EAN10 Safe Electrical Working with TIG Brush Cleaning Fluids

As is commonly known, water in connection with high voltage creates a risk of electrocution to people nearby. This occurs when the person provides a return path to ground for the high voltage. However, in order for someone to conduct enough electricity through tap water to be fatal, in general the person would need to be in very good contact with the water – e.g. sitting in a bath, standing in a swimming pool etc. However, if the water was a better electrical conductor, a hazardous condition could result far more easily. For example, just standing in a puddle of very conductive fluid could result in a fatal level of electricity to be conducted through the person.

The outstanding weld cleaning results achieved through the TIG Brush Weld Cleaning System relies on the unique Dynamic Power Transfer electronics working with specifically designed fluids. The TB cleaning fluids that are used with the TIG Brush are conductive to electricity, which allows the power of the brush to pass unimpeded to the surface of the material to be cleaned.

The conductivity of the fluids presents no hazard to the operator working with the TIG Brush as per the operation directions. The output voltage of all the TIG Brush units is very low – below 18 volts. However, if the cleaning fluids make contact with a high voltage source outside the TIG Brush (which includes the mains power connection to the TIG Brush), the fluid could provide a path for the electricity outside the confines of the electrical wiring, resulting in a potential hazard.

See the chart below for a comparison of electrical conductivities between liquids. The higher the number, the more conductive the liquid is. It can be seen that some of the TB fluids are more than 1000 times more conductive than tap water. The consequence of this is if the more conductive fluids (such as TB-25 or TB-31) are spilled onto the floor or dripped into a puddle of water, the operator needs to take a great deal of care to avoid a situation where they are in contact with the puddle. For example, if a mains lead is sitting in a puddle of conductive fluid, and the operator is standing in the fluid and touching an earthed bench, the situation could be life threatening.

<table>
<thead>
<tr>
<th>Fluid</th>
<th>Electrical Conductivity (µS/cm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tap Water</td>
<td>200-800</td>
</tr>
<tr>
<td>Sea Water</td>
<td>52,000 - 54,000</td>
</tr>
<tr>
<td>TB-25</td>
<td>231,000</td>
</tr>
<tr>
<td>TB-30ND</td>
<td>87,000</td>
</tr>
<tr>
<td>TB-21ND</td>
<td>12,500</td>
</tr>
<tr>
<td>TB-31ND</td>
<td>146,000</td>
</tr>
</tbody>
</table>
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Advice for Safe use of TB Fluids with Respect to Electricity

• Conduct an organised routine inspection of power cables, extension cables and connections for splits, cracks or any other damage that compromises the insulation and safe connection of the cables.
• If damage is found to cables or connections, do not use the affected parts, label and quarantine and inform your company manager. Replace with inspected and sound cables or connections.
• If the leads or connections of the TIG Brush are damaged, label and quarantine then report to your manager and TIG Brush sales representative.
• Do not use the TIG Brush with any damage including damage to cables or connections.
• Ensure all connections of power cables are not in contact or near water or TB cleaning fluids or any other water based liquids
• Elevate power cables and connections above floors, which may be wetted with water or chemicals.
• If the extension cable connections are likely to contact with small amounts of water or chemicals, use a suitable connection protector, which is designed to prevent water or chemical ingress. These can be sourced from your electrical distributor.
• Keep the floor and workbench where the TIG Brush is being used as free from surface water or chemicals as possible.
• Avoid excessive dripping of TIG Brush cleaning fluids over the bench or floor where the work is being done.
• By using rubber/plastic gloves and aprons, avoid excessively wetting the clothes and boots of workers using the TIG brush
• Confirm that the work area is protected by an earth leakage circuit breaker to protect all workers from electrocution via all electrical devices.
• The use of liquids around electrical devices as in the TIG Brush Weld Cleaning System presents an easily controlled risk that needs to be adequately risk assessed and managed as with all workplace risks.

At all times be aware that working with electrical devices and their power cables requires diligent safety behaviour.

Ensitech considers safety above all else.

If there are any doubts about using the TIG Brush Weld Cleaning System safely, please contact your TIG Brush representative for advice before using the system.