

ANALYSIS OF ANTI-GLARE COATING ON HELMET VISOR

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Abstract

Glasses are used in large variety of purposes in our daily activities. In that for safety measures we use glass materials like front mirror in vehicles and in helmet visors. In today's life everyone needs to wear helmet while riding two wheelers. During day time there is nothing problem in wearing helmet. But during night time, the light rays from the other vehicles which are coming from opposite side of us cause eye irritation and poor visibility which leads to major accidents. To avoid those problems we are working to coat the helmet visors to restrict the light rays from other vehicles. The present few helmets have two different layers of components for protective purpose: a thin, hard, outside shell will made of fiber glass, polycarbonate plastic, or Kevlar and thick, inner soft liner made of expandable polystyrene or polypropylene (Expanded Poly Styrene)foam. In that we additionally made coating to restrict the above mentioned issue.

Keywords : Glass, Material Coating, Visibility, Road accidents etc.,

1.INTRODUCTION

Safety is the most important factor that everyone needs in their day to day activity. There must be a problem in every activity that may cause major or minor injuries. One of the major safety problems is during travelling through vehicles. Government implemented lot of rules and regulations for the safety of people. In that wearing helmet is mandatory nowadays. But during night journey we experience poor visibility due to light from opposite vehicles. This light causes eye irritation and due to that light rays the driver cannot see the road clearly. Since there is a maximum possibility of accidents which lead accidents and cause loss of life. Avoid wearing helmets also an unsafe thing in which if the driver fall down he will get injured severely. Therefore to overcome from these problems we made anti reflecting coating in helmet

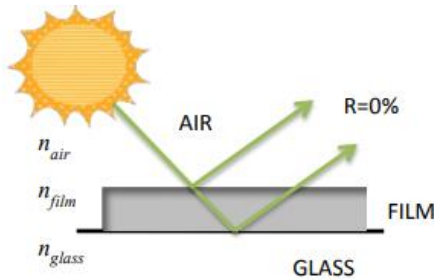
visors using light absorbing material. The material is coated as a thin film on the helmet visors so that the light rays will be absorbed by the material partially and makes somewhat clear vision during night journey. It is very helpful and safety in transportation. Many human lives can be saved and also the eye problems will not rise mostly after this project.

2. LIGHT PROPERTIES

The main property involved in this project is refractive index of light. The light's refractive index is explained as the light speed in vacuum to the specific medium.

Since it passes through the different medium the portion of rays of light get reflected. According to Fresnel's equation ~4% of sunlight gets reflected at normal incidence.

The refractive index varies for different medium. In fact, the unity refractive index at the film air interface is impossible.



Therefore, the most practical approach in this field is to reduce the packing density of the films. However, this affects the mechanical strength of the ARCs.

3.LITERATURE SURVEY

System and scientist	Outcomes	Drawbacks
Analysis of helmet with anti glare visor. Sathish Gandhi Kumaravelan Ramesh Venkatesh	Reduces refractive index of visor using polymer coating and also designing of aero dynamic helmet designing.	High cost
Coating composition having anti reflective and anti fogging properties. Mathew Scholz T George V. Tiers	Composition material of anti oxide coating in glasses increases the anti reflecting property and also reduces fog formation in glasses.	Material manufacturing is harder.
Photocatalytically hydrophilifiable coating composition	Coating of composition material on the surface of a material.	Poor Efficiency.

Filter enhancing vision and protecting the eye.	and	Selective filtering of light by polarization interference used to enhance vision and protect eye.	Good result with 15% efficiency.
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4.PROBLEM IDENTIFIATION

The poor visibility during the night journey, due to light rays from the opposite vehicle. This may lead to accidents which may be severe causing loss of life or major injury to body. The proposed project is to get clear visibility by coating thin layer of reflective material.



5. WORKING MODEL

The normal helmet visors are made up of fibre glass, plastic materials etc. This helmet allows the light rays to pass over the visors which make eye irritation. In our project we used silicon and oxides mixed composition and thus light rays will be reflected and can avoid all the above mentioned problems.

The silicon is a good light absorbing material in which it is used in solar energy production. The oxides such as silicon oxide(SiO_2), magnesium oxide(MgO_2) have improved in light absorption property. Hence we used it to coat as a thin layer coating in the visor of the helmet.



Fig : Thin layer coatings in visor.

As the coating is done by different layer, each layer can restrict the few light ray so as we can get good vision.

6. REASON FOR COATING

Anti reflecting coating cannot be done as like painting on walls or as like a thick layer to be applied. The ARC coating techniques are derived from natural species such as moth and antelopes. The broad vision field of eyes of eagles also a factor to this methods. The Scanning electron microscopic images of eye field of moth says that they have eye surface as a nano bumps on the upper surface of its corneal lens.



Fig: SEM image of eye lens of moth.

7. APPLICATIONS

- Eye glasses and latest multi element optical materials like telephoto lenses rely on anti-reflective coatings that decrease inappropriate images, loss of contrast and other image degradation.
- Straight forward applications of thin film interface:
 - ✓ Coating of SiO, MgF₂ or other. Hard, translucent and simple to coat thin uniform layer.

- Front and side mirrors of vehicles, in which the light from opposite as well as in behind side can also be eliminated.
- Other places where the light refraction cause poor image quality.

8. BENEFITS

- Existing helmets are non-reflective for light rays. So they are poor in visibility during night. Our project has high visibility than that.
- Reflections are restricted from entering into our eyes because of the special coating.
- When glare is restricted, you see better and you won't feel strain to your eyes.
- As compared to normal glasses it giving you a crystal clear and the sharp vision
- Perfect for night driving.
- Offer superior comfort while driving.
- Used in helmet gives highly safety to our life.

9. CONCLUSION

Everyone should accept the importance of these special coatings in glasses. As we discussed briefly, the coating are used wide range of applications and in emerging areas such as in industrial fields like military equipments, submarines, aircrafts, solar cells, LEDs, lasers etc. Nowadays the glasses include the coating as a main part in fabrication process.

Human lives are precious one. Apart from other mentioned uses, this special coating gives a clear vision and removes eye straining. Hence we can avoid accidents which can save lot of lives and also can have good healthy

eyes. Finally it is concluded that our project plays a major role not only in single area. It plays a part in various range of area and used as a dual purpose as safety as well as clear vision.

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