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MUSEO STORICO
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PLASTIC MATERIALS IN MOTORCYCLE HELMETS

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DAINESE



TEX



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PLASTIC MATERIALS FOR MOTORCYCLE HELMETS

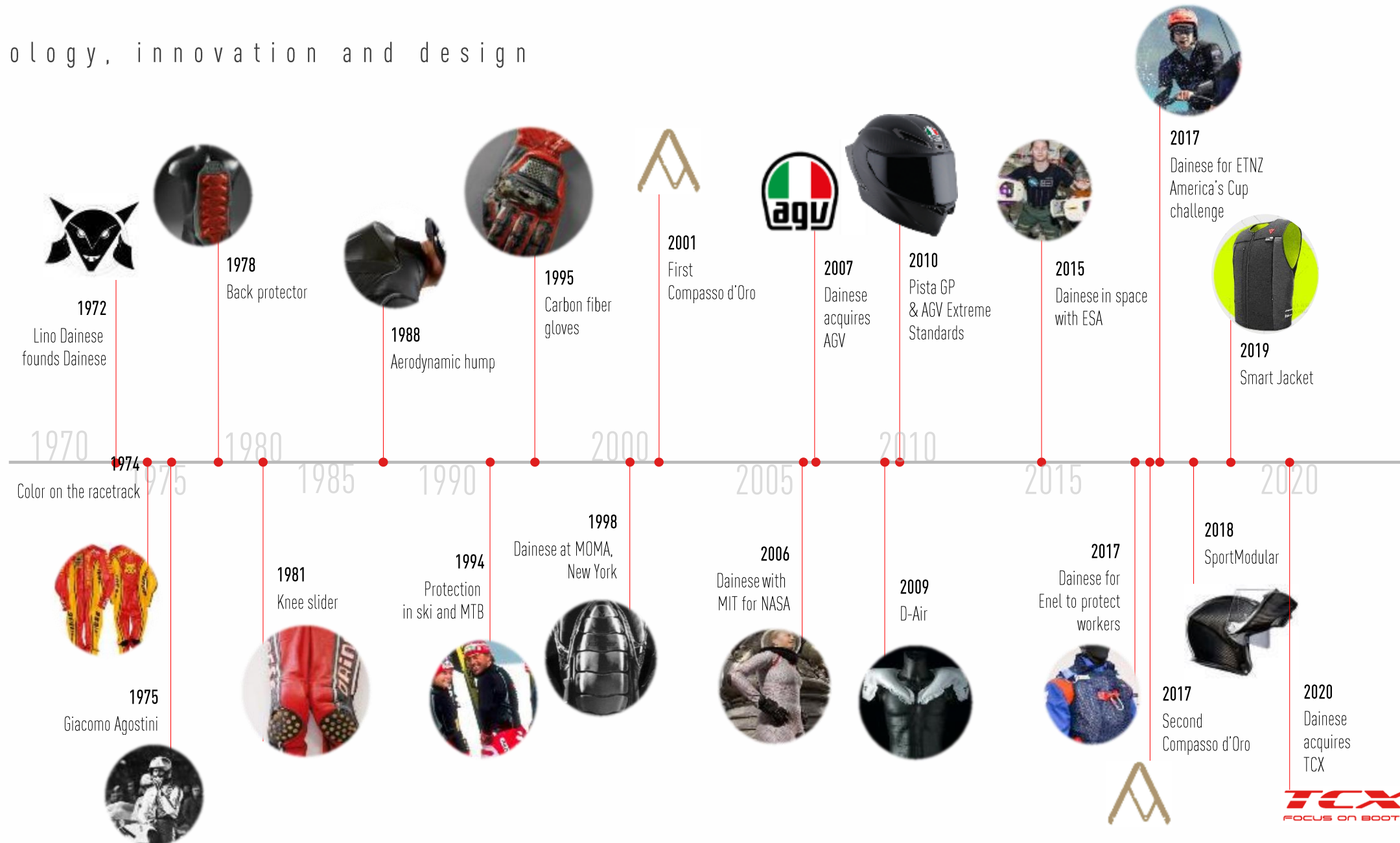
The use of plastic materials in motorcycle helmets is very popular today, both to guarantee the safety in the crash test and, at the same time, to help the all the mechanisms to work well.

The presentation, starting from how a motorcycle helmet is made, will define the main technical and operational problems in the choice of materials to be used to guarantee the required performance, with some examples managed over the years in Dainese for AGV products.

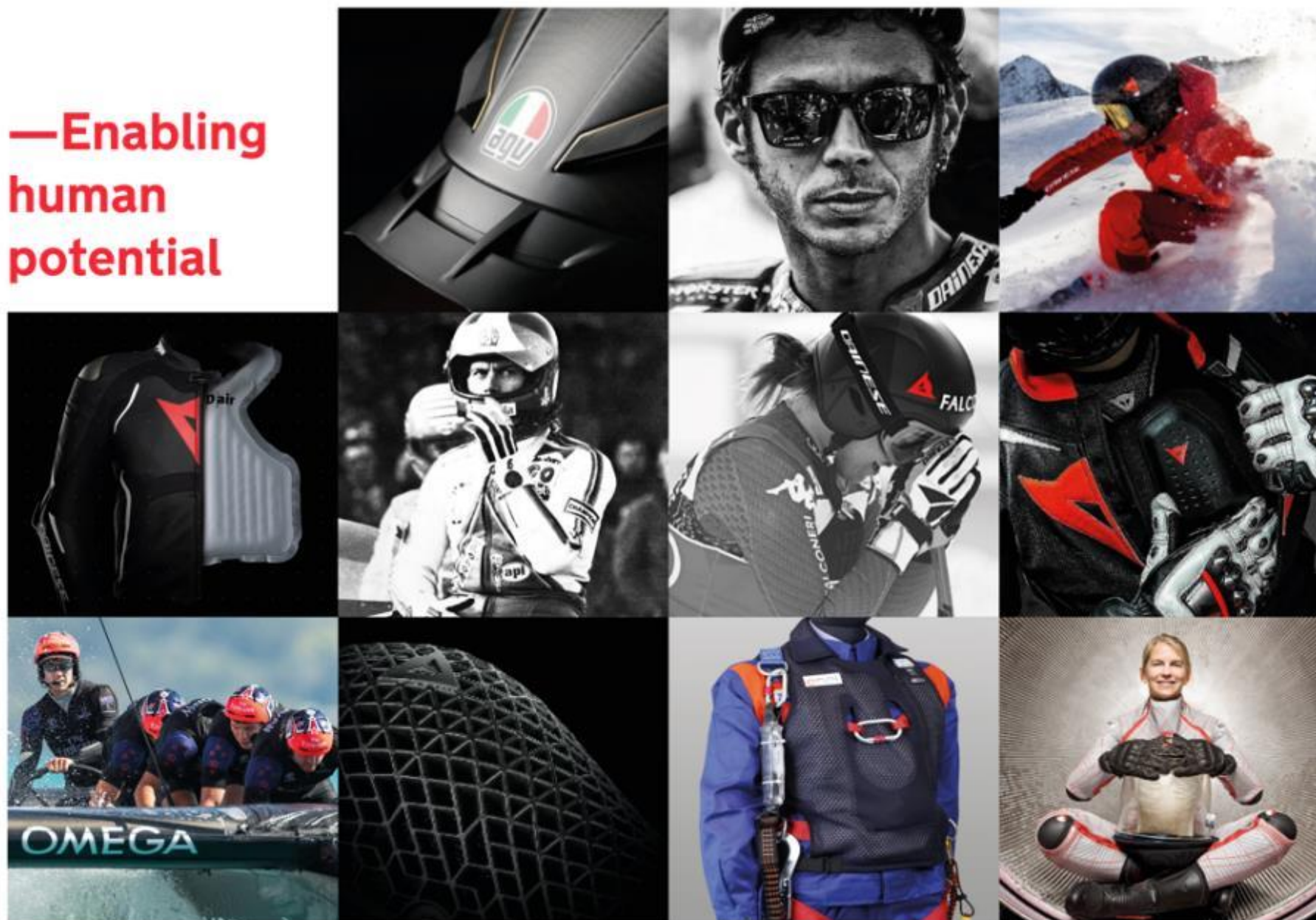
2. INTRODUCTION TO DAINESE GROUP

DAINESE

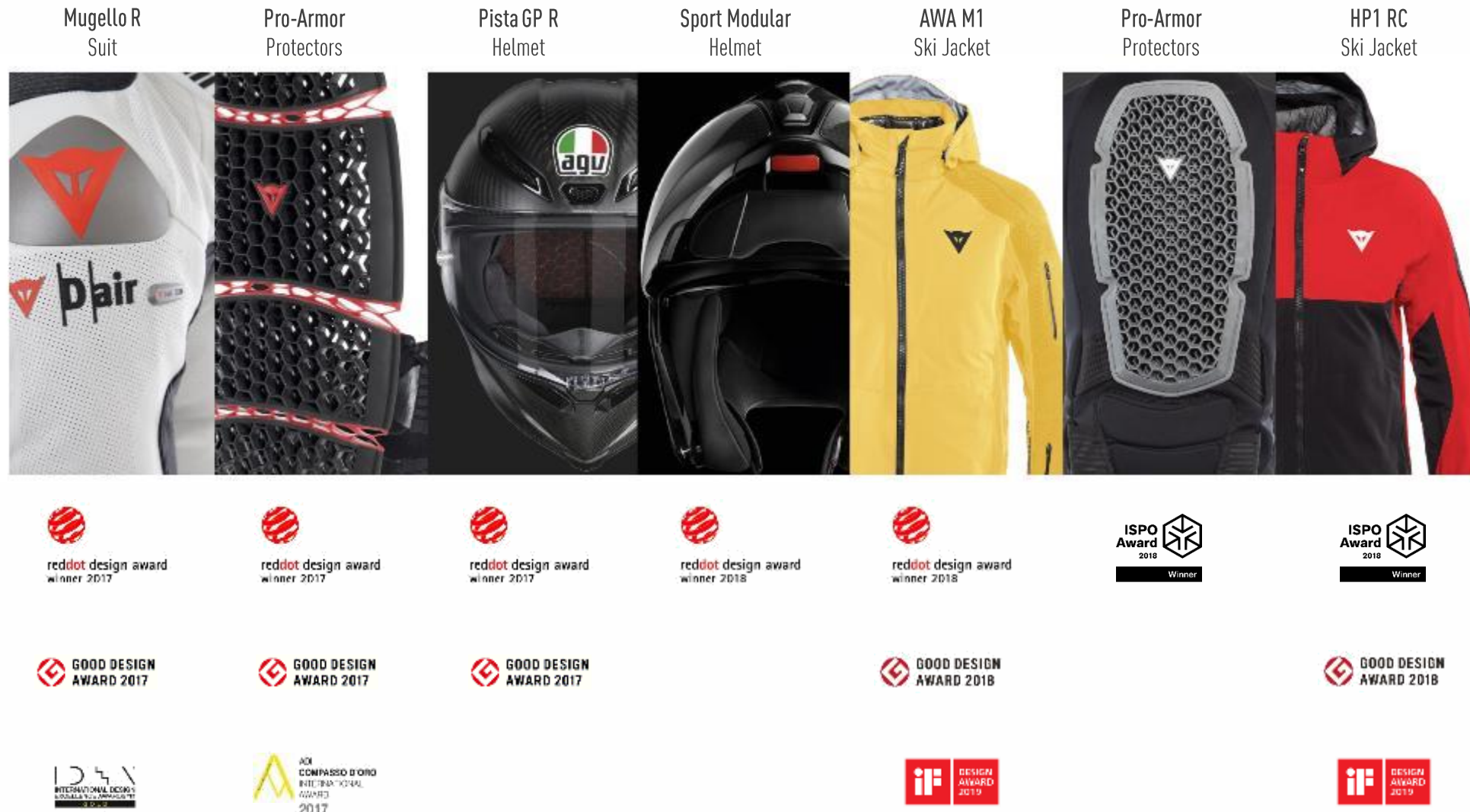
Technology, innovation and design



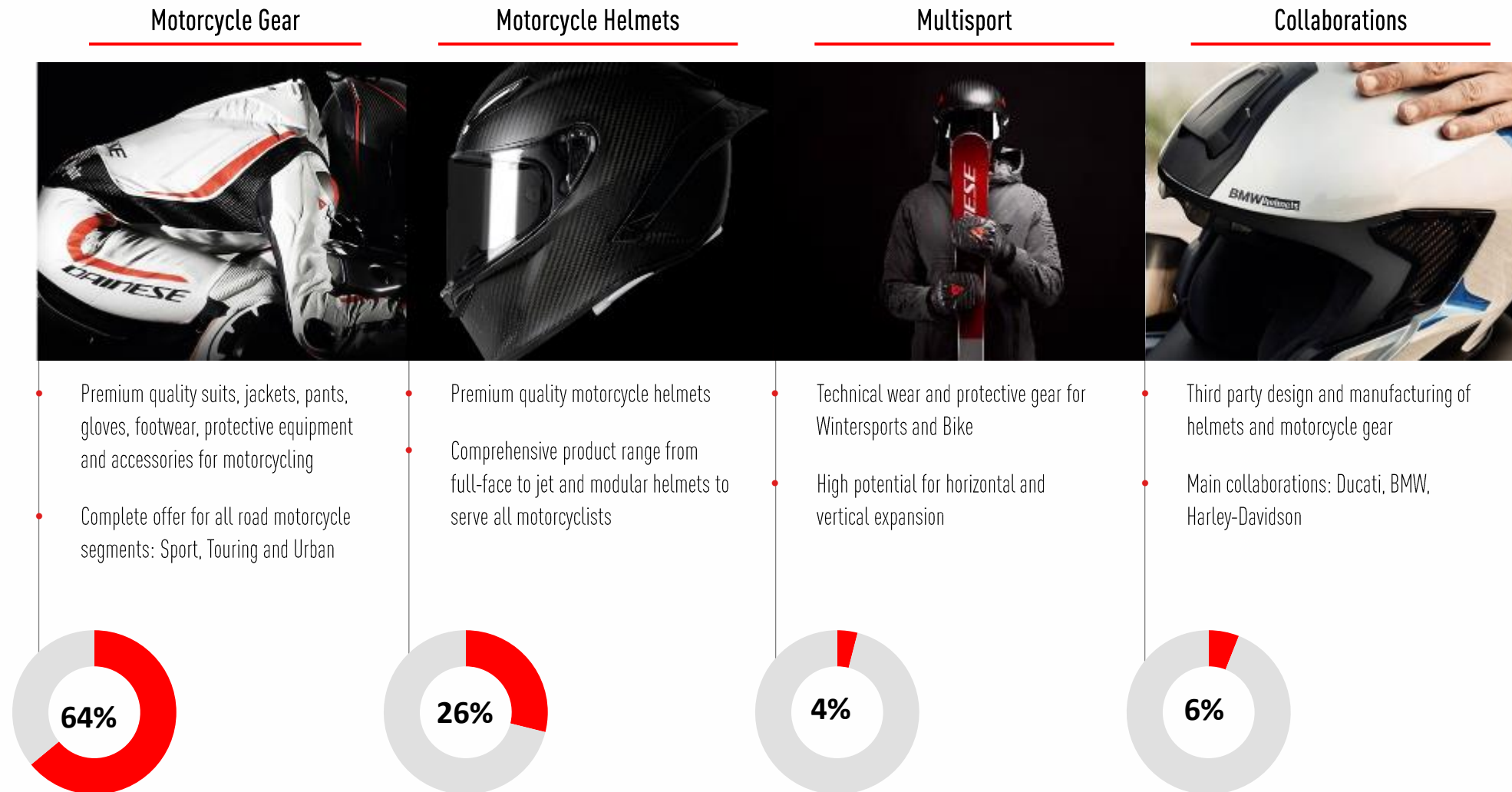
—Enabling
human
potential



Recongnized as an indutrial desing excellence



Full «Head-to-toe» product offering





WHY DAINESE AT SMARTPLASTICS?

AGV PRODUCT RANGE

High-range



Pista GP RR



K6 S



Sportmodular



AX9

Mid-range



K5 S



Tourmodular



K-5 Jet

Low-range



K3



K1 S



Streetmodular



Obryt



KEY POINTS

Design

Homologation

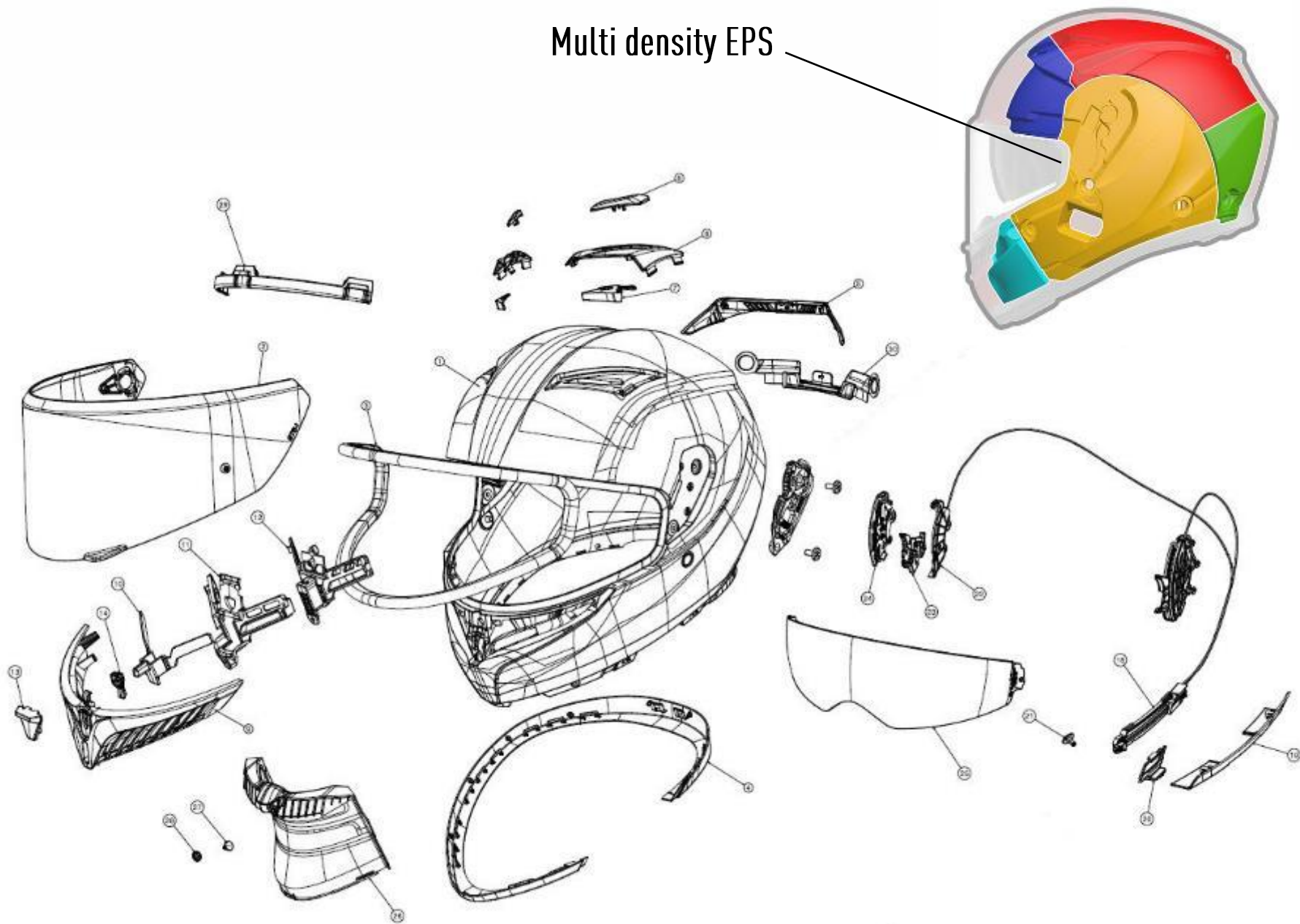
Customer sizing & fit

Visor optical class 1

Aerodynamics

Noise reduction

Multi density EPS



n.	Description	Material
1	SHELL ECE	ABS
2	VISOR GT6-1 PLK READY	PC
3	VISOR TRIM	EPDM
4	BASE TRIM	HDPE
5	REAR SPOILER	PC
6	BASE TOP VENT	PC
7	SLIDER TOP VENT	POM
8	BUTTON TOP VENT	PC
9	BASE CHIN VENT	PC
10	SLIDER CHIN VENT	POM
11	FRAME CHIN VENT	POM
12	SUBFRAME CHIN VENT	POM
13	BUTTON FINISHED MICRO-OPENING SYSTEM	PC/ABS+TPU
14	SPRING MICRO-OPENING SYSTEM	POM
15	GROUNDPLATE VISOR MECHANISM	POM
16	SPRING VISOR MECHANISM	POM
17	LEVER VISOR MECHANISM	POM
18	BASE SUNVISOR BUTTON MECHANISM MOVEMENT	PA66
19	FRAME SUNVISOR BUTTON MECHANISM MOVEMENT	PA66
20	SLIDER SUNVISOR BUTTON MECHANISM MOVEMENT	POM GF10
21	CHEEKPAD HOOKING BUTTON MALE	PA66
22	BASE SUNVISOR MECHANISM MOVEMENT	POM
23	SLIDER SUNVISOR MECHANISM MOVEMENT	POM
24	FRAME SUNVISOR MECHANISM MOVEMENT	POM
25	SUNVISOR	PC
26	CHIN COVER	PP
27	CHEEKPAD HOOKING BUTTON MALE	PA66
28	CHEEKPAD HOOKING BUTTON FEMALE	PA66
29	CROWNPAD FRONT HOOKING FRAME INMOLDING	PA66
30	CHEEKPAD HOOKING FRAME	PA66



PROBLEM: Q4 system was big, noisy, difficult to remove visor and not so reliable



4 parts

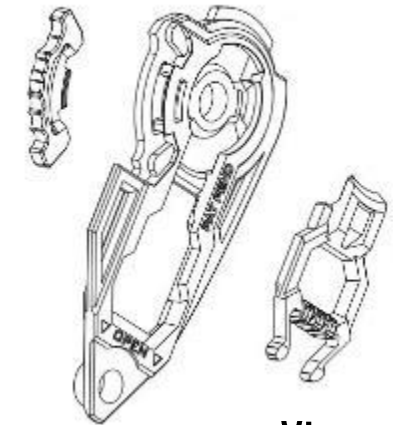
Visor base groundplate (PA66)
Visor tooth (POM)
Spring (Steel)
Visor removing lever (PA66)

A new mechanism has been developed taking in account:

- Components reduction → from 4 to 3 parts
- Durability → from 10000 cycles open/close to 30000 cycles
- Personalization → 3 different spring movement shape (road, race, touring)
- Cost → less material
- Easy to assembly/disassembly → less locking points
- Smooth movement → based on part flexion during visor shaft movement up/down
- POM material for all components



Visor spring



Visor groundplate

Visor release lever



PROBLEM: screeching noise during mount / dismount visor

A screeching noise appear during development phase and as the unmount/mount is not so often this issue has been considered an unquality perception

All the others mechanism function was fully respected, so as the lever must have a spring function too, POM was mandatory, the only way to improvement was related to the GROUNDPLATE. So has been evaluate different materials, but with the fixed point to use the same mold already made. The choice has been to move to PA. Successfully test and validation have confirmed the PASS result for all the requirement and with the noise claim solved.

	GROUNDPLATE	POM Black	New material →	PA Black
	LEVER	POM Red	No change	POM Red

THANKS

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TCX



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