NPT ADHESIVES & SEALANTS

SiMP ADVANCED

EU PROJECT

THIS PROJECT HAS RECEIVED FUNDING FROM THE HORIZON 2021 FRAMEWORK PROGRAMME OF THE EUROPEAN UNION UNDER GRANT AGREEMENT N° 848560

THE FUTURE OF INNOVATION

ADVANCED SMP TECHNOLOGY

- New Generation Technology
- Environmental sustainability
- Ultimate mechanical performance
- Manufacturing process efficency and design

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SiMP ADVANCED

Since its origins NPT has based its value proposition on chemical research, aimed at the creation of innovative products of high quality and performance, all having as a fundamental driver the ability to give added value and differentiation to its partners and customers.

The most substantial evolutionary needs arise from the Automotive & Transportation sector, as well as from that of industry in general. The continuous need to experiment new and more performing materials, with a lower environmental impact and with a higher aesthetic and design content, have prompted NPT to invest in the latest generation technologies.

The decision to develop a new technological family of products, based on a new generation of silane polymers able to combine the advantages of this technology with the high performance typical of the dominant polyurethane-based technology was born from this research.

This is called **SiMP Advanced**.

The new generation of silane adhesives and sealants for elastic structural bonding in the automotive and transport sectors.

Driven by the growing demand of the market for the use of materials that combine the reduction of emissions of volatile substances and CO2, the reduction of the use of hazardous components such as isocyanates and solvents, the maintenance or improvement of performance in order to guarantee greater safety for both producers and end users, as well as the possibility of simplifying and reducing the economic impact in the production phases, NPT has finalized the first of a family of products: **SiMP Advanced 70 UP**.

Performance, environmental sustainability and attention to production costs, all this in a single solution, in which the European Commission also believed, selecting the research, industrialization and marketing project among the most deserving projects at community level in 2019. This allowed us to accelerate the process and to be the first with a unique and revolutionary solution for the market.

The project that we are proud to present today, in the form of SiMP Advanced 70 UP, is complex and involve synthetic chemistry, for the creation of a unique polymer, formulation chemistry, the result of research and experimentation of special components never used in the world of silanes, as well as innovation of the production process, through the construction of a dedicated plant for the processing of part of the semi-finished products whose use is essential for the realization of the final product.

From all this comes SiMP Advanced 70 UP.

The product combines the main and typical advantages of silane technology with the high mechanical performance currently reserved for the exclusive prerogative of polyurethane technology.

All this is the result of the joint effort of a diverse team of human resources who believed they could achieve this goal. It is a symbol of a typically Italian capacity for innovation; it is the desire to look ahead, beyond the usual mental schemes and the pure economic profit.

All this is SiMP Advanced, what we believe may become ***the future technological standard at the service of innovation***.

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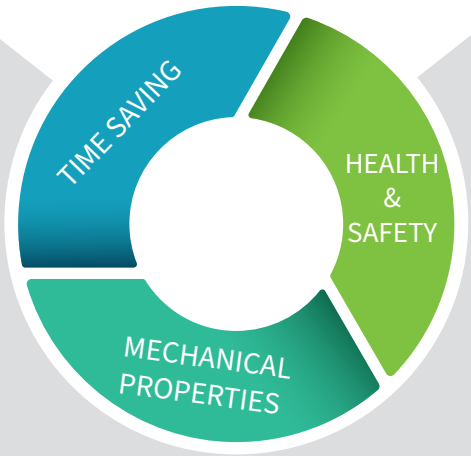
SiMP ADVANCED: THE REVOLUTIONARY TECHNOLOGY

Automotive and transportation represents one of the most important and dynamic markets of the last decades. Innovation and high levels of technology are the main drivers for all major players. OEM Manufacturers are investing billions of Euros in the continuative development of their products.

SiMP Advanced is a high-performance silyl-modified polymer that possess the inherent advantages of SiMP adhesives (environmental friendly and no need for pre-treatments) with radically improved mechanical performance typical of the PU. This unique combination of properties leads SiMP Advanced to be used for the elastic structural bonding in the industrial application in an efficient and sustainable manner.

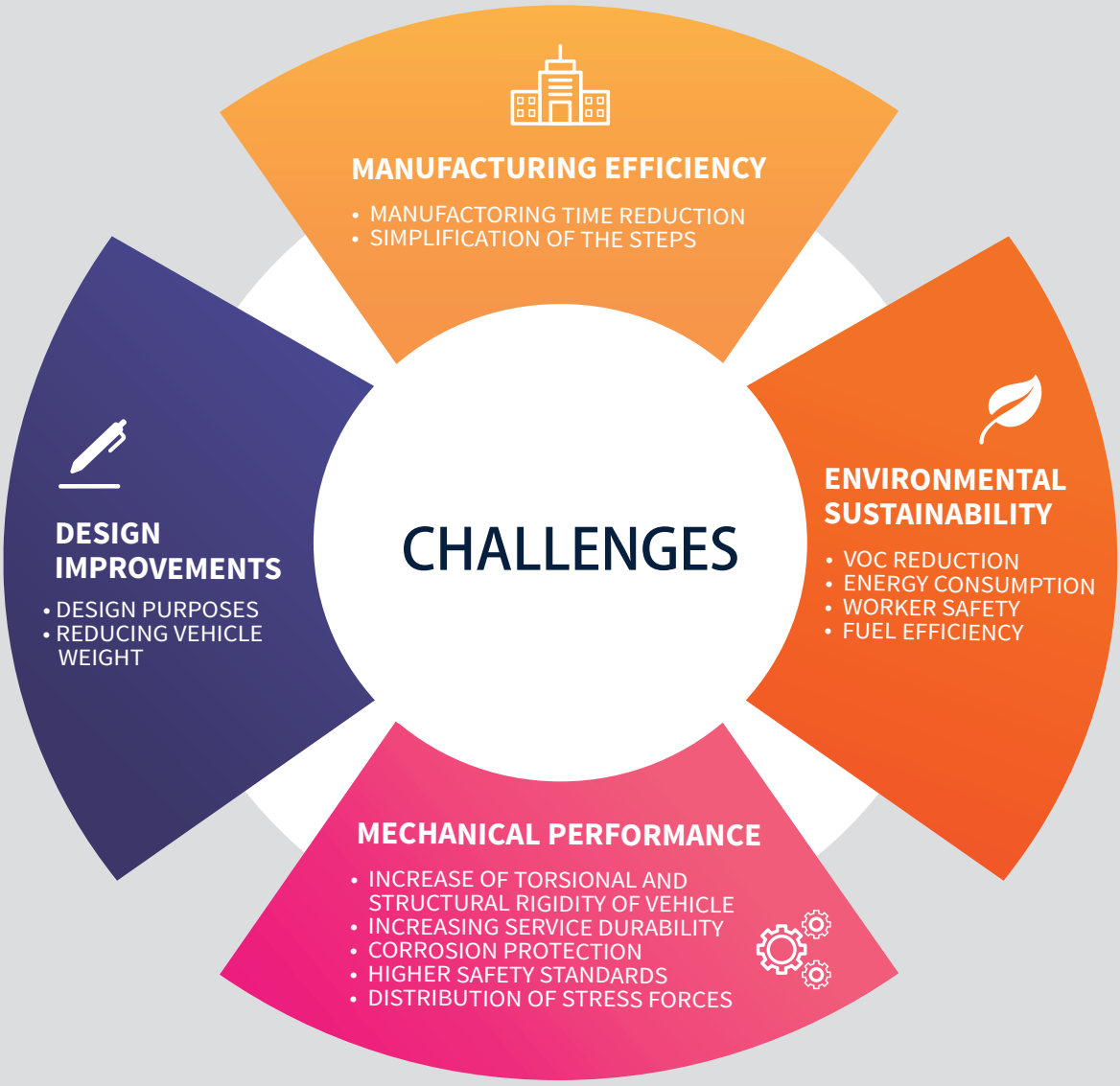
	PU TECHNOLOGY	MS-SMP TECHNOLOGY	SiMP ADVANCED
SPECTRUM OF ADHESION	✗	✓	✓
SURFACE PREPARATION	✗	✓	✓
STRUCTURAL PROPERTIES	✓	✗	✓
ENVIRONMENTAL IMPACT	✗	✓	✓
WEATHERING AND UV RESISTANCE	✗	✓	✓
PROCESS FASTING	✗	✓	✓



Based on our proprietary polymer backbone structure we have developed a solution with mechanical properties comparable to those of PU. Very importantly, SiMP Advanced allows to by pass the surface preparation step increasing the manufacturing efficiency and, at the same time, creating important savings of cost and time compared to current solutions. The polymer obtained can range from hard and tough like a resin to elastic and flexible like a rubber, thus finding application as either sealant or adhesive.

SiMP ADVANCED:
A STEP TOWARDS THE FUTURE

The new competitive scenario is based on an increasingly demanding market where performance, environmental sustainability, safety at work and cost efficiency in production processes are the drivers of success. NPT has created SiMP ADVANCED TECHNOLOGY to combine and respond to these needs.



FEATURES

- NO PRE-TREATMENTS
- ONE PRODUCT LESS COMPLEXITY
- PRIMERLESS ADHESION ON SEVERAL SUBSTRATES
- ELIMINATION OF WELDING

FEATURES

- FAST CURING AND APPLICATION
- HIGH TACK AND GRAB PROPERTIES
- HIGH MECHANICAL PERFORMANCE
- AGEING AND WEATHERING RESISTANCE
- COMPLIANCE TO HOMOLOGATION STANDARDS

FEATURES

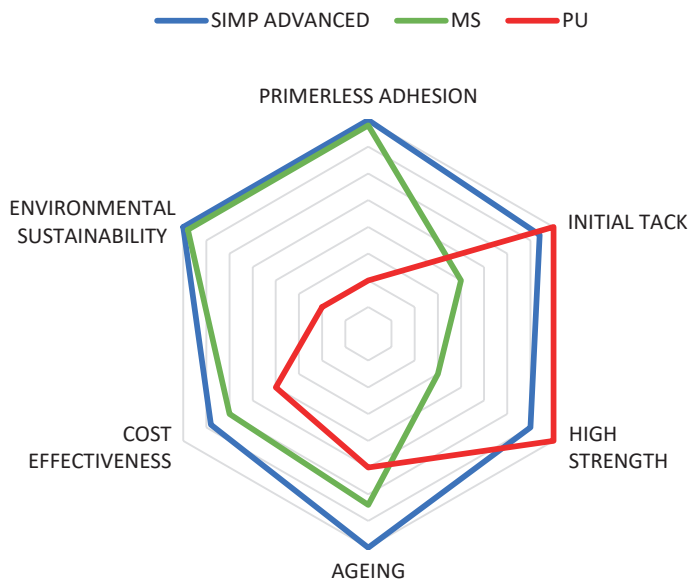
- NO ISOCYANATE
- NO SOLVENT
- NO CO2
- NO USE OF ACCESSORY DANGEROUS GOODS
- WEIGHT REDUCTION
- NO HAZARD SYMBOLS

FEATURES

- EASY TO APPLY AND TOOL
- IDEAL FOR BONDING AND BACK FILLING
- DESIGN FEATURES DUE TO THE TECHNOLOGY

SiMP ADVANCED: HIGH PERFORMANCE AND MORE

Nowadays, technological innovation is no longer intended only as research aimed at the exclusive growth of technological product performances but represents a complex system that must respond, starting from the performance characteristics of the product, to a whole series of qualitative standards pointing at the concept of total quality, also made up of respect for the environment, safety, efficiency and compliance with industry standards. SiMP Advanced represents the extended technological system that meets the needs of the market.



CERTIFICATES

SiMP ADVANCED 70 UP

INDOOR AIR COMFORT eurofins GOLD CERTIFIED PRODUCT

GEV-EMICODE EC 1 PLUS very low emission

VDA 278

EN 45545-2 R1/R7

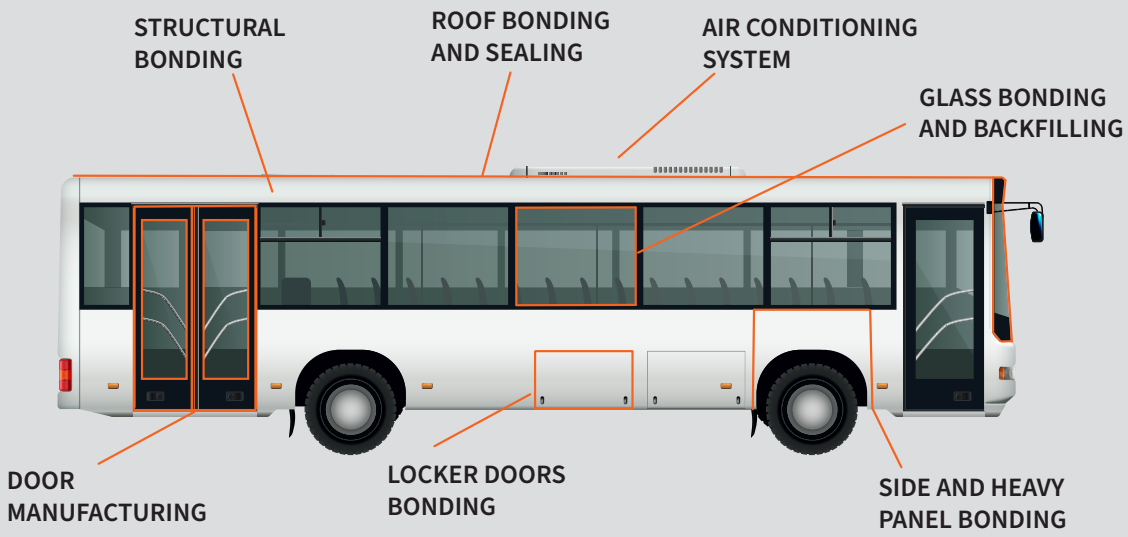
ISEGA PRODUCT SAFETY WITH LETTER AND SEAL

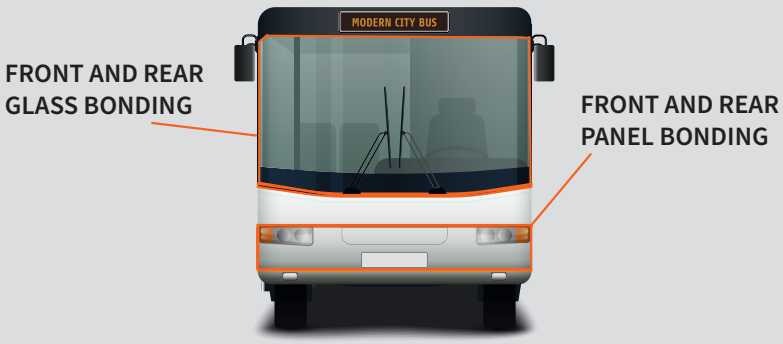
		SiMP ADVANCED	TYPICAL PU	TYPICAL MS-SMP
Base	-	SIMP 1C	PU 1C	MS-SMP 1C
Skin time	min	25-35	15-60	15-20
Curing through volume	mm/24h	>3,0	>3,0	2,5-3,0
Fixture time	h	2	0,5-8	0,5-2
Tensile strength (DIN 53504/ISO37)	MPa	6,0-7,0	6,0-9,0	3,0-3,5
Shear strength (DIN 53283/ ASTM D1002)	MPa	3,5-4,0	>4,0	1,8-2,2
E-Modulus [10%] (DIN 53504/ISO37)	MPa	>5,0	>3,0	2,0-2,5
G-Modulus (DIN 3504/ISO37)	MPa	1,7-1,8	1,3 - 1,5	0,8 - 1,2
Elongation (DIN 53504/ISO37)	%	> 400	> 400	> 250
Conductivity	-	NO	YES/NO	YES/NO
Weathering resistance	-	+++	++	++
Pre-treatment	-	NO	YES	NO
Environmental Sustainabiliy	-	YES	NO	YES

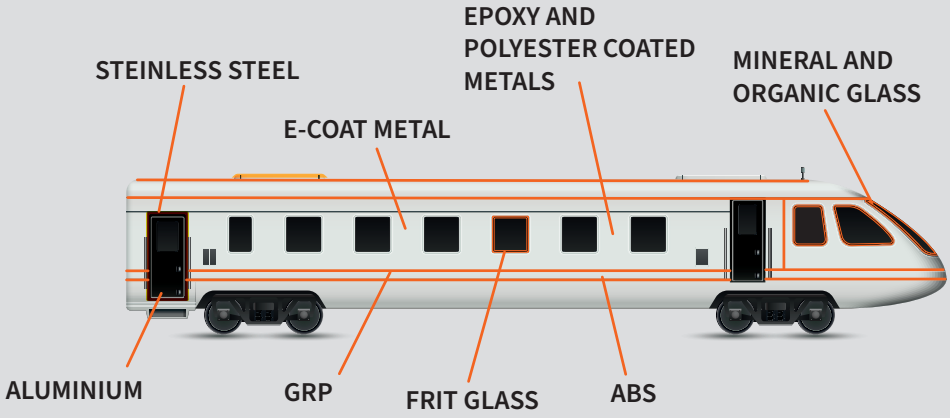
SiMP ADVANCED: UNIQUE SOLUTION FOR AUTOMOTIVE AND TRANSPORTATION INDUSTRY

In recent decades, the bonding technology has rapidly and inexorably replaced the fastening systems such as mechanical fixing and welding systems. This has made it possible to create vehicles that are much more integrated from the point of view of torsional dynamics and structural rigidity. This guarantees safety and stability as well as a longer durability of the vehicles.

SiMP Advanced represents a unique bonding solution which, thanks to its mechanical and rheological characteristics, contributes to the integrity of the vehicles.







SiMP ADVANCED: APPLICATIVE VERSATILITY

The continuous search for advanced materials that allow to obtain original results in terms of design, above all a lightening of vehicles without losing safety, has gradually led the industrial sectors to abandon the exclusive use of metals to the advantage of new composite materials. On the other hand, the growth of application complexity has required the introduction of more and more specific accessory materials that guarantee the correctness of the gluing as well as their stability over time.

SiMP Advanced represents a highly versatile solution allowing in most applications to avoid surface pre-treatments and therefore the correct gluing of the parts.

WORKING CONDITIONS*

General bonding for internal and not structural application
No contact with water or extreme temperatures

Bonding for interiors and exteriors in enviromental conditions
or in contact with water

ADHESIVE / SUBSTRATE	*SiMP ADVANCED*					
	CLEANING	ACTIVATOR	PRIMER	CLEANING	ACTIVATOR	PRIMER
ALUMINUM	E + SB, E	400 NP	160	E + SB, E	400 NP	160
STAINLESS STEEL	E			E		
HOT DIP GALVANIZED STEEL	E			E		
ELECTROGALVANIZED STEEL	E			E		
E-COAT	E			E		
PAINTED SHEET EPOXY COATED	E			E		
PAINTED SHEET POLYESTER COATED	E	400 NP		E	400 NP	160
FLOAT GLASS	G + S			G + S		
CERAMIC FRIT GLASS	G + S			G + S		
FRP	E			E		
ABS	E		135	E		135
POLYCARBONATE	E	400 NP		E	400 NP	160
PMMA	E	400 NP		E	400 NP	160

CLEANER E | CLEANER G + S | ABRASIVE PAD (scotchbrite) | ACTIVATOR 400 NP | U - PRIMER 160 | PRIMER 135

**The present table is based on our internal testing and using specific homologated materials. Preliminary tests on substrates are always advised.*

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N.P.T. s.r.l. single shareholder
Administrative and Commercial Office

Via Guido Rossa n.2
Loc. Crespellano
40053 Valsamoggia (BO) – Italy
Tel: +39 051.969.109
Fax: +39 051.969.837
npt@nptsrl.com

Research and Production Unit

Via Stazione, 12
27030 Villanova d'Ardenghi
(PV) Italy
Tel: +39 0382.400.140

npt@nptsrl.com

nptsrl.com

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