



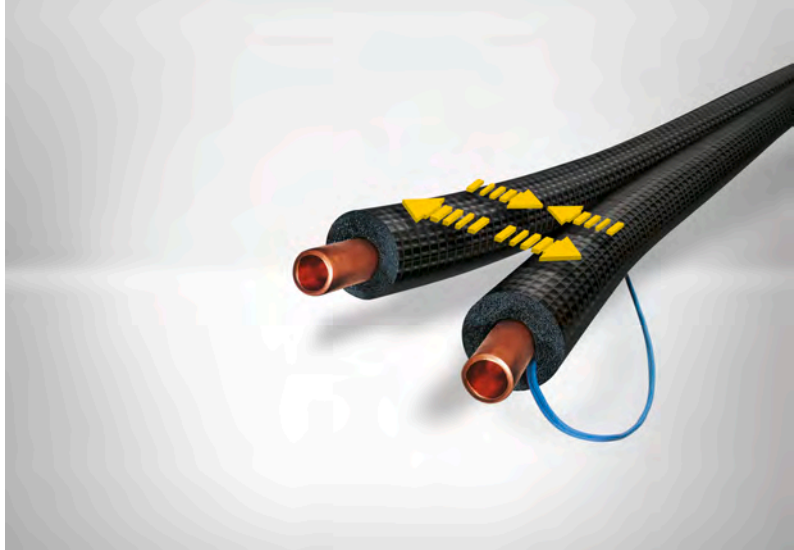
ARMAFLEX DUOSOLAR

EFFICIENCY IN SOLAR APPLICATIONS



- Joint split technology reduces cost and saves time of assembly
- Coating provides good resistance to UV radiation and mechanical impact
- Integrated temperature sensor cable
- Wide range of additional accessories available

Armaflex DuoSolar



The Armaflex DuoSolar range offers reliable and easy-to-install solutions for solar thermal systems. The pre-insulated feed and return pipes connect the solar panel with the thermal storage water heater. They optimize thermal efficiency and increase the life time expectancy of the entire system. Armaflex DuoSolar for flat solar collectors with up to +150 °C is available as covered corrugated stainless-steel tubing (Armaflex DuoSolar VA) and copper piping (Armaflex DuoSolar CU). Due to the patented join-split fastening system, the pre-insulated pipes can be split and re-joined easily during the installation process without any damage to the protective foil.



DUOSOLAR 220

While solar pipes for flat plate collectors are only suitable for a maximum application temperature of 150 °C, DuoSolar 220 even withstands the high temperatures of tube collectors of up to 220 °C. Flexible foam insulation materials become brittle at such high temperatures and lose their insulating properties. With DuoSolar 220 Armacell has closed this gap and also provides a twin-pipe system for the high operating temperatures of evacuated tube collectors.



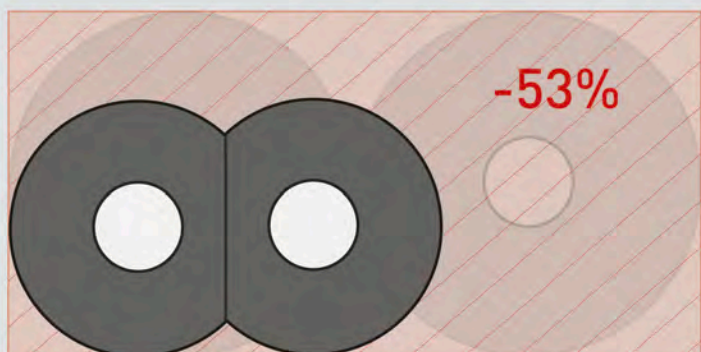
QUICK-FITTING COUPLINGS

System accessories which are especially tailored to the solar range ensure tight connections. For the installation of Armaflex DuoSolar VA Armacell offers quick-fitting couplings: The flexible pipes can be connected to the system components of solar thermal systems in seconds – simply by tightening a nut. This eliminates the time-consuming flanging of connections and allows considerable cost savings. The couplings provide a permanent and leakproof seal for corrugated stainless steel tubes.



Armaflex DuoSolar e-Save

While the German Energy Saving Ordinance (Energieeinsparverordnung - EnEV) does not explicitly state requirements for the insulation of solar pipes and leaves room for interpretation, the Building Energy Act (Gebäudeenergiegesetz - GEG) will close this gap in the law. According to the draft bill for the GEG, the average value of heat distribution lines must not exceed $0.25 \text{ W/(m} \cdot \text{K)}$. This means that solar pipes must be insulated with a wall thickness of 100 % according to EnEV. As a result, space can soon become tight in installation shafts, not only when they are used for various pipes.



MAXIMUM ENERGY EFFICIENCY WITH LOW SPACE REQUIREMENTS

With Armaflex DuoSolar e-Save Armacell now provides a space-saving '100% solution'. Based on calculations by FIW Munich using the finite element method, the R&D department developed pre-insulated twin pipes that not only offer maximum energy savings, but are also extremely space-efficient. Armaflex DuoSolar e-Save requires less than half the space needed by separately laid solar pipes to achieve same energy efficiency.

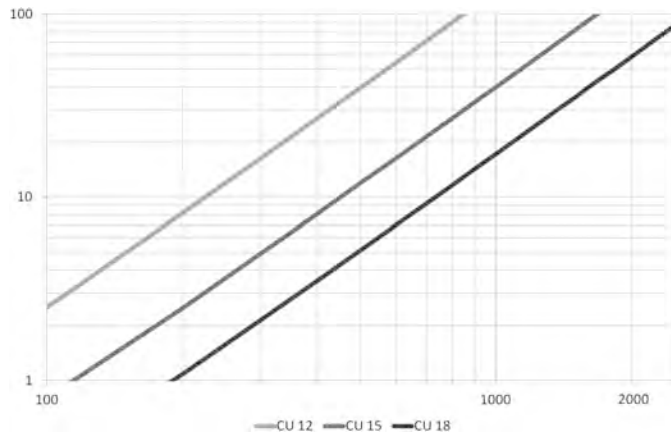
Technical Data - Armaflex DuoSolar

Brief description	Armaflex DuoSolar is a flexible pre-insulated, UV resistant piping system used to connect solar collectors with the hot-water storage tank in an easy and professional way. The system is offered with a smart join-split system with two copper or stainless steel hoses and includes a sensor cable.
Material type	Insulation material: Synthetic EPDM rubber based foam. Factory made flexible elastomeric foam (FEF) according to EN 14304. Copper pipes seamless drawn soft annealed copper tubes, according to EN 1057. Corrugated stainless steel hose: austenitic stainless steel, according to EN 10088-2: X 2 CrNiMo 17-12-2 and DIN 17441: 1.4404. Fulfill EN ISO 10380:2013 and EN 13618 p.B7.2 Facing: polyolefin copolymer coating.
Colour	black
Material Special Information	In the return pipe, a sensor cable (2 x 0,75 mm ²) with halogen-free, temperature-resistant silicon coating (+180 °C) is integrated.
Product Range	Pre-insulated copper pipes or corrugated stainless steel hoses, in different coil lengths.
Applications	Piping system to connect the solar collector with the hot water boiler and for other uses.
Assembly	During normal installation we strongly recommend that proprietary hangers are used every one meter to support the whole system.
Remarks	The solar system and heat transfer fluid has to be well matched in order to guarantee corrosion and interference-free operation. We recommend an annual laboratory test of the fluid medium (density, concentration, corrosion, pH). The heat transfer fluid has to be completely replaced in case the parameters no longer meet the requirements. Declaration of Performance is available in accordance with Article 7(3) of Regulation (EU) No 305/2011 on our homepage: www.armacell.com/DoP EC Certificate of Conformity no. 0543 of Güteschutzgemeinschaft Hartschaum e.V. , Celle

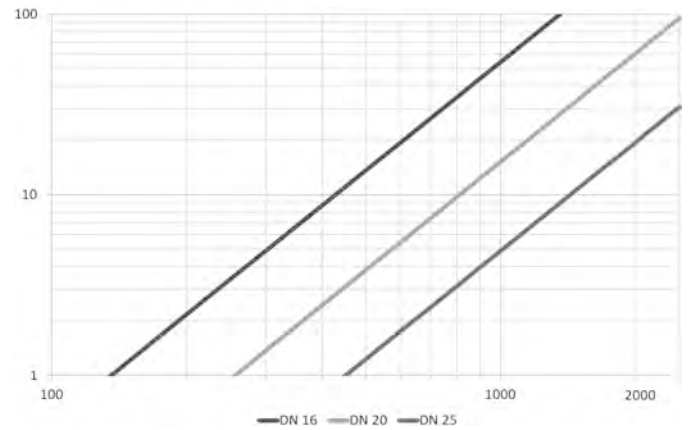
Property	Value/Assessment	Test ^{*1}	Special Remark
Temperature Range			
Temperature Range	max. service temperature + 150 °C min. service temperature -50 °C	EU 5316	Tested acc. to EN 14707 EN 14304
Thermal Conductivity			
Thermal Conductivity	ϑ_m 40 °C $\lambda =$ $\lambda \leq 0,042$ W/(m · K) $[36,92 + 0,125 \cdot \vartheta_m + 0,0008 \cdot (\vartheta_m - 30)^2]/1000$	EU 5316	Declared acc. to EN ISO 13787 Tested according to EN ISO 8497
Water vapour diffusion resistance			
Water vapour diffusion resistance	$\mu \geq 4.000$	EU 5316	Tested according to EN 13469
Fire performance			
Reaction to fire	Euroclass E	EU 5316	Classified acc. to EN 13501-1 Tested according to EN ISO 11925-2
Other technical features			
Dimensions and tolerances	In accordance with EN 14304, table 1	EU 5316	Tested acc. to EN 13467
UV resistance	Very Good	TB 142	Tested according to EN ISO 4892-2 (Xenon-test)
Max. operating pressure (bar)	CU12 = 79 DN16 = 16 CU15 = 62 DN20 = 10 CU18 = 65 DN25 = 10		
Pipe volume (l/m)	CU12 = 0,085 DN16 = 0,272 CU15 = 0,141 DN20 = 0,430 CU18 = 0,201 DN25 = 0,633		
Maintenance	Long-term corrosion and failure-proof operation of the solar thermal equipment is only possible when the system and heat transfer medium are optimally matched to each another. We recommend an annual laboratory test of the medium (eg density, concentration, corrosion protection, pH). The heat transfer medium must be replaced completely if the parameters do no longer meet the specifications.		

*1 Further documents such as test certificates, approvals and the like can be requested using the registration number given.

Presssure drop diagram copper pipes



Presssure drop diagram corrugated stainless steel pipes



Medium temperature 60 °C
 Heat fluid 1,2 Propylenglykol
 Dynamic Viscosity 1612,8 10-6 kg/ms
 Weight density 1008 kg/m³

X-axis = volume flow in litre per hour
 Y-axis = pressure drop in millibar per meter

All data and technical information are based on results achieved under typical application conditions. Recipients of this information should, in their own interest and responsibility, clarify with us in due time whether or not the data and information apply to the intended application area. Installation instructions are available in our Armaflex installation manual. Armaflex HT625 adhesive must be used to guarantee proper installation. For temperatures below -50 °C or above +150 °C, please consult our Customer Service Center for further information.

Armaflex DuoSolar CU pipes pre-insulated endless



Code	Insulation thickness [mm]	Outer- Ø [mm]	Ring length [m]
SO-DC-14X12/E15	14,0	2 x 40	15
SO-DC-14X12/E25 •	14,0	2 x 40	25
SO-DC-14X15/E10	14,0	2 x 43	10
SO-DC-14X15/E15	14,0	2 x 43	15
SO-DC-14X15/E20 •	14,0	2 x 43	20
SO-DC-14X15/E25	14,0	2 x 43	25
SO-DC-14X18/E10	14,0	2 x 46	10
SO-DC-14X18/E15	14,0	2 x 46	15
SO-DC-14X18/E20 •	14,0	2 x 46	20
SO-DC-14X18/E25	14,0	2 x 46	25

• Item not in stock. Delivery on request. [MTO]

Armaflex DuoSolar CU accessories



Code	Article description	Pieces/set
SCH-CU15-FEF14	Pipe hanger for CU15-FEF14 with hex-head screw M8x80 and raw plugs S11, insulation thickness 14mm	4
SCH-CU18-FEF14 •	Pipe hanger for CU18-FEF14 with hex-head screw M8x80 and raw plugs S12, insulation thickness 14mm	4

Remark

4 pieces/set

• Item not in stock. Delivery on request. [MTO]

Armaflex DuoSolar VA pipes pre-insulated endless



Covering Color black, pre-insulated corrugated tubes made of stainless steel 1.4404 (ASTM 316 L)

Outer- Ø [mm]	Code	Insulation thickness [mm]	Outer-Ø pipe + insulation [mm]	Ring length [m]
21,4 VA	SO-DV-14X16/100	14,0	2 x 50	100
21,4 VA	SO-DV-14X16/E10	14,0	2 x 50	10
21,4 VA	SO-DV-14X16/E15	14,0	2 x 50	15
21,4 VA	SO-DV-14X16/E20	14,0	2 x 50	20
21,4 VA	SO-DV-14X16/E25	14,0	2 x 50	25
21,4 VA	SO-DV-14X16/E50	14,0	2 x 50	50
26,7 VA	SO-DV-14X20/100	14,0	2 x 55	100
26,7 VA	SO-DV-14X20/E10	14,0	2 x 55	10
26,7 VA	SO-DV-14X20/E15	14,0	2 x 55	15
26,7 VA	SO-DV-14X20/E20	14,0	2 x 55	20
26,7 VA	SO-DV-14X20/E25	14,0	2 x 55	25
26,7 VA	SO-DV-14X20/E50	14,0	2 x 55	50
31,8 VA	SO-DV-14X25/100	14,0	2 x 60	100
31,8 VA	SO-DV-14X25/E15	14,0	2 x 60	15
31,8 VA	SO-DV-14X25/E25	14,0	2 x 60	25

Armaflex DuoSolar VA accessories



Code	Article description	Pieces/set
SCH-DN16-FEF14	Pipe hanger for DN16-FEF14 with hex-head screw M8x80 and raw plugs S10, insulation thickness 14mm	4
SCH-DN16-FEF20	Pipe hanger for DN16-FEF20 with hex-head screw M8x80 and raw plugs S10, insulation thickness 20mm	4
SCH-DN20-FEF14	Pipe hanger for DN20-FEF14 with hex-head screw M8x80 and raw plugs S11, insulation thickness 14mm	4
SCH-DN20-FEF20	Pipe hanger for DN20-FEF20 with hex-head screw M8x80 and raw plugs S11, insulation thickness 20mm	4
SCH-DN25-FEF14	Pipe hanger for DN25-FEF14 with hex-head screw M8x80 and raw plugs S12, insulation thickness 14mm	4
SO-VA-DNI-16	Double nipple ¾" for DN 16	2
SO-VA-DNI-20	Double nipple 1" for DN 20	2
SO-VA-DNI-25	Double nipple 1 ¼" for DN 25	2
SO-VA-FIT-16/4	Fitting set for DN16 with 4 of each spring rings, union nuts, washers	4
SO-VA-FIT-20/4	Fitting set for DN20 with 4 of each spring rings, union nuts, washers	4
SO-VA-FIT-25/4	Fitting set for DN25 with 4 of each spring rings, union nuts, washers	4

Armaflex DuoSolar fitting for corrugated hoses



Quick fitting coupling for corrugated stainless steel hoses

Stainless steel VA	Code	Connection	Pieces/carton
DN 16	SO-SDN16-DN16	corrugated stainless steel hoses DN 16	10
DN 20	SO-SDN20-DN20	corrugated stainless steel hoses DN 20	10
DN 25	SO-SDN25-DN25 •	corrugated stainless steel hoses DN 25	4

• Item not in stock. Delivery on request. [MTO]

Armaflex DuoSolar fitting for copper pipes



Quick fitting coupling with clamping ring for copper pipes

Stainless steel VA	Code	Connection	Pieces/carton
DN 16	SO-SDN16-CU12 •	plain pipes Ø 12 mm	10
DN 16	SO-SDN16-CU15	plain pipes Ø 15 mm	10
DN 16	SO-SDN16-CU18	plain pipes Ø 18 mm	10
DN 16	SO-SDN16-CU22	plain pipes Ø 22 mm	10
DN 20	SO-SDN20-CU15 •	plain pipes Ø 15 mm	10
DN 20	SO-SDN20-CU18	plain pipes Ø 18 mm	10
DN 20	SO-SDN20-CU22	plain pipes Ø 22 mm	10
DN 25	SO-SDN25-CU18 •	plain pipes Ø 18 mm	4
DN 25	SO-SDN25-CU22 •	plain pipes Ø 22 mm	4

• Item not in stock. Delivery on request. [MTO]

Armaflex DuoSolar fitting with female straight internal thread



Quick fitting coupling with female straight internal thread for metal-to-metal or for flat-sealing screw joints

Stainless steel VA	Code	Connection	Pieces/carton
DN 16	SO-SDN16-I1 •	inside thread G1"	10
DN 16	SO-SDN16-I1/2	inside thread G½"	10
DN 16	SO-SDN16-I3/4	inside thread G¾"	10
DN 20	SO-SDN20-I1	inside thread G1"	10
DN 20	SO-SDN20-I3/4	inside thread G¾"	10
DN 25	SO-SDN25-I1	inside thread G1"	4
DN 25	SO-SDN25-I11/4 •	inside thread G1 ¼"	4

• Item not in stock. Delivery on request. [MTO]

Armaflex DuoSolar fitting with male straight thread



Quick fitting coupling with male straight thread for flat-sealing screw joints

Stainless steel VA	Code	Connection	Pieces/carton
DN 16	SO-SDN16-F1 •	external thread G1"	10
DN 16	SO-SDN16-F3/4	external thread G3/4"	10
DN 20	SO-SDN20-F1	external thread 1"	10
DN 20	SO-SDN20-F3/4	external thread G3/4"	10

• Item not in stock. Delivery on request. [MTO]

Armaflex DuoSolar fitting with male tapered thread



Quick fitting coupling with male tapered thread for metal-to-metal sealing screw joints

Stainless steel VA	Code	Connection	Pieces/carton
DN 16	SO-SDN16-E1 •	external thread R1"	10
DN 16	SO-SDN16-E1/2	external thread R1/2"	10
DN 16	SO-SDN16-E3/4	external thread R3/4"	10
DN 20	SO-SDN20-E1	external thread R1"	10
DN 20	SO-SDN20-E3/4	external thread R3/4"	10
DN 25	SO-SDN25-E1	external thread R1"	4
DN 25	SO-SDN25-E11/4 •	external thread R1 1/4"	4

• Item not in stock. Delivery on request. [MTO]

Armaflex DuoSolar fitting with cylindrical connection



Quick fitting coupling with cylindrical connection piece

Stainless steel VA	Code	Connection	Pieces/carton
DN 16	SO-SDN16-Z18 •	cylindrical connection piece Ø 18 mm	10
DN 20	SO-SDN20-Z18 •	cylindrical connection piece Ø 18 mm	10

• Item not in stock. Delivery on request. [MTO]

Armaflex DuoSolar clamping ring



Clamping ring for quick fitting coupling

Stainless steel VA	Code	Connection	Pieces/carton
DN 16	SO-SDN16-CR	clamping ring	50
DN 20	SO-SDN20-CR •	clamping ring	50
DN 25	SO-SDN25-CR	clamping ring	50

• Item not in stock. Delivery on request. [MTO]