Solar IPC Technology for High-Performing Utility-Scale Solar Projects

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Meet Our TE Experts

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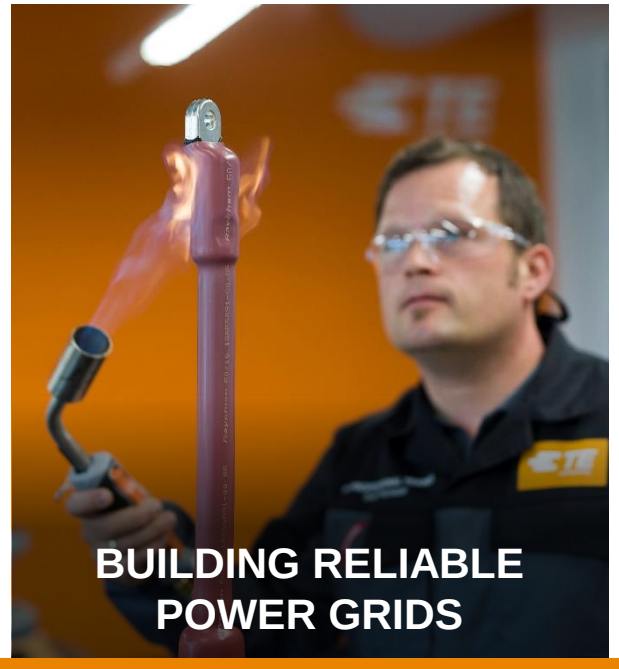
FULFILLING OUR PURPOSE IN ENERGY

WE CREATE A SAFER, SUSTAINABLE, PRODUCTIVE AND CONNECTED FUTURE.



Solar Projects are Complex and Costly

Selecting the right technology is crucial for success

Solar sites are exposed to:

- Extreme temperature fluctuations
- High humidity levels
- Tight implementation timelines

Inadequate technology can lead to major **project failures**

How it All Started

IPCs or Insulation Piercing Connectors were designed to create a connection without stripping the wire insulation.

TE pioneered the IPC technology 40 years ago and was the first to develop an IPC specifically for solar applications.

20+ GW
Solar IPCs deployed by TE worldwide

1980s
First IPC Design
(SIMEL)

1990s
TE acquires SIMEL

2000s
First MV IPC
15 kV at 600 kcmil

Distribution Networks

2010s
First UL listed
Solar IPC

2020s
Pre-assembled multitap
Solar IPC (UL & IEC)

Continued upgrades
(Wider range of cables)

Solar Applications

Key Differences in IPC Technology

	Overhead Distribution Networks (Utility)	Solar Requirements	TE´s Solar IPC Technology
Voltage Class	• 600V AC	• 1500V DC	• 1500V DC
Clearance/Creepage Distance	• Not required	• 14 mm through air • 15 mm over surface	• >24 mm from any live part
Flame Retardancy	• HB (Lowest rating)	• V0 (UL) • Minimum HB or V-2 (IEC) • Glow wire (IEC 60695-2-11)	• V0 UL94 • Glow wire (IEC 60695-2-11)
Outdoor Rating	• Not required	• f1 UV rating (UL746C) • Weather Resistance (ISO 4892-2)	• f1 UV rating (UL746C) • EN 50483-4 (EU) • Weather Resistance (ISO 4892-2)
Insulation Thickness	• Single	• Single (UL) or Double (IEC) • Thicker than distribution networks	• Single (UL) or Double (IEC) • Thicker than distribution networks
Applicable Standards	• ANSI c119.5	• Depends on customer requirements	• UL9703 & UL486 A/B • IEC 62852

Solar IPC Technology
Use cases

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Use Case: Installation

Challenge

Increased **project timelines and project costs** due to installation **quality and availability** of labor

Solution

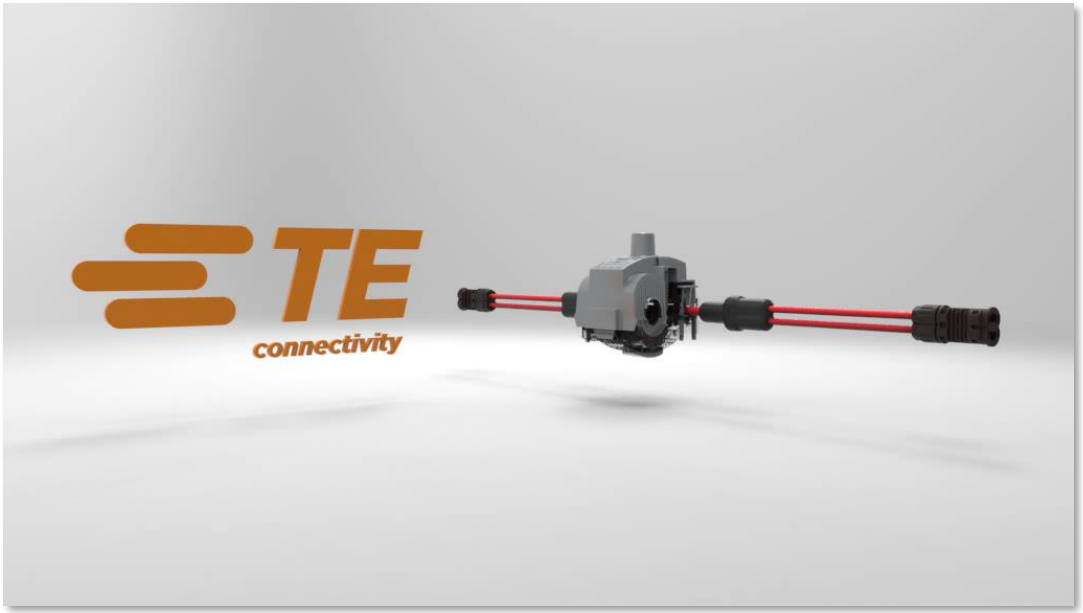
- Components that do not require special installation skills
- Pre-assembled components designed for flexibility, enabling easy adaptation and minimizing installation time
- Expert guidance and support

Up to 40%
savings in installation costs

Ease of Installation

What it is

- Solar IPC with integrated tap cables
- Safety connectors to prevent dust or humidity during installation
- Field installation - allows for flexibility and adaptation on the ground



Features

- **Protection, insulation, and high-quality sealing** ensure fast, easy and safe connections of PV cables
- **Pre-positioned tap** accelerates the installation and minimizes field challenges
- Single SIPC accommodates the **full range of trunk bus sizes** from 4/0 to 1000 kcmil

Up to 200 Solar IPCs installed*
per person per day

*As reported by TE customers

Use Case: Performance

Challenge

Solar projects endure **extreme conditions and temperature variations**

Solution

- Components should last throughout the life of the project
- Choose components designed and tested to withstand extreme conditions (heat, frost, humidity)
- Check compliance with c/UL and IEC standards – specific for solar applications

Qualifications You Should Look for

Industry Standard	Test Type	Duration	TE Test
UL486 A/B	Electrical	1000h	1000h
UL 9703	Thermal Cycling	1200h	1200h
	Humidity Freeze	240h	240h
IEC 60068-2-14	Thermal Shock	200h	200h
IEC 62852	Humidity	1000h	1000h
EN 50483	Electrical	2300h	**4300h**
	Climatic test	1000h	1000h
	Corrosion Aging	1300h	1300h
IP68 / IEC 60529	Water immersion	1h	**24h**

8264h
Total Testing

3300h Electrical

4694h Environmental

Case Study: Adaptability in the Field

12 MW area reconfigured

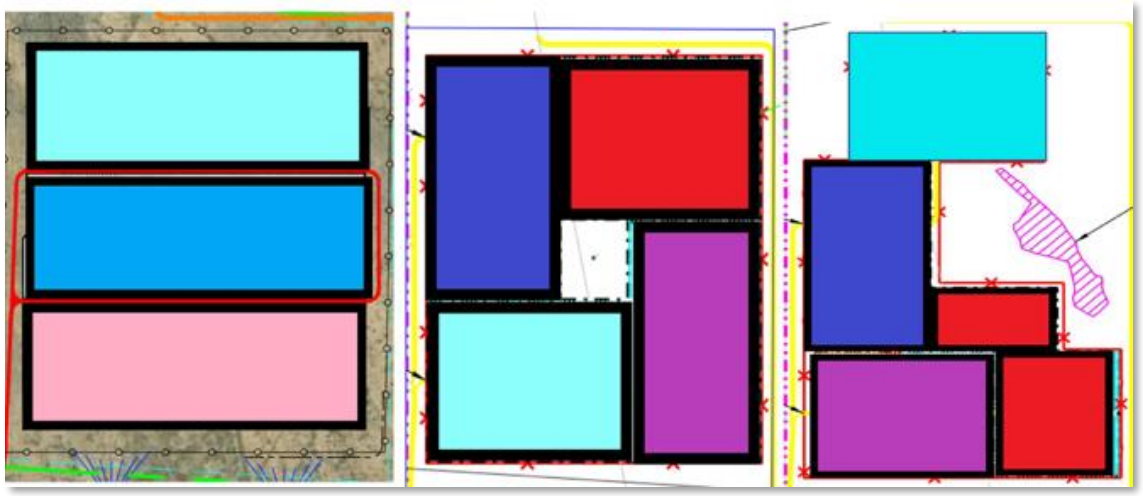
REGION North America

CUSTOMER 75 MW Solar Farm

CUSTOMER CHALLENGE

- Construction of a solar farm halted when a sacred burial site was discovered
- Need to **reconfigure the solar farm layout using existing materials**
- Protect the sacred area with no additional costs

Preliminary *IFC* *As Built*



SOLUTION

Customizable Trunk Solution CTS with pre-assembled solar IPCs was **adjusted in the field reshaping the original cabling design** to circumvent the burial site

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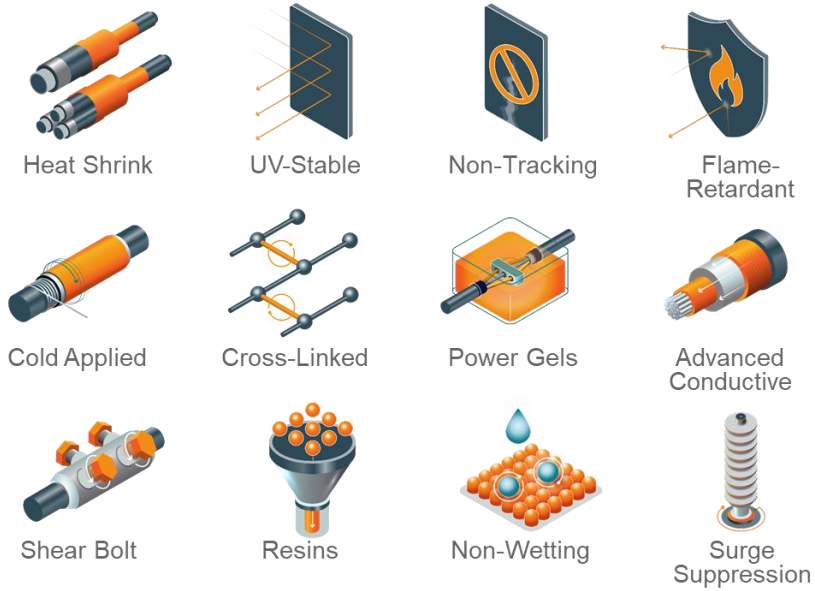
OUTCOME

- 12 MW area reconfigured within original time & budget
- Zero Change Orders & Zero Liquidated Damages
- Sacred burial ground remained protected

Customer Collaboration Drives Innovation

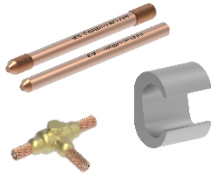
TE Material Science Expertise



Innovation from TE's core platforms

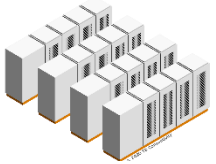
Latest Products to Market

Solar IPC Assemblies



Grounding Solutions

PV Connectors



Battery Energy Storage

20+GW of solar power enabled with TE´s Solar IPC Technology

Sustainability in the Field

Up to 50% savings on waste disposal on site and eco-friendly packaging

Ready to Make Every Connection Count?

Visit TE.com/cts to discover our Customizable Trunk Solution for utility-scale solar farms

Watch our Solar IPC Assembly video to see the key installation steps for our product

Scan the QR code to get more information about TE´s Solar IPC Assemblies for UL and IEC

SCAN ME

Top 100 Global Innovator 2025 Clarivate

Q&As

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TE connectivity