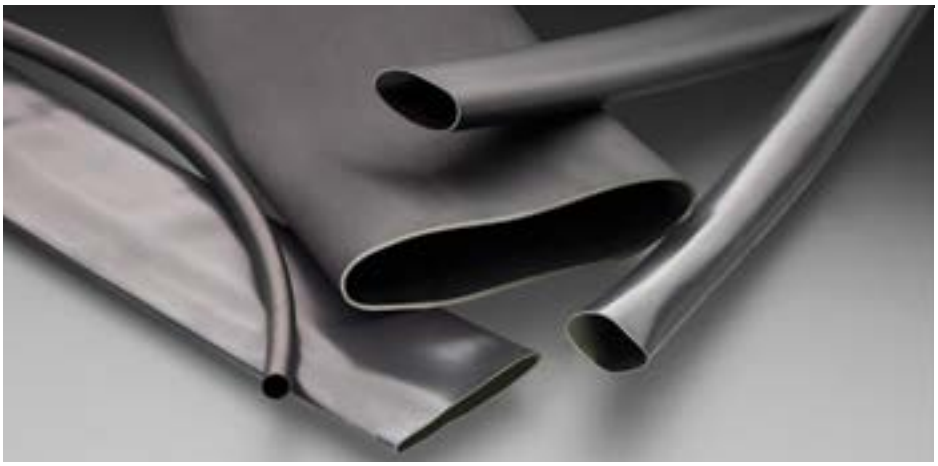


# INTEGRATED MILITARY HARNESS SYSTEMS

HARNESSING SYSTEMS AND COMPONENTS FOR DEFENSE AND INDUSTRIAL SYSTEMS

# Integrated Military Harness Systems

Harnessing systems and components for defense and industrial systems

Assembled Military Harness

Military Harness System Components

## VERSATILE

- A wide range of special devices, such as SolderSleeve devices for primary wire interconnection
- Multiconductor (multicore) cables

## RUGGED

- A selection of electrical shielding (screening) options, including braids and termination assemblies

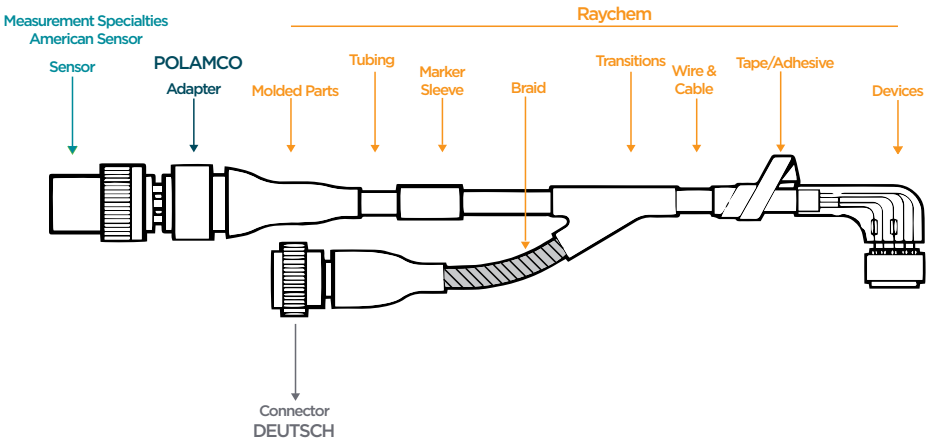
## ADAPTABLE

- Specialty adhesives and sealants for complete environmental sealing.*

## Description

TE Connectivity (TE) integrated harness systems have been developed for a wide range of defense and industrial applications. Each system consists of compatible components, including cable jackets, heat-shrinkable components, and adhesives. Performance of all parts is assured by testing each component separately as well as part of an assembled system in TE's Fremont, CA lab (see photo at left).

A typical designed harness consists of seven component parts (pictured below):




1. **Primary Wire and Cable**
2. **Heat-Shrinkable Tubing**
3. **Backshell Adapter**
4. **Molded Part**
5. **Adhesive**
6. **Cable Jacket**
7. **Marker Sleeve****

Table 1 on the next page serves as both a summary of Raychem brand products for specific harnessing systems and a selection table for harnessing system components. An explanation of how to select components for a harness system follows.

*TE Sealant product information available at www.te.com
**TE Identification products information available at www.te.com

# Integrated Military Harness Systems

**TABLE 1. HARNESSING SYSTEMS AND THEIR COMPONENTS**

| Components | System 10 | System 20 | System 25 | System 30 | System 100 | System 200 | System 300 | System 770 | System 780 | System 790 | INSTALITE |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Wire | 44 | 44 | 44 | 55 | 99<br>100A<br>100G | 55 | 55 | 44 | 55 | 55 | 44 |
| Tubing | VERSAFIT | NT-FR | DR-25 | VPB | ZHTM<br>ZH-150 | RW-200 | RT555 | RT-770 | RT-780 | RT-790 | DR-25<br>ZH-150 |
| Molded Part | -3<br>-4<br>-71 | -51 | -25 | -50 | -100 | -12 | -55<br>-125 | -770 | -780 | -790 | -25L |
| Rayaten Molded Part | — | — | -25C | — | -100C | — | — | — | — | — | — |
| Adhesive | S1017,<br>S1030 | S1124,<br>S1048 | S1048,<br>S1125 | S1125,<br>S1255-04 | S1030,<br>S1125 | S1125,<br>S1255-04 | S1255-04 | S1264 | S-1255-04 | S-1255-04 | S1125<br>S1030 |
| Precoated Adhesive | /42<br>/180 | /86<br>/164 | /86<br>/225 | — | /180 | — | — | — | — | — | /86<br>/225 |
| Conductive Adhesive | — | — | S1184 | — | S1184 | — | — | — | — | — | — |
| Cable Jacket | Thermorad | NT-FR | FDR-25 | Thermorad VPB | Zerohal | RW-200 | RT555 | — | — | — | FDR-25 |
| Marker Sleeve | TMS-SCE | TMS-SCE | TMS-SCE | TMS-SCE | HX-SCE | HT-SCE | HT-SCE | TMS-SCE | TMS-SCE | TMS-SCE | TMS-SCE |

## Selection Process

Selecting the components for a harnessing system is a four-step process:

**Step 1:** Select the material system appropriate for the operating conditions and environment to which the harness will be exposed.

**Step 2:** Select the adhesive system appropriate for the material system you select in Step 1.

**Step 3:** Determine the level of EMI shielding required.

**Step 4:** Select the components.

A description of each step follows. A selection table accompanies each step. You can also use HarnWare software to design your harness.

## Step 1. Select the Material System

Detailed in Table 2 on the next page are the major material systems for use in a wide range of operating conditions and environments.

Choose a material system that:

- Has the physical characteristics your harness requires.
- Will accommodate the operating temperature and the fluids intense physical conditions to which the harness will be exposed.

# Integrated Military Harness Systems

## TABLE 2. MATERIAL SYSTEM SELECTION

| | System 10 | System 20 | System 25 |
|---|---|---|---|
| **Operating Temperature** | -20°C to +60°C [-4°F to +140°F] | -55°C to +121°C [-67°F to +250°F] | -75°C to +150°C* [-103°F to +302°F] |
| **Physical Characteristics** | Environmentally Sealable<br>Lightweight<br>Small Diameter<br>Flexible | Environmentally Sealed<br>Tough<br>Flexible<br>Low Profile | Environmentally Sealed<br>Rugged<br>Abrasion Resistant<br>Very Flexible |
| **Flammability** | Flame Retardant<br>Self Extinguishing | Flame Retardant<br>Self Extinguishing | Flame Retardant<br>Self Extinguishing |
| **Fluid Resistance** | Resists Common Industrial and Military Cleaning Solvents and Degreasers | Resists Most Commonly Used Military Fuels, Oils, and Greases | Resists Most Common Military Fuels, Oils, and Greases up to +70°C [+158°F] |
| **Typical Applications** | Used in High-Performance Industrial Applications, and in Military Communication and Test Equipment<br>  | Specially Suited to Military Vehicles and Engine Compartments; Low Profile Shapes Save Space and Weight<br>  | Specially Suited to Military Vehicles, Aerospace and Marine Applications, and Communication and Test Equipment<br>  |

## HARNESSING SYSTEMS AND THEIR COMPONENTS — NBC SURVIVABLE SYSTEMS

| Components | System 770 | System 780 | System 790 |
|---|---|---|---|
| **Wire** | 44 | 55 | 55 |
| **Tubing** | RT-770 | RT-780 | RT-790 |
| **Molded Part** | -770 | -780 | -790/-791 |
| **Adhesive** | S-1264 | S-1255-04 | S-1255-04 |
| **Marker Sleeve Cover** | RT-375 | RT-375 | RT-375 |
| **Marker Sleeve*** | TMS-SCE | NBC-SCE | NBC-SCE |

*TE Identification products information available at www.te.com.

## ADHESIVE SELECTION

| Material System | Adhesive Type | Component Adhesive | Precoated Adhesive Designation | Service Temperature |
|---|---|---|---|---|
| **System 770** | Two-Part Epoxy | S-1264 | — | +150°C |
| **System 780** | Thermoset Tape | S-1255-04 | — | +200°C |
| **System 790** | Thermoset Tape | S-1255-04 | — | +200°C |

# Integrated Military Harness Systems

| System 30 | System 100 | System 200 | System 300 |
|---|---|---|---|
| -55°C to +150°C [-67°F to +302°F] | -30°C to +105°C [-22°F to +221°F] | -55°C to +200°C [-67°F to +392°F] | -55°C to +200°C [-67°F to +392°F] |
| Environmentally Sealed<br>Tough<br>Flexible<br>Low Profile | Environmentally Sealed<br>Flexible | Environmentally Sealed<br>Very Flexible | Environmentally Sealed<br>HIghly Abrasion Resistant<br>Low Profile |
| Flame Retardant<br>Self Extinguishing | Low Toxicity Index<br>(as Defined by NES-13)<br>Low Smoke Emission<br>(as Defined by NES-711)<br>Low Corrosive Gas Evolution | HIghly Flame Retardant | HIghly Flame Retardant |
| Resists Most Commonly Used<br>Military Fuels, Oils, and Greases | Resistant to a Range of Military<br>Fuels, Oils, and Greases | Resists Long-Term Immersion in<br>Military Fuels, Oils, and Greases<br>at Elevated Temperatures | Performs in Aggressive Fluids at<br>Extremely High Temperatures |
| Specially Suited to Military Vehicles<br>and Engine Compartments for<br>Higher Temperature Applications;<br>Low Profile Shapes Save<br>Space and Weight<br>  | Specially Suitable for Confined Habitat<br>Areas in Military and Civil Applications;<br>Extensively Used in Surface and<br>Submarine Vessels and<br>Underground Railways<br>  | Used Where There is Prolonged<br>Exposure to High Temperatures;<br>Used Where a Harness may be<br>Permanently Immersed in Difficult<br>Fuels, such as in Fuel Tanks<br>  | Permanent Immersion in<br>Aggressive Fluids<br>  |

| | System 770 | System 780 | System 790 |
|---|---|---|---|
| **Operating Temperature** | -55°C to +125°C [-67°F to +257°F] | -65°C to +175°C [-85°F to +347°F] | -65°C to 200°C [-85°F to +392°F] |
| **Physical Characteristics** | Environmentally Sealed<br>NBC Resistant<br>Flexible | Environmentally Sealed<br>NBC Resistant<br>Flexible | Environmentally Sealed<br>NBC Resistant<br>Flexible |
| **Flammability** | Flame Retardant<br>Self Extinguishing | Flame Retardant<br>Self Extinguishing | Flame Retardant<br>Self Extinguishing |
| **Fluid Resistance** | Resistant to NBC Uptake<br>and Decontamination | Resistant to NBC Uptake<br>and Decontamination | Resistant to NBC Uptake<br>and Decontamination |
| **Typical Applications** | Base-Line System for NBC<br>Resistant Applications | HIgh Temperature System for<br>NBC Resistant Applications<br>  | Extreme HIgh Temperature System<br>for NBC Resistant Applications |

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