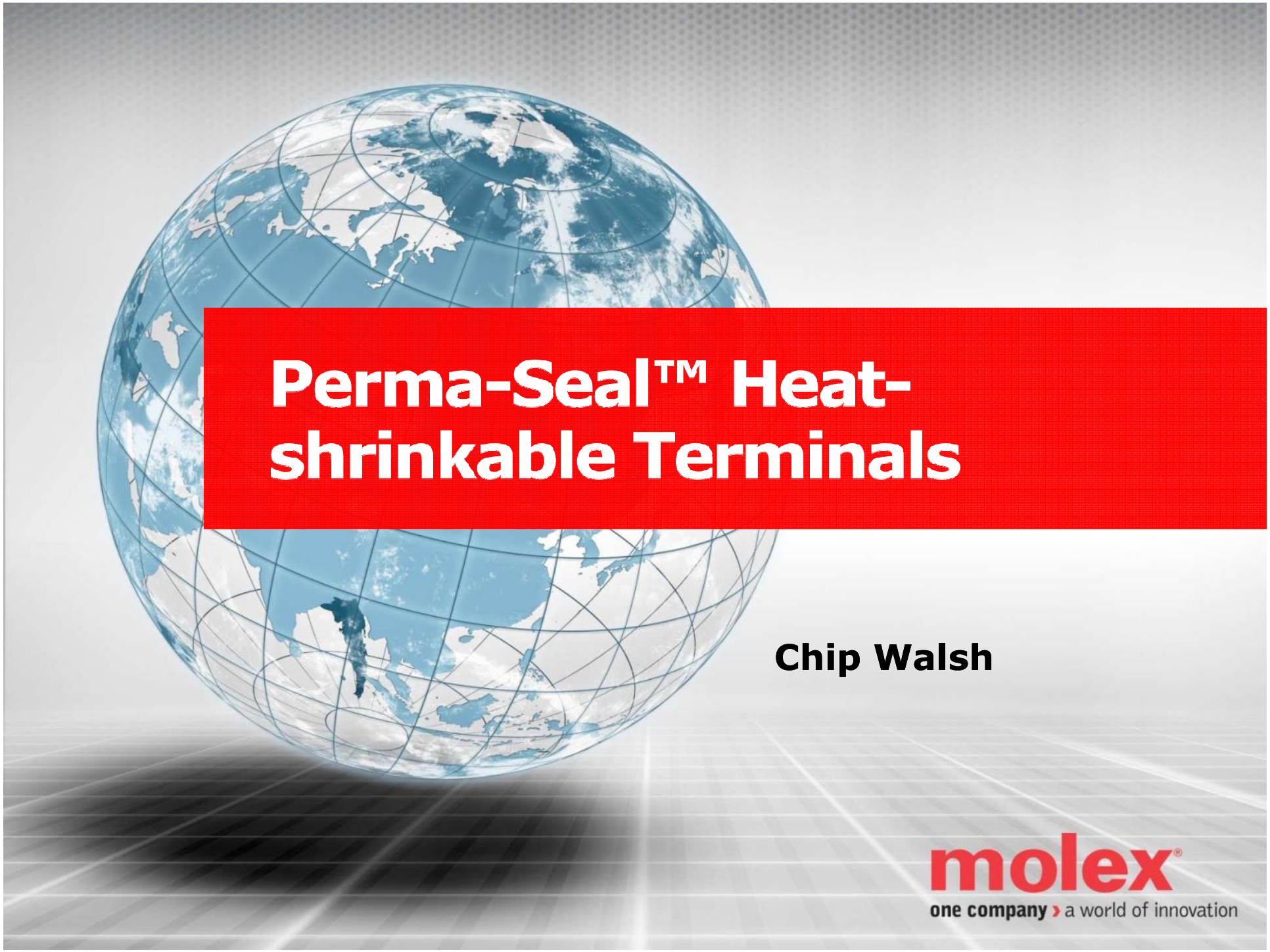

Perma-Seal™ Heat-shrinkable Terminals

Chip Walsh

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one company › a world of innovation

What is Perma-Seal?

- **Perma-Seal terminals and splices provide a rugged, environmentally sealed connection that will insulate, seal and protect connections from physical abuse and abrasion**
  - Manufactured using a propriety polymer call NiAc™
- **Provides a long lasting, moisture proof connection even in the most hostile environments**
  - Withstands water, salt, condensation, corrosion and heat, all of which can cause serious problems for conventional, unsealed connections

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What is Perma-Seal?

- **The inner wall of the perma-seal sleeve is lined with special hot-melt adhesive**
- **As the sleeve is heated, the adhesive melts and flows within the tubing, and fills any existing voids to create a seal**
  - Repels moisture even during pressure cycling
  - Resists abrasion and cutting
  - Stands up to some of the most rigorous tests that can be applied to high performance splices
- **Used where reliability and strength are a priority**

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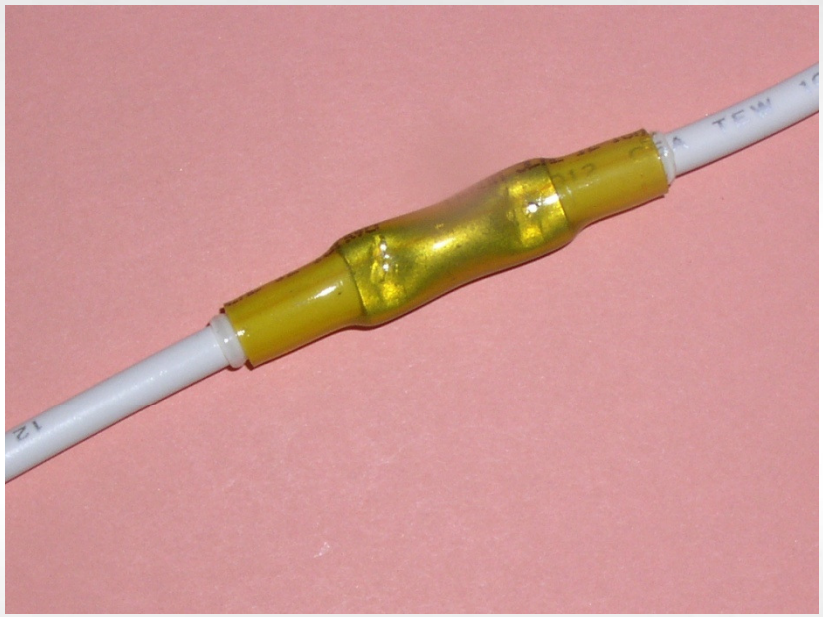
Perma-Seal Product Family

- **Molex offers a full line of heat shrinkable terminals and splices**
- **Low shrink temperature for fast installation**
  - Also reduces chance of damage to wire
- **Excellent insulation clarity**
- **High resistance to solvents, moisture and abrasion**
- **Available on Mylar Tape for machine applied terminal**
- **UL Listed at 600V**
- **RoHs compliant**
- **3:1 shrink ratio**

Perma-Seal splices

- **Widest wire range available**
  - 22-8 AWG
  - Step down versions
    - Big to small
  - Replaces traditional method of crimping splice and covering with heat shrink tubing
  - All splices are available on Mylar Tape



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Perma-Seal Applications

- **Any application where the connection will be subject to harsh environments including moisture, solvents and/or abrasion**
  - Manufacture and repair of automobiles, trucks, trailers, farm equipment, motorcycles, snow mobiles, ships, boats, RV's . . .
  - Manufacture and repair of equipment used in harsh environments
    - Pumps, generators, motors, construction tools
- **Used where reliability and strength is a priority**

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Perma-Seal Comparison

	Polyolefin	Nylon	NiAc
Shrink Temperature	105° C	180° C	90° C
Average Shrink Time	22 seconds	45 seconds	18 seconds
Insulation Clarity	Poor	Fair	Excellent
Abrasion Resistance	Good	Excellent	Excellent
Chemical Resistance	Good	Excellent	Excellent
Water Resistance	Excellent	Excellent	Excellent
UL Listed	Yes	Yes	Yes

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Why is a lower shrink temperature important to the Customer?

- **Less chance of damaging the wire insulation**
  - Typically wire insulation carries temperature ratings of 105C (PVC) to 125C (PE)
- **Faster shrink time, which results in less labor dollars spent waiting for product to shrink**
  - 40% faster !!!

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Summary

- **Waterproof adhesive seal**
  - Tough and durable
- **Reduced installation times**
  - Shrinks 40% faster
- **Improved wire dielectric life**
  - Less chance of damaging wire insulation
- **Comparable chemical resistance or better**
  - Industrial solvents tests and water absorption tests showed NiAc performing better than nylon
  - Abrasion resistance tests showed NiAc to be equivalent to nylon.
- **Perma-Seal brand well known in the Market**

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