



TE Aerospace, Defense and Marine  
WHMA  
February 19, 2015

EVERY CONNECTION COUNTS



# An Overview of Aerospace, Defense & Marine

## Markets

### Commercial



**Commercial  
Aerospace**



**Space**



**Offshore  
Oil & Gas**



**Military  
Aerospace**



**Ground  
Defense**



**Military  
Marine**



**Ground/Air  
Comm. (C4ISR)**

### Defense

## With a Broad Range of Connectivity Products and Technology



**Wire  
Products**



**Connectors**



**Heat Shrink  
Tubing**



**Relays**



**Rugged  
Products**



**DataBus**



**Fiber  
Optics**

## And Extensive Global Resources

**~ 500 Engineers**  
Close to our Customers

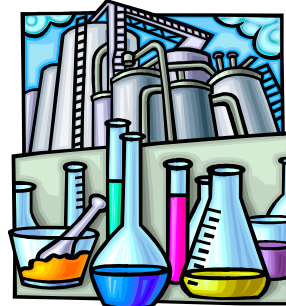
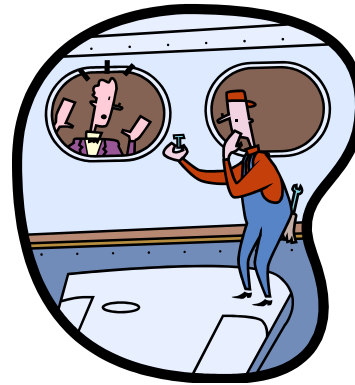
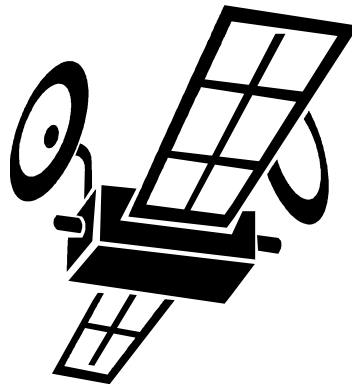
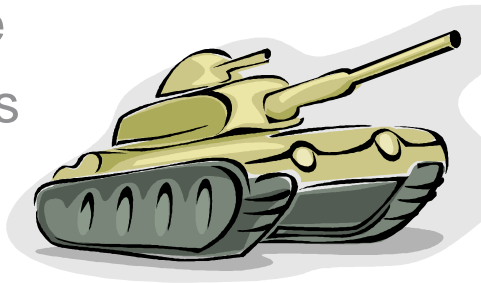
**~ 300 Salespeople**  
Advising our Customers

**3 Industry Focus**  
with  
Global Customer Base

**14**  
**Manufacturing Sites**  
Serving Every Region

# Rugged, harsh environments

- High Temperature
- Low Temperatures
- Corrosion
- Aggressive Fluids
- High Vibration
- Space
- Long Life
- NBC
- High Altitude





# AD&M product groups...the “Core”

Interconnect



AMP,  
MicroDot,  
Nanonics

Wire & Cable



Raychem

Harness Protection



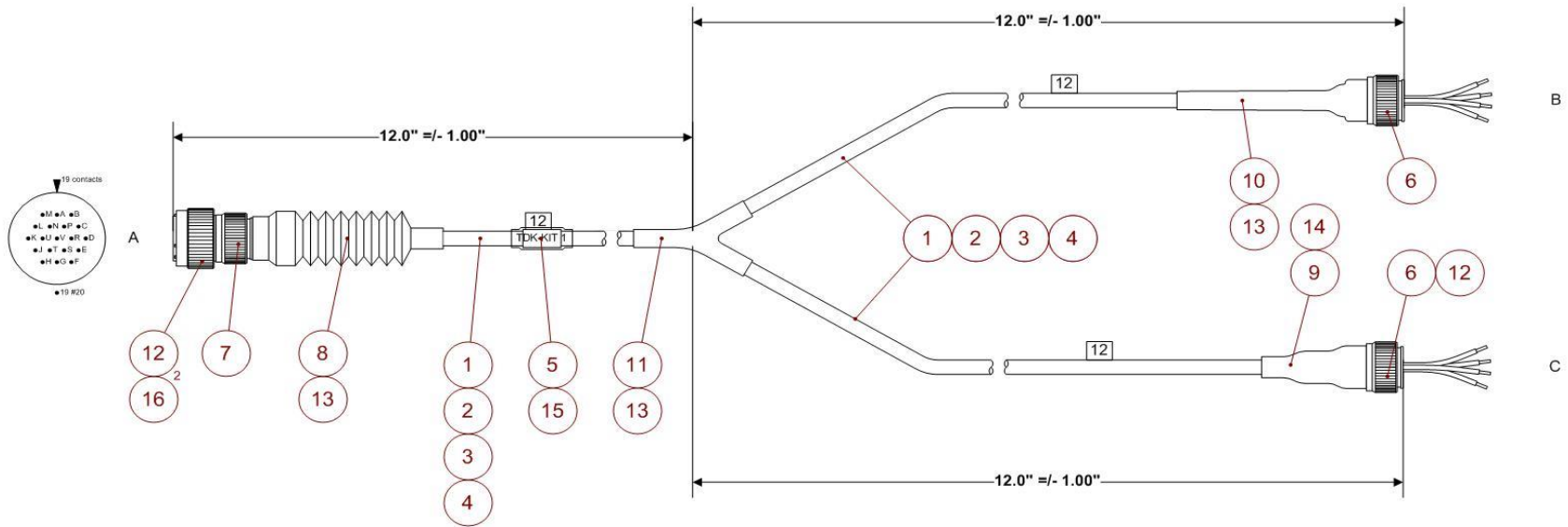
Mil Circular  
Connectors



Deutsch

# HarnWare Computer Aided Electrical Harness Design Software

Printed 6/1/2007, 2:14:25 PM



**tyco** / *Electronics*  
HARNESS PROPOSAL DRAWING

TITLE:		DATE:	6/1/2007
CREATOR:	Dave Litz	PROJECT:	
PART NUMBER:		ISSUE:	
CUSTOMER:		FILENAME:	TDK-1.vsd
		Page 1 of 6	

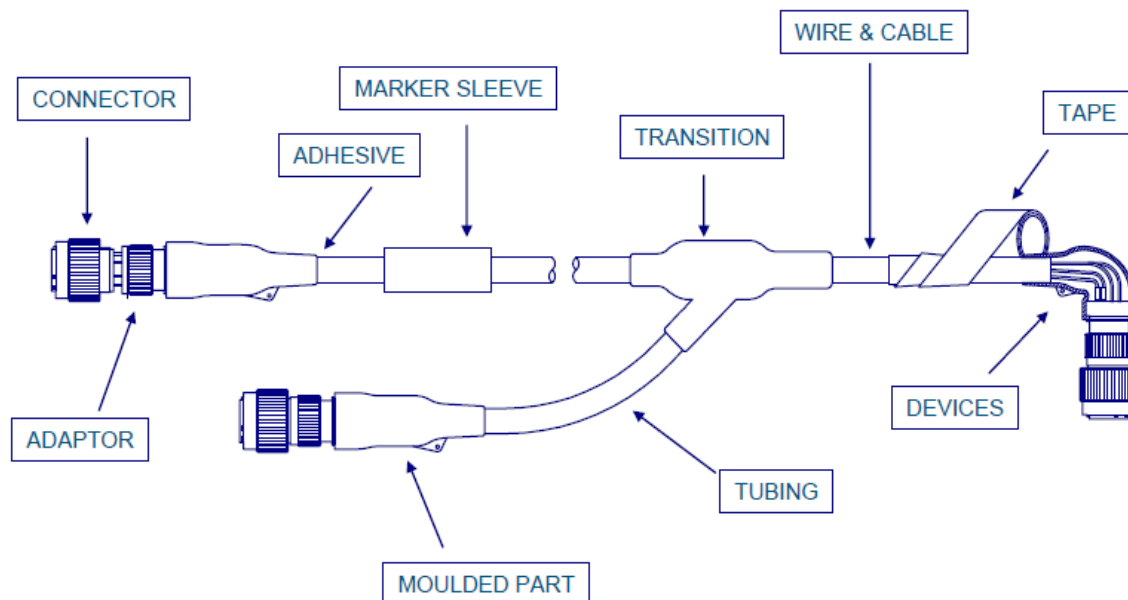
# HarnWare con't

HarnWare

## Harness components

A typical harness may consist of:

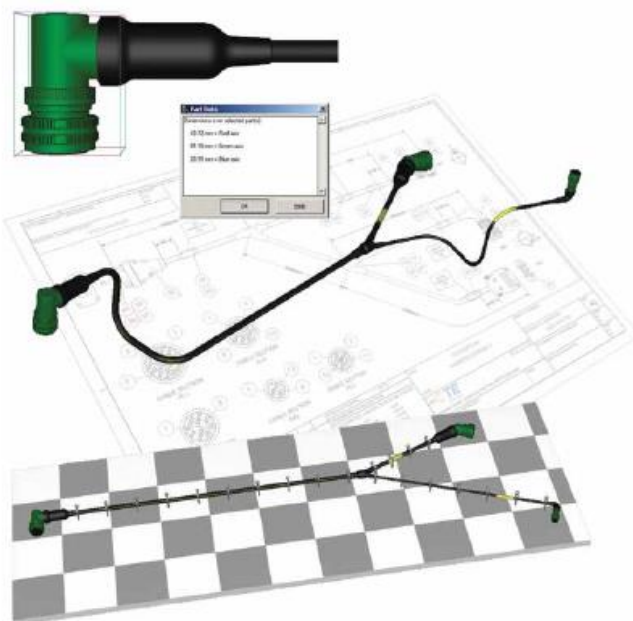
connectors, adapters, boots, tubing, adhesive...



### 3D Modelling and Lay-up Boards

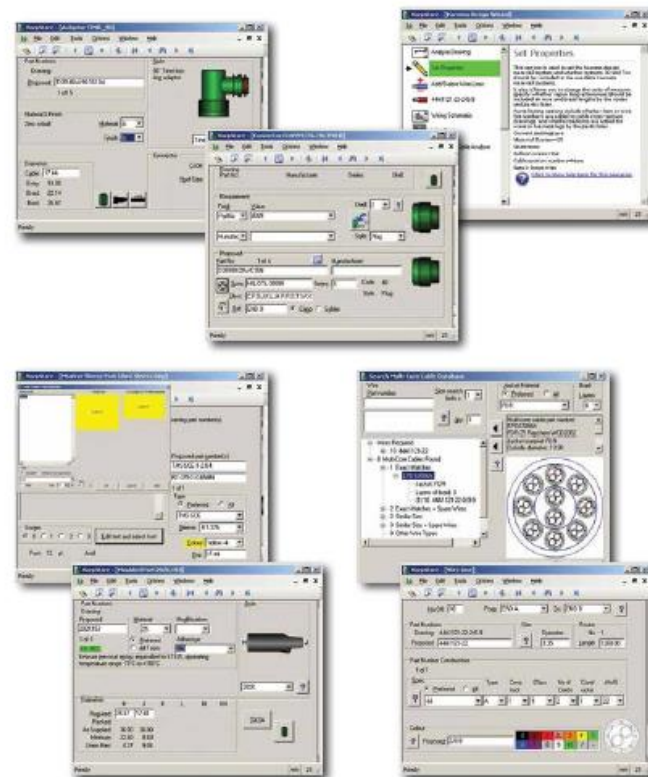
The HarnVis 3D harness design visualisation system offers automatic generation of to-scale 3D models of wiring harnesses and components. These 3D models provide "virtual prototypes" of harnesses allowing the user to see the harness with lengths, diameters and parts shown to-scale. By simply clicking on a part, the user can access such data as part numbers, materials, finishes, adhesives, etc.

These "virtual prototypes" reduce the potential for errors, harness lay-up boards (also known as nail, form and peg boards) can be modelled and pegs can be automatically positioned along the harness legs. When a long harness leg makes it necessary, legs can be bent to fit a lay-up board. 3D models of harnesses and of many TE parts can be exported from the HarnVis system in the form of IGES files for use in other CAD systems.



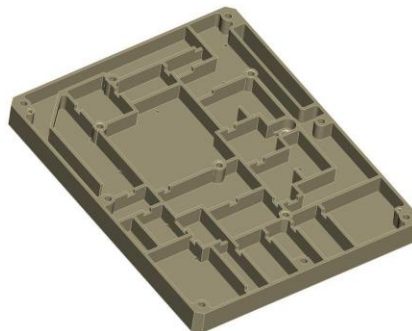
### HarnWare V6 User Friendly Forms

The forms for selecting the wide range of TE components are clear and easy to use with many links to data sheets and design help topics.



# Technology Trends, **SWaP**

- Lighter **W**eight
  - Higher temperatures
  - **S**mall size
  - Faster data rates
    - **S**peed
  - More corrosion resistant
  - More **p**ower
- Easier and faster to use





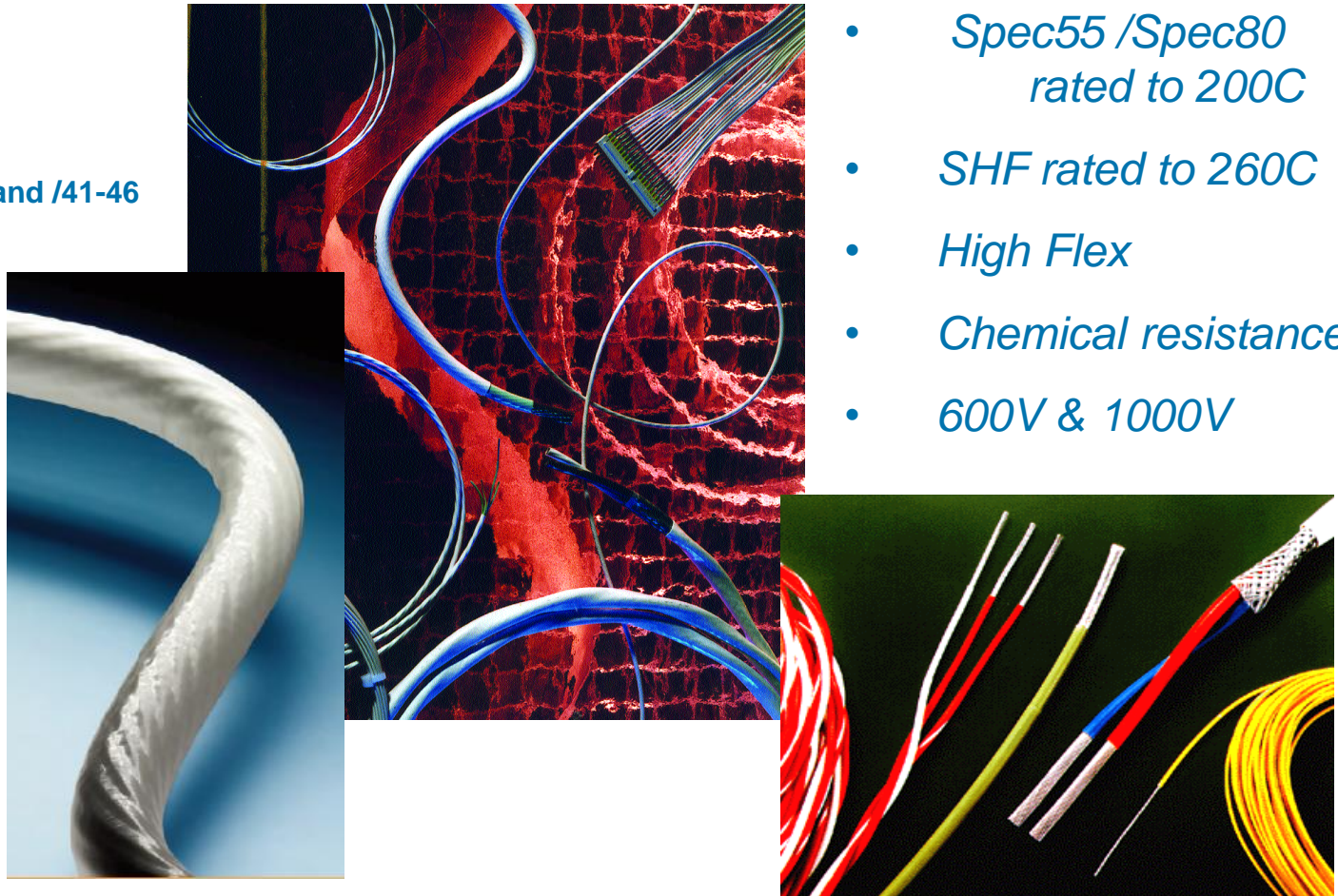
# Wire & Cable

## Primary/ Hook Up Wire

- Spec55  
55/  
55LT  
55F  
55PC  
M22759/32-35 and /41-46

- Spec80  
81A  
82A

- SHF  
WXA



- *Spec55 /Spec80  
rated to 200C*
- *SHF rated to 260C*
- *High Flex*
- *Chemical resistance*
- *600V & 1000V*

# Primary Wire & Small Cable Products

## Spec 44 wire:

- Dual wall general purpose up to 150°C wire. XLPE/PVF<sub>2</sub>

## Spec 55 wire:

- Single and dual wall airframe wire up to 200°C. XLETFE.

## Cheminax Cables:

- **Smaller, Lighter weight alternatives to RG and Mil-C-17 signal cables**

## Spec 82 wire:

High strand count, flexible modified XLETFE

# Wire & Cable

## Controlled Electricals

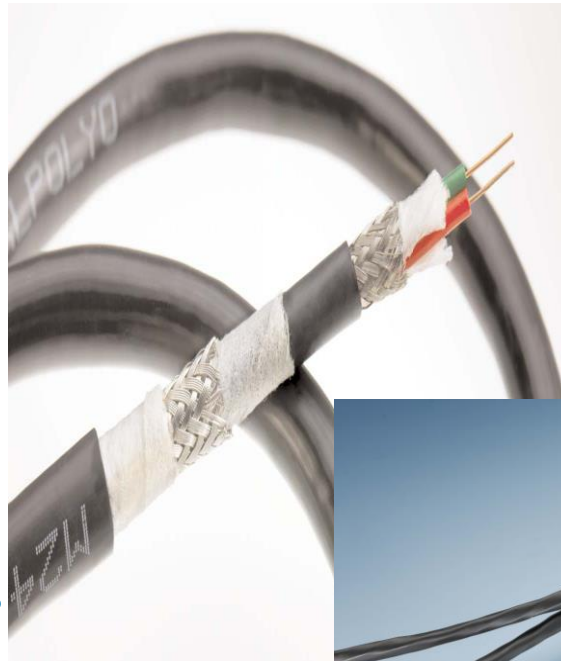
- Twinax/Triax/Coax
- Fiber Channel
- Ethernet
- USB
- Quadrx
- CAT5/ CAT6 constructions
- HDMI

*Rated to  
200C*

*Light Weight*

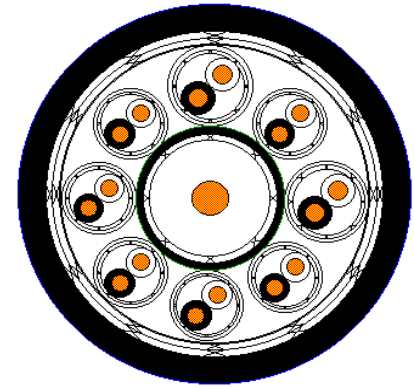
*Small Size*

*High Flex*



# Wire & Cable

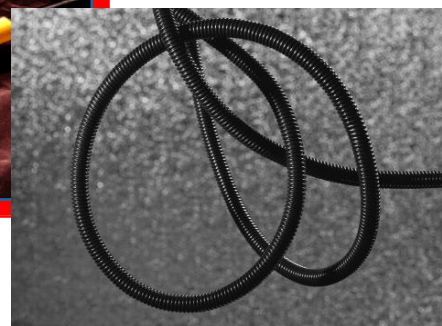
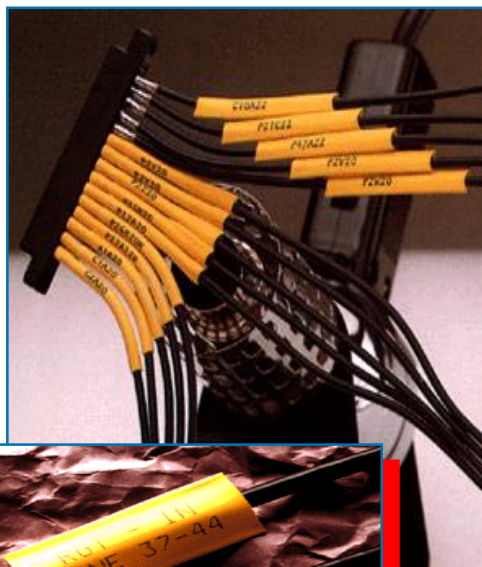
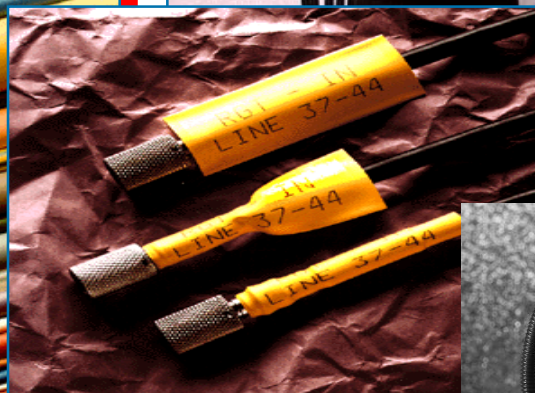
## Multi-Conductor Cables





# Heat-Shrinkable Tubing

- Tubing
- Caps
- Conduit
- Minispools
- Kits

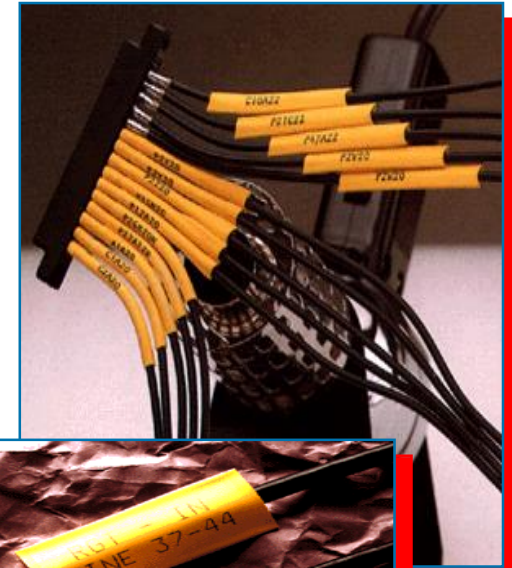
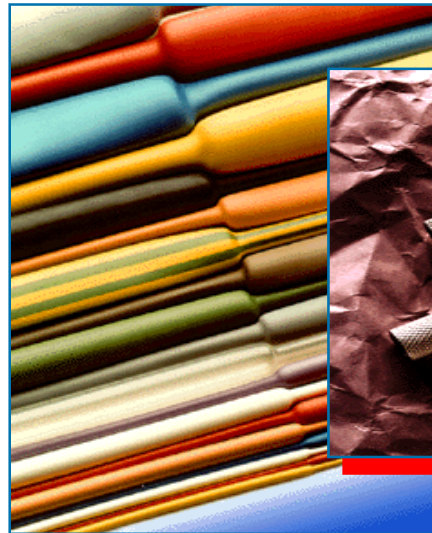


- *Rated up to 200C*
- *Fluid Resistance*
- *Flame Retardant*
- *High Flexibility*

# Heat-Shrinkable Tubing

Made of polyolefin, fluropolymers, and elastomers enhanced by radiation cross-linking and heatshrinkability

- Tubing shrink to conform to virtually any shape
- Provides dependable insulation, mechanical protection and strain relief.
- Single-wall [NT-MIL]
- Dual-wall (adhesive lined) [ATUM]
- Heavy-duty [BSTS]
- Special purpose (color coded, low halogen, etc.) [ ZHTM ]



# Harnessing Products

- Long term protection provided by high performance crosslinked materials
- Supplied in expanded form, ready for installation
- Lightweight and small size
- Optional Materials rated to 200C

## Configurations

- Straight and 90°
- Transitions
- Edge protection
- Pre-coated adhesives
- Screened variants for EMI protection
- CES



# Molded Parts

- **Boots** – for sealing backshell adapters
- **End caps** – for environmental sealing
- **Feedthroughs** – for sealing and strain relief
- **Transitions** – for sealed cable branches
- **Hot melt tapes and epoxies** – for every need



- Boots and transitions form a watertight seal, protecting cables and equipment from corrosion and mechanical abuse.
- Available materials meet the requirements for most military and commercial applications.
- Adhesives and sealants accommodate a wide range of applications, materials and environmental conditions



# Molded Parts - Product Overview

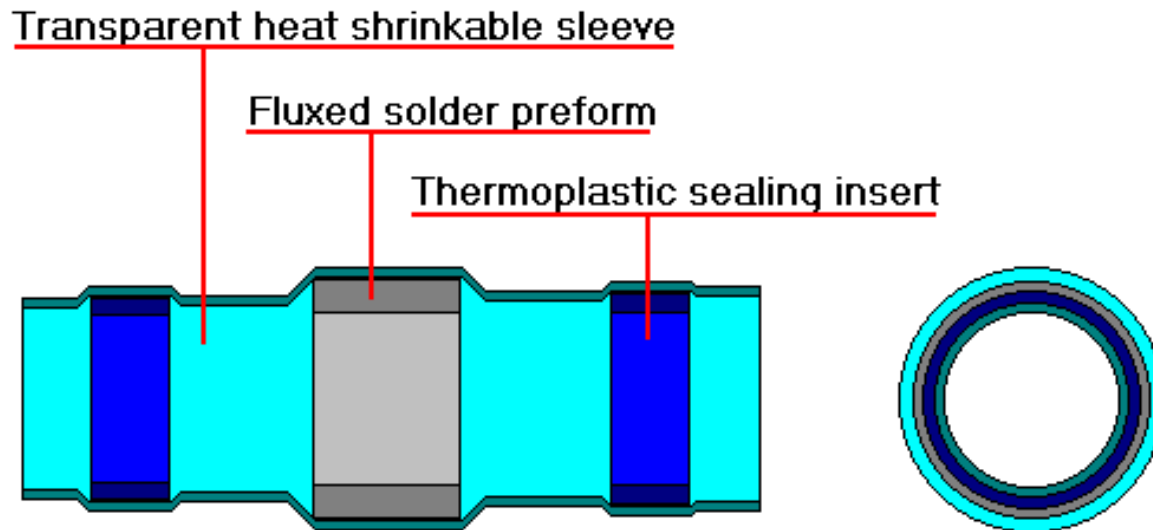
## Features

1. Many available shapes
2. Many available materials
3. Heat Shrinkable
4. Adhesive lining
5. Maintains wall thickness from connector to cable jacket
6. Maintains bottle shape and does not fully conform to substrate

## Benefits

1. Route and Protect all harness configurations
2. Products for every environment
3. Repairable, Custom fit.
4. Sealable
5. Better abrasion protection, consistent strain relief
6. Provides space for “service loops”
7. No investment in over molding equipment

# Devices - Soldersleeves



*In one easy step they* { *Electrically connect*  
*Insulate*  
*Seal*  
*Strain-relief*

# Devices Product Selection

Hundreds of part numbers are organized into six major product groups:

## ◆ Applications

- ◆ Wire-to-wire splicing
- ◆ Shield termination
- ◆ Terminals and disconnects
- ◆ Wire termination to pin/post/tab
- ◆ Coaxial cable termination
- ◆ Cable-to-cable splicing
- ◆ Shielded Contacts

## ◆ Functions Provided

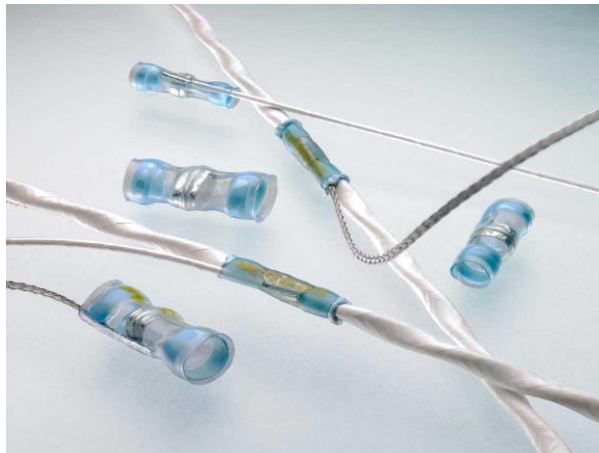
- ◆ EMI protection/maintaining
- ◆ Environmental sealing
- ◆ Size and weight reduction
- ◆ Strain relief
- ◆ One-step installation



Over 2,000 additional part numbers for special applications

# Devices

- **Wire to Wire**
- **Shield Terminators**
- **Coax Terminators**
- **Splice Kits**
- **Terminals / Disconnects**
- **Cold Applied Splices**

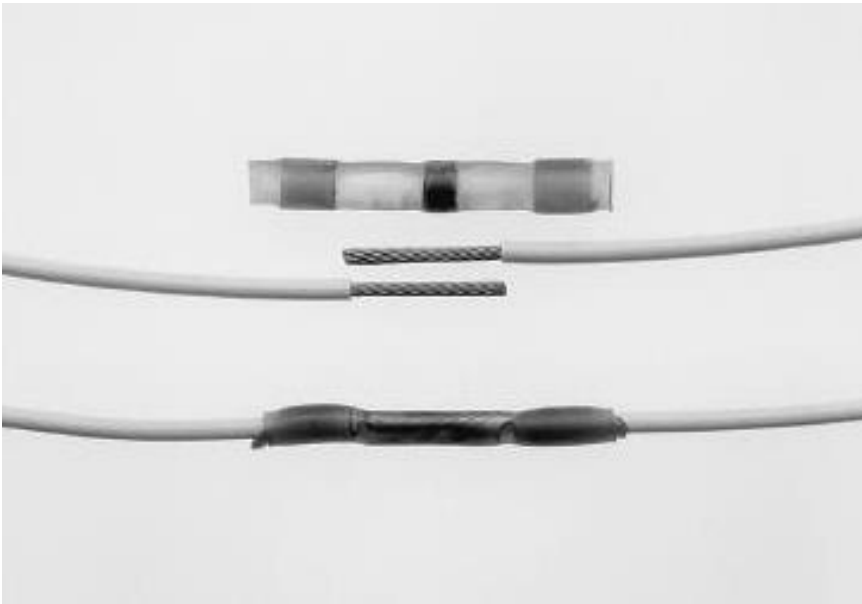


- **Rated up to 200C**
- **Easy Install**
- **Light Weight**
- **Repeatable**
- **Inspectable**



# Types of Devices

- Wire to Wire Splicing



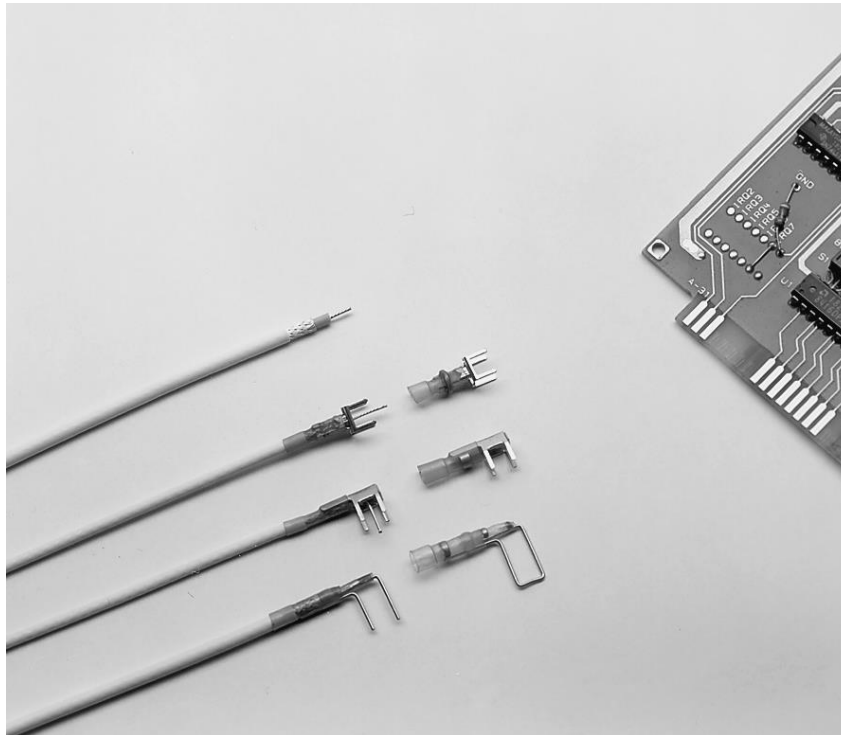
# Types of Devices

- Shield Terminations



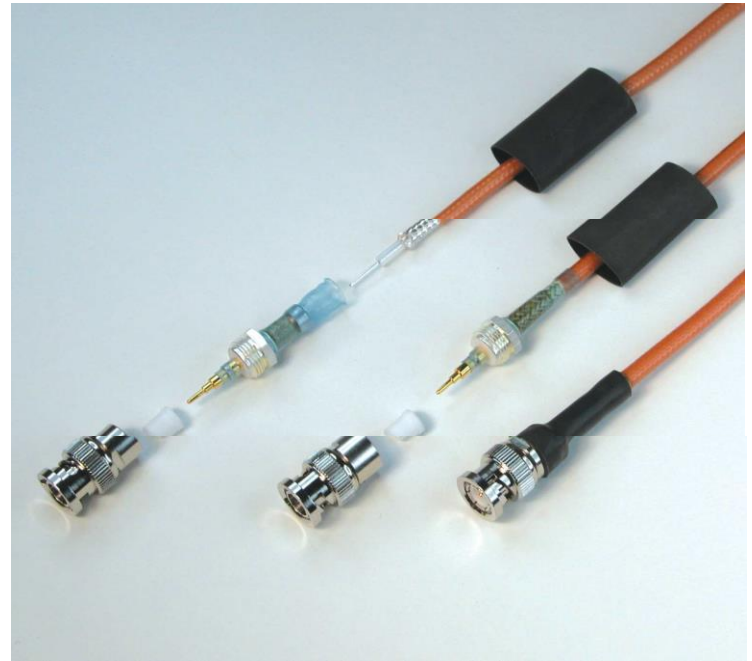
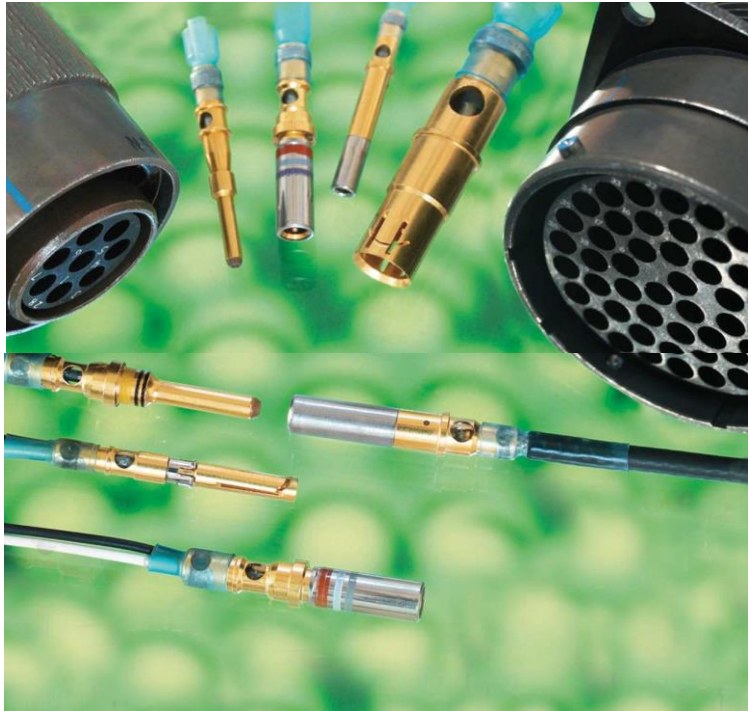
# Types of Devices

- Coaxial Terminators



# Types of Devices

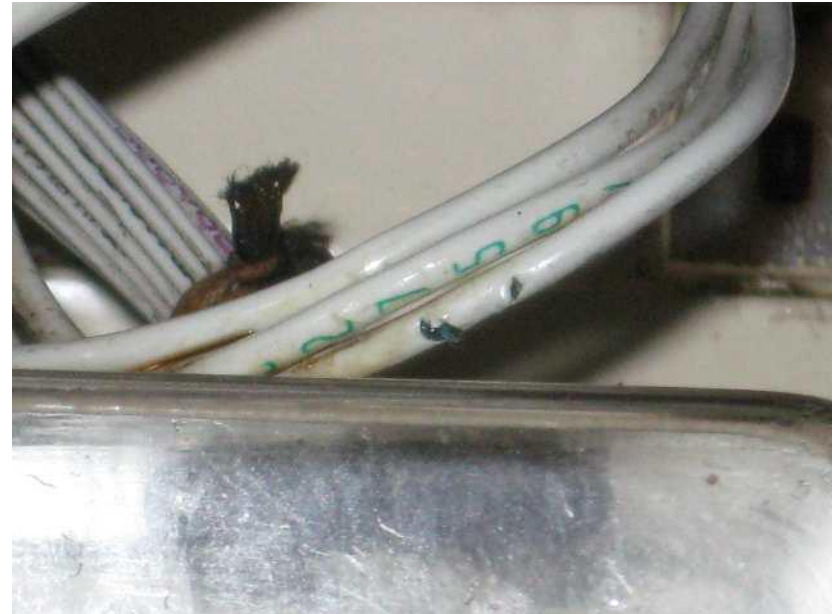
- Shielded Contacts, RF OneStep





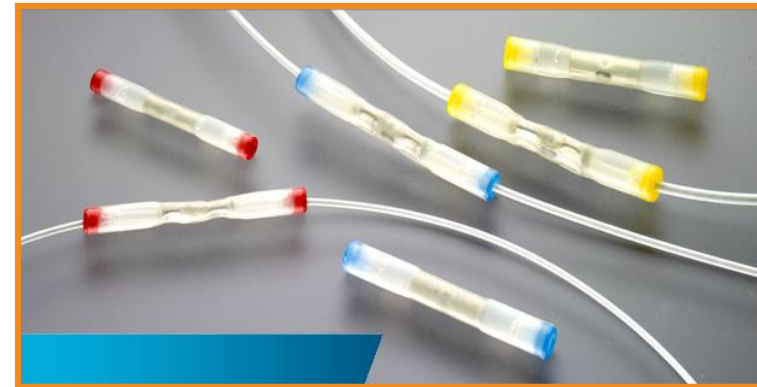
# New Product - C-Wrap Side Entry Repair D-150-C-1X

- Two piece wrap around
- design for the repair of
- chaffed wires.



# New Product D-436-3X-COLD Applied Splice

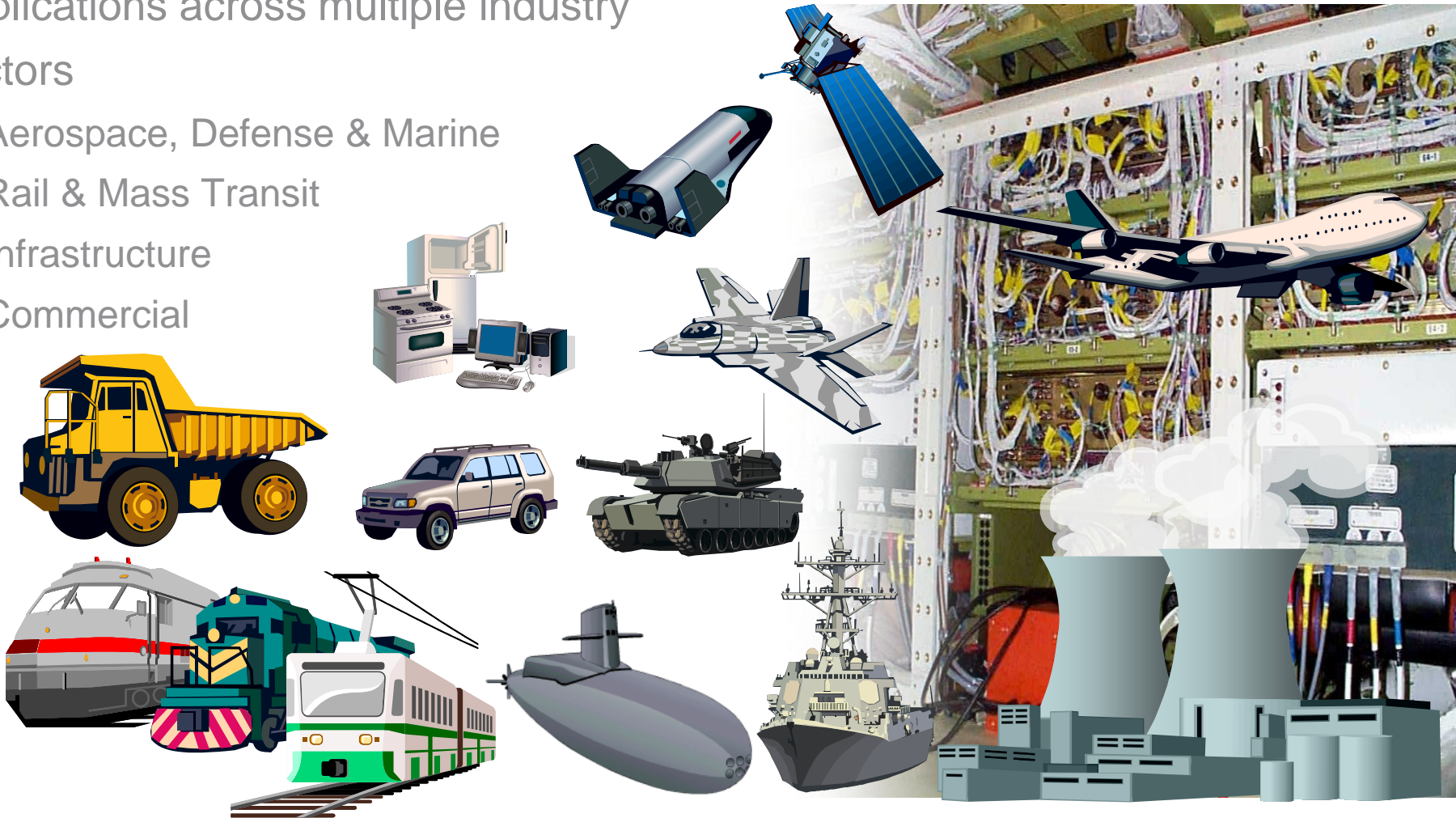
- Crimp barrel in a gel-filled insulation sleeve
- In-line Nickel-plated sealed crimp splices for 150°C applications
- Developed for growing needs of high temperature applications in the aerospace and defense industry
- Provide the smallest, lightest, and the most environment-resistant splices available, while meeting all requirements of SAE-AS81824/12 (modified for cold use applications).



# Identification Products

- Applications across multiple industry sectors

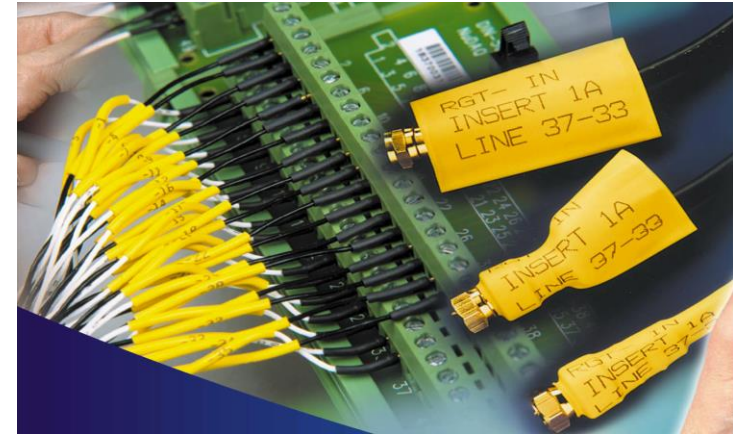
- Aerospace, Defense & Marine
- Rail & Mass Transit
- Infrastructure
- Commercial



# Identification Basics

## Heat-shrink Tubing for Identification cont.

- Heat shrinkable tubing is applied over wires and “recovered” with a heat gun... but then sometimes it’s not recovered
- Formatted/kitted products are directly fed into a printer
- Specifically designed with optimum surface properties for printing
- Used with Tyco Electronics printers, ribbons and software
- Low total installation cost
- Products are well specified and defined

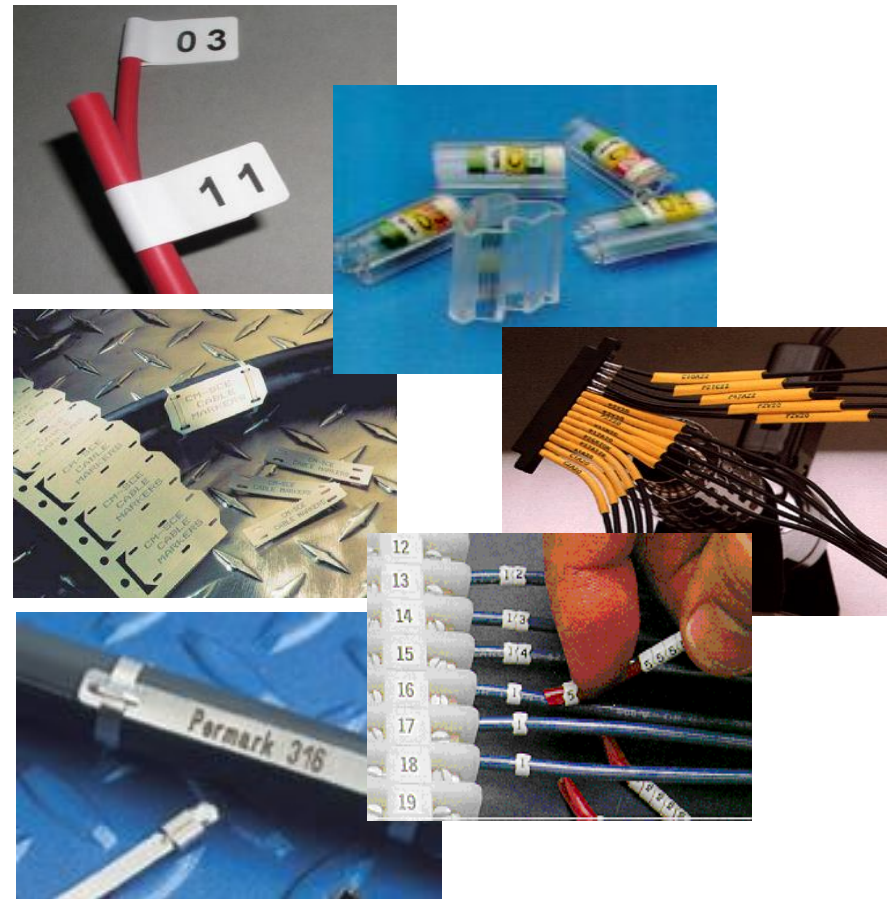




# Identification Basics

## Identification Methods

- Wrap-a-round Labels
- Tie-on Markers
- Push-on & Clip-on Markers
- Insert Markers
- Laser Etched & Inkjet Marking
- Computer-printable Sleeves
- Engraved Nameplates... and much more







## Connector Accessories Adapters, Backshells & Kits

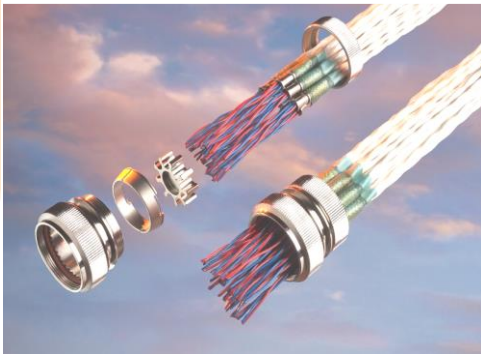
EVERY CONNECTION COUNTS



DEUTSCH

# Circular Backshells

- Solid
- Spin
- Tinel
- Hexashield
  - Hexashield F
  - Flexiscreen



**HexaShield**



**HexaShield F**



**FlexiScreen**

# Saddle Clamp Spin-Lock Adapter

Assembled Clamp Style



Clamp components





# Side Entry Bushing



# Description of product

One strip of this Side Entry Bushing (SEB) replaces as much as 6 feet and 40 wraps of traditional tapes. The material is crosslinked and thermoformed to naturally conform to the tight bundle configuration of its application. The standard SEB has no adhesive layer, so it is easily removed and can be reused often after repairs





# Features

- Fewer wraps needed than conventional silicone tapes
- High temperature resistant silicone sleeve material rates to 180°C thermally formed so it naturally conforms to circular wire bundles
- Re-usable
- Few sizes to stock (6 sizes)
- Trim to fit capabilities
- No adhesive layer for easy remove
- Conforms to Mil Standard

AMS-DTL-23053/10 , MIL-PRF-46846 Type II Class 1 and RT-1140



# Applications

- Used in a non-environmentally sealed backshell and in clamping and wire management applications



# Micro Molded Parts and Light Weight Molded parts

- Supplied in expanded form
- Light Weight Molded Parts are 25% lighter
- Adhesive lined options
- Strain relief
- Available in a range of different cross-linked polymeric material



# Application Equipment



A thick orange vertical bar with rounded ends is positioned on the left side of the slide.

# Thank You