



**HSR COMPANY LTD**  
**柏洲實業有限公司**  
ISO 9001 Certified



**HSR Company Ltd. founded in 1999.**

## **2001**

We became the dealer of the well-known SPARCO - SABELT - ISOTTA in Taiwan.

## **2002**

We started our own line of products trademarked HSR " HIGH SPEED RACING." The products include Muffler, Brake Pad, Gear knob, Pedal kit and more car accessories.

## **2003**

We introduced the products made by the well-known Italian steering wheel manufacturer SPORTLINE & LUISI and lubricant/-transmission oil by SENTINEL into our market area.

More significantly, starting from this year, we began developing and manufacturing our own auto accessories. In addition to business, we have been actively participating racing activities in Taiwan. We have own racing team and we also sponsor of many other racing teams in Taiwan.

## **2008**

Started for to produce car use mirror ( side mirror ), in 2008 we have changed the business way from the importer, dealer for to specialist manufacture for car side mirror, we had with Japanese company cooperate for to produce the mirror for to supply to Japanese market.

## **2010**

We started the new project for to used nano SOL-GEL mirror coating for to produce multilayer SOL-GEL coating blue mirror, build the new place in factory for clean room standard class 1000 and class 100 for to coating the mirror.

## **2012**

Founded the chemical laboratory for to produce  $\text{SiO}_2$  -  $\text{TiO}_2$  chemical for using on sol gel coating mirror.

## **2018**

Started corporate with US company for to preparing for a series car care products and export to US Car market. ( Car Shampoo , Ceramic coating series, exterior cleaners series, interior cleaners series )

## **2019**

OEM and export car care products to European company.

## **2020**

OEM and export car care products to Japanese company.

## **2021**

Register in the word BC logo "  " and strated to selling to the market.

## **2022**

Moved to new Factory in Yangmei Dist., Taoyuan City.

Devoted to the prosperity of our customers, our communities and our company, Through commitment, we will continue to build the strong partnership, and keep exceeding your expectations.





## **TURN SIGNAL LED REARVIEW MIRROR GLASS**

With the scientific and technological advances, economic development, and declining production costs, means of private transportation become readily available to more people. Private vehicles bring convenience and shorten the distance between people i.e. fulfilling the transportation needs.

According to statistics, the number of the registered motor vehicles in Taiwan has exceeded over 17 million.

Every day there are a huge number of motor vehicles on the roads, making traffic order a problem. Traffic accidents are also on the rise.

Safety problems have become an increasing concern for the use of vehicles.

It is important that a vehicle is equipped with a variety of safety equipment to ensure the safety of the passengers. Generally, vehicles are equipped with directional lights, installed on both sides of the motor vehicles at the front and at the rear.

It is originally intended to indicate change of lanes or directions to the vehicles at the rear or to the incoming vehicles.

For drivers travelling next to each other, this configuration is not effective because the drivers are at a "blind spot" and can not see the turning lights.

Many accidents are the result of drivers failing to notice the vehicle next to them was turning or changing lane. To alleviate this problem, we have added LED lights to the rearview mirrors.

This product is called LED rearview mirrors. LED lights are added as additional directional lights for better visibility for the adjacent vehicles.

Our LED rearview mirrors function both as mirror viewing vehicles at the rear and the direction lights to the vehicle next to it.

This device can very effectively reduce the possibility of accidents since the direction of the movement of the vehicle is clearly indicated to the vehicles around it.

## Product Features

1. Easy installation.
2. Do not change original vehicle circuitry.
3. Effective warning indicating the direction the vehicle is moving.
4. Concealed assembly. LED lights are behind the rear mirror.
5. LED lights are synchronous to the turning signal.
6. Proper LED light intensity will not affect driver vision.
7. No light dispersion.
8. Water repellent. Special treatment on the repels the water. Maintains mirror clarity.
9. Effective Signaling to drivers on both sides of the vehicle. (especially motor cycles)



## Mirrors Model Features



**Automobile  
Side Mirrors**



**Automobile  
Rearview Mirrors**



**Motorcycle Mirrors**





**Yellow Mirrors**



**Blue Mirrors**

### Anti-Glare Effect

After treated with anti-glare technology, it effectively diminishes glare and also increase focus in the mirrors.

At night the strong beam lights reflected in the side view mirrors by rear cars greatly distract drivers, especially when the drivers switching lanes. This easily risks the safety of the drivers on the road.

The mirrors produced by our company have the feature of anti-glare, which diminishes the glare created by the rear cars. Having this feature, the drivers can overcome the annoying glare and drive more safely.

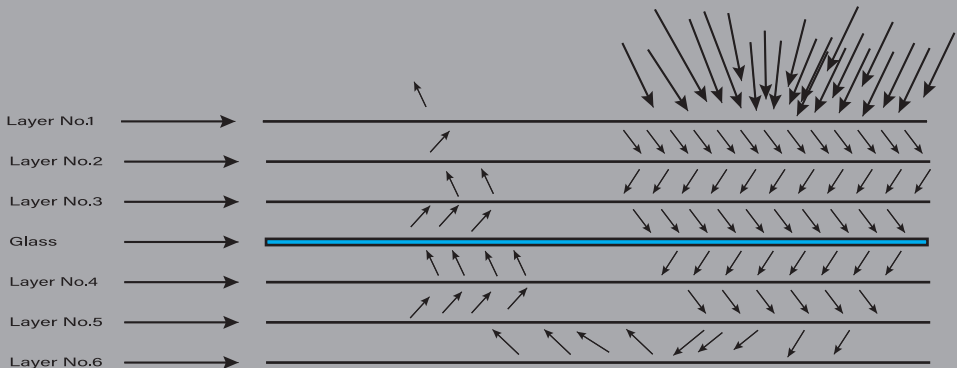
Anti-glare essentially involves reducing the reflectivity to achieve an anti-glare effect.

Vacuum electroplating is a direct reflective coating method.

In the case of vacuum electroplating for blue and yellow lenses, it is practically impossible to achieve an anti-glare effect without darkening the color. However, the darkened colors lead to poorer nighttime visibility.

On the other hand, nano sol-gel coated white, blue, and yellow lenses are multi-layer coated lenses. The anti-glare property of sol-gel coated lenses is attributed to their multiple thin-film optical characteristics. When light enters the optical thin film, it will be reflected in different directions at each layer.

The layers themselves help eliminate some of the light, ultimately leading to a focused or concentrated light effect.





# The Special Features of HSR nano Sol-Gel Mirrors

Advantages:

1. Impossible for the coating to come off.
2. Strong anti-corrosion.
3. Uniform color.
4. Strong coating hardness.
5. Able to produce large-size glasses.
6. High reliability of the products.

Disadvantages:

1. High manufacturing costs
2. Advanced technologies required to manufacture
3. The formulas used to manufacture is trade secret
4. Stringent manufacturing environment

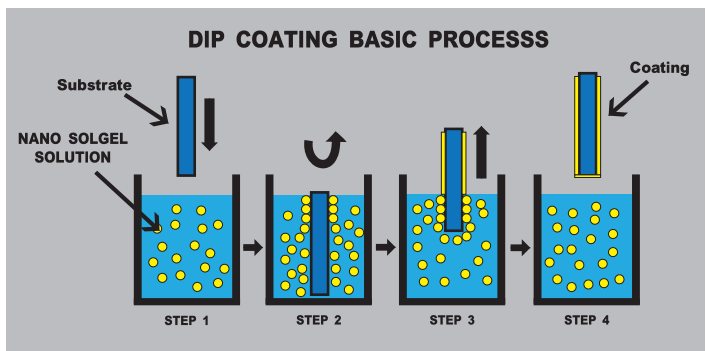
SOL-GEL NANO is not used in the conventional metal coating process, rather used in the manufacturing process in producing blue mirrors, having the surface hardness as 7H (, the average is 9H). The manufacturing environment for blue mirrors is very stringent. The equipment and the environment require an extremely high standard of cleanness to make sure there are no dirt and dusts. The humidity and temperature control, which is required to be precise and stable, is important. As a result, in order to manufacture blue mirrors that are high quality, it requires the state of the art equipment and the state of the art clean room.

Because SOL-GEL NANO blue mirrors produce blue color that is perfectly uniform, people might mistakenly think that this perfectly uniform blue color is the result of coating the blue color directly onto the surface of the mirror. In contrast, the blue color is not the color of the coated mirror. Rather, the coated mirror does not have any colors at all. As a matter of fact, the blue color that you see is the reflection of spectrum that is seen by human eyes. As the back of the coated mirror processed with a layer of black color, it only allows the light entering the coated mirror to be reflected back out of the coated mirror as only the blue color.



In order to produce this perfectly uniform blue color, the selection of a right type of mirrors that is high quality is critical. For this type of high quality mirrors, we use optical glass because it allows producing clean and spotless mirrors required by the coating process.

SOL-GEL NANO coating process uses immersion method. Specifically, the process uses the state of the art equipment to immerse the mirrors in a tank filled with SOL-GEL. This allows SOL-GEL. This allows SOL-GEL and the mirrors to have direct chemical reaction.



This immersion process is repeated three times but each time a different type of SOL-GEL is used in order to get the perfectly uniform blue color. The immersed mirrors also baked and sintered in high temperature to solidify the chemical reaction between the mirrors and the SOL-GEL. The hardness of the coated mirrors can reach 7H (the average is 9H) In contrast, here is the vacuum coating process; unprocessed mirror – cleaning – baking (making the mirror curvature) – coating chrome – coating blue color onto the glasses surface.

Multilayer nano SOL-GEL Blue mirror process: unprocessed mirror – cleaning ( brushes ) – cleaning (6 Ultrasonic Cleaning Tanks) – coating 1 – baking – cleaning (6 Ultrasonic Cleaning Tanks) – coating 2 – baking – cleaning (6 Ultrasonic Cleaning Tanks) – coating 3 – baking – high temperature sintering.

## Background on SOL-GEL NANO Mirrors

The SOL-GEL NANO technology is currently being internationally recognized as the most promising and valuable in new materials development and product development. This technology allows small particles (each is smaller than 100 nm) chemically bonded. The chemically bonded particles have the ability to suspend in the liquid to provide the characteristic of being transparent to the eyes, called SOL-GEL NANO.

The SOL-GEL NANO technology is very mature. As a result, the application of this technology is widely used in various industries, such as optoelectronics, electronics, and chemical industries. Here are some specific products using this technology in the foregoing industries, such as transparent conductors, electrochromic glasses, light laser, etc.

The reason the SOL-GEL NANO technology is widely used in the industries now is because it is able to provide a solution to a common issue of the conventional vacuum technology that cannot meet the industry demand, specifically for large, non-flat, surfaces and processed plastic materials. The SOL-GEL NANO technology is able to satisfy the current market demand because it has the following qualities: It can create materials that having a variety of refractive index (e.g. 1.35 to 2.) The materials not only can absorb the ultraviolet, infrared reflection, the materials can also produce glasses coated for anti-reflection, antireflective, anti-UV, etc.



To summarize the advantages of SOL-GEL NANO technology over the conventional vacuum coating technology, the SOL-GEL NANO technology can produce supreme products that the conventional vacuum coating technology is incapable of.

## SOL-GEL NANO Blue Mirrors

Light spectrum is made of three major colors (red, green, blue), the soft color that human eyes can easily accept is the blue color. Thus, the development of blue mirrors exists. The blue mirrors that we produce are capable of reflecting about 60% of the blue light, lowering the yellow and red lights that are glaring to human eyes. This provides a great benefit of greatly reducing the strong light coming from the rear cars that produces glaring to drivers who is driving at night. Thus, it reduces danger and increases safety in driving.

Human eyes have limited sensitivity toward light spectrum. There is only a portion of the light spectrum that human eyes can see. For the portion that can be seen, it consists of red, orange, yellow, green, blue, indigo, and purple. The sensitivity of human eyes varies toward these various colors. The sensitivity is low toward blue and purple colors. The sensitivity is high toward the orange and yellow colors, especially in strong light or poor light. For example, the flame that is orange and yellow colors can be seen from 20 to 30 meters away. In contrast, the flame that is blue and purple colors can be ignored within 1 meter.



Blue rear mirrors have the feature of strengthening the blue and purple colors that greatly lowering the sensitivity of human eyes and weakening the orange and yellow lights that human eyes are very sensitivity of. Thus, it creates the color of blue for the rear mirrors, called blue rear mirrors. Blue mirrors that has the feature of lowering glaring and increasing clarity is commonly used in European cars, such as BMW, Mercedes, VW, AUDI, etc. that are considered high end cars. The majority of cars using halogen light bulbs produce yellow light. SOL-GEL NANO blue mirrors are capable of reducing the intensity of yellow light, and thus reducing the glaring to create the dimming effect.

Driving a long period of time under the strong sun, the regular rear mirrors create strong glaring that hurts the human eyes. In contrast, the blue mirrors create clear image that is gentle to human eyes, no glaring. As a result, SOL-GEL NANO blue mirrors are very suitable for driving either during the day or night.

# VISIBLE LIGHT SPECTRUM

The visible light spectrum is the segment of the electromagnetic spectrum that the human eye can view. More simply, this range of wavelengths is called visible light.



<b>VIOLET</b> 380~440	<b>BLUE</b> 440~485	<b>CYAN</b> 485~510	<b>GREEN</b> 510~565	<b>YELLOW</b> 565~590	<b>ORANGE</b> 590~625	<b>RED</b> 625~740
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## The Special Features of HSR Sol-Gel Yellow Mirrors

Yellow mirrors are capable of capturing lights, absorbing 100% UV lights, allowing red lights and 83% visible lights to penetrate. As the sun lights shine through the atmosphere, the main color seen is blue (this explains the reason the sky is seen as blue). The main advantage of the yellow mirrors is to filter out the blue lights that have the negative effect of creating high contrast. After the yellow mirrors filter out the blue lights, it makes the objects seen more natural. The details of the objects are more clearly visible. This makes the yellow mirrors suitable for drivers who need quick responses in response to driving movements.

In general people think that yellow lights, such as the ones from the sun, are glaring to the human eyes. However, the yellow mirrors do not have this negative effect because the yellow mirrors are created with a special material. This special material is called SOL-GEL, unlike typical coated mirrors, that this have a multiple layers of coating such that as the lights enter the SOL-GEL yellow mirrors, the blue lights are effectively filtered out to create very crisp and visible objects.

### During the Day

Yellow mirrors effectively filter out the sun lights to reduce the glare of lights.



### At Night



Driving at night as drivers eyes exposed to intense traffic lights, the eye pupils cannot adjust quickly to see and drive safely. The Sol-Gel yellow mirrors can effectively reduce the glare to overcome this driving safety concern. For a night driver who needs constantly checks the rear traffic, the Sol-Gel yellow mirrors reduce the fatigue on the eyes because the mirrors effectively filter out the glaring lights to increase the driving safety.

Based on actual road tests, the Sol-Gel yellow mirror is an effective solution to reduce glare created by the car traffic lights and inadequate street lights at night time, especially at night in the winding roads or driving on streets with inadequate street lights. This effective solution greatly reduces the glare to increase the safety of driving.

One again to emphasize the advantage of the SOL-GEL Yellow Mirror, the benefit is the ability to effectively filter out the blue lights to create crisp and clear objects to enhance the driving safety.

## ■ The differences between Vacuum Coating Mirrors and SOL-GEL NANO Mirrors:

### Vacuum Coating

100% on the market used vacuum coating, Here describes problems of blue mirrors produced by a method called vacuum coating. Most of conventional blue rearview mirrors available in the market are produced via the method of vacuum coating. For this method, a first layer of chrome is coated on a mirror prior to a thin second layer of blue coating is coated on the first layer of chrome. Often time mirrors have dirt or dusts on thereof. As this method applies on these mirrors having dirt or dusts, adversely the dirt or dust is also coated on certain surface areas of these mirrors. As a result, the blue coating cannot be firmly coated on the surface areas of the mirrors where consisting of dirt or dusts. Consequently, after normal wears and tears, such as wiping and washing the mirrors, the blue coating disintegrates from the mirrors. This negative effect is called " pinholes " in the industry.

Furthermore, it is well known that corrosion resistance of blue mirrors, produced via the method of vacuum coating, is weak. As these mirrors under a long period of rain, sunshine, and treatment of chemical cleaning agent, the color of blue coating is easily faded, especially the LED portion of the mirrors. In addition, the LED portion is easily scratched because the LED portion has a thinner coating layer that allows light transmittance. Because of the thinner coating layer, the surface hardness of the LED portion becomes weaker, resulting in being easily scratched.

#### Advantages:

1. Mass production.
2. Low cost.
3. Less advanced technology capable of.

#### Disadvantages:

1. Easy to disintegrate.
2. Weak corrosion resistance.
3. Uneven color.
4. The color will fade.

## ■ Wide angle side view mirror (refer to figures below)

