

BIW Isolierstoffe GmbH

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Certified management system by:

- IATF16949
- ISO9001
- ISO13485
- ISO14001
- ISO50001
- IIP (Investors in People)



TECHNICAL DATASHEET

INDUSTRIES AND APPLICATIONS



ARA - PETFLEX reverse

Typical uses

- Automotive industry
- Crash protection
- E-mobility / hybrid
- Cable manufacture
- Line protection
- Commercial vehicles

Key properties

- Long-term heat resistance of -40°C to $+180^{\circ}\text{C}$
- Short-term heat resistance up to $+205^{\circ}\text{C}$
- abrasion classification E, tested in accordance with VW 60360-3
- Very good crash protection
- high impact protection
- Good resistance to fuels and lubricants, water, salt spray and cleaning agents during temporary exposure
- High cut resistance
- High bending and tensile strength
- thick-walled, thermally insulated
- Extremely assembly-friendly for long cable sets thanks to very smooth hose inner surfaces
- Physiologically harmless
- Colour: black, orange, purple, red
- Nominal Diameter: 10 mm to 22 mm



Tests / References



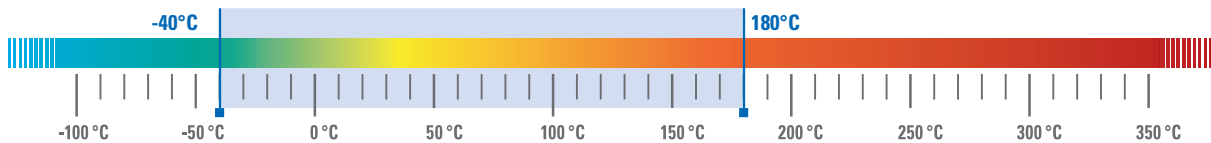
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INDUSTRIES AND APPLICATIONS



ARA - PETFLEX reverse

Application temperature



Product description

The ARA - PETFLEX reverse protective hose is a combination of a mixed fiber made of aramid and polyester with a fixation consisting of a temperature-resistant silicone resin. This protective hose is used to protect lines (electrically and from liquids) or as a mechanical and thermal contact protection via insulated hoses. The mixed fiber and the special impregnation achieve an outstanding abrasion characteristic under mechanical stress and a very high shock protection. The orange color denotes possible use in the application field of high-voltage technology in the e-mobility/hybrid area. The ARA - PETFLEX reverse can be used in the engine compartment, body or in the interior of motor vehicles or utility vehicles. The thermal resistance also stands up to 205°C (short term) in extreme situations. A temperatures over 160°C, color changes (orange) are possible. The ARA PETFLEX reverse protective hose is distinguished by its excellent resistance to fuels and lubricants. The ARA - PETFLEX reverse protective hose, because of its good stability, kinking resistance and extremely high assembly-friendliness based on its smooth hose inner surfaces, is especially well-suited for the assembly of longer cable sets. A particular advantage compared to protective hoses containing glass is that no skin irritation is to be expected in its handling. The ARA - PETFLEX reverse is designed as a protective hose without a defined breakdown voltage. The substantial wall thickness also offers good thermal protection. The ARA - PETFLEX reverse offers interesting cost aspects due to the mixed fiber.

Application properties

Property	Standard	Test requirements	Result
Flame resistance	DIN 75200 FMVSS 302 SAE J2192	Flame time 15s Air flow 0,1 - 0,3 m/s	Class B
Sound damping	VW 60360-3, 2019-05	Number of measurements 10 Test temperature (+23 ±2)°C Stress (0,16 ±0,01) N	Class B
Hot water jet test	VW 60360-3, 2019-05	Test duration 2 min. Water temperature 80±5°C Working pressure 80±5 bar	Requirements achieved No visible damages
Absorbency	VW 60360-3, 2019-05	Test duration 15 min. Immerersion depth 30 mm Distilled water Engine oil	Requirements achieved
Shrinkage	VW 60360-3, 2019-05	Number of samples 3 Sample length 200 mm Test temperature (205 ± 2) °C Test duration 15 min.	Requirements achieved

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ARA - PETFLEX reverse

Ageing

Property	Standard	Test requirements	Result
Hydrolysis test	VW 60360-3, 2019-05	Test temperature (85 ± 2) °C Relative humidity (85 ± 5) %r.F. Test duration 1500 h Sample length (400 ± 10) mm	Requirements achieved No visible damage or color change
Short-term ageing 240h / 205°C	VW 60360-3, 2019-05	Test temperature (205 ± 3) °C Sample length (400 ± 10) mm Test duration 240 h	Requirements achieved No visible damage or color change
Long-term ageing 3000h / 180°C	VW 60360-3, 2019-05	Test temperature (180 ± 3) °C Sample length (400 ± 10) mm Test duration 3000 h	Requirements achieved No visible damage or color change
Ozone test	VW 60360-3, 2019-05 DIN ISO 1431-1, A	Test duration 48 h Test temperature (40) °C Relative humidity (55 ± 10) % Ozone concentration (50 ±) pphm	Requirements achieved No visible damage or color change
Temperature and humidity cycling	VW 60360-3, 2019-05	Temperature Hi (180 ± 2) °C Temperature Lo (-40 ± 2) °C	Requirements achieved No visible damage or color change

Mechanical / physical properties

Property	Standard	Test requirements	Result
Abrasion resistance	VW 60360-3, 2019-05	Test temperatures (23 ± 2) °C Sample length 200 mm Load 7 N Mandrel Ø 5 mm	Abrasion class E
Pressure resistance in the heat	VW 60360-3, 2019-05 LV 112-1	Number of samples 3 Test temperatures 280°C, 290°C, 300°C Test time 4 h	>300°C
Increased mech. requirements (Falling tool F1 / Single-core cable)	VW 60360-3, 2019-05	Number of samples 6 Sample length 100mm Test voltage (12 ± 1) V DC Mass of the drop body (10 ± 0,05) kg	Class C to E = 15 Joule bis 50 Joule
Increased mech. requirements (Falling tool F1 / Shielded cable)	VW 60360-3, 2019-05	Number of samples 6 Sample length 100mm Test voltage (12 ± 1) V DC Mass of the drop body (10 ± 0,05) kg	Class B = 10 Joule
Increased mech. requirements (Falling tool F2 / Single-core cable)	VW 60360-3, 2019-05	Number of samples 6 Sample length 100mm Test voltage (12 ± 1) V DC Mass of the drop body (10 ± 0,05) kg	Class B bis C = 15 Joule to 20 Joule
Increased mech. requirements (Falling tool F2 / Shielded cable)	VW 60360-3, 2019-05	Number of samples 6 Sample length 100mm Test voltage (12 ± 1) V DC Mass of the drop body (10 ± 0,05) kg	Class B = 10 Joule

(Continued on the next page)

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Mechanical / physical properties

Property	Standard	Test requirements	Result
Notching resistance	VW 60360-3, 2019-05 VW 60360-1	Load cell Speed of testing 2 mm/min. Ø Conductor 0,45 mm	>500 N

Compatibilities

Medium	Standard	Test requirements	Result
Ad Blue	VW 60360-3, 2019-05	Test temperatures (+85 ±2) °C Test duration 240h, 480h, 720h, 1000h Winding test	Requirements achieved, no visible damage
Automatic transmission oil	VW 60360-3, 2019-05	Test temperatures (+150 ±2) °C Test duration 240h, 480h, 720h, 1000h Winding test	Requirements achieved, no visible damage
Battery acid	VW 60360-3, 2019-05	Test temperatures (+150 ±2) °C Test duration 240h, 480h, 720h, 1000h Winding test	Requirements achieved, no visible damage
Biodiesel	VW 60360-3, 2019-05	Test temperatures (+150 ±2) °C Test duration 240h, 480h, 720h, 1000h Winding test	Requirements achieved, no visible damage
Break fluid	VW 60360-3, 2019-05	Test temperatures (+150 ±2) °C Test duration 240h, 480h, 720h, 1000h Winding test	Requirements achieved, no visible damage
Diesel	VW 60360-3, 2019-05	Test temperatures (+150 ±2) °C Test duration 240h, 480h, 720h, 1000h Winding test	Requirements achieved, no visible damage
Fogging	VW 60360-3, 2019-05	PV 3015, VW 50180	Requirements achieved, no visible damage
Intensive cleaner	VW 60360-3, 2019-05	Test temperatures (+150 ±2) °C Test duration 240h, 480h, 720h, 1000h Winding test	Requirements achieved, no visible damage
Cold cleaning agent	VW 60360-3, 2019-05	Test temperatures (+150 ±2) °C Test duration 240h, 480h, 720h, 1000h Winding test	Requirements achieved, no visible damage
Fuel FAM-B	VW 60360-3, 2019-05	Test temperatures (+150 ±2) °C Test duration 240h, 480h, 720h, 1000h Winding test	Requirements achieved, no visible damage
Penetrating oil	VW 60360-3, 2019-05	Test temperatures (+150 ±2) °C Test duration 240h, 480h, 720h, 1000h Winding test	Requirements achieved, no visible damage
Radiator antifreeze	VW 60360-3, 2019-05	Test temperatures (+150 ±2) °C Test duration 240h, 480h, 720h, 1000h Winding test	Requirements achieved, no visible damage

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Compatibilities

Medium	Standard	Test requirements	Result
Steering gear fluid	VW 60360-3, 2019-05	Test temperatures (+150 ±2) °C Test duration 240h, 480h, 720h, 1000h Winding test	Requirements achieved, no visible damage
Multigrade engine oil	VW 60360-3, 2019-05	Test temperatures (+150 ±2) °C Test duration 240h, 480h, 720h, 1000h Winding test	Requirements achieved, no visible damage
Engine compartment sealing	VW 60360-3, 2019-05	Test temperatures (+150 ±2) °C Test duration 240h, 480h, 720h, 1000h Winding test	Requirements achieved, no visible damage
Grease	VW 60360-3, 2019-05	Test temperatures (+150 ±2) °C Test duration 240h, 480h, 720h, 1000h Winding test	Requirements achieved, no visible damage
Road saltsolution	VW 60360-3, 2019-05	Test temperatures (+150 ±2) °C Test duration 240h, 480h, 720h, 1000h Winding test	Requirements achieved, no visible damage
Water-Glycol-mixture	VW 60360-3, 2019-05	Test temperatures (+150 ±2) °C Test duration 240h, 480h, 720h, 1000h Winding test	Requirements achieved, no visible damage

Ecology, Environment & Safety

Ingredients compliant with VDA requirements

IMDS listed

RoHS, GADSL compliant

Non-asbestos, textilee glass fibres non-carcinogenic, non hazardous to the environment, not hazardous to water

In use and disposal of the ARA - PETFLEX reverse protective sleeve there are no environmentally relevant co-products expected

During the handling there are no skin irritations expected

BIW-Standard dimensions

ARA - PETFLEX reverse (Code: APU)

On demand individual dimensions available at any time

ID [mm]	Tol. ID [mm]	Wd [mm]	Tol. Wd [mm]	Ring [m]
10.0	±0.50	min. 1.0	+1.0	100
12.0	±0.50	min. 1.0	+1.0	100
13.0	±0.50	min. 1.0	+1.0	100
16.0	±0.50	min. 1.0	+1.0	100

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BIW-Standard dimensions

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On demand individual dimensions available at any time

ID [mm]	Tol. ID [mm]	Wd [mm]	Tol. Wd [mm]	Ring [m]
17.0	±0.50	min. 1.0	+1.0	100
20.0	±1.00	min. 1.0	+1.0	100
22.0	±1.00	min. 1.0	+1.0	100