

#### RHEOLIGHT ART EXHIBITION CES LAS VEGAS USA JANUARI 2024

CRYSTAL GLASS PIGMENTS FOR A BRILLIANT, BEAUTIFUL AND SAFER WORLD

### CEO'S LETTER

"Sensor-friendly colors hold the key to a safer traffic environment" Paul Mijnen – CEO Ink Invent- said. "We are extremely proud to receive the CES® 2024 Smart Cities Innovation Award. Recognizing RheoLight as a breakthrough innovation supportive of the transition to full autonomous driving. This award is strengthening our belief and mission of providing RheoLight to the world, making it safer, more colorful and beautiful for everyone". CES INNOVATION AWARDS

# COLOR IN A NEW LIGHT

RheoLight as world's first 1-10 micron size Crystal Glass Microsphere pigments, are specifically designed for the automotive industry. RheoLight enhances visual visibility and sensor detection of vehicles for Advanced Driver Assistance Systems (ADAS). Hereby RheoLight sets the new safety standard for exterior design in the mobility industry.

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### RHEOLIGHT ART EXHIBITION

"Color in a New Light" is an extraordinary showcase at the intersection of art, innovation, and safety. The exhibition unveils the compelling story of RheoLight, the world's first Crystal Glass Microsphere pigment specially produced for the automotive industry. Through seven exhibits, we delve into the transformative effect of RheoLight, where every color shade plays a role in redefining the future of mobility.







### LIGHTEN UP YOUR COLOR

With "Transitional Lapiz Lazuli", the artist orchestrates striking transformations within a singular color spectrum, revealing softened hues and nuanced shades. The artwork showcases playful color shifts and encapsulates a contemporary, elegant, and futuristic aesthetic. Seamlessly integrating functional safety elements necessary for the era of autonomous driving.

ArtistMenno Knoote, December 2023TitleTransitional Lapiz LazuliExhibitCar front on concrete 160 cm x 110 cmOwnerRheoLight ColorLab Academy



# COLOR TREND 2025 FUNCTIONAL AND CAPTIVATING



#### INVISIBLE VISIBILITY

Some dark colors are hardly detectable by current ADAS autonomous driving sensors and are a serious risk in traffic safety. Now, it is possible to make previously invisible objects visible. By adding a low concentration of RheoLight to invisible (dark) colors they become visible and detectable for ADAS.

ArtistJeffrey StouthamerTitleLive LiDARExhibitLiDAR scannerOwnerRheoLight ColorLab Academy





Extensive LiDAR system field tests have shown that 1-3% of RheoLight improves LiDAR detectability significantly. The original color stays intact and there is no visual high reflectivity effect. Improved LiDAR, ADAS and AI algorithm responses ultimately result in a safer traffic environment and contribute to the progression of reaching next SEA levels of autonomous driving.

# NOW ADAS, LIDAR AND AICAN DETECT YOU!



#### VISUAL VISIBILITY BOOST

The percentage RheoLight implemented in color formulations control the visual reflection by day and night. The Vespa scooter on the right has RheoLight added to the original grey metallic color. In daylight the color is similar as the Vespa scooter without RheoLight (left).

At night, activated by car headlights, Rheolight's billion Crystal Glass Microspheres maximize both human eye and sensor visibility. LiDAR detection results goes up 140 times and Computer Vision reliability increases with 21%. This is an additional benefit for the accuracy of AI making the right decisions in autonomous driving systems.



## TO BE SEEN SAVES LIVES





COMPUTER VISION: INCREASED RELIABILITY WITH 21%





### ULTIMATE SAFETY IN MOBILITY

By day and night every color becomes less visible under increasing angles of observation. In traffic, where safety is driven by visibility and detectability, not being seen is dangerous. RheoLight as Tunable Detection & Determination Technology provides an effective safety factor for creating beautiful, higly visible colors for the mobility industry.

The striping applied on the car shows a standard dark grey metallic automotive color. The mini striping in the middle is tuned by adding 3% RheoLight to the color formula. The outer sides of the bodywork contains 20% RheoLight. Self-driving sensors detection reliability improves with 100 up to 200%! The image shows the visual effect lighted by car headlights, under ambient daylight the color is dark grey.



## SAFETY MADE BEAUTIFUL



### IT'S ALL ABOUT COLOR

In our philosophy, we embrace color as a powerful manifestation of both creativity and functionality. RheoLight Crystal Glass pigments engage in a fascinating dialogue with every variant of effect pigment, allowing color designers and formulators to create truly unique and purposeful color shades.

Using as little as 1% of RheoLight in a pearlescent or metallic color, you can instantly change the light reflection angle. This unique feature creates the Twin Flop effect, which is an exciting interplay of color, shape and light reflections. If you want to enhance both the visual appeal and the visibility for self-driving sensors (ADAS) you can add 10 to 20% RheoLight to the color formulation. This will result in unparalleled sensory impact and visibility.

ArtistJacques Arthur Knoote, November 2023TitleEverybody can be an artistExhibitCar models on concrete 80 cm x 50 cmOwnerRheoLight ColorLab Academy



# FORM AND COLOR TNTENSIFICATION



#### SEEING IS BELIEVING

Being visible in traffic is especially valuable for Vulnerable Road Users (VRU's) such as bicycles, scooters, motorbikes, etc. Traffic safety and emergency response vehicles (e.g. ambulances, police, firefighters, tow trucks etc.) can also benefit from being even more visible. The bicyles in action at night shows the exceptional visibility difference of a dark grey and orange color without and with RheoLight inside.

### NOW YOU SEE ME



### AURA OF VISUAL EXCLUSIVITY

Artist Objective; optical elegance by day, and maximum visual and ADAS sensor visibility at night.

Yamaha Dragster 650 Classic. Pearlescent orange and titanium silver automotive colors remastered by adding 20% RheoLight.

MC Laren 720 S. Black metallic base coat with 10% RheoLight, and a transparant red chameleon as second coat. RheoLight intensifies the chameleon color shift.

Harley Davidson Night Rod Custom. Smokey grey for the body and helmet. The original color tuned with 22% RheoLight and 1% blue pearlescent effect pigment.

ArtistMenno Knoote, July 2023TitleRemastered ClassicsExhibitHelmet on concrete 45 cm x 40 cmOwnerRick Pastor



## HIGH VISIBILITY CRUISERS



#### ENCHANTING COLORS

"Color Harmony" is an art display showcasing abstract car models on a concrete surface. The artwork's unique form and color choice goes beyond traditional car design, inviting viewers to reflect on the interplay between shape, color and the essence of mobility. The reflective surfaces give the impression that the shapes are not static objects but rather embodiments of the ever-changing nature of mobility.

The artwork features a radiant palette of bright, high-gloss colors that convey a dynamic and cheerful mood. The RheoLight color shifts brings depth and visual clarity making it easier for both humans and machines to perceive the object.

ArtistMenno Knoote, November 2023TitleColor HarmonyExhibitCar models on concrete 160 cm x 110 cmOwnerRheoLight ColorLab Academy



# 10 AUTOMOTIVE TRENDCOLORS REMASTERED







### TUNABLE COLOR REFLECTION

"Blue Devil" is an exciting journey that takes viewers through the streets at night, showcasing the dynamic allure of a RheoLight scooter at different times of the day. The colors are a masterful combination of movement and stillness, with a commanding presence of deep blue amplified by the mysterious darkness of the night.

Jorik Koopman, the creator of "Blue Devil," not only formulated the scooter color, but breathes life into it, turning it into a symbolic representation of speed, elegance and the rebellious spirit of the urban night. He captures the raw energy of urban mobility and the intricate details making the scooter a symbolic "blue devil" on the streets.

ArtistJorik Koopman, December 2023TitleBlue DevilExhibitPetrol Tank on concrete 48 cm x 40 cmOwnerKoopman Lakken



## BRILLIANT COLOR SHIFTS



#### NO LIMITS CREATIVITY

RakeStreken is an artistic collaboration between Sanne Knoester and Paul Boswijk based in The Netherlands. Since 2012, they have combined their unique styles - Sanne's graphic arts expertise and Paul's visual arts proficiency. Their artistic journey has been characterized by continuous evolution, from initial sketches in notebooks to intricate sketches on canvas and murals.

After securing a dedicated studio, they ventured into lifestyle design, using the open space as a catalyst for their creations. These distinct artistic journeys converge seamlessly, with a holistic approach to creating cohesive, visually pleasing environments across multiple design disciplines.

ArtistSanne Knoester, Paul Boswijk, December 2023TitleDress to Impress

- **Exhibit** Suits RheoLight Management
- **Owner** RheoLight ColorLab Academy



### NOUVELLE COLOR DESIGN

After years of research, our chemists and engineers developed the impossible, world's first 1-10 micron Crystal Glass microsphere pigments with a average particle size of 5 micron. Like diamonds they refract light with ever changing reflections opening a new world of color shades for designers in every industry.

#### RHEOLIGHT CSTL SPECIFICATIONS

Particle size1Particles in size range2Optical properties1Color2Luster2Diaphaneity1Density2Refractive index2Melting point2

1-10 micron > 99% Isotropic Colorless Adamantine Transparent 1.9 g/cc ± 0.3 g/cc 2.1 > 1.200°C

#### HOW SMALL IT CAN BE?

Almost not imaginable, 1 gram RheoLight contains 12 billion perfectly round Crystal Glass Microspheres with an average particle size of 5 microns! A bicycle frame needs about 50 gram, 600 billion microspheres in the color formulation to be very visible in the dark and optimal detectable by ADAS sensors. To boost ADAS sensors detection of a dark color sedan, 100 gram, 1.2 trillion microspheres is adequate.

NA 1.25

### PLATFORM TECHNOLOGY

RheoLight is developed as a universal, patent protected, platform technology. As a result, it fits seamlessly in existing coating, ink, paint and plastic formulations, and is compatible with every industrial application process. RheoLight is available in water- and solvent based dispersions and plastic mono concentrates. Easy to incorporate in any formulation to create amazing living colors with dynamic light effects.

#### APPLICATIONS

#### Automotive coatings

#### Industrial coatings

Textile and Wallpaper inks

Leather & synthetic leather coatings

Interior design paints

Art & creative inks & paints

Plastic master batch & compounds

### ABOUT INK INVENT

Ink Invent BV, a privately-owned company in the Netherlands, proudly presenting RheoLight, a strategic innovation in effect pigments specifically designed for the mobility and automotive industry. Founded in 2018 by passionate engineers and entrepreneurs. With an extensive global patent portfolio we are redefining color functionality enabling enhanced visibility and detection of all traffic participants, ultimately contributing to a safer traffic environment.





### COLOFON

#### Editor in chief: Paul Mijnen

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