Presentation on Taxi Protection Console in Polycarbonate
Covid-19

Pandemic of The Century
Coronavirus: Taxi drivers fear for their safety

Taxi drivers have among the highest death rate of coronavirus in the UK, figures show.

Along with security guards, they are more likely to die with Covid-19 than any other occupation.

So drivers in Wales are urging local authorities to speed up changes to rules that will allow them to fit screens between themselves and their passengers.

"It's only a matter of time before more drivers die unless something is done," said taxi driver Paul O'Hara.

Cardiff council said it is working with taxi firms and producers to agree a specification for screens that would not affect safety systems, such as air bags.

14 May 2020

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Do we have solutions?
Slough council supports safety screens for taxis and private hire vehicles

Written by Amy Horsfield

02:22PM, Friday 15 May 2020

The council has thrown its support behind a new initiative for taxis and private hire vehicles to install a plastic screen between the driver and passengers to protect all residents when travelling in the future. Polycarbonate clear screens are being recommended by the licensed vehicle governing bodies for the safety of taxi drivers, the private hire workforce and their passengers.

Auto glazing: New York taxis employ polycarbonate partition glazing

COVID-19: Customised cab interiors to ensure passengers' safety in Coimbatore

This will help his customer avoid physical contact with both the driver and the fellow passenger.

Lynk Taxis spends €150,000 to acquire virus shields for its 1,500-vehicle fleet

Driver safety: A polycarbonate screen is fitted on to a Lynk taxi
Coronavirus – Update 5

Updated advice for taxi and private hire licensees

Any fittings and equipment must comply with the Road Vehicle (Construction and Use) Regulations. Any screen must be tested to the relevant EU standard for an original equipment type approval test covering interior fittings. The screen must be approved by MIRA or other comparable independent product engineering, testing, consultancy and certification organisation. Screens must be professionally and securely fitted in accordance with the manufacturer’s instructions. Certification from the vehicle’s manufacturer should be sought to confirm that the screen does not compromise the integrity of the vehicle structure. Screens should be constructed of PETg or polycarbonate. The screen should not impede the driver’s vision, movement, or communication with passengers. The screen should not impede driver or passenger access or egress to the vehicle. Insurers should be notified of any modifications made to the vehicle. Prior to installing a safety screen, drivers should contact the licensing authority (TfL) to check that they will permit the installation and ensure that the screen and installation will meet their requirements.
Why PolyCarbonate?

- Light Weight (60% lighter than Glass; 85% lighter than Steel)
- Virtually Unbreakable
- Service Temperatures (-40°C to +120°C)
- Fire Retardant Material (V2 Grade – UL Standards)
- Superior Clarity & Light Transmission
- Excellent Options Available for Thermal Insulation
- 99.90% Cut of Harmful UV Rays
- Design Flexibility (Can be cold curved)
- Ease in Handling & Maintenance
- 100% Recyclable
## PolyCarbonate vs Other Materials

<table>
<thead>
<tr>
<th>Properties</th>
<th>Polycarbonate (PC)</th>
<th>Acrylic (PMMA)</th>
<th>PVC</th>
<th>PET-G</th>
</tr>
</thead>
<tbody>
<tr>
<td>Light Weight</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Density 1.20g/cm³</td>
<td>Density 1.18kgs/m²</td>
<td>Density 1.38kgs/m²</td>
<td>Density 1.38kgs/m²</td>
</tr>
<tr>
<td>Impact Strength</td>
<td>High 70MPa</td>
<td>Moderate 38MPa</td>
<td>Low 35MPa</td>
<td>Low 40MPa</td>
</tr>
<tr>
<td>Mouldable (Thermoformed)</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Flammability</td>
<td>Fire Retardant (UL 94: V0~V2)</td>
<td>Highly Flammable</td>
<td>Fire Retardant (Emits Toxic Gases)</td>
<td>Moderate (UL 94: HB Rated)</td>
</tr>
<tr>
<td>Life</td>
<td>Good</td>
<td>Moderate</td>
<td>Low</td>
<td>Good</td>
</tr>
<tr>
<td>Transparency</td>
<td>Excellent 90%</td>
<td>Excellent 92%</td>
<td>Moderate 70%</td>
<td>Excellent 90%</td>
</tr>
<tr>
<td>Maximum Temperature</td>
<td>120°C</td>
<td>70°C</td>
<td>50°C</td>
<td>63°C</td>
</tr>
</tbody>
</table>

*Source: Polycarbonate: Makrolon ET3113 Data Sheet; Other Materials: Omnexus.Specialchem*
Why TUFLITE?

- Ranked by Economic Times and Statista, Germany as one of the Top 100 fastest Growing Companies in India for the year 2019.

- Widest Product Range
  - Clickfix System (Cladding/Facades)
  - Top Seam System (Interlocking System for Roofing & Cladding)
  - Multiwall/Hollow Sheets (OTS Coverings in Domes/Pyramids)
  - Extruded Profiled Sheets (Matching with Metal Roofs for Industrial Applications)
  - Solid Sheets
    - Abrasion Resistant + UV (Security Applications – Alternate to Glass with High Performance)
    - Abrasion Resistant + Anti Microbial (Medical Applications)
    - Standard (Machine Guards, Machine Components)

- Geographical Spread:
  - Bangalore (H.O.)
  - Chennai
  - Mumbai
  - Ahmedabad
  - Delhi
  - Tainan, Taiwan
Why TUFLITE?

- Approved with most of Government Entities in India:
  - Airport Authority of India
  - Indian Railways – Integral Coach Factory (ICF), Central Railways, Delhi Metro Rail Corporation Limited (DMRC), Nagpur Metro, Ahmedabad Metro, Navi Mumbai Metro
  - Ministry of Defence - Military Engineering Services (MES), Ordinance Factories
  - Department of Space – Satish Dhawan Space Centre (ISRO)
  - Department of Atomic Energy – BARC, NPCIL, Tarapur Atomic Power Station
  - Education – IIT, IIM, Central University of Karnataka, Central University of Kerala
  - Engineering – BHEL, BEL, Engineers India Limited, Engineering Projects India Limited

And many more...
Taxi Protection Console

- Protection of Taxi Drivers by allowing Social Distancing from Passengers
- All Protection consoles are D.I.Y. (Do It Yourself) systems which are easy to assemble
- Options Available:
  - Option 1: Mid Isolators
  - Option 2: Full Isolators
  - Option 3: Driver Protection Console
Options 1 : Mid Isolators

- D.I.Y. System : Do It Yourself
- Easy to Install in all types of Sedan, SUV and MUV Vehicles. (No Customization Required)

Components –
- Mid & Centre Polycarbonate Isolators
- Holding Straps
- Foam Fillers
Options 1 : Mid Isolators

- Mid Isolators with Centre Piece.
- Isolators are supplied with Protection film on both sides to prevent transit damages.
- Protection Film should be to be removed, after Installation.
Options 1 : Mid Isolators

ISOLATOR WITH MASKING FILM AT THE TIME OF INSTALLATION.

AFTER REMOVING THE MASKING FILM, THE MID ISOLATOR IS TRANSPARENT.
Options 1: Mid Isolators
Options 2: Full Isolators

- Single Moulded Piece in Polycarbonate
- Customized as per vehicle design
- Easy to Install

Components –
- Full Polycarbonate Isolators
- Foam Fillers
Options 2: Full Isolators
Option 3: Driver Protection Console

- Isolation only for Driver

- Full Isolators need to be customized for different vehicles – Hatchback, Sedan, MUV, SUV, etc. based on different dimensions & seat arrangements, making it time consuming.

- Dimensions of driver seat are almost standard across all vehicle types.
Basic Design

Salient Features:

- Two Piece Moulded Polycarbonate:
  - Part 1 - Covering behind the driver seat
  - Part 2 - Covering beside the driver seat
- Standard Designs that can be used on all Cars
- Design Elements:
  - No restriction to driver movements –
    - Seat can be moved both front & back, up & down
    - Headrest can be adjusted.
    - Reclining of driver seat.
  - Communication & Ventilation points available
  - Money collection slots available
  - Quick Installation
  - Easy to Maintain
Basic Design

DRIVER CONSOLES ARE SUPPLIED WITH MASKING FILM ON BOTH SIDES TO PREVENT HANDLING & TRANSIT DAMAGE.
ONCE INSTALLED, THE MASKING FILM NEEDS TO BE REMOVED MAKING THE CONSOLE TRANSPARENT.
Basic Design
## Comparison – Isolator Options

<table>
<thead>
<tr>
<th>Basic Design</th>
<th>Option 1: Mid Isolators</th>
<th>Option 2: Full Isolators</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material</td>
<td>Polycarbonate</td>
<td>Polycarbonate</td>
</tr>
<tr>
<td>No. of Parts</td>
<td>2 Pieces</td>
<td>1 Piece</td>
</tr>
<tr>
<td>Components</td>
<td>2 Polycarbonate Panels, Foam Fillers, Fasteners and Velcro</td>
<td>1 Polycarbonate Panel, Side Clamps, Foam Fillers</td>
</tr>
<tr>
<td></td>
<td><strong>Option 1:</strong> Mid Isolators</td>
<td><strong>Option 2:</strong> Full Isolators</td>
</tr>
<tr>
<td>------------------------</td>
<td>------------------------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>Customization</strong></td>
<td>General Design which can be easily adopted in different vehicle types.</td>
<td>Customized based on every car type, model# and make.</td>
</tr>
<tr>
<td><strong>Installation</strong></td>
<td>Easy. Can be done by Driver</td>
<td>Difficult. Needs to be installed in Garage.</td>
</tr>
<tr>
<td><strong>Damage to Vehicle</strong></td>
<td>No. The isolator will be strapped to the seats thereby preventing any damage to the vehicle.</td>
<td>Depends on the design. The Full Isolator can be clamped to centre Beam. In many cases, this is drilled into the vehicle seats and floor.</td>
</tr>
<tr>
<td><strong>Strength</strong></td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td><strong>Replacement</strong></td>
<td>The driver may wish to change only 1 part and not the whole isolator if it is damaged by customers.</td>
<td>The driver will be forced to replace the entire isolator if it is damaged by customers.</td>
</tr>
<tr>
<td><strong>Insurance Claims in Case of Accidents</strong></td>
<td>No Problem as the car is not tampered.</td>
<td>May be a problem if Full Isolator is drilled, thereby making physical alterations to the original design.</td>
</tr>
</tbody>
</table>
## Comparison Chart – Isolator Options

<table>
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<th></th>
<th>Option 1: Mid Isolators</th>
<th>Option 2: Full Isolators</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cost</strong></td>
<td>Cost Effective</td>
<td>Expensive</td>
</tr>
<tr>
<td>Cost of Mould</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>Development</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Delivery Period</td>
<td>Quick</td>
<td>Slow</td>
</tr>
<tr>
<td>Manufacturing Speed</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>Installation Time</td>
<td>Low</td>
<td>High</td>
</tr>
</tbody>
</table>

![Image of isolator options]
TUFLITE POLYMERS LIMITED
No.1, Vivek Industrial Estate
Walbhat Cross Road, Goregaon East,
Mumbai – 400063

Email: info@tuflite.com

Website: www.tuflite.com

Contact: +91 77 388 93501

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