
ZDRAX™
SUPREME SURFACE TECHNOLOGIES

**The whole of science is nothing more than a refinement of everyday thinking.**

**Albert Einstein**
(1879 - 1955)

# 01. HISTORY



**1979**
Paul Gaiser (founder of ZDRAX) became bi-national champion and one of the 10 best hang gliding pilots of the world. The crinkled surface of his wings helped him to fly faster and longer.

**1983**
First concept for the ZDRAX surface inspired by the hang-gliding experience

**1984 - 2005**
First tests on a waterski with drillings, inspired by the golfball-structure and other structured surfaces

**2005**
Concept to realize the structured surface with a net made out of polyester

**2008 - 2009**
First prototypes on cars and Formula 1 speedboats

**2010**
Setting up the company ZDRAX
Registration of the first patent method - ZCX RESISTANCE -

**2012**
Developing the first patent method in cooperation with different scientific instituts
Registration of the second patent method - ZCX RAPIDWRAP

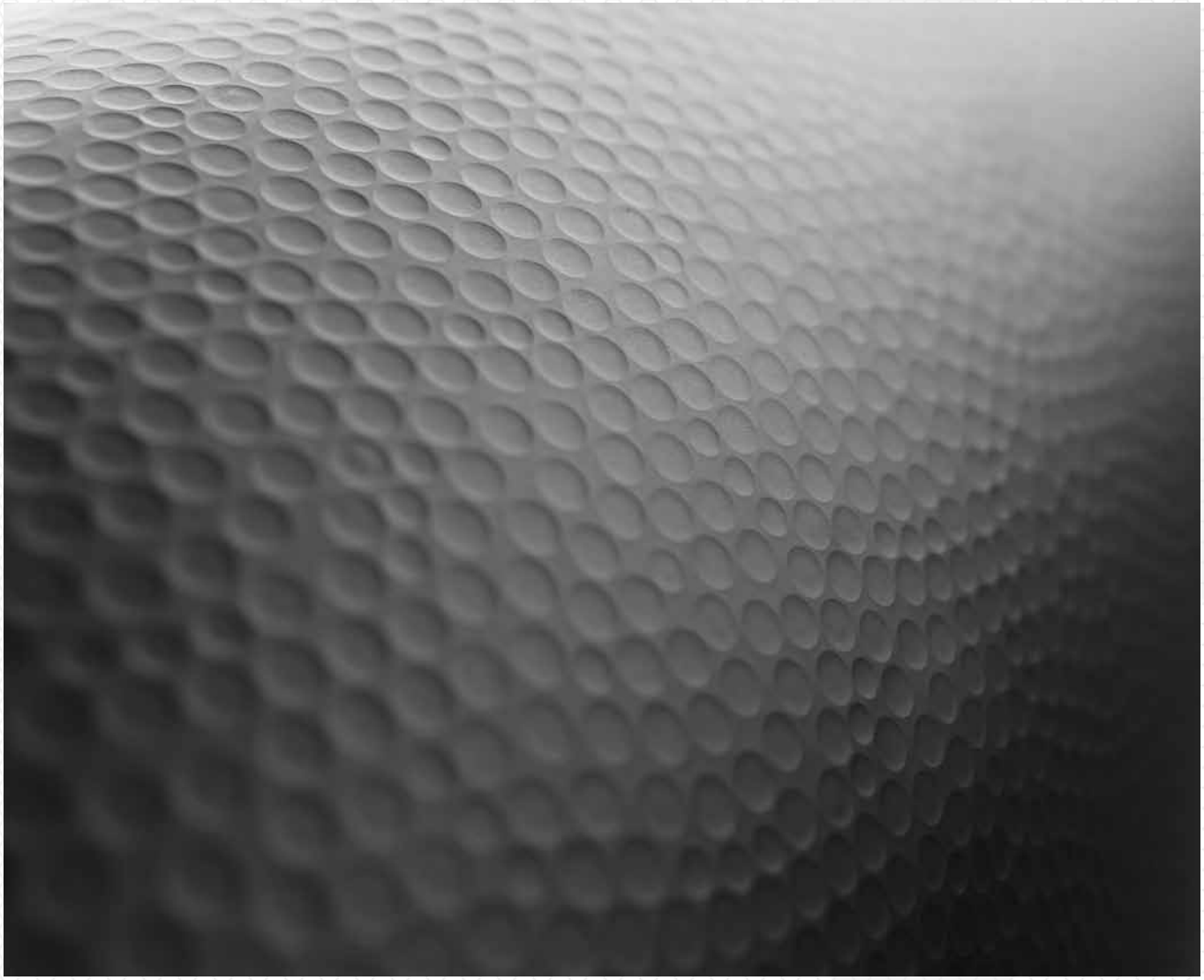
# 02. PRODUCT - ZCX RAPIDWRAP - FILM



Patent on the structural pattern
Special developed polymer film
Special glue
Bionic structure

# 02. PRODUCT - ZCX RAPIDWRAP - FILM - CLOSEUP 01





# 02. PRODUCT - ZCX RAPIDWRAP - FILM - CLOSEUP 01



# 02.1 PRODUCT - ZCX RAPIDWRAP - EFFECT AND ADDED VALUE



**Effect**

Energy-efficient
Reduces emissions
More stability by increasing Speed
Less wind noise by increasing Speed
Higher final velocity
Less drag resistance

**Added Value**

Protection of the original coating or surface
UV-Protection
Corrosion protection
Thermal insulation and heat insulation
Easy removable
7 years waranty

# 02.2 PRODUCT - ZCX RAPIDWRAP - FIELDS OF APPLICATION



Automobiles
Trucks (Commercial vehicles)
Trains
Boats
Planes
Surfboards,  Wakeboards, Waterski
Windturbines
Pipelines
Motorbikes and equipment
Bicycles and equipment
Architecture
... much more applications

# 03. PRODUCT - ZCX RESISTANCE - COATING



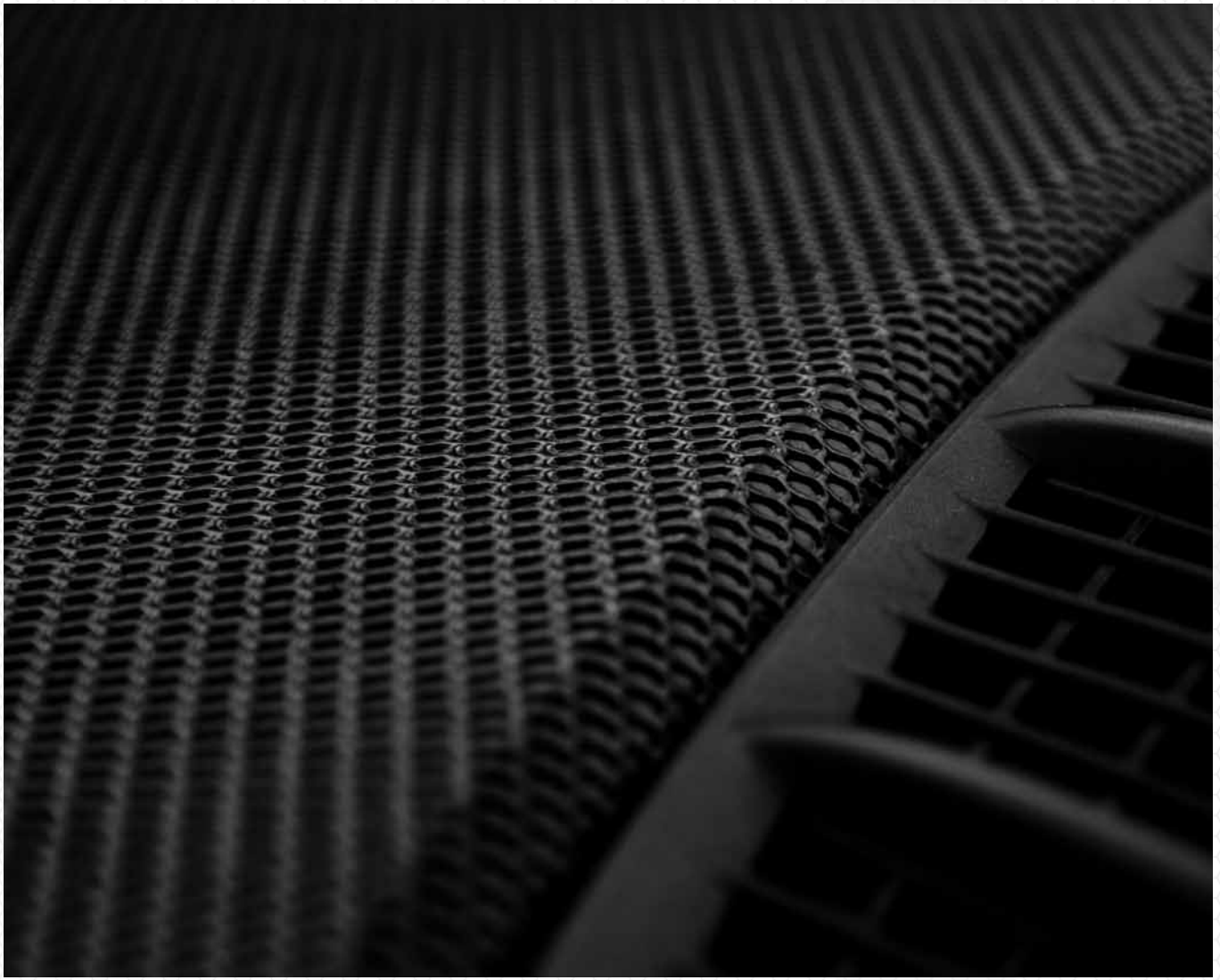
Custom-made product
Applied during the conventional coating process
High mechanical resistance
All kind of coating upgrades possible

# 03. PRODUCT - ZCX RESISTANCE - COATING - CLOSEUP 01



# 03. PRODUCT - ZCX RESISTANCE - COATING - CLOSEUP 02





# 03.1 PRODUCT - ZCX RESISTANCE - EFFECT AND ADDED VALUE



**Effect**

Energy-efficient
Reduces emissions
More stability by increasing Speed
Less wind noise by increasing Speed
Higher final velocity
Less drag

**Added Value**

Longer durability
Higher mechanical resistance
Higher compressive strength
Special advantage of water applications - less fouling

# 03.2 PRODUCT - ZCX RESISTANCE - FIELD OF APPLICATION



Speedboats
Boats
Architecture

**In general**
Surfaces - special applications which need a strong mechanical resistance because of extreme external influences like:
- high final velocity
- high pressure gradients
- extrem weather conditions

# 04. BIONIC / BIOMIMETIC = BIO TECHNOLOGY



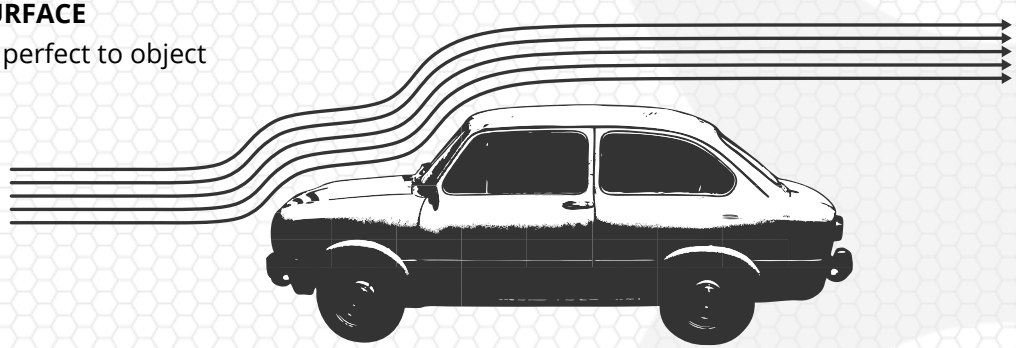
Structured Surfaces are present all over nature and adapt their behaviour from time to time.
Bionic means independent technological design inspired by nature.
Examples for bionical design are: Planes, velcro, Speedos Shark Skin swimming suit...

# 05. AERODYNAMIC BEHAVIOR



Effect caused by micro air turbulence that creates an air-pillow
Friction between air and air
Longer coanda effect and better laminar flow
Less drag
Bionic structure reduces the wave drag
More stability by increasing Speed

**WITHOUT STRUCTURED SURFACE**
Laminar flow does not stick perfect to object
Low efficiency

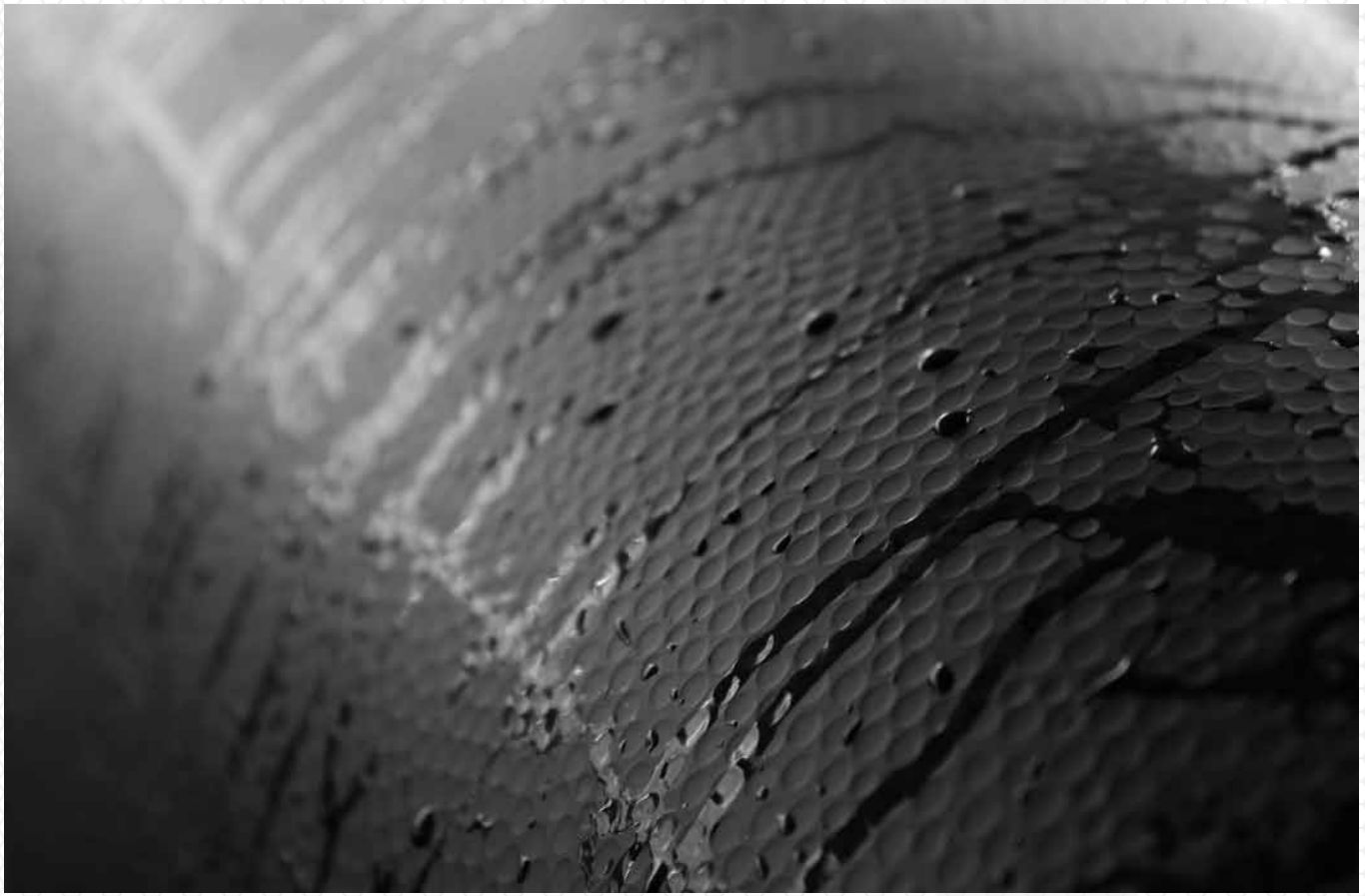


**WITH STRUCTURED SURFACE**
Laminar flow sticks perfect to object
Higher efficiency

# 06. HYDRODYNAMIC BEHAVOIR



Effect caused by small air portions catched by each dimple
Air bubbles are passed trough the dimples which creates an air pillow
Friction between water and air
Better water flow and stability



# 07. ADVANTAGE OF STRUCTURED SURFACES



Reduce fuel / energy consumption
Reduce bad emissions
Increase final velocity
Better stability
Wind-noise reduction
In general more efficient
Less drag
Better thermal insulation

# 08. SUSTAINABILITY



**Ecological**
Reduce emissions
Save resources
Better energy efficiency
Extended durability of products

**Economic**
Save fuels / energy because of less drag
Protection of the original coating or surface
Quicker and cheaper color change process

**All truth passes through three stages.**
**First, it is ridiculed.**
**Second, it is violently opposed.**
**Third, it is accepted as being self-evident.**

**Arthur Schopenhauer**
Deutscher Philosoph (1788 - 1860)

## MORE INFORMATIONS

www.zdrax.de

## CONTACT US

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