**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**

**Certified management system by:**

- IATF16949
- ISO9001
- ISO13485
- ISO14001
- ISO50001

When it comes to competence

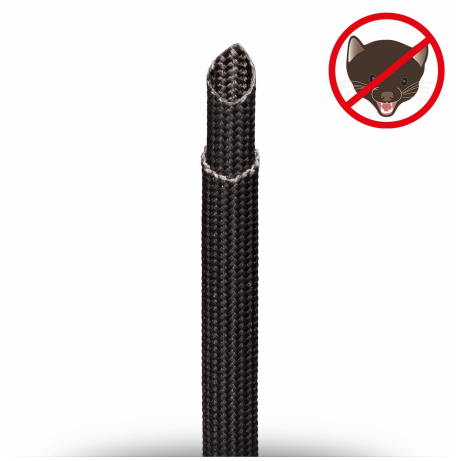


INDUSTRIES AND APPLICATIONS

# THERMOFLEX RI DUO

## 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 +275°C
- Short-term heat resistance up to +300°C
- Institute-tested against marten bite
- Good resistance to water, water-glycol mixture, salt spray, as well as fuels and lubricants in case of temporary exposure
- Abrasion class B, standard VW 60360-3
- Optimal protection for shielded sheathed cables and single wire lines
- Good crash protection
- Thick walled, double-layered, thermally insulated
- High buckling strength, cut resistance, impact strength and tensile strength
- Colour: natural, black
- Nominal diameter 5.0 mm to 30.0 mm

Chlorine free

## Tests / References

EDAG LABCO

**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**

**Certified management system by:**

- IATF16949
- ISO9001
- ISO13485
- ISO14001
- ISO50001

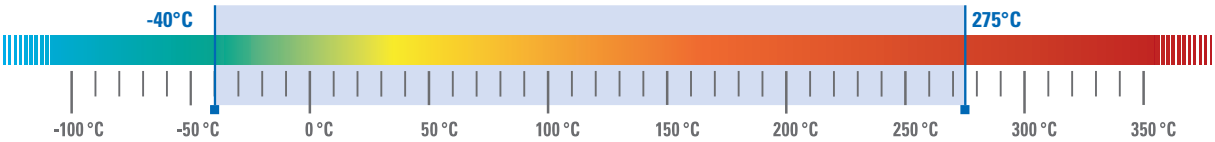
When it comes to competence



INDUSTRIES AND APPLICATIONS

# THERMOFLEX RI DUO

## Application temperature




## Product description

The THERMOFLEX RI DUO is a multi-layer insulating protective hose made of heavy duty, specially woven textile glass fibres (E glass) with a special impregnation of silicone resin. The combination of these materials allows use of the insulating protective hose in the automotive industry as a line protection against marten gnawing and as crash protection. The thermal resistance also stands up to 450°C in extreme situations. The protective function remains largely intact even in the case of partial thermal overloading due to the excellent temperature properties of the textile glass hose. Temperatures >300°C can result in colour changes (black). The THERMOFLEX RI DUO is distinguished by good resistance to short-term contact with fuels and lubricants. The THERMOFLEX RI DUO is particularly well-suited for assembling long cable sets thanks to its good kinking resistance. The THERMOFLEX RI DUO is also designed, without defined strength, as a crash-protection hose

## Application properties

| Property | Standard | Test requirements | Result |
|---|---|---|---|
| Flame resistance | FMVSS 302 | Flame height 38 mm<br>Flame exposure 15s | Classification A |
| Sound damping | VW 60360-3 - 2019-05 | Sample length 190mm ±3,0mm<br>Number measurements 10<br>Steel bar 8mm<br>Test temperature 23°C ±2°C<br>Stress 0,16N ±0,01N | Classification B / 4.8 |
| Shrinkage | ISO 6722-1 | Temperature 275°C | No shrinkage |

## Ageing

| Property | Standard | Test requirements | Result |
|---|---|---|---|
| Hydrolysis test | LV 312-3_2015-04 | 1500h bei 85% relative humidity<br>Winding test at room temperature | Requirements achieved |
| Short-term ageing 240h / 300°C | VW 60360-3_2019-05 | Winding test<br>Breaking force<br>Tear resistance | Requirements achieved |
| Long-term ageing 3000h / 250°C | LV 312-3_2015-04 | Winding test<br>Breaking force<br>Tear resistance | Requirements achieved |

(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**

**Certified management system by:**

- IATF16949
- ISO9001
- ISO13485
- ISO14001
- ISO50001

When it comes to competence



INDUSTRIES AND APPLICATIONS

# THERMOFLEX RI DUO

## Ageing

| Property | Standard | Test requirements | Result |
|---|---|---|---|
| Long-term ageing 3000h / 275°C | Based on VW 60360-3_2019-05 | Winding test | Requirements achieved |
| Ozone test | DIN 53509-1 | Methode B | Requirements achieved |

## Mechanical / physical properties

| Property | Standard | Test requirements | Result |
|---|---|---|---|
| Abrasion resistance | VW 60360-3_2019-05 | Test temperaturer 23±2°C/40±2°C/90±2°C Load 7N Metal mandrel 5mm | Classification B |
| Increased mech. requirements (Falling tool F1 / Single-core cable) | VW 60360-3_2019-05 | Falling tool F1 T-profile steel | Drop test class D25 J up to E50 J |
| Increased mech. requirements (Falling tool F1 / Shielded cable | VW 60360-3_2019-05 | Falling tool F1 T-profile steel | Drop test class B10 J up to B15 J |
| Increased mech. requirements (Falling tool F2 / Single-core cable) | VW 60360-3_2019-05 | Falling tool F2 Torx screw M6 | Drop test class D25 J |
| Increased mech. requirements (Falling tool F2 / Shielded cable) | VW 60360-3_2019-05 | Falling tool F2 Torx screw M6 | Drop test class B10 J up to B15 J |
| Notching resistance | LV 312-3_2015-04 | LV 112-1 Metal mandrelØ 5mm Speed of testing 10 mm/min. | Requirements achieved |
| Impact resistance | LV 312-3_2015-04 | ISO 6722-1 4h at -40°C | Requirements achieved |
| Stone chip resistance | DIN EN ISO 20567-1 Methode A | Pressure 1bar Mass 500 g Delivery time 10±2s | Requirements achieved |
| Tensile strength / elongation at break | LV 312-3_2015-04 | Speed 100 mm/min. | Requirements achieved |

## Compatibilities

| Medium | Standard | Test requirements | Result |
|---|---|---|---|
| Ad Blue | LV 312-3_2015-04 | Storage at 180°C Removal after 240h, 480h, 720h,1000h Winding test | Requirements achieved |
| Automatic transmission oil | LV 312-3_2015-04 | Storage at 180°C Removal after 240h, 480h, 720h,1000h Winding test | Requirements achieved |

(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**

**Certified management system by:**

- IATF16949
- ISO9001
- ISO13485
- ISO14001
- ISO50001

When it comes to competence



INDUSTRIES AND APPLICATIONS

# THERMOFLEX RI DUO

## Compatibilities

| Medium | Standard | Test requirements | Result |
|---|---|---|---|
| Biodiesel | LV 312-3_2015-04 | Storage at 180°C<br>Removal after 240h, 480h, 720h,1000h<br>Winding test | Requirements achieved |
| Break fluid | LV 312-3_2015-04 | Storage at 180°C<br>Removal after 240h, 480h, 720h,1000h<br>Winding test | Requirements achieved |
| Diesel | LV 312-3_2015-04 | Storage at 180°C<br>Removal after 240h, 480h, 720h,1000h<br>Winding test | Requirements achieved |
| Intensive cleaner | LV 312-3_2015-04 | Storage at 180°C<br>Removal after 240h, 480h, 720h,1000h<br>Winding test | Requirements achieved |
| Fuel FAM-B | LV 312-3_2015-04 | Storage at 180°C<br>Removal after 240h, 480h, 720h,1000h<br>Winding test | Requirements achieved |
| Penetrating oil | LV 312-3_2015-04 | Storage at 180°C<br>Removal after 240h, 480h, 720h,1000h<br>Winding test | Requirements achieved |
| Radiator antifreeze | LV 312-3_2015-04 | Storage at 180°C<br>Removal after 240h, 480h, 720h,1000h<br>Winding test | Requirements achieved |
| Steering gear fluid | LV 312-3_2015-04 | Storage at 180°C<br>Removal after 240h, 480h, 720h,1000h<br>Winding test | Requirements achieved |
| Multigrade engine oil | LV 312-3_2015-04 | Storage at 180°C<br>Removal after 240h, 480h, 720h,1000h<br>Winding test | Requirements achieved |
| Engine compartment sealing | LV 312-3_2015-04 | Storage at 180°C<br>Removal after 240h, 480h, 720h,1000h<br>Winding test | Requirements achieved |
| Mycological test | DIN EN ISO 846 | Methode: A<br>Fungal growth test | Requirements achieved |
| Grease | LV 312-3_2015-04 | Storage at 180°C<br>Removal after 240h, 480h, 720h,1000h<br>Winding test | Requirements achieved |
| Road saltsolution | LV 312-3_2015-04 | Storage at 180°C<br>Removal after 240h, 480h, 720h,1000h<br>Winding test | Requirements achieved |

(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**

**Certified management system by:**

- IATF16949
- ISO9001
- ISO13485
- ISO14001
- ISO50001

When it comes to competence



INDUSTRIES AND APPLICATIONS

# THERMOFLEX RI DUO

## Compatibilities

| Medium | Standard | Test requirements | Result |
|---|---|---|---|
| Water-Glycol-mixture | LV 312-3_2015-04 | Storage at 180°C<br>Removal after 240h, 480h, 720h,1000h<br>Winding test | Requirements achieved |

## Ecology, Environment & Safety

Ingredients compliant with VDA - requirements
IMDS listed
RoHS, GADSL compliant
Non-asbestos, textile glass fibres non-carcinogenic, non-hazardous to the environment, non-hazardous to water.
The textile glass sleeve requires compliance with the industrial hygiene. Workplace ventilation has to be turned away from the worker, sensitive individuals may get slight skin irritation.
When using and disposing of the THERMOFLEX RI DUO protective sleeve there are no environmentally relevant by-products expected.

## BIW-Standard dimensions

**THERMOFLEX RI DUO (Code: GHW)**

On demand individual dimensions available at any time

| ID [mm] | Tol. ID [mm] | Wd [mm] | Tol. Wd [mm] | Ring [m] |
|---|---|---|---|---|
| 5.0 | ±0.30 | 1.80 | ±0.30 | 100 |
| 6.0 | ±0.30 | 1.80 | ±0.30 | 100 |
| 7.0 | ±0.30 | 1.80 | ±0.30 | 100 |
| 8.0 | ±0.30 | 1.80 | ±0.30 | 100 |
| 9.0 | ±0.50 | 1.80 | ±0.30 | 50 |
| 10.0 | ±0.50 | 1.80 | ±0.30 | 50 |
| 11.0 | ±0.50 | 1.80 | ±0.30 | 50 |
| 12.0 | ±0.50 | 1.80 | ±0.30 | 50 |
| 13.0 | ±0.50 | 1.80 | ±0.30 | 50 |
| 14.0 | ±0.50 | 1.80 | ±0.30 | 50 |
| 15.0 | ±0.50 | 1.80 | ±0.30 | 50 |
| 16.0 | ±0.50 | 1.80 | ±0.30 | 50 |
| 17.0 | ±0.50 | 1.80 | ±0.30 | 50 |
| 18.0 | ±0.50 | 1.80 | ±0.30 | 25 |

(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**

**Certified management system by:**

- IATF16949
- ISO9001
- ISO13485
- ISO14001
- ISO50001

When it comes to competence



INDUSTRIES AND APPLICATIONS

THERMOFLEX RI DUO

## BIW-Standard dimensions

**THERMOFLEX RI DUO (Code: GHW)**

On demand individual dimensions available at any time

| ID [mm] | Tol. ID [mm] | Wd [mm] | Tol. Wd [mm] | Ring [m] |
|---|---|---|---|---|
| 19.0 | ±0.50 | 1.80 | ±0.30 | 25 |
| 20.0 | ±0.70 | 1.80 | ±0.30 | 25 |
| 21.0 | ±0.70 | 1.80 | ±0.30 | 25 |
| 22.0 | ±0.70 | 1.80 | ±0.30 | 25 |
| 23.0 | ±0.70 | 1.80 | ±0.30 | 25 |
| 24.0 | ±0.70 | 1.80 | ±0.30 | 25 |
| 25.0 | ±0.70 | 1.80 | ±0.30 | 25 |
| 26.0 | ±0.70 | 1.80 | ±0.30 | 25 |
| 27.0 | ±0.70 | 1.80 | ±0.30 | 25 |
| 28.0 | ±0.70 | 1.80 | ±0.30 | 25 |
| 29.0 | ±0.70 | 1.80 | ±0.30 | 25 |
| 30.0 | ±0.70 | 1.80 | ±0.30 | 25 |