Overhead Lines Galvanic Corrosion Challenges

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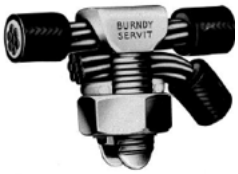
Purpose of an Electrical Connector

- Connect two electrical conducing medium
  - Conduct electricity
  - Satisfy mechanical requirements

- For the Life of the connection



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Keys to a Good Connection

- Choose the right **Material** for application
  - Copper vs Aluminium vs Other
- Maximize **Contact Area**
  - Increase "A Spots" (electrical contact points)
- Optimize **Pressure (Force)**



- Maintain all three for the life of the connection

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Material Selection

- Choose the right **Material** for application
  - Copper vs Aluminium vs Other

Copper to **Copper**	→	**Copper** Connector
Aluminium to **Aluminium**	→	**Aluminium** Connector
Aluminium to **Copper**	→	**Aluminium** Connector*

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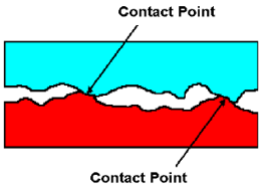
Electrical Contact

- Maximize **Contact Area**
  - Increase "A Spots" (electrical contact points)

"A" spots are contact points between two conducting surfaces that actually conduct and transfer current from one surface to other

The actual electronic contact surface may be as little as 10% of the visible contact surface



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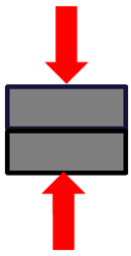
Optimize Pressure

- Optimize **Pressure (Force)**



Pressure helps create and maintain "A" spots (electrical contact points)

Too much pressure, however, can cause material deformation and lead to reduction in conductive area

Reduction of pressure over life will reduce contact spots and lead to failure

Thermal expansion and relaxation can cause reduce pressure

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Material Selection (Harsh Environment)

❖ Choose the right **Material** for application

Aluminium to ~~Copper~~ → Aluminium Connector

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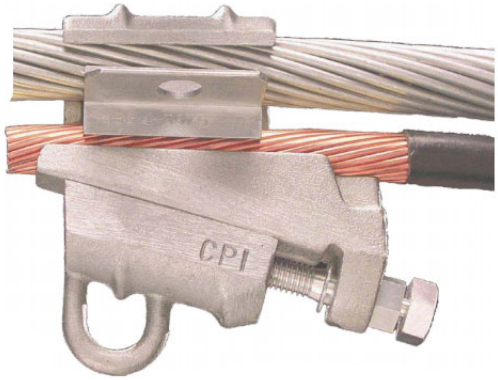
Material Selection (Harsh Environment)

Aluminium **(Main)** →

Copper **(Tap)** →



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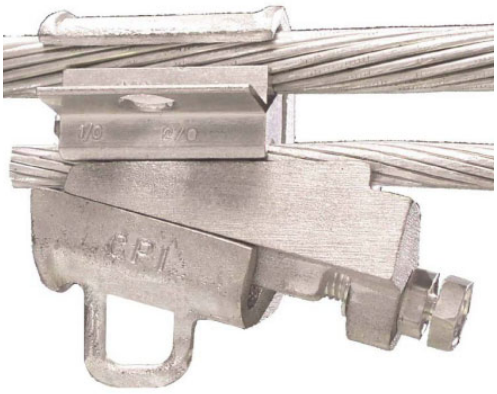
Material Selection (Harsh Environment)

Aluminium **(Main)** →

Aluminium **(Tap)** →



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NZ Harsh Environment Case Study

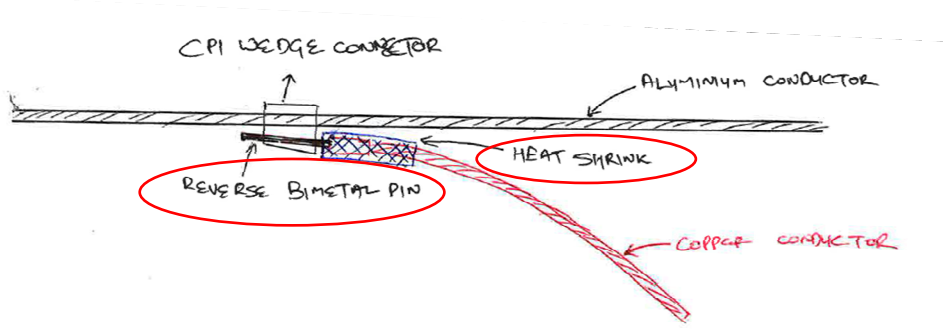

FIG — TAP CONNECTION VIA BIMETAL PIN

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NZ Harsh Environment Case Study

Aluminium to **Copper** Connection

Oct 2017 – Feb 2020 2.5 Years

Aluminium to **Copper** Connection
Via **Bimetallic pin**

July 2018 – May 2020 ~2 Years

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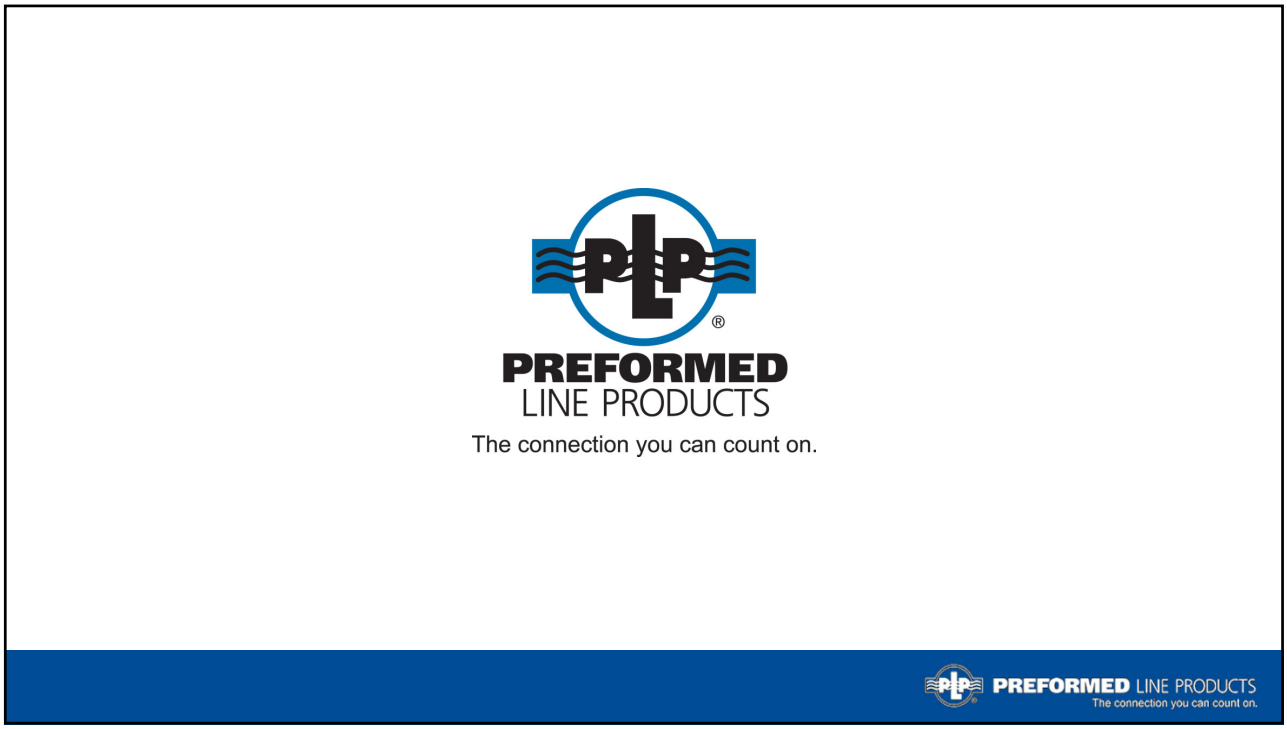
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