CONTOUR ARC
FACE PROTECTION
SYSTEM
When Clarity Counts
WHAT IS AN ARC FLASH?

An electrical Arc Flash (or blast) is an intensive lightning that occurs when an electrical discharge or short circuit moves through the air and releases an intense burst of energy. Hotter than the sun and capable of creating a shrapnel explosion faster than a bullet, it can also result in large doses of electromagnetic radiation, toxic air, extreme noise and an explosive pressure wave.

HOW CAN AN ARC FLASH OCCUR?

Over 70% of Arc Flash incidents occur during, or immediately after, electrical maintenance. Most commonly, it can be the result of a loose cable or connector, working with dirty or rusty terminals, or simply a tool dropped near a busbar. Other causes can be improper work, live contacts, over voltage or water ingress. It is vital that we increase understanding amongst both employers and employees of how these incidents occur, what can be done to prevent them, and how they can then protect themselves in the event of an Arc Flash.

MOST COMMON APPLICATIONS AFFECTED BY ARC FLASH

The number above is surprising for some, but when we consider the multiple situations where an Arc Flash can occur, we start to understand why they may be more common than previously considered.

It is also believed that between 60%-70% of Arc incidents are underreported (Source: HSE), which could mean that those numbers may not tell the whole story. Because many people do not understand the Arc Flash phenomena, many Arc Flash incidents are statistically categorised as regular fires. Therefore incidents may be either more common or more serious than reported, and we shouldn’t make the mistake of thinking they are limited to high voltage environments.

An Arc Flash is basically an effect caused by a very high fault current - thousands of amperes, travelling through ionized air, and can easily occur in low voltage environments too. It’s imperative that the right precautions are taken at all times, even when working on something as ‘simple’ as a house connector box, the engineer should be using a protective face screen that can suitably protect them from a potential Arc Flash.

Applications that can lead to an Arc incident include, but are not limited, to:

- Live cable jointing
- During phasing in operations (high voltage)
- Racking in and out of switchgear
- Reclosing of electrical switchgear onto a fault
- Mal-operation or failure of switchgear
- Excavating near live cables
- Accidental contact with live conductors during maintenance
Evidence points to the fact that whenever a worker suffers thermal injuries, at least 50% of the time these injuries or risks will occur to the face or head. As experts in above-the-neck protection, we wanted to focus on the best possible solution having partnered with Paulson - an Arc expert - to address this area.
NEW ARC CLASS 2 CONTOUR FACE PROTECTION

ACTIVE SMART ABSORPTION TECHNOLOGY – THE MOST EFFECTIVE ARC PROTECTION SOLUTION

The new Arc Class 2 screens use the latest Arc technology; incorporating Nanotechnology particles that use the arc energy to modify the screen at the point of the arc flash. A thick heat, light and electromagnetic radiation absorbing crust is generated which helps to block out light and heat – the whole process only takes a matter of milliseconds. It has taken 25 years of research and development for Paulson to arrive at this solution. It represents a great leap forward in protecting workers from the various hazards and dangers that come from an Arc Flash.

NEW CLEAR-GREY HT TECHNOLOGY – THE FUTURE OF SPECIALISED ARC PROTECTION

Additionally, the Clear-Grey HT screen is the next generation solution, providing the clearest European Arc Class 2 screen.

The nanoparticle technology in the injection moulded screen provides complete protection, and compared to Green shaded Arc screens, the new Clear-Grey HT screen transmits more wavelengths, therefore making colours clearer and more visible across the colour spectrum. This means increased safety levels come from improved colour recognition. The chinguard is also made of the same Clear-Grey HT material and thus allows for excellent downward vision.

The improved active nanoparticles technology used in the new Clear-Grey HT screen has also proven to provide consistent impact and arc protective properties. Paulson are confident to confirm an extended in use life of 10 years (of constant indoor or outdoor product usage).

Smart Active Absorption - Paulson’s Arc Face Screen Technology

- Nanotechnology uses the Arc energy to modify the face screens
- Protects using carbonisation technology
- Generates a heat and radiation absorbing crust
- Protection starts at the point of Arc flash
- The Arc energy is consumed and used for modification
- Uses ablation - meaning: consumes the Arc energy for controlled surface dissociation
- Thick layer then blocks light and heat by additionally created insulating air cells
- Higher VLT and better colour perception

CENTURION HELMET AND CONTOUR CARRIER SYSTEM

This new screen development needs to be seen as part of a complete ‘above-the-neck’ system. Combining the new screens with the Nexus or Concept helmet and Contour carrier system, which is engineered exactly to the contours of the helmet in order to keep any remaining debris away from the facial area, has created what we believe is the most effective system on the market.
CONTOUR XIII

CLEAR-GREY HT ARC FACE SCREEN

The Contour XIII Clear-Grey HT (Highly Transparent) screen utilises the latest Arc technology; the clearest European Class 2 screen with the highest Visible Light Transmittance providing improved colour recognition, important for accuracy of cable identification and ideal in areas with poor visibility.

ATTRIBUTES

• Specialised nanoparticles technology providing Class 2 arc protection
• Highest Visible Light Transmittance Class 0 (>80%)
• NEW easy fit replaceable screen
• Permanent Anti-Fog and Anti scratch
• Longer in use life of 10 years (no degradation of the impact or arc protective properties)
• Permanently attached Clear-Grey HT Chinguard reduces risks of trips or falls

Visible Light Transmittance (VLT) >80%
Extremely light and almost clear
CONTOUR XII

LIGHT-GREEN ARC FACE SCREEN

The Contour XII Light-Green screen provides an effective Class 2 face protection solution.

- Visual Light Transmittance (VLT): >75%
- 5 year lifetime
- Integrated Nylon Grey Chinguard

CONTOUR XI

MULTI PURPOSE MOULDED FACE SCREEN

Contour XI multi purpose screen provides arc protection to Class 1 as well as being suitable for general purpose impact protection.

- Easy fit, Arc Class 1 approved screen
- Polycarbonate moulded screen with integrated chinguard
EUROPEAN EN 166

EN 166 – Option 8 is the current European face protection standard with a provision for Arc Flash protection.

However, there is no actual test involved – the protective screen just needs to meet minimal requirements of screen material, thickness, scale, height and visibility.

GS-ET-29

The German Institution for Statutory Accident Insurance and Prevention in the Precision Engineering, Electrical and Textile Industries (BGETEM) introduced GS-ET-29 Additional Requirements for the Testing and Certifying of Electrician’s Face Protection.

The Arc-in-a-box test is a constrained test with the following method:

- Requires a high current laboratory
- A controlled Arc source
- A flame-resistant head equipped with sensors
- Enclosed in a box simulating the reflective properties of a switch cabinet
- Focus the Arc energy to the centre of the face and shield
- Creates a dirty Arc by using two different material electrodes
- The effect is to generate molten material and debris
- Tested at 400V AC for 500ms

The test guarantees that the face screens prevent second-degree burns up to the thermal incident energy claimed within the arc protection class.

In GS-ET-29, the Arc-in-a-Box test is used to differentiate two protection classes, Class 1 and 2, as well as three classes to differentiate the visible light transmittance.

Two Arc protection classes:

<table>
<thead>
<tr>
<th>Class</th>
<th>Incident energy</th>
<th>Cal/cm²</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>135kJ/m²</td>
<td>3.2 cal/cm²</td>
</tr>
<tr>
<td>2</td>
<td>423kJ/m²</td>
<td>10.1 cal/cm²</td>
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</table>

Three Visible Light Transmittance (VLT) Classes:

<table>
<thead>
<tr>
<th>Class</th>
<th>VLT Rating</th>
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<tbody>
<tr>
<td>0</td>
<td>≥ 75%</td>
</tr>
<tr>
<td>1</td>
<td>50% ≤ VLT ≤ 75%</td>
</tr>
<tr>
<td>2</td>
<td>VLT &lt; 50%</td>
</tr>
</tbody>
</table>

PRODUCT SPECIFICATION MATRIX

<table>
<thead>
<tr>
<th>Arc GS-ET-29 Class</th>
<th>Class 2</th>
<th>Class 1</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Contour XIII</td>
<td>Contour XII</td>
</tr>
<tr>
<td>Screen</td>
<td>Clear-Grey HT High grade Polycarbonate with Nanoparticles and High Transparency technology</td>
<td>Light-Green / Solid Grey High grade Polycarbonate with Nanoparticles technology</td>
</tr>
<tr>
<td>Chinguard</td>
<td>As Screen</td>
<td>Injection Moulded Nylon</td>
</tr>
<tr>
<td>Weight</td>
<td>257g</td>
<td>275g</td>
</tr>
<tr>
<td>GS-ET-29 VLT Class and %</td>
<td>0 / &gt;80%</td>
<td>0 / &gt;75%</td>
</tr>
<tr>
<td>In use lifetime (years)</td>
<td>10</td>
<td>5</td>
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<tr>
<td>Product code &amp; Pricing</td>
<td>Screen Only</td>
<td>£830</td>
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<td>Screen, Carrier and Helmet kit</td>
<td>£270.00</td>
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