



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832

Email & Skype: info@chipsmall.com Web: www.chipsmall.com

Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China



DWFR TUBING

Dual Wall, Heat Shrink Tubing

Highly flame-retardant, UL VW-1 rated



DWFR tubing from TE Connectivity (TE) is a highly flame-retardant, high-shrink ratio, adhesive-lined tubing made from a polyolefin jacket with a thermoplastic adhesive inner wall. It insulates and environmentally seals and protects components and other electrical connections and terminations. DWFR's medium wall thickness provides increased mechanical protection. Its high shrink ratio allows DWFR to cover a variety of substrates with a limited number of tubing sizes. It is suitable for sealing and protection of connector-to-cable transitions and repairing damaged cable jackets. It can also be used to create and seal breakouts in harnesses.

KEY FEATURES

- Highly flame-retardant with UL VW-1 flammability rating
- 3:1 and 4:1 shrink ratios provide design versatility
- Moisture-resistant seal
- Withstands mechanical stress for increased product reliability

APPLICATIONS

- Household appliances
- Automotive
- Commercial electronics and communications
- Consumer products
- Industrial equipment

MATERIALS

- Irradiated polyolefin jacket
- Thermoplastic adhesive inner wall

ELECTRICAL

- Provides excellent electrical insulation

MECHANICAL

- Medium wall jacket provides mechanical protection from abrasion and bending
- Adhesive liner bonds to a variety of substrate materials, providing protection from moisture ingress

TEMPERATURE RATING

- Minimum shrink temperature: 60°C [140°F]
- Full recovery temperature: 110°C [256°F]
- Operating temperature: -40°C to 110°C [-40°F to 230°F]

STANDARDS AND SPECIFICATIONS

- Customer drawing: DWFR
- UL 224 VW-1
- UL file E35586
- Submitted for CSA Certification

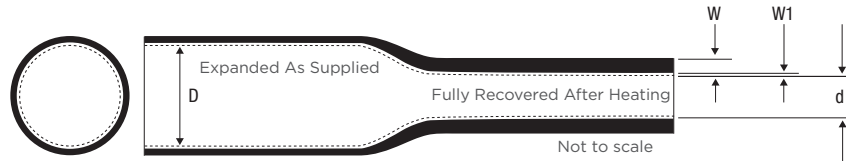
ORDERING INFORMATION

- Color: Black (-0)
- Standard packaging (-STK): Cut pieces that are 1.2m [4ft] long
Optional special order packaging (-SP): Spool, varying lengths (consult TE for details)
- Ordering description: Specify product name, size, color and packaging. For example, DWFR-3/1-0-STK

DWFR TUBING

Dual Wall, Highly Flame-Retardant Heat Shrink Tubing

DIMENSIONS



Shrink Ratio	Size	Minimum Expanded I.D. (D)	Maximum Recovered I.D. (d)	Total Recovered Wall Thickness (W)	Minimum Recovered Inner Meltable Wall Thickness (W1)
3:1	3/1	3.0 [0.118]	1.0 [0.039]	1.12 ± 0.25 [0.044 ± 0.010]	0.25 [0.010]
	6/2	6.0 [0.236]	2.0 [0.079]	1.14 ± 0.25 [0.045 ± 0.010]	0.25 [0.010]
	9/3	9.0 [0.354]	3.0 [0.118]	1.40 ± 0.25 [0.055 ± 0.010]	0.56 [0.022]
	12/4	12.0 [0.472]	4.0 [0.157]	1.78 ± 0.36 [0.070 ± 0.014]	0.58 [0.023]
	19/6	19.0 [0.748]	6.0 [0.236]	2.25 ± 0.50 [0.088 ± 0.020]	0.58 [0.023]
	24/8	24.0 [0.945]	8.0 [0.315]	2.54 ± 0.50 [0.100 ± 0.020]	0.79 [0.031]
	40/13	40.0 [1.575]	13.0 [0.512]	2.54 ± 0.50 [0.100 ± 0.020]	0.86 [0.034]
4:1	4/1	4.0 [0.157]	1.0 [0.039]	1.12 ± 0.25 [0.044 ± 0.010]	0.25 [0.010]
	8/2	8.0 [0.315]	2.0 [0.079]	1.14 ± 0.25 [0.045 ± 0.010]	0.25 [0.010]
	12/3	12.0 [0.472]	3.0 [0.118]	1.40 ± 0.25 [0.055 ± 0.010]	0.56 [0.022]
	16/4	16.0 [0.630]	4.0 [0.157]	1.78 ± 0.36 [0.070 ± 0.014]	0.58 [0.023]
	24/6	24.0 [0.945]	6.0 [0.236]	2.25 ± 0.50 [0.088 ± 0.020]	0.58 [0.023]
	32/8	32.0 [1.260]	8.0 [0.315]	2.54 ± 0.50 [0.100 ± 0.020]	0.79 [0.031]
	52/13	52.0 [2.047]	13.0 [0.512]	2.54 ± 0.50 [0.100 ± 0.020]	0.86 [0.034]

PRODUCT DESCRIPTION AND ORDERING INFORMATION

Shrink Ratio	Material Description	Material Number
3:1	DWFR-3/1-0-STK	EH2288-000
	DWFR-6/2-0-STK	EH2289-000
	DWFR-9/3-0-STK	EH2290-000
	DWFR-12/4-0-STK	EH2291-000
	DWFR-19/6-0-STK	EH2292-000
	DWFR-24/8-0-STK	EH2293-000
	DWFR-40/13-0-STK	EH2294-000

Shrink Ratio	Material Description	Material Number
4:1	DWFR-4/1-0-STK	EH2295-000
	DWFR-8/2-0-STK	EH2296-000
	DWFR-12/3-0-STK	EH2297-000
	DWFR-16/4-0-STK	EH2298-000
	DWFR-24/6-0-STK	EH2299-000
	DWFR-32/8-0-STK	EH2300-000
	DWFR-52/13-0-STK	EH2301-000

DWFR-3/1-0-STK

- Stick Packaging (Cut pieces that are 1.2m [4ft] long)
- Color is Black
- Size
- Highly Flame-retardant, Dual Wall Product

PROPERTY REQUIREMENTS

Property	Unit	Requirement	Test Method
Physical			
Dimensions*	mm [in]	As shown in DIMENSIONS table	ASTM D 2671
Longitudinal Change	Percent	0, -15%	ASTM D 2671
Tensile Strength*	psi (MPa)	1500 (10.3) minimum	ASTM D 2671
Ultimate Elongation*	Percent	200 minimum	ASTM D 2671
Secant Modulus (Expanded)	psi (MPa)	2.5 x 10 ⁴ (172) maximum	ASTM D 882, 2% strain
Cold Bend Test at -30 ± 1°C (-22 ± 1.8°F) for 1 hour	-	No cracking	UL 224, section 5.9
Heat Shock* 4 hours at 250 ± 1°C (482 ± 1.8°F)	-	No dripping, flowing or cracking of outer wall	UL 224, section 5.8
Heat Resistance 168 hours at 158 ± 2°C (347 ± 4°F) followed by test for Tensile strength Elongation	psi (MPa) Percent	70% of original minimum 100% minimum	UL 224
Sealing Efficiency	-	No openings on reheat	AMS-DTL 23053/4
Electrical			
Dielectric Strength	Volts/mil (V/mm)	300 (11,811) minimum on dual wall specimen	ASTM D 2671
Volume Resistivity	ohm/cm	10 ¹⁴ minimum on dual wall specimen	ASTM D 2671
Chemical			
Copper Mirror Corrosion 16 hours at 121 ± 2°C (250 ± 4°F)	-	No removal of copper	ASTM D 2671, Procedure A
Copper Contact Corrosion 16 hours at 121 ± 2°C (250 ± 4°F)	-	No pitting or blackening of copper	ASTM D 2671, Procedure B
Flammability	-	Pass	UL 224, VW-1
Water Absorption 24 hours at 23°C (73°F)	Percent	0.5 maximum	ASTM D 2671

* Denotes Lot Acceptance Test

For More Information

Visit www.te.com and enter search term “DWFR” or visit www.te.com/DWFRtubing

TE Technical Support Center

USA: +1 (800) 522-6752
Canada: +1 (905) 475-6222
Mexico: +52 (0) 55-1106-0800
Latin/S. America: +54 (0) 11-4733-2200
China: +86 (0) 400-820-6015
Germany: +49 (0) 6251-1333-1999
UK: +44 (0) 800-267666
France: +33 (0) 1-3420-8686
Netherlands: +31 (0) 73-6246-999

For phone numbers in other countries, go to te.com/support-center

TE Connectivity, TE, and TE connectivity (logo) are trademarks of the TE Connectivity Ltd. family of companies. Other products, logos and company names mentioned herein may be trademarks of their respective owners. While TE has made every reasonable effort to ensure the accuracy of the information in this document, TE does not guarantee that it is error-free, nor does TE make any other representation, warranty or guarantee that the information is accurate, correct, reliable or current. TE reserves the right to make any adjustments to the information contained herein at any time without notice. TE EXPRESSLY DISCLAIMS ALL IMPLIED WARRANTIES REGARDING THE INFORMATION CONTAINED HEREIN, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. In no event will TE be liable for any direct, indirect, incidental, special or consequential damages arising from or related to recipient's use of the information. It is the sole responsibility of recipient of this information to verify the results of this information using their engineering and product environment. Recipient assumes any and all risks associated with the use of the information.

www.te.com

© 2015 TE Connectivity Ltd. family of companies. All Rights Reserved.

1-1773862-9 APP CS 11/2015