

- IATF16949
- ISO9001
- ISO13485
- ISO14001
- ISO50001

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°C
- Short-term heat resistance up to +205°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

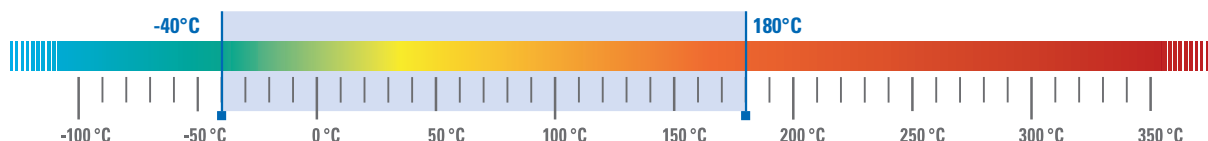


### Tests / References



- IATF16949
- ISO9001
- ISO13485
- ISO14001
- ISO50001

**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

- IATF16949
- ISO9001
- ISO13485
- ISO14001
- ISO50001

## INDUSTRIES AND APPLICATIONS


**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)

- IATF16949
- ISO9001
- ISO13485
- ISO14001
- ISO50001

## INDUSTRIES AND APPLICATIONS

**ARA - PETFLEX reverse****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

(Continued on the next page)

- IATF16949
- ISO9001
- ISO13485
- ISO14001
- ISO50001

## INDUSTRIES AND APPLICATIONS


**ARA - PETFLEX reverse**
**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

(Continued on the next page)

## BIW Isolierstoffe GmbH

Pregelstraße 2-5  
D-58256 Ennepetal  
Tel.: +49 (2333) 8308-0  
Fax.: +49 (2333) 8308-10  
info@biw.de  
[www.biw.de](http://www.biw.de)

## Certified management system by:

- IATF16949
- ISO9001
- ISO13485
- ISO14001
- ISO50001



TECHNICAL DATASHEET

## INDUSTRIES AND APPLICATIONS



## ARA - PETFLEX reverse

### 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]
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