IZADI
nano2industry

ESTCRATCH SOLUTIONS

Improved materials and innovative injection moulding process for more performing and aesthetics enhanced PMMA plastic parts

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 686165.

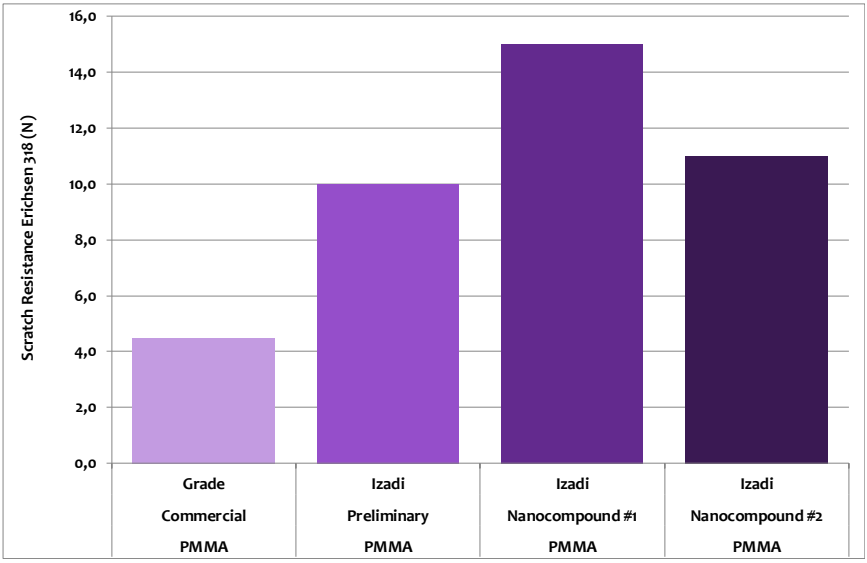
This brochure has been developed in the framework of IZADI-NANO2INDUSTRY project (H2020, G.A. no.686165). It is aimed at presenting the main results achieved by ESTCRATCH PILOT partners, whose activities have been focused on the development of innovative materials and processes to produce exterior plastic trims with enhanced aesthetics and anti-scratch properties for the automotive sector.

Optimized materials for nanoreinforced injected thermoplastics

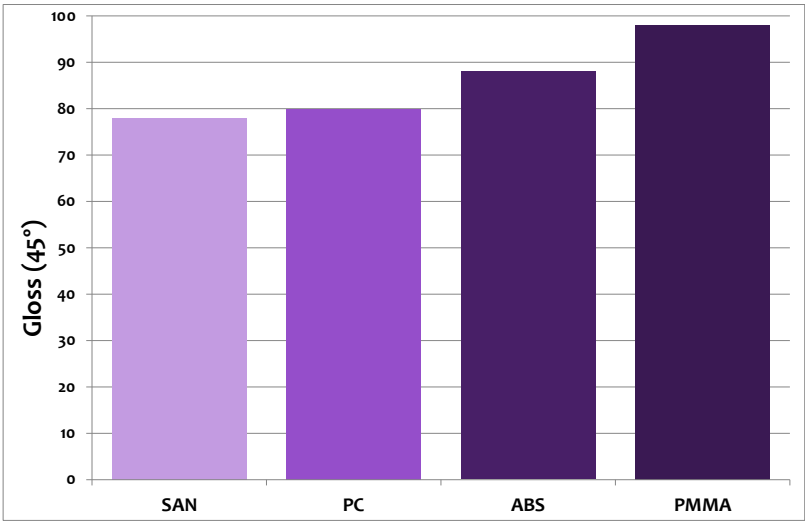
OUR ACHIEVEMENTS

PMMA nanocompounds with better resistance to scratch

- Improved scratch resistance more than 140% compared to standard PMMA

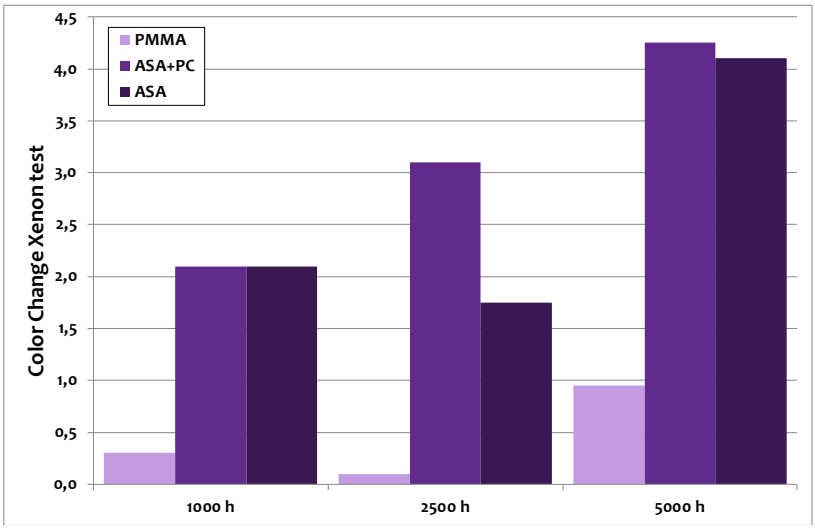


- Low variation of gloss



Gloss equal to the 98% of the gloss of the reference material

- Low variation of colour



Low color variation of the PMMA material developed compared to reference materials

WHAT WE OFFER

Tailor-made consultancy services for the formulation of thermoplastic compounds and masterbatches in granular form

- Cumulated enhanced appearance, colour, targeted functionalities and better processability incorporated in polymers
- Tailored degree of additives dispersion at nanolevel, exploiting the synergy between additives in a very stable and reproducible manner

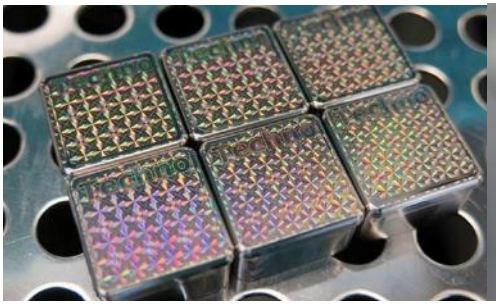
Advantages of IZADI-NANO2INDUSTRY PMMA Nanocompound

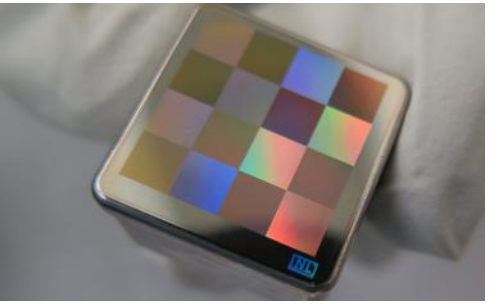
- Best possible light transmission (92% at clear grades)
- Good chemical resistance
- 100% recyclable - environmentally friendly
- Polishable to remove small surface scratches
- High mechanical strength, surface hardness and abrasion resistance
- Very good weather resistance
- Optimum mechanical properties
- High heat deflection temperature
- Good flow / melt viscosity
- Class-A Surface (without painting)
- Economic production
- Less weight
- Freedom of design

Enhanced aesthetics and colour effects for injection moulded plastic parts

OUR ACHIEVEMENTS

Production and supply of nanotextured mould inserts able to provide Diffractive/Plasmonic aesthetics finishes to plastic part directly during the injection moulding process





WHAT WE OFFER

Technical consultancy services related to:

- Patterning of injection moulding tool inserts
- Imprint processes on injection moulding steel tools and other substrates
- Design of plasmonic and dielectric metasurfaces compatible with DUV lithography master origination
- Laser printing, for opto-thermal modification with resolution down to individual nano-structure/"meta-atom".

Advantages of IZADI-NANO2INDUSTRY Innovative Decoration System

Reduction of production phases and costs as the parts are made in a single step and several decoration and labelling processes can completely be removed.

More green manufacturing process due to lower energy consumption, less transportation and increased recyclability as parts consist of fewer materials.

Nanostructured surfaces developed can also be used to add other functional effects to a plastic surface such as anti-reflection, self-cleaning, increased wetting and reduced friction.

Material	Finish	Logo	Aesthetic	Scratch Resistance	Impact Resistance	Part Cost*
ASA	Mass Coloured	Tampoprinted	Not Good	Not Good	OK	78%
ABS	Painted	Tampoprinted	OK	OK	OK	93%
PMMA	Mass Coloured	Tampoprinted	OK	Not Good	Not Good	106%
PMMA / ABS-GF	Mass Coloured	Tampoprinted	OK	Not Good	OK	100%
PMMA / ABS-GF	Mass Coloured	Diffractive	OK	OK	OK	118%

** Compared to reference material*

Main app
Are

Automotive

Rear light lenses, warning triangle, wind deflectors, sun visors, lenses, interior and exterior trim parts

Building

Extruded Sheets, balcony lining, green houses, light dome, window profiles (Co-extrusion on PVC), solar collectors

Electrical Industry

Covers, screens, displays, housings, back-light units for LCD-TV's

Lighting

Light fittings, light cover, light diffuser, light guide, advertising and decorative emblems

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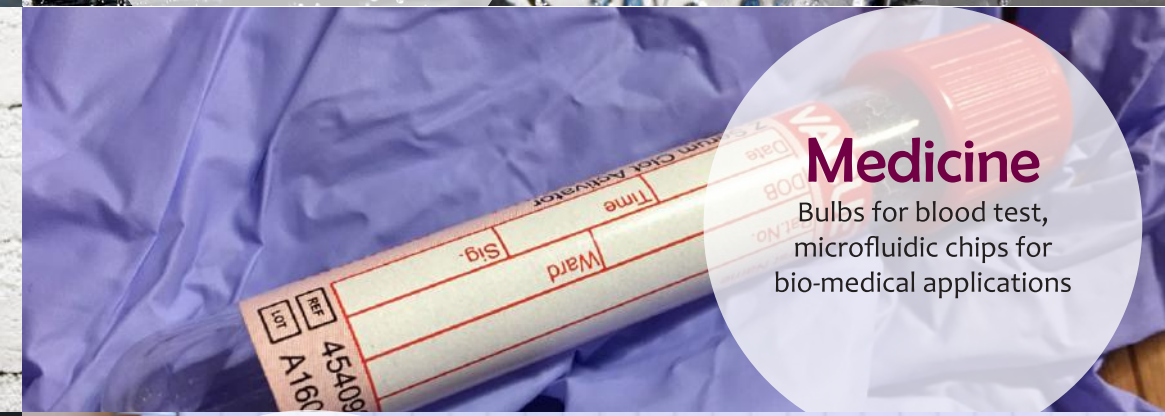
Optical parts

Lenses, magnifying glasses, prism, Fresnel lenses, watch glasses, sun glasses

Sanitary

Fitting knobs, bathtubs, shower trays



Medicine

Bulbs for blood test, microfluidic chips for bio-medical applications

Household

Furniture, writing instruments, decorative parts, fashion ornaments

Early adopter: AUTOMOTIVE SECTOR

Selected Component:

B-Pillar

Need:

exterior trim with enhanced aesthetics and anti-scratch properties

Result achieved:

B-pillars fulfilling OEM requirements and combining diffractive and plasmonic colors with anti-scratch properties

Contacts

Early Adopter

Mario Ordonez
marord@mtc.maier.es

Nano-improved PMMA producer

Cristina Elizetxea
cristina.elizetxea@tecnalia.com

Nano-improved PMMA Producer

Zina Vuluga
zvuluga@icechim.ro

Insert Developer

Renè Hansen
rh@michaellundbech.dk

Plasmonic Colors Designer

Anders Kristensen
Anders.kristensen@nanotech.dtu.dk

Nanotexturing Developer and diffractive gratings Designer

Alicia Johansson
alicia@nilt.com

Nanostructures Patterner

Konrad Bienk
kbi@cemecon.dk

IZADI nano2industry

IZADI-NANO2INDUSTRY (H2020, G.A. no.686165) aims at contributing to overcome the barriers that nano-materials are currently facing to get introduced in the market. During the project, technologies and strategies based on nano-reinforced materials, nanotextured surfaces and nanostructured-coatings have been implemented in three innovative PILOTS that are proposing new added-value products to OEMs and solutions to the European Automotive, Construction and Agricultural Machinery sectors.

Project Contacts

Project Coordinator

Cristina Elizetxea
cristina.elizetxea@tecnalia.com

tecnalia Inspiring Business

Project Scientific Coordinator

Maider Garcia De Cortazar
maider.garciadecortazar@tecnalia.com

tecnalia Inspiring Business

Dissemination & Communication Manager

Isella Vicini
isella.vicini@warrantgroup.it

WarrantGroup® GRUPPO TECNOINVESTIMENTI

Exploitation Manager

Andrea Torcelli
andrea.torcelli@bonfiglioli.it

Bonfiglioli Forever Forward

For more info:

www.izadinano2industry.eu

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