial paper made under the ISO regulation of paper manufactured has intervened with copper microparticles.



10 μm



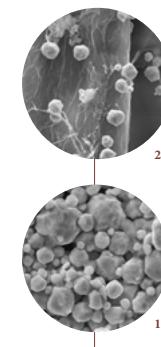
20 μm

Scanning Electron Microscope (SEM)



200 μm

Scanning Electron Microscope (SEM)



1 μm

Scanning Electron Microscope (SEM)



2 μm

Scanning Electron Microscope (SEM)

Cu-paper is an innovative product based on proprietary technology, enabling the addition of copper particles to cellulose paper. Cu-paper has antibacterial, biodegradable and flexible properties while maintaining the attributes of conventional paper. Cu-paper has multiple applications in the growing antibacterial market for medical, food and industrial areas.

First patent granted
INAPI CHILE

2017

Analysis test of concept #2
· INTA
· SIMET

2019

Research team
Alejandra Amenábar
DEAN SCHOOL OF DESIGN
Paulina Contreras
RESEARCH DIRECTOR AT THE SCHOOL OF DESIGN
Víctor Apablaza
CO-RESEARCHER

Nataly Silva
RESEARCHER

2020

Concept test development #3
UDD + FPC

Second patent granted
INPI BRASIL

2021

★ PAPER PROPERTY
· ANTIMICROBIAL
· ANTIFUNGAL
· ANTIVIRAL

Evaluation of the antiviral activity of copper sheets for SARS-CoV2
SCHOOL OF MEDICINE AT THE PONTIFICIA UNIVERSIDAD CATÓLICA DE CHILE

2022

★ PAPER PROPERTY
· ANTIMICROBIAL
· ANTIFUNGAL
· ANTIVIRAL

design + science

What will happen if we combine design and science? This is the question they have kept asking and working on for the last couple of years at the School of Design at Universidad del Desarrollo.

In a stage of growing climate crisis and social complexities, in which problems are increasingly difficult, interconnected, and challenging, this virtuous union can bring innovative, functional, and efficient answers.

The Cu-paper project, led by a research team, from the mentioned school, is the result of the collaboration between, the depth of science with the creative and reflected capacity that design, as a discipline, brings to us. Setting up the first paper with copper particles in the world. This innovative technology, which also joins two of the main raw material from Chile: copper and cellulose, brings material with a high immersion potential in multiple industries, since it has antibacterial, antifungal, and even antiviral properties against SARS-CoV-2.

In the line we present to you, we invite you to learn about the research process behind the Cu-paper.

← timeline Cu-paper

Nuestra **misión como Facultad es masificar el diseño**, acercarlo a las personas, mostrar su valor para que su rol sea entendido y generar puentes para la unidad de distintas áreas de desarrollo. En este caso puntual, estas áreas se encuentran ligadas a las **industrias del cobre y la celulosa**, ambas representativas de la **identidad de Chile**. Esperamos, a través de ellas, poder incentivar, promover y difundir el diseño local, fortaleciendo nuestra imagen país, con énfasis en el valor agregado de sus industrias.

Bajo el concepto propuesto por el **SaloneSatellite 2023**, “**Diseño: ¿a dónde vas?**”, y como una invitación que combina creatividad, ciencia, academia y sostenibilidad, surge **fibra / Our future lies in our past**, confeccionada a partir de **Cu-paper**.

Alumnos de Diseño, de las sedes Santiago y Concepción de la Universidad del Desarrollo, diseñaron un **objeto utilitario sostenible para transportar elementos de uso cotidiano**, que luego de pasar por procesos como encerado, tintura, plegado y armado, **dieron origen a los 21 objetos que se presentan en esta muestra**.

Una colección que proyecta el diseño desde nuestra tierra, desde nuestras materias primas y recursos naturales. **La naturaleza y su riqueza más primitiva guarda las posibles soluciones que el futuro del planeta requiere**.

Our **mission as a School is to massify design**, bring it closer to people, show its value, and contribute to exposing its role in generating bridges for the unity of different areas of development. In this specific case, these areas are linked to the **copper and cellulose industries**, representing Chile's identity. Through them, we hope to encourage, promote and disseminate local design, strengthening our country's image with emphasis on the added value of its industry.

Under the concept proposed by the **SaloneSatellite 2023**, “**Design: Where are you going?**”, We present **fiber / Our Future Lies in Our Past, made from Cu-Paper** as an invitation that combines creativity, science, academia and sustainability.

Students from the Santiago and Concepción Design Schools of Universidad del Desarrollo **designed a sustainable utilitarian object to transport daily use elements**. After undergoing waxing, dyeing, folding and construction processes, **it gave rise to the 21 objects presented in this show**.

A collection that projects design from our land, from our raw materials and natural resources. **Nature and its most primitive wealth keep the possible solutions that the planet's future requires.**

Main
coordinator
of the project

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Dean School of Design
at the Universidad
del Desarrollo (UDD)

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Researcher
Santiago

Ian Tidy
Space and Object
Design Director

Hernán Díaz
Researcher
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Francisco del Despósito
Space and Graphic Design
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Academics

Yerko Tank
Academic, Santiago

Francisca Llarulluri
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Nicolás Parraguez
Academic, Santiago

Rodrigo Caparrós
Academic, Concepción

Students

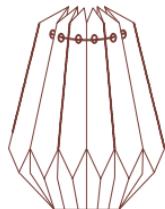
Sofía Álamos
Josefa Blanco
Ángela Bravo
Paula Dospital
Maximiliano Drake
Antonia Farías
Jacinta Gana
Natalia Gómez
Laura González
Catalina Howard
Josefina Jiménez

Sofía Kusanovich
Valentina López
Leonardo Luengo
Elisa Middleton
Antonia Muñoz
Camila Peña
Amira Salamé
Paula Solís
Gabriela Tolosa
Ángela Vidal

Cu²⁹ | fibra

paper bags from Chile

the humming bags



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Cu|fibra our future lies in our past



torcü



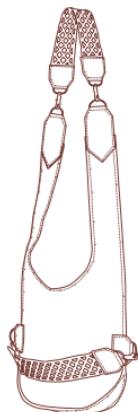
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blue swallow bag

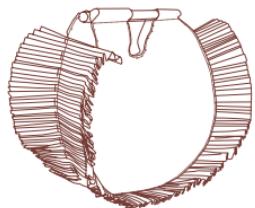


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spino



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Cu|fibra our future lies in our past



the fold



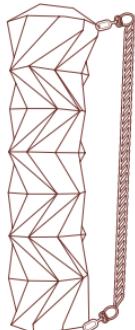
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pix



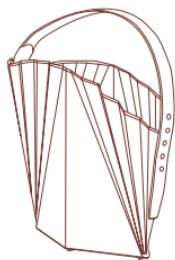
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Laura González
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marea



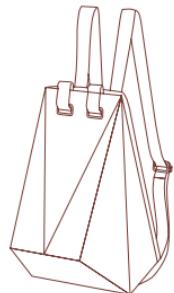
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zaino vose



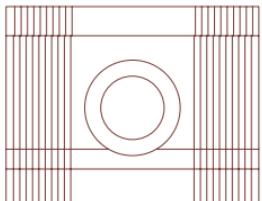
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volare



Sofia Kusanovich
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loibag



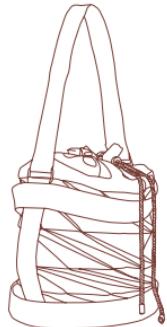
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neonrise



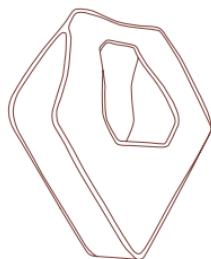
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diamanda nyx



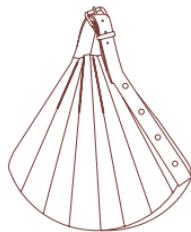
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anteojillo



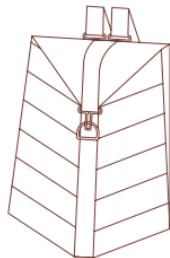
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ignis alas



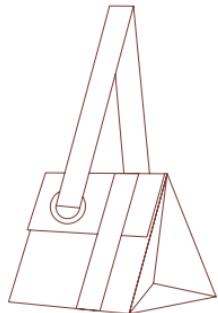
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pecker bag



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c-bag



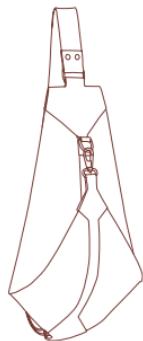
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Dean School of Design UDD

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Natalia Yáñez

Fashion and Management
Design Director

Ian Tidy

Space and Object
Design Director

Germán Espinoza

Digital Interaction
Design Director

Francisco del Despósito

Space and Graphic
Design Director, Concepción

Daniela Reyes

Development, Continuing
Education and Alumni Director

Paulina Contreras

Research Director

Our mission

The Design School at the Universidad del Desarrollo has the mission to contribute to progress and development, generate transferable knowledge for society, and develop skills to train excellent and innovative leaders and entrepreneurs who with a sustainable look be able to integrate into the project process the different areas of knowledge, work methodologic and technology advances.

Our vision

The Design School at the Universidad del Desarrollo, in its commitment to the values and the mission of the University, will become a permanent benchmark of excellence and academic quality. And it will promote the design discipline as a central factor for innovation and an engine in different areas of the country's development.

Our seals:

What mobilizes us

-
- 1.** Excellence in design training: a transformative education based on sustainable innovation, technology, entrepreneurship, and interdisciplinarity.

-
- 2.** Research for the development and transfer of knowledge with an impact on society.

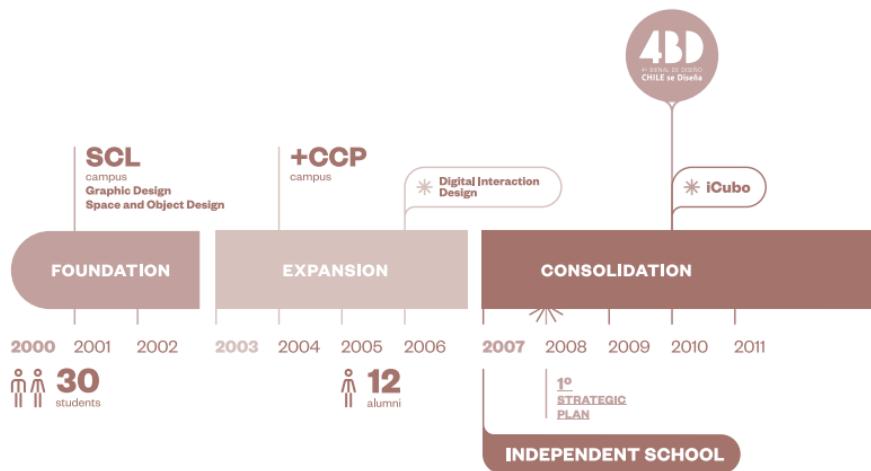
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- 3.** Linkage with public and private organizations.

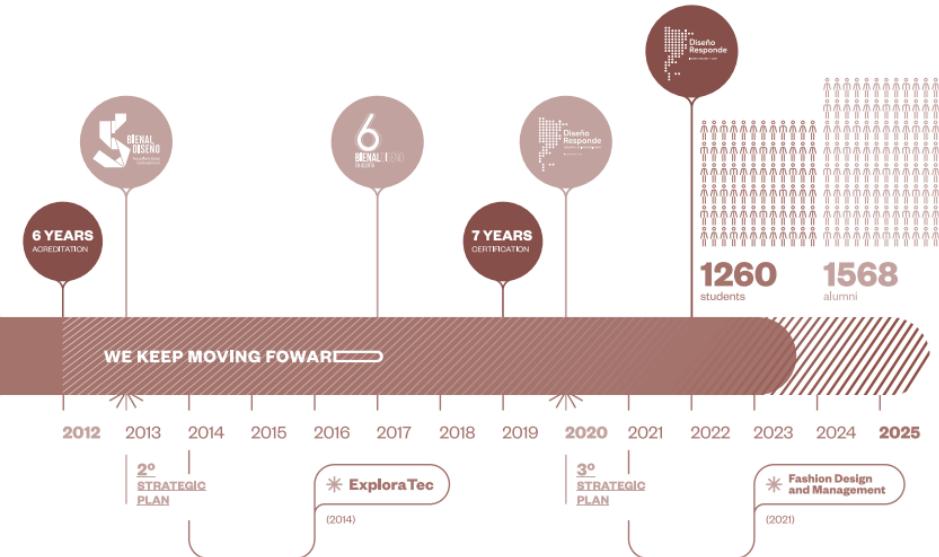
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- 4.** Connection with the world.

-
- 5.** Promotion of the discipline as a strategic agent for the development of the country.

School of Design

23 years in permanent evolution







Cu|fibra our future lies in our past

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**UDD | we keep
Design | moving forward**

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Chile 2023

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