# Grado Zero Espace Interview

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- Grado Zero Espace "Oricalco" -

This series of interviews is based the Test_Lab “Clothing without Cloth” which took place at V2_Institute for the Unstable Media in Rotterdam, May 2011 and featured: Emily Crane (UK), Carole Collet (UK), Christien Meinderstsma (NL), Grado Zero Espace (IT), Pauline van Dongen (NL) and Freedom Of Creation (NL).

The Italian design company Grado Zero Espace has been pioneering high-tech performance wearables for over a decade. They excel in finding new applications and design solutions to scientific innovations from integrating hydrogels in fire safety gear, uses of carbon nanotubes in tennis rackets to light-emitting fabric which can be cut. Giada Dammacco, one of the co-founders of the company brought to the Test_Lab "Clothing without Cloth" a whole suitcase of designs and let us literally let us demo, play, hit and test the limits of these performance-enhancement wearables.

> A garment is an extension of our physical characteristics and establishes an intimate relationship with our body.

## BACKGROUND

***How and when did Grado Zero Espace begin?***
Grado Zero Espace began in 2001. We have ten years experience in product development. Our background comes from the fashion industry, producing limited edition for different brands like D&G, Cerruti, Hugo Boss, Prada, Mandarina Duck etc. Grado Zero Espace cooperates with ESA (European Space Agency) within the Technology Transfer Programme to transfer space technology into daily use.

***What is your background?***
My background is in industrial design. I'm the co-founder of Grado Zero Espace. I joined the design team from the beginning of my career since I was interested in doing applied research with the aim of improving the quality of life through the development of new products around the human being.

> Our clothes are a way of communicating, an information platform, as well as a protection.

***What led to your interest in fashion and technology?***
A garment is an extension of our physical characteristics and establishes an intimate relationship with our body. Our clothes are a way of communicating, an information platform, as well as a protection. My research started with an interest in advanced technical textile and then went on to examine the potential applications, imagining scenarios targeting different types of users and uses requiring certain types of product.


- Grado Zero Espace "Hydro* Jacket" -

SITES

***Please describe the Grado Zero Espace studio - where are you located, how many designers/technologists work with you, and how are the garments produced?***
Grado Zero Espace is located in Tuscany near Florence, at the Leonardo da Vinci's area. Located here is one of the bigger Italian textile and leather districts. We are a small private company. Our team is composed of ten technologists including designers, chemists, textile experts, electronics engineers, computer engineers, mechanical engineers, and optical engineers. We design and manufacture concept samples and prototypes in our lab, then we optimize the final prototype at the client's facilities. In the meantime, we produce limited or special garment editions with our brand available through our website.

***How does the environment you work in influence the designs you make (i.e. access to***

***technology/ specialists)?***
The working environment is essential. We created a multidisciplinary team, from chemists to engineers working in a synergic way. Furthermore we are involved in many pure research projects, co-operating with different international research centers trying to figure out the future applications of those innovations.

> The challenge is to manufacture and integrate components and subsystems able to solve the human needs in a harsh environment where the performance is fundamental.

## TECHNOLOGIES

***What kinds of materials and technologies are used or integrated into your designs?***
It depends on the project. Each one requires different materials/technologies/processes to come up with new solutions. Further research across disciplines like micro-nano technologies, materials, physiology/biology/medicine and ICT is necessary in order to achieve highly performing, user-friendly and cost-effective wearable systems.

***Do you collaborate with technologist/laboratories, and if so, whom and how does this effect the choice of technologies and materials?***
We have an internal laboratory to analyze and test new materials. We also collaborate with different external specialized laboratories according to the specific application since we work for the automotive industry as well as for healthcare or sports and safety equipment.

> Design follows materials.

***How much do the materials and technologies used in the designs influence the aesthetics? Or do the aesthetics dictate the technologies and materials, and how?***
The materials and technologies influence the aesthetics, and it gives a strong identity to the final product. Design follows materials.

***What kinds of technologies has Grado Zero Espace invented/developed?***
We are really focusing on the manufacturing process. We develop new technologies or treatments stemming from the combination of proper materials and design construction. The wearable cooling system is an example.

***What are the challenges for you as a designer working with innovative materials and technology?***
The challenge is to manufacture and integrate components and subsystems able to solve the human needs in a harsh environment where the performance is fundamental.

> The role of design is to make the technology easy to use.

***What do you think the technology brings to the craft and role of design?***
The relationship between technology and design is crucial and the disciplines are strictly linked to each other. The role of design is to make the technology easy to use.

***What are the most important industries you are collaborating with? Safety? Medical? Military? What is the demand in the field of wearable technologies?***
Safety and medical equipment are the most important industries we are collaborating with. The main demand in the field of wearable technology is to help their work.


- Grado Zero Espace "LQ Jacket" -

GRADO ZERO ESPACE DESIGNS

***Could you describe the work that you showcased at the V2_ Test_Lab "Clothing without Cloth" event?***

Our work is to bring technological innovation, in order to maintain and strengthen the Tuscan manufacturing tradition. As a result, we have more of a chance to obtain something unique in the global market. For the V2_ Test_Lab "Clothing without Cloth" event I am going to show you some demonstrations which are a synthesis of our research activity and expression of our approach.

> Thanks to this technology we created a self-ironing shirt. The fabric can be crumpled up into a hard ball, pleated and creased then just by a flow of hot air (even a hair-dyer) it pops back automatically to its former shape.

***What is "thermal shape memory alloy" and what makes the Oricalco shirt special? What other***

***fashion application can you see this material being used for?***
“Thermal shape memory alloy” is characterized by its extraordinary ability to recover any shape, pre-programmed, upon heating. Thanks to this technology we created a self-ironing shirt. The fabric can be crumpled up into a hard ball, pleated and creased then just by a flow of hot air (even a hair-dyer) it pops back automatically to its former shape. Until today, this lightweight alloy with about 50% titanium inside has been used in advanced sectors like space and recently in medical applications, for example, to develop cardiac stents. Due to cost and the laborious manufacturing process, few examples of fashion application have been realized.

> d3o technology is a specially engineered material with intelligent molecules that flow with you as you move but on shock lock together to absorb impact energy.

***The “LQ-Jacket” is a motorcycle jacket which becomes hard on impact. Has it been very popular? Can you describe in accessible yet scientific terms how this works? What other application do you see for this technology in fashion?***
d3o technology is a specially engineered material with intelligent molecules that flow with you as you move but on shock lock together to absorb impact energy. It has been very popular for work wear and in the sportswear industry. The “LQ-Jacket” contains also other innovative solutions. It is made of ultra-thin leather treated with Liquid Shell, a protective treatment which allows a marked increase in leather properties, such as flexibility and elasticity, with an excellent resistance to abrasion, UV ray and to saline environments. The technology has been used for furnishing, yachting, accessories and luxury leather goods.

***What is the “Hydro*Jacket”? Who uses it?***
The “Hydro*Jacket” is a proximity garment for fireman. It provides comfort and safety to the fireman’s activities. The objective was to develop a thermal and moisture management layer based on a super absorbent polymer, called hydrogel. There is a multiple layer structure. The external layer reflects the sun rays and a FR coating is activated by the heat of a fire. The second layer works as a heat dissipator and thermal barrier.

> Carbon atoms' bond is the strongest bond existing, therefore a structure made of this kind of bond gains a really high resistance to deformation.

***Why would I want carbon nanotubes integrated into my tennis racket? Does it make it stronger? Lighter? Last longer?***
Nanotubes are made only of carbon atoms, bound together to create a stiff structure that grant the material good physical and mechanical features. Carbon atoms' bond is the strongest bond existing, therefore a structure made of this kind of bond gains a really high resistance to deformation. The extreme resistance, combined with great flexibility, makes these nanotubes the best solution to strengthen up fibres in high-performance composite materials, replacing traditional carbon fibre, kevlar or glass fibre.

***Describe how "reLIGHT" works and what fashion or safety garments it is being integrated into.***
“reLIGHT” is a new generation light source based on electro-luminescent technology. “reLIGHT” is a soft shining cape with physical-mechanical properties which make it lightweight, foldable, and durable. It is made by glass-fiber fabric coated with micro-layered conductive polymeric material without the use of mercury or other toxic substances as found in many other light source. It can be sew as a normal fabric. The integration of “reLIGHT” in wearable systems brings important advancements for the visibility and comfort of protective clothing.

***You are located in Italy - the pinnacle of high fashion design. Have you collaborated with***


***couture labels such as Gucci, Prada etc for the integrating some of your technologies? Is there interest?***

We work for luxury brands in many different areas of product innovation, from yacht design to interior design and watch industry. We work with clothing companies, but we cannot mention the brands because we are under confidential agreements. IPR (intellectual property right) issues are fundamental for our work.

> The use of smart materials and technology is going to become very popular.

***Do you imagine that in 2030 we will all have "smart" materials and technologies integrated into our everyday garments? Or will it remain something for special uses only?***

The use of smart materials and technology is going to become very popular. The main problem and future research will be focused on efficiency, durability, and will need to consider eco-friendly aspects.

- Grado Zero Espace "reLIGHT" -

V2_ TEST_LAB "CLOTHING WITHOUT CLOTH"

***Does Grado Zero Espace interface with the world of food and biological technologies as suggested by the presentations of Emily Crane's "Micro-Nutrient Couture" and Carole Collet from Central Saint Martins Textiles Futures in the V2 Test_Lab "Clothing without Cloth"?***

It has been a very interesting presentation. Grado Zero Espace looks at the biological technologies

for different application domains, like packaging design or medical and cosmetic sectors.

> Our idea is to use the Italian resources (in particular the Tuscan district) by adding new technical contents in our products.

***Christien Meindertsma* in her "One Sheep Sweater" is using local "textiles". How is Grado Zero Espace looking at uses of Italian natural resources in its future designs?**
The Italian resources are in the manufacturing. We have many ancient manufacturing traditions in textiles, leather, minerals as well as in steel sector and much more. We co-operate with different craftsman and we well know the added value related to the quality goods. Our idea is to use the Italian resources (in particular the Tuscan district) by adding new technical contents in our products. In this scenario the natural or eco-friendly materials/processes still have a big potential in the future designs.

***How do you envision using 3D printing technologies such as those used by Pauline van Dongen with Freedom Of Creation and what it might bring to the forms and materials you are working with?***
Our laboratory is equipped with 3D printers and the related finishing treatments. We use this technology to have an immediate response of the tridimensional shape in the concept prototyping phase, but we offer the service also to create and commercialize 3D printed design products.

Florence, June 2011

Tags: 3lectromode, Clothing without Cloth, Fashion, Grado Zero Espace, Materials, V2_, Valérie Lamontagne, Wearables