

Warm Tiles™

Troubleshooting

CONTENTS



DFT Cable Construction

(p.1) An overview of how the cable is built and what comprises the cable.



Types of Cable Faults

(p.4) Discusses the different types of faults and what happens during a fault. (Open Fault, Short Fault, Damaged Insulation)

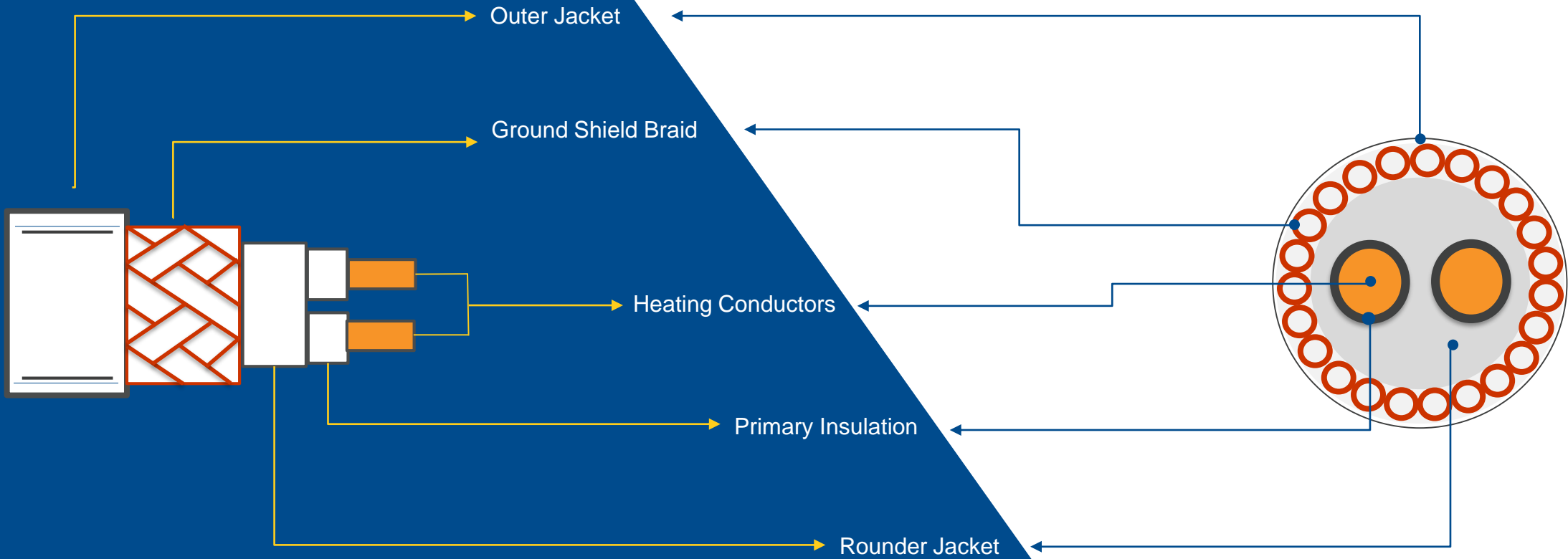


How to Identify the Types of Faults

(p.12) Explains how to distinguish between the types of faults that can occur in a heating cable.

DFT Cable Construction

Cross Sectional View



Side View

Outer Jacket



Rounder Jacket



Heating
Conductors



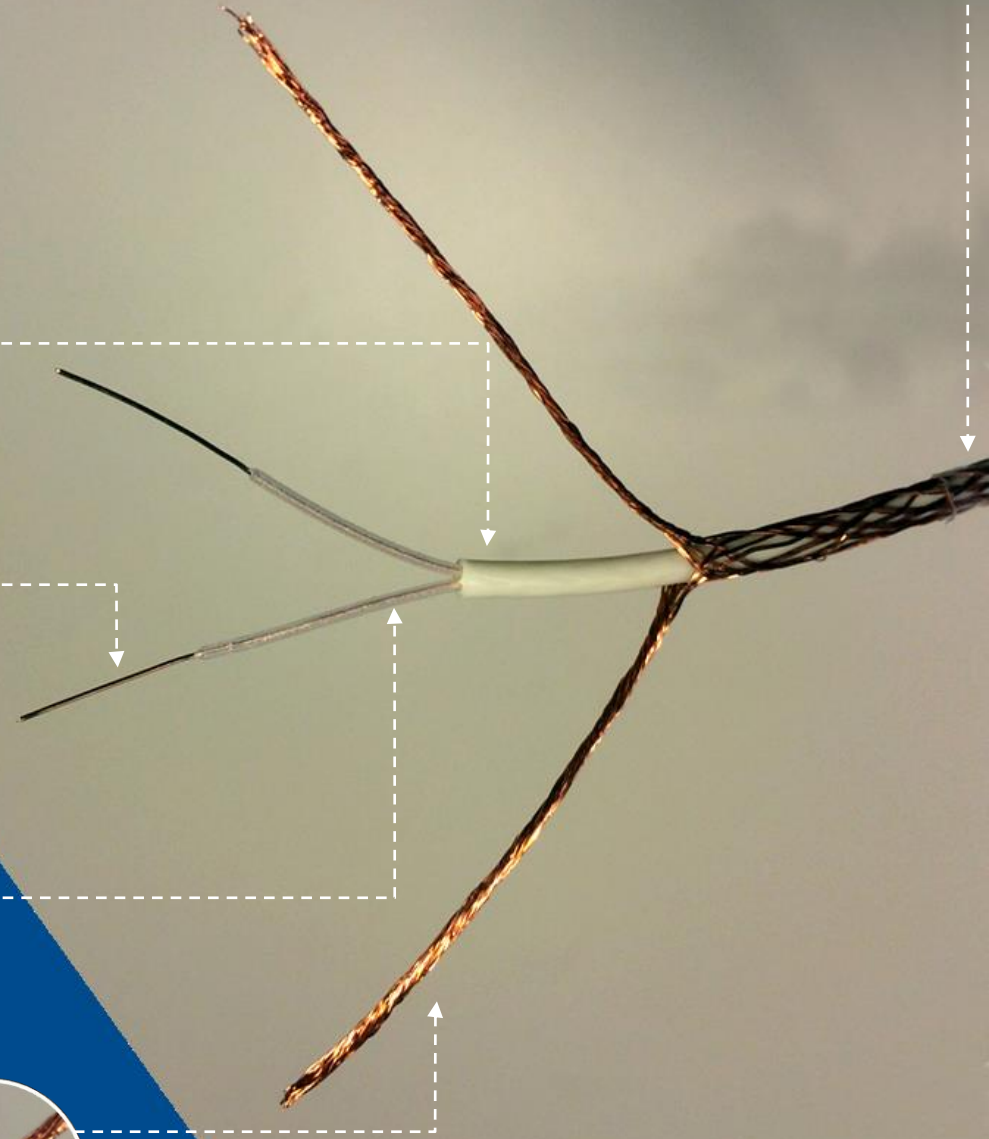
Primary Insulation



Ground
Shield Braid

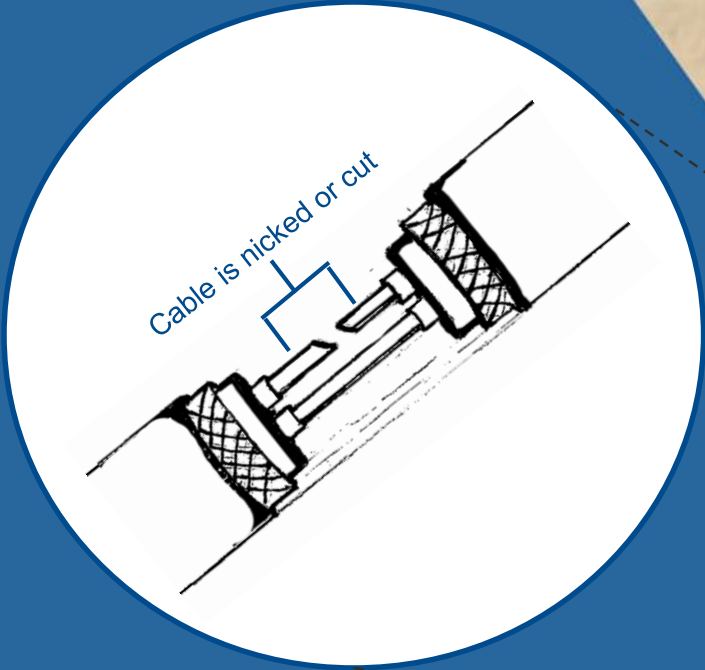


Stripped out DFT cable



Types of Cable Faults

- Open Fault
- Short Fault
- Damaged Insulation

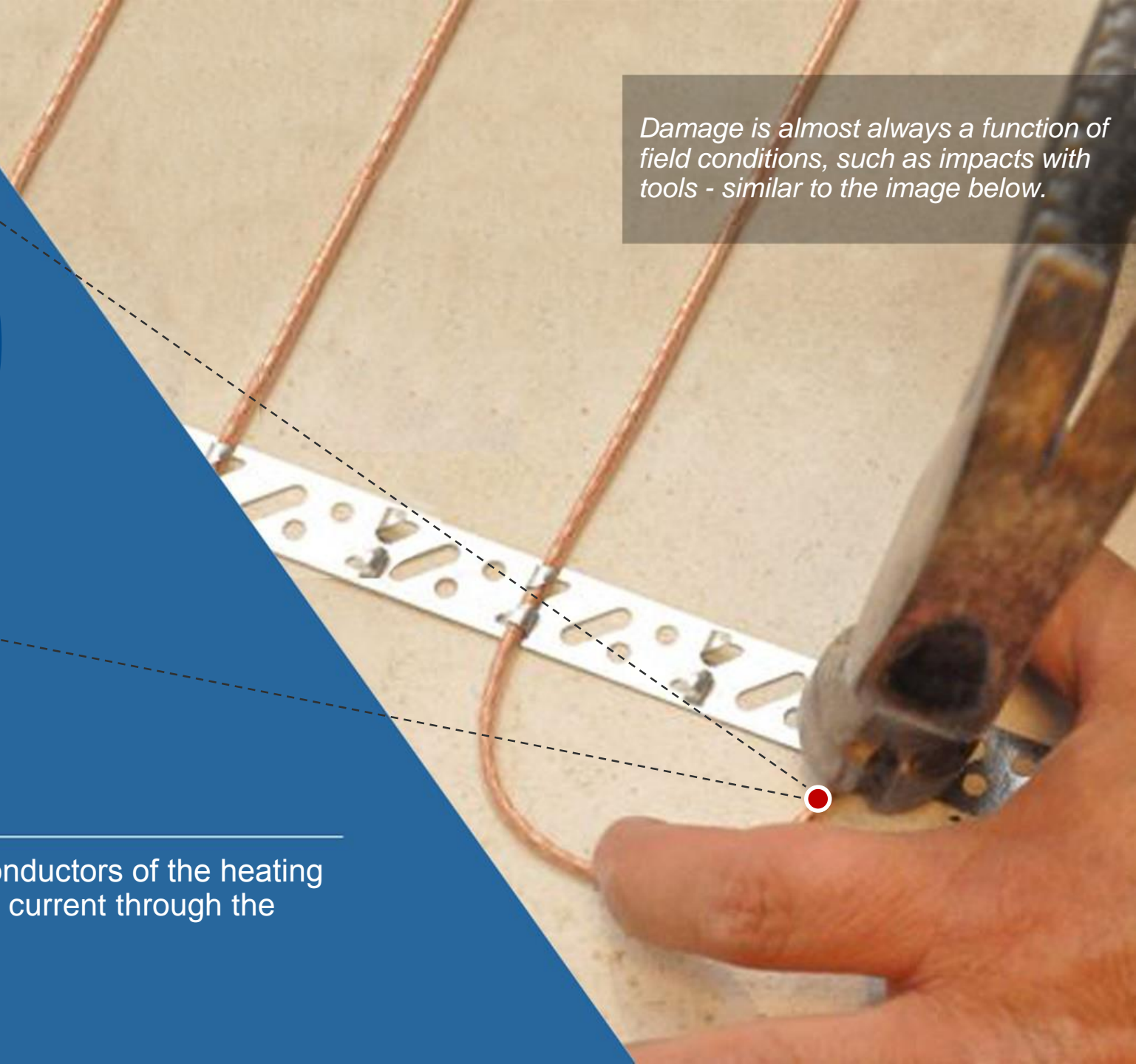


Damage is almost always a function of field conditions, such as impacts with tools - similar to the image below.

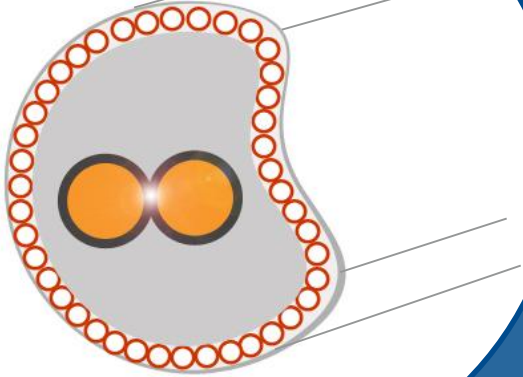
Open Fault

In an "Open Fault" condition, one or both of the conductors of the heating cable have been severed and cannot conduct any current through the heating cable.

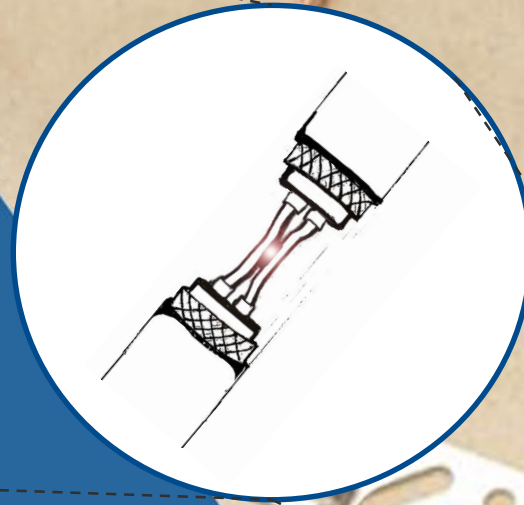
Result : No floor heating.



Cross Sectional
View



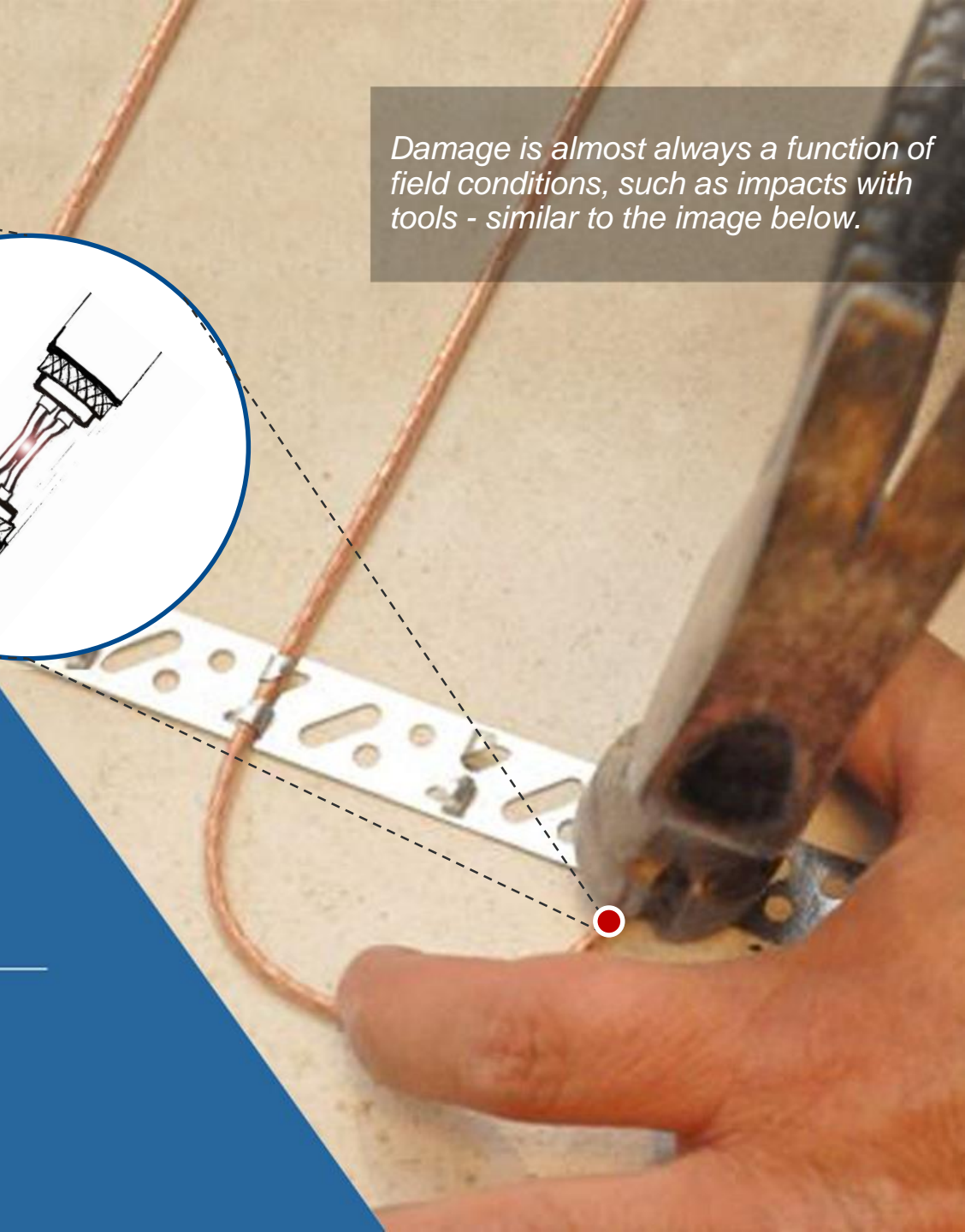
Damage is almost always a function of field conditions, such as impacts with tools - similar to the image below.



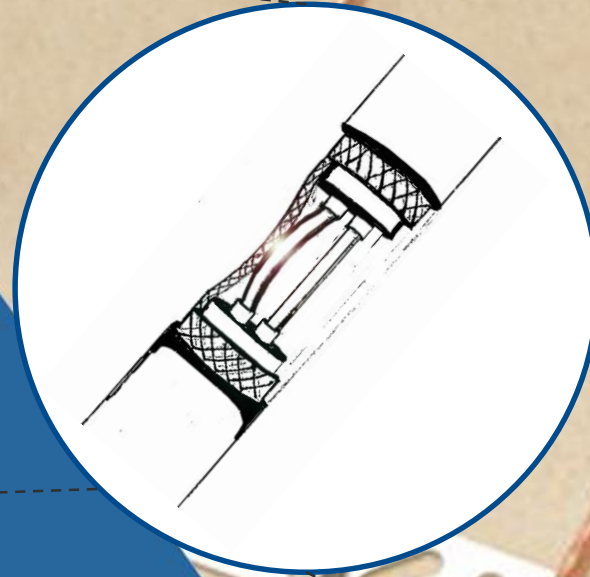
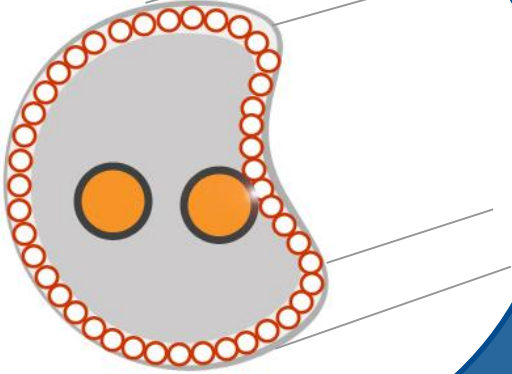
Shorted Between Heating Elements

Both conductors of the heating cable are making electrical (physical) contact before the Tail End Splice.

Result: Partial or no floor heating



Cross Sectional
View

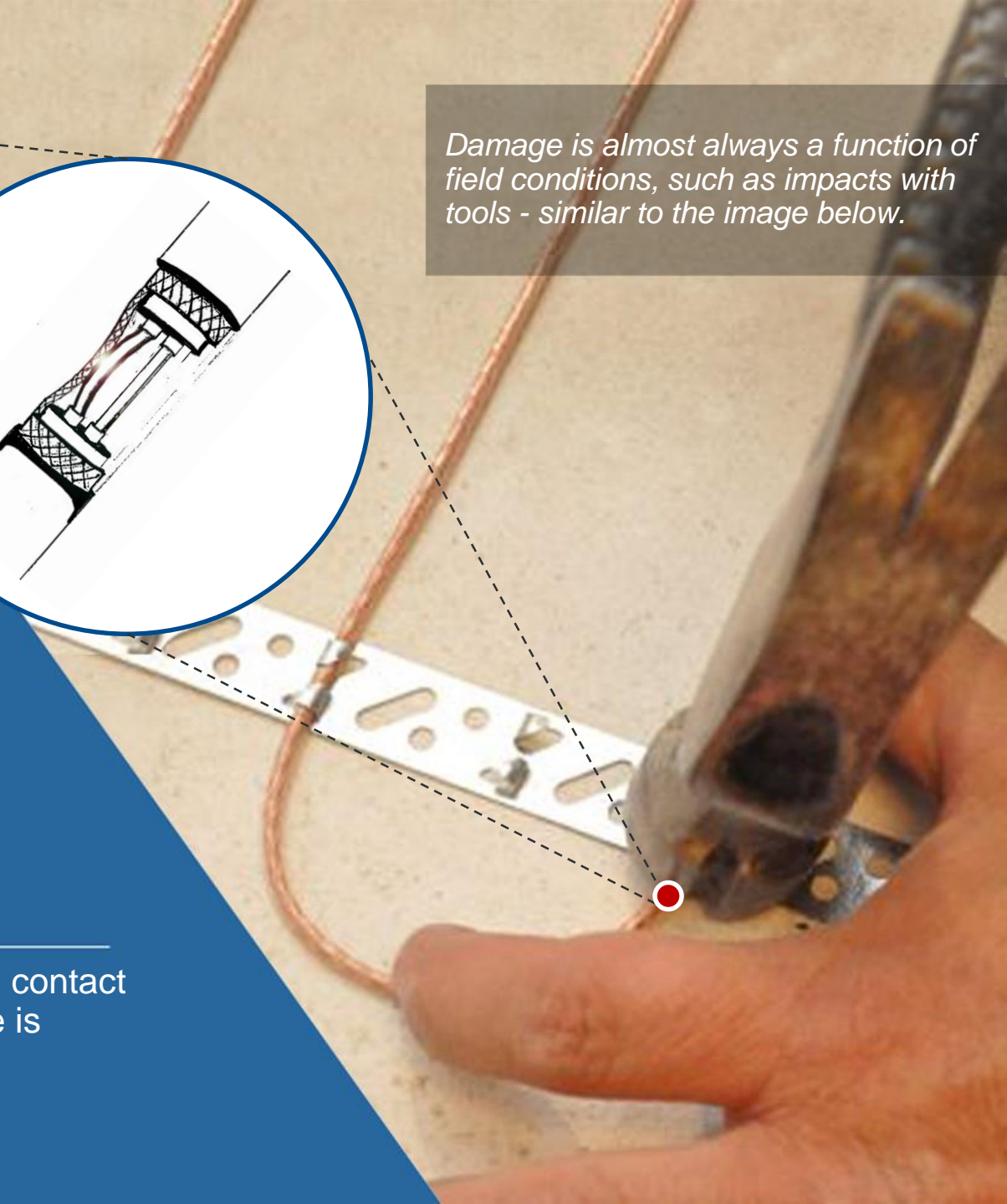


Damage is almost always a function of field conditions, such as impacts with tools - similar to the image below.

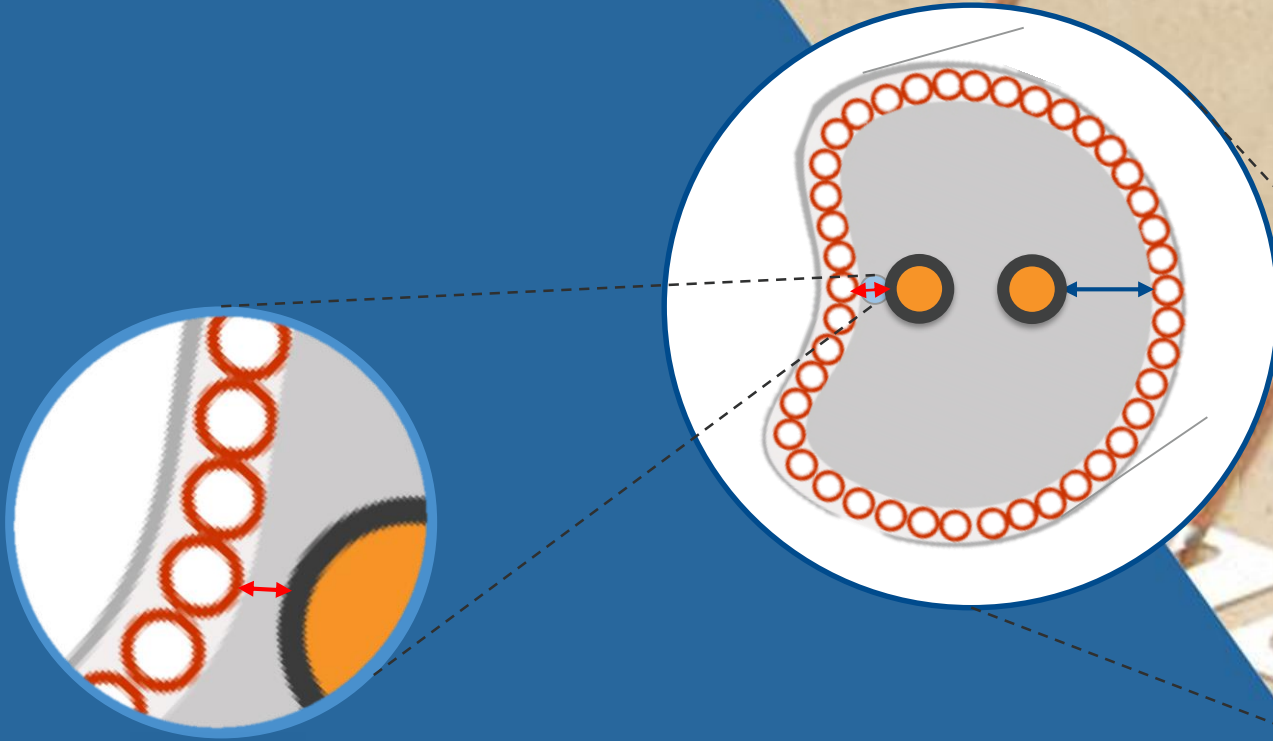
Shorted to the Ground Shield Braid

One or both conductors of the cable are making electrical (physical) contact with the outer Ground Shield Braid. Ground Fault occurs if the cable is shorted to Ground Shield Braid.

Result: Thermostat trips or GFI breaker trips



Damage is almost always a function of field conditions, such as impacts with tools - similar to the image below.



Damaged Insulation

Insulation materials that isolate one or both conductors become compromised causing a small amount of current to leak to the Ground Shield Braid. Ground Fault occurs if the cable is shorted to Ground Shield Braid.

Result: Thermostat trips or GFI breaker trips

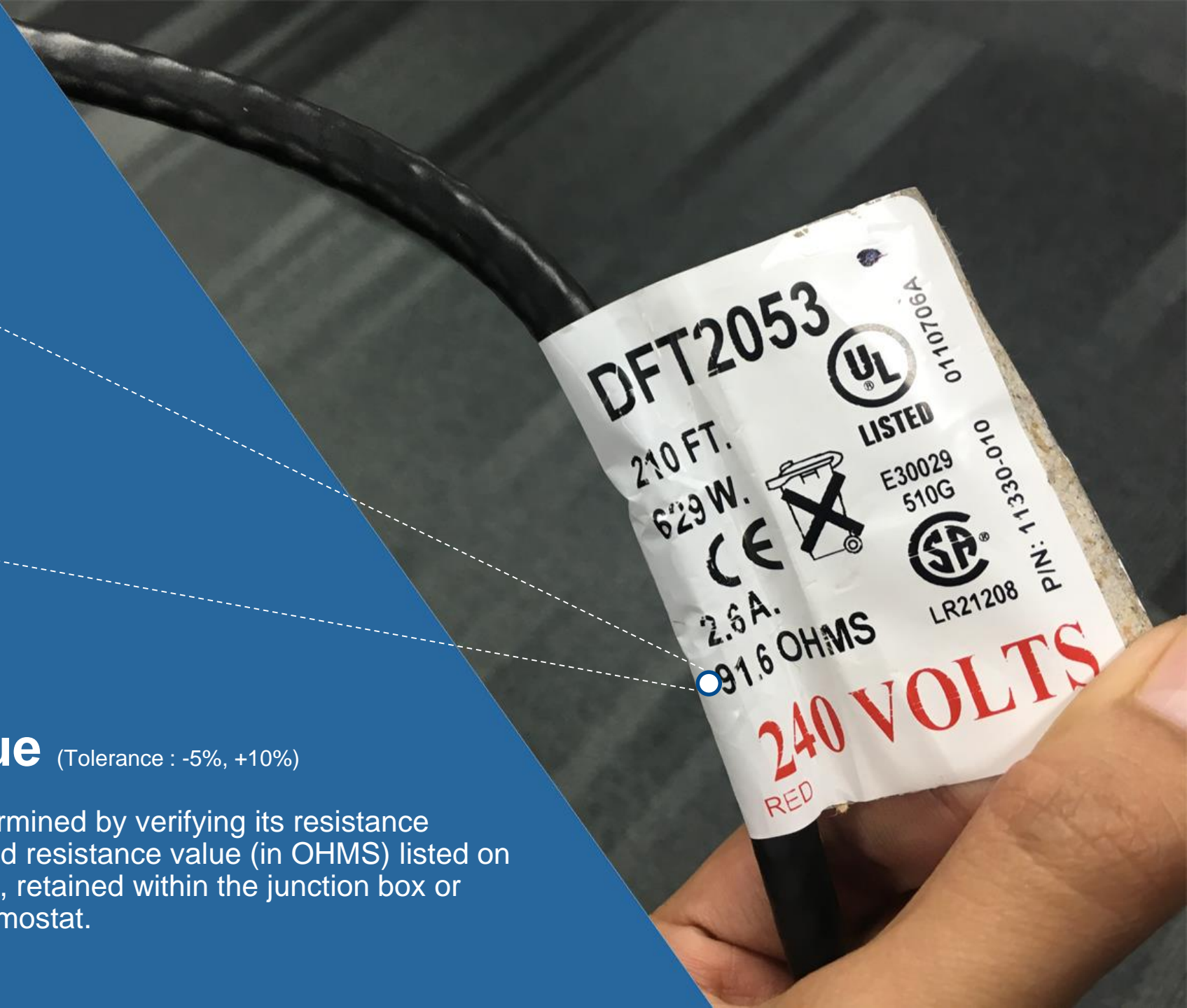


How to identify the types of faults of a heating cable?

Troubleshooting and Checking the Condition of the cable

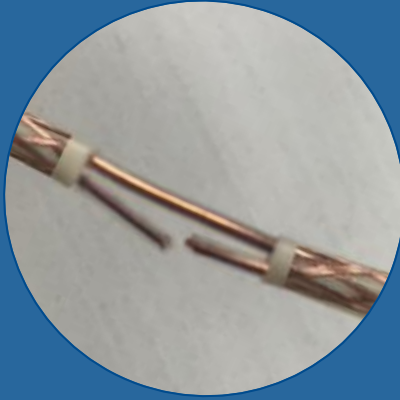
Tools typically used are:

- Digital Multi-meter (DMM)
- Mega-ohmmeter



Cable Resistance Value (Tolerance : -5%, +10%)

The condition of the heating cable is determined by verifying its resistance value. Each heating cable has its expected resistance value (in OHMS) listed on the white sticker attached to the cold lead, retained within the junction box or electrical connection box, behind the thermostat.



In an Open Fault, one or both of the conductors are severed. Therefore, no current flows through the conductors and no heat is generated.

How to check for an Open Fault?

Use a multi-meter to check the resistance value or continuity of the heating cable. If the multi-meter reads O.L. (Overload) an Open Fault exists on the circuit.

Note: Multi-meter must be set to 200-Ohm range or higher to obtain appropriate reading.





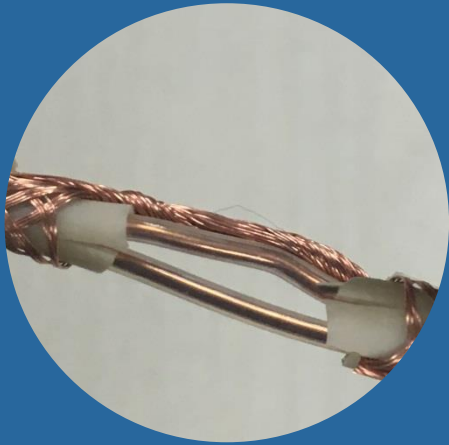
When a cable is shorted between two conductors, the measured resistance is lower than the expected resistance value.

How to check if a cable is shorted between conductors?

As an example, the expected resistance value of a DFT2053 is approximately 91.6 Ohms. If the measured resistance value is less than 91.6 Ohms, cable is shorted between conductors.

Note : (Ohms Tolerance: -5%, +10%)





When a cable is shorted to the Ground Shield Braid, a low resistance value is measured between each of the conductors to the Ground Shield Braid.

How to check if a cable is shorted to the Ground Shield Braid?

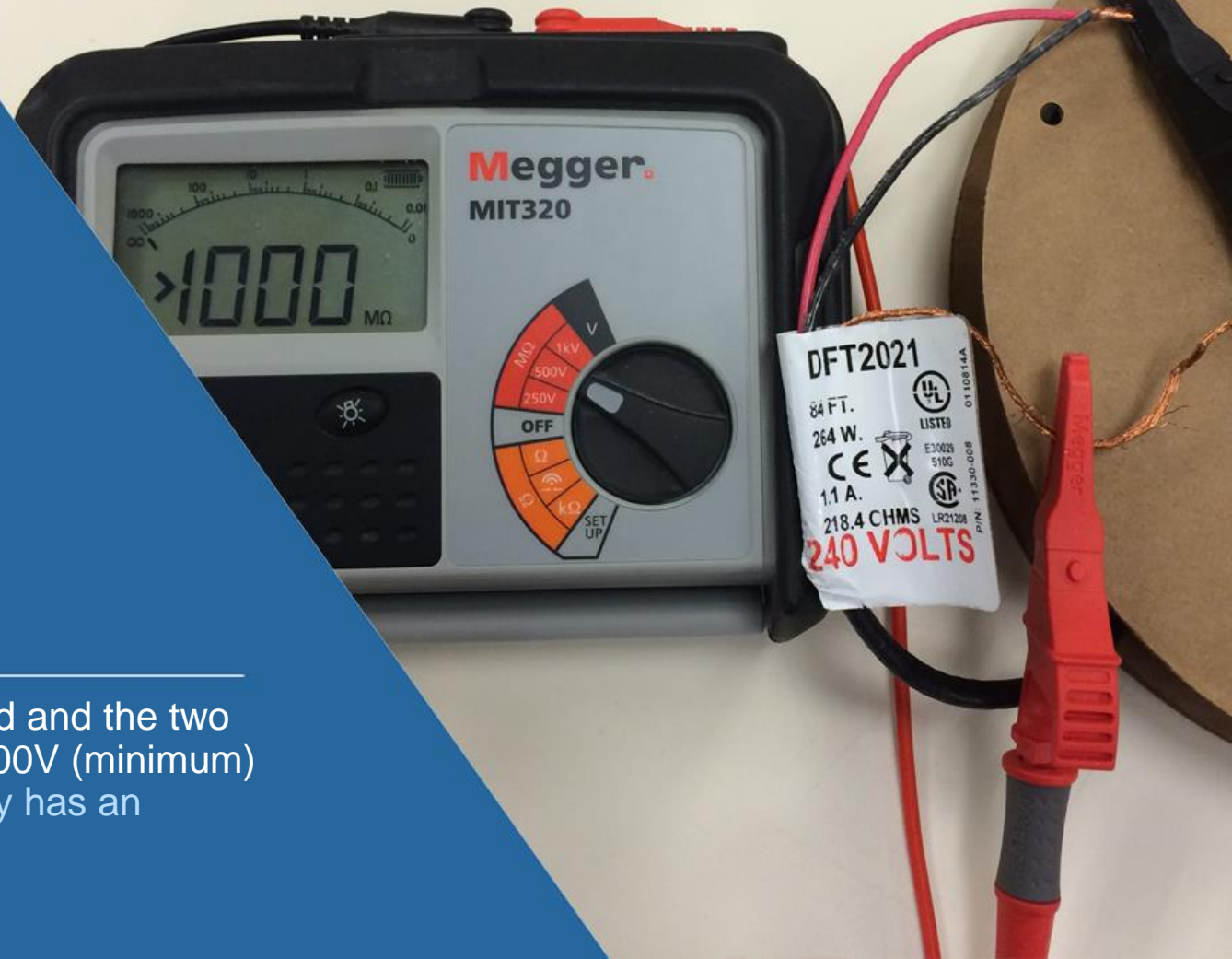
As an example, DFT2053 is expected to have a very high resistance measured between each of the conductors to the Ground Shield Braid, usually indicated as "O.L.". If a low resistance value is measured between one or both of the conductors to the Ground Shield Braid, the cable is shorted to the Ground Shield Braid.



A good cable typically has an insulation resistance value of at least 20 Mega Ohms.

How to check if the cable has a Damaged Insulation?

Connect a mega-ohmmeter between the copper ground braid and the two cold lead conductors connected together. Set the tester at 500V (minimum) and measure the insulation resistance. A good cable typically has an insulation resistance value of at least 20 Mega Ohms.



C O N T A C T S

For additional inquiries, please feel free to contact us at the following:

1-800-537-4732

EasyHeat Toll Free Hotline

EasyHeat.Technicalservices@Emerson.com

Technical Mailbox

877-270-1738

Fax Number

