

FLEXIBLE INSULATION FOR RAILWAY VEHICLES

ArmaFlex® Rail

The first closed-cell insulation to meet EN 45545-2 fire protection requirements

- // Innovative closed-cell thermal insulation for railway industries
- // Built-in water vapour barrier reduces risk of corrosion under insulation
- // Extremely low smoke density
- // Does not generate flaming droplets
- // Reduce risk of mould and mildew, contributing to improved indoor air quality
- // First flexible closed-cell insulation to meet hazard levels 2 and 3 for railway vehicles according to EN 45545

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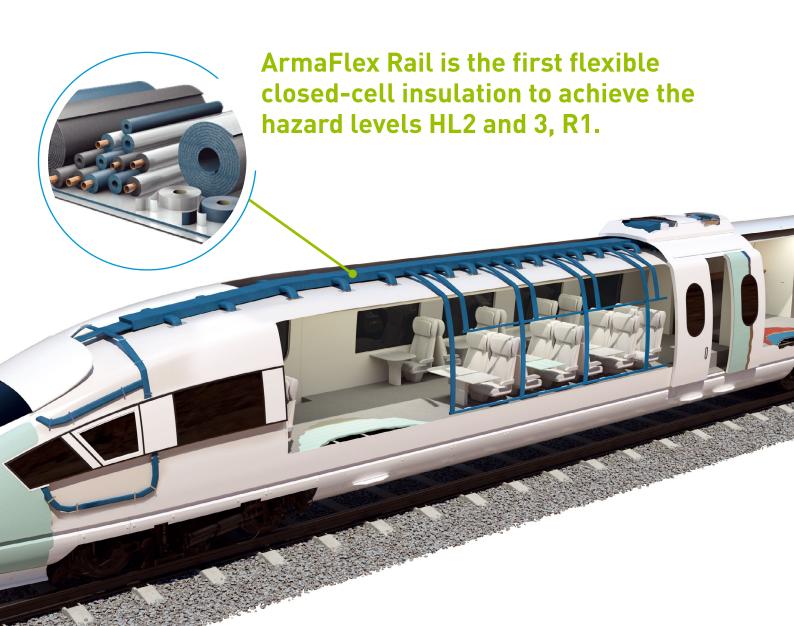






ArmaFlex Rail

With more than 50 years of experience in the railway industry, Armacell knows the requirements and standards and offers global support and technology you can rely on.



EN 45545 is a seven-part European standard for fire protection on railway vehicles. The objectives of this standard are to minimise both the risk of a fire starting and spreading within railway vehicles and its effects on passengers and employees. As a consequence, this provides the best level of protection against the occurrence of a fire on board.

FIRE STANDARD
EN 45545 TAKES
THE FIRST
PRINCIPLES INTO
CONSIDERATION

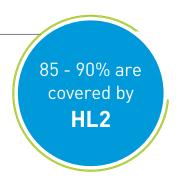
Flame spread
Ignitability
Rate of heat release
Smoke emissions
Toxic gas emissions

To achieve the highest possible level of safety in trains, both materials and components must meet strict fire, smoke and toxicity requirements. Depending on where they are used, materials are assigned to the categories R1 to R26 (R = Requirement Set).

The various operating and design classes provide the basis for hazard levels (HLs) which in turn define the requirements of the classification system. There are a total of three hazard levels (HL1 to HL3). HL3 is the highest level and thus makes the highest demands of the materials used.

TYPE OF VEHICLE AND OPERATION DETERMINE THE REQUIRED HAZARD LEVEL.

| Operation category | N: Standard vehicles | A: Vehicles of automatic train, no emergency trained staff on board | D: Double decked vehicles | S: Sleeping / couchette vehicles |
|--|-------------------------|---|------------------------------|--|
| 1: No underground lines. | HL1 | HL1 | HL1 | HL2 |
| 2: Regular use of underground sections and tunnels. Fast evacuation possible. | HL2 | HL2 | HL2 | HL2 |
| 3: Regular use of underground sections and tunnels. Slow evacuation possible. | HL2 | HL2 | HL2 | HL3 |
| 4: Regular use of nderground sections and tunnels (incl. Euro-Tunnel). No evacuation possible. | HL3 | HL3 | HL3 | HL3 |



EN 45545-2 specifies the test methods, test conditions and reaction to fire performance requirements for all onboard materials and components used on railway vehicles as defined by the HL. Key fire tests defined in this standard are flame propagation, cone calorimeter and the smoke and toxicity tests. For requirement set R1, they are all based on radiant panels with 50 kW/m² heat fluxes.

REQUIREMENT SET FOR R1 (INSULATION MATERIAL)

| European standard | Test standard | Parameter unit | Requirement definition | HL1 | HL2 | HL3 |
|---|--|-------------------------|------------------------|------|-----|------|
| EN 45545-2 | Spread of flame ISO 5658-2 | CFE kWm ⁻² | Minimum | 20 | 20 | 20 |
| Railway application Fire protection on railway vehicles | Heat release, smoke production and mass loss rate ISO 5660-1 | MAHRE kWm ⁻² | Maximum | | 90 | 60 |
| Requirements for fire behaviour of materials and components | Smoke optical density and toxicity EN ISO 5659-2 | DS(4) dimensionless | Maximum | 600 | 300 | 150 |
| | | V0F4 | Maximum | 1200 | 600 | 300 |
| | | CITG dimensionless | Maximum | 1.2 | 0.9 | 0.75 |

TECHNICAL DATA - ARMAFLEX RAIL SD

| Brief description | A highly flexible, closed cell insulation foam with improved fire retardant properties, low smoke generation and built in Microban® anti-microbial protection for railway vechicles. | | | | |
|--|--|---|--|---|--|
| Material type | Elastomeric foam based rubber manufactured with Ar | rmaprene® patented | technology; US patent no. 8 16 | 3 811, EU patent no. 2 261 305. | |
| Colour | Blue. | | | | |
| Material special features | The pressure-sensitive adhesive coating is based on n Traces of silicone can be found on the protection pape | | | vered with polyethylene foil. | |
| Applications | Insulation / protection for air ducts and pipes (incl. elb condensation. Not designed for insulations exposed to | | | igeration systems to prevent | |
| Installation | The ArmaFlex manual should be consulted before assembly. | | | | |
| Property | Value/Assessment Standard/Test method | | | | |
| Temperature range | | | | | |
| Service temperature | Max. service temperature +110 °C | | C if glued to the object with its surface. | Test EU 5654 Tested acc. to EN 14706, | |
| | Min. service temperature -50 °C | | | EN14707 & EN14304 | |
| Thermal conductivity | | | | | |
| | $\lambda_{\text{0}^{\circ}\text{C}} \le 0.040 \text{ W/(m·K)}$ [40+0.1· $^{\text{9}}\text{m} + 0.0009$ · | ⁹ m²]/1000 | | Test EU 5654 Declared acc. to EN ISO 13787 Tested acc. to EN 12667 & EN ISO 8497 | |
| Water vapour diffusion resistar | nce | | | | |
| Water vapour diffusion resistance factor | μ > 5,000 | | | Test EU 5654 Tested acc. to EN ISO 12086 & EN 13469 | |
| Fire performance & approvals | | | | | |
| Reaction to fire | Hazard level | HL2, R1 (3mm sheets & ta | ape: HL3, R1) | Test EU 5838, EU 5786, EU 6268 & EU 6422 Declared acc. to EN 45545-2 | |
| | Fire behaviour and fire side effects | S4, ST2, SR2, FED < 1 | | Test D 5882 Classified acc. to DIN 5510-2 Tested acc. to DIN 54837 | |
| | Russian Federation certificate of conformity | G1, B2, D2, T2 | | Test RUS 6866 Declared acc. to GOST 12.1.044- 89 | |
| | Burning behaviour for use in motor vecicles (ECE Regulations) | Passed Annex 6,7,8,9 | | Test D 5842 ECE R-118 | |
| | NFPA 130 American fire test to railway components | I _s ≤ 25 D _s (4.0) ≤100 | 0 | EU 5955 & EU 5956 Classified acc. to NFPA 130:2014 Tested acc. to ASTM E 162:20 & ASTM E 662:2012 | |
| Practical fire behaviour | Self-extinguishing, does not drip, does not spread flar | mes. | | | |
| Other technical features | | | | | |
| Dimension and tolerances | In accordance with EN 14304, table 1 | | | Test EU 5654 Tested acc. to EN 822, EN 823 & EN 13467 | |
| Health aspects | Fulfills hygiene requirements of Russian rail Industry | | | Test RUS 6567 | |
| Storage & shelf life | Material should be stored in dry, clean rooms at normal relative humidity (50% - 70%) and ambient temperature (0°C - 35°C). Self adhesive sheets, tapes: 1 year | | | | |

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 our Technical department

TECHNICAL DATA - ARMAFLEX RAIL SD-C

| Brief description | A highly flexible, closed cell, pre-covered insulation foam with improved retardant properties, low smoke generation and built in Microban® antimicrobial protection for railway vechicles. | | | | |
|--|---|-------------------------------------|--|--|---|
| Material type | Elastomeric foam based rubber with high-tech coating and manufactured with Armaprene® patented technology; US patent no. 8 163 811; EU patent no 2 261 305; patent for multi-layer coating technology EP 522 502. | | | | |
| Colour | Blue with silver metallic look coating. | | | | |
| Material special features | | | | clate basis with mesh structure and coop protect self-adhesive closures. | vered with polyethylene foil. |
| Special features | The covering offers excellent of | lurability, even under U\ | / exposure w | hen used for outdoor applications. It is | also easy to clean. |
| Applications | Insulation / protection for air o | lucts and pipes (incl. elb | oows, fittings | s, flanges etc.) of air-conditioning / refr | igeration systems to prevent |
| Installation | When dimensioning the insula The ArmaFlex manual should | | | n an external suface coefficient of 8 W/ | (m²-K). |
| Property | Value/Assessment | | | | Standard/Test method |
| Temperature range | | | | | |
| Service temperature | Max. service temperature | +110 °C | | +85 °C if glued to the object with its whole surface. | Tested acc. to EN 14706, EN 14707 & EN 14304 |
| | Min. service temperature | -50 °C | | | _ |
| Thermal conductivity | | | | | |
| | $\lambda_{0^{\circ}c} \le 0.040 \text{ W/(m·K)}$ | [40+0.1 · ⁹ m + 0.0009 · | ⁹ m²]/1000 | | Declared acc. to EN ISO 13787 Tested acc. to EN 12667 & EN ISO 8497 |
| Water vapour diffusion resistar | nce | | | | |
| Water vapour diffusion resistance factor | μ > 10,000 | | | | Tested acc. to EN ISO 12086 & EN 13469 |
| Fire performance & approvals | | | | | _ |
| Reaction to fire | Hazard level | | HL3, R1 | | Test EU 6253 & EU 5949 Declared acc. to EN 45545-2 |
| | Russian Federation certificate of conformity | | G1, V2, D2, T2, I1, 8 | | Test RUS 6866 Declared acc. to GOST 12.1.044-89 |
| | Boeing standard fire test - Toxicity | | CO (ppm) 140, NOx (ppm) 10, SO2 (ppm) n.n, HCN 9 (ppm) 8, HCL 9 (ppm) 166, HF 9 (ppm) 11 | | Test EU 6999 Tested acc. to BSS 7239:1988, BSS 7242:1989 |
| | NFPA 130 American fire test to | o railway components | I _s ≤ 25 D _s (4 | 6. 0} ≼100 | Test EU 6905, EU6906, EU6907 & EU 6908 Classified acc. to NFPA 130:2014 Tested acc. to ASTM E 162:20 & ASTM E 662:2012 |
| Practical fire behaviour | Self-extinguishing, does not d | rip, does not spread flar | nes. | | |
| Other technical features | | | | | |
| Dimension and tolerances | In accordance with EN 14304, | table 1 | | | |
| Storage & shelf life | Material should be stored in dry, clean rooms at normal relative humidity (50% - 70%) and ambient temperature (0°C - 35°C). Self adhesive sheets, tapes: 1 year | | | | |

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 our Technical department

TECHNICAL DATA - ARMAFLEX RAIL ZH

| Brief description | Halogen free, flexible closed-cell insulation foam with improved fire retardant properties and low smoke generation for railway vehicles. | | | | | |
|--|---|--|--|--|--|--|
| Material type | Elastomeric foam based on | Elastomeric foam based on synthetic rubber. | | | | |
| Colour | Dark grey. | Dark grey. | | | | |
| Material special features | | sive coating is based on modified and on the protection paper/foil used | crylate basis with mesh structure and co d to protect self-adhesive closures. | vered with polyethylene foil. | | |
| Special features | Without halogens (chloride, | bromide) acc. to DIN / VDE 0472, pa | rt 815. Fulfils DIN 1988 parts 200. | | | |
| Applications | | r ducts and pipes (incl. elbows, fittir for insulations exposed to sunlight | ngs, flanges etc.) of air-conditioning / refr and is not UV stable. | igeration systems to prevent | | |
| Installation | The ArmaFlex manual shou | d be consulted before assembly. | | | | |
| Property | Value/Assessment | | | Standard/Test method | | |
| Temperature range | | | | | | |
| Service temperature | Max. service temperature | +110 °C | +85 °C if glued to the object with its whole surface. | Tested acc. to EN 14706, EN14707 & EN14304 | | |
| | Min. service temperature | -50 °C | | _ | | |
| Thermal conductivity | | | | | | |
| | $\lambda_{0^{\circ}C} \le 0.040 \text{ W/(m·K)}$ | [40+0.1· ⁹ m + 0.0009· ⁹ m ²]/1000 | | Declared acc. to EN ISO 13787 Tested acc. to EN 12667 & EN ISO 8497 | | |
| Water vapour diffusion resi | stance | | | | | |
| Water vapour diffusion resistance factor | μ ≥ 1,000 | | | Tested acc. to EN ISO 12086 & EN 13469 | | |
| Fire performance & approve | als | | | | | |
| Reaction to fire | Hazard level | HL2, R | 1 | Test EU 5816, EU 5857, EU 5896 & EU 6665 Declared acc. to EN 45545-2 | | |
| Practical fire behaviour | Self-extinguishing, does not drip, does not spread flames. | | | | | |
| Other technical features | | | | | | |
| Storage & shelf life | Material should be stored in temperature (0°C - 35°C). Self adhesive sheets, tapes: | | humidity (50% - 70%) and ambient | | | |

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 our Technical department in due time whether or not the data and information apply to the intended application area.



TECHNICAL DATA - ARMAFLEX RAIL ZH-C

| Brief description | Halogen free, flexible closed-cell insulation foam with improved fire retardant properties and low smoke generation for railway vehicles. | | | | |
|--|---|--|--|---|--|
| Material type | Elastomeric foam based on synthetic rubber with patented high-tech multi-layer coating EU patent no. 2 522 502. | | | | |
| Colour | Dark grey with silver metall | ic look coating. | | | |
| Material special features | | | acrylate basis with mesh structure and co ed to protect self-adhesive closures. | vered with polyethylene foil. | |
| Special features | | | oart 815. Fulfils DIN 1988 parts 200. The co The insulation system is designed for easy | | |
| Applications | | r ducts and pipes (incl. elbows, fit for insulations exposed to sunligh | tings, flanges etc.) of air-conditioning / refr nt and is not UV stable. | igeration systems to prevent | |
| Installation | | ulation thickness, please calculate ld be consulted before assembly. | with an external suface coefficient of 8 W/ | (m2.K). | |
| Property | Value/Assessment | | | Standard/Test method | |
| Temperature range | | | | | |
| Service temperature | Max. service temperature | +110 °C | +85 °C if glued to the object with its whole surface. | Tested acc. to EN 14706, EN14707 & EN14304 | |
| | Min. service temperature | -50 °C | | _ | |
| Thermal conductivity | | | | | |
| | λ _{0°C} ≤ 0.040 W/(m·K) | [40+0.1 · ⁹ m + 0.0009 · ⁹ m ²]/100 | 00 | Declared acc. to EN ISO 13787 Tested acc. to EN 12667 & EN ISO 8497 | |
| Water vapour diffusion resis | tance | | | | |
| Water vapour diffusion resistance factor | μ > 10,000 | | | Tested acc. to EN ISO 12086 & EN 13469 | |
| Fire performance & approva | ls | | | | |
| Reaction to fire | Hazard level | HL3, | R1 | Test EU 6997 & EU 5818 Declared acc. to EN 45545-2 | |
| Practical fire behaviour | Self-extinguishing, does not drip, does not spread flames. | | | | |
| Other technical features | • | | | | |
| Storage & shelf life | Material should be stored ir temperature (0°C - 35°C). Self adhesive sheets, tapes: | • | ve humidity (50% - 70%) and ambient | | |

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 our Technical department in due time whether or not the data and information apply to the intended application area.

ARMAFLEX RAIL SD

The first closed-cell insulation for increased safety in railway vehicles.

- Extremely low smoke density and superior fire behaviour
- Built-in Microban protection reduces mould and bacteria growth
- Complies with most international railway standards for insulation materials
 - EN 45545 HL2, R1
 - NFPA 130
 - DIN 5510-2
 - GOST 12.1.044-89
 - United Nations ECE R-118 p. 6-8



Product range

2m length tubes, rolls, self-adhesive rolls and tape.

Tubes (Length: 2.0m, Colour: Blue)

| | 9mm | | 13mm | Dina mavimum |
|-----------|----------------|-----------|----------------|---|
| Item | Carton content | Item | Carton content | Pipe maximum outside diameter |
| | [m] | | [m] | [mm] |
| RA-09X012 | 192 | RA-13X012 | 130 | 12 |
| RA-09X015 | 164 | RA-13X015 | 112 | 15 |
| RA-09X018 | 150 | RA-13X018 | 98 | |
| RA-09X022 | 122 | RA-13X022 | 88 | |
| RA-09X028 | 90 | RA-13X028 | 64 | |
| RA-09X035 | 68 | RA-13X035 | 56 | 35 |
| RA-09X042 | 56 | RA-13X042 | 48 | 42 |
| | | | | |

Other information

| Length tolerance | ± 1.5% | | |
|---------------------|---------------------------------------|--|--|
| Thickness tolerance | ± 1.5mm | | |
| Reaction to fire | Hazard level 2, R1 acc. to EN 45545-2 | | |

Rolls (Width: 1.0m, Colour: Blue)

| Insulation thickness | Dimension (length) | Carton content |
|-------------------------|-------------------------------------|---|
| [m] | [m] | [m²] |
| 3 | 30 | 30.0 |
| 6 | 15 | 15.0 |
| 9 | 10 | 10.0 |
| 13 | 8 | 8.0 |
| 19 | 5 | 5.0 |
| 25 | 4 | 4.0 |
| | ### Thickness [m] 3 6 9 13 19 | thickness Dimension (length) [m] [m] 3 30 6 15 9 10 13 8 19 5 |

Other information

| Length tolerance | ± 1.5% | | |
|---------------------|--|--|--|
| Thickness tolerance | 3 - 6mm: ± 1.0mm | | |
| | 9 - 19mm: ± 1.5mm | | |
| Reaction to fire | Hazard level 2, R1 acc. to EN 45545-2 3mm sheets: HL3. R1 | | |

Self-adhesive rolls (Width: 1.0m, Colour: Blue)

| Item | Insulation thickness | Dimension (length) | Carton content |
|-------------|-------------------------|--------------------|----------------|
| | [m] | [m] | [m²] |
| RA-03-99/EA | 3 | 30 | 30.0 |
| RA-06-99/EA | 6 | 15 | 15.0 |
| RA-09-99/EA | 9 | 10 | 10.0 |
| RA-13-99/EA | 13 | 8 | 8.0 |
| RA-19-99/EA | 19 | 5 | 5.0 |
| RA-25-99/EA | 25 | 4 | 4.0 |

Other information

| Length tolerance | ± 1.5% | | |
|---------------------|--|--|--|
| Thickness tolerance | 3 - 6mm: ± 1.0mm | | |
| | 9 - 19mm: ± 1.5mm | | |
| Reaction to fire | Hazard level 2, R1 acc. to EN 45545-2 3mm sheets: HL3, R1 | | |

Accessories

| Item | Carton content | Article description [m²] | |
|------------------|---------------------|--|--|
| | [m] | | |
| RA-TAPE 12 rolls | | ArmaFlex Rail SD Tape (3mm thickness x 50mm width x 15m length) | |
| AHU-700/1.0 | 12 x 1.0 litre cans | ArmaFlex Ultima adhesive 700 | |

Other information (ArmaFlex Rail SD Tape)

| Length tolerance | -1.5 / +5% | |
|---------------------|---------------------------------------|--|
| Thickness tolerance | -0.1 / +1.5mm | |
| Reaction to fire | Hazard level 3, R1 acc. to EN 45545-2 | |

ARMAFLEX RAIL SD-C

The first closed-cell insulation material for use in areas requiring the highest hazard level - HL3.

- Built-in Microban protection reduces mould and bacteria growth
- Excellent mechanical protection and high degree of stability under exposure to UV
- Wash-down waterproof and easy to clean
- Meets the highest hazard level requirements
 - EN 45545 HL2, R1



Product range

2m length pre-covered tubes, self-adhesive pre-covered sheets and tape.

Tubes (Length: 1.0m, Colour: Blue with silver covering) 9mm insulation thickness

| [m] | |
|-----|----------------------------|
| | [mm] |
| 96 | 12 |
| 82 | |
| 75 | |
| 61 | |
| 45 | |
| 34 | 35 |
| 28 | 42 |
| | 82 75 61 45 34 |

Other information

| Length tolerance | ± 1.5% | |
|---------------------|---------------------------------------|--|
| Thickness tolerance | 9mm ± 1.5mm | |
| Reaction to fire | Hazard level 3, R1 acc. to EN 45545-2 | |

Self-adhesive sheets, precovered (Width: 1.0m, Colour: Blue)

| Item | Insulation thickness | Dimension (length) | Carton content |
|------------|-------------------------|--------------------|----------------|
| | [m] | [m] | [m²] |
| SDC-06MM/A | 6 | 2 | 50.0 |
| SDC-09MM/A | 9 | 2 | 34.0 |
| SDC-13MM/A | 13 | 2 | 24 |
| SDC-19MM/A | 19 | 2 | 16 |
| SDC-25MM/A | 25 | 2 | 12 |

Other information

| Length tolerance | ± 1.5% | |
|---------------------|---------------------------------------|--|
| Thickness tolerance | 6mm: ± 1.0mm | |
| | 9 - 19mm: ± 1.5mm | |
| | 25mm: ± 2.0mm | |
| Reaction to fire | Hazard level 3, R1 acc. to EN 45545-2 | |

Accessories

| Item | Carton content | Article description [m²] ArmaFlex Rail SD-C Tape (0.08mm thickness x 30mm width x 25m length) | |
|-----------------|----------------|---|--|
| | [m] | | |
| ACH-PSATAPES-30 | 10 rolls | | |
| ACH-PSATAPES-50 | 6 rolls | ArmaFlex Rail SD-C Tape (0.08mm thickness x 30mm width x 50m length) | |

Wherever energy is transported, part of the valuable resource is lost when the equipment is not, or poorly, insulated. With HVAC equipment being the second largest energy consumer, insulation with our dedicated ArmaFlex Rail products offers enormous energy-saving potential.



ARMAFLEX RAIL ZH

The first halogen-free, closed-cell insulation material to achieve HL2, R1 classification, under EN 45545.

- Halogen-free insulation minimises corrosive effects and smoke toxicity in the event of fire
- Low smoke density, superior fire behaviour
- Dust- and fibre-free material with low thermal conductivity
- High-tech insulation with built-in fire protection for railway vehicles
 - EN 45545 HL2, R1



Product range

2m length tubes, rolls, self-adhesive rolls and tape.

Tubes (Length: 2.0m, Colour: Dark grey) 9mm insulation thickness

| Carton content | Pipe maximum outside diameter |
|----------------|-------------------------------|
| [m] | [mm] |
| 192 | 12 |
| 164 | 15 |
| 150 | 18 |
| 122 | |
| 90 | |
| 68 | 35 |
| 56 | 42 |
| | [m] 192 164 150 122 90 68 |

Other information

| Length tolerance | ± 1.5% | |
|---------------------|---------------------------------------|--|
| Thickness tolerance | 9mm ± 1.5mm | |
| Reaction to fire | Hazard level 2, R1 acc. to EN 45545-2 | |

Rolls (Width: 1.0m, Colour: Dark grey)

| Item | Insulation thickness | Dimension (length) | Carton content |
|------------|-------------------------|--------------------|----------------|
| | [m] | [m] | [m²] |
| ZH-03-99/E | 3 | 30 | 30.0 |
| ZH-06-99/E | 6 | 15 | 15.0 |
| ZH-10-99/E | 10 | 10 | 10.0 |
| ZH-13-99/E | 13 | 8 | 8.0 |

Other information

| Length tolerance | ± 1.5% | |
|---------------------|--|--|
| Thickness tolerance | 3 - 6mm: ± 1.0mm | |
| | 10 - 13mm: ± 1.5mm | |
| Reaction to fire | Hazard level 2, R1 acc. to EN 45545-2 3mm sheets: HL3, R1 | |

Self-adhesive rolls (Width: 1.0m, Colour: Dark grey)

| Item | Insulation thickness | Dimension (length) | Carton content |
|------------|-------------------------|--------------------|----------------|
| | [m] | [m] | [m²] |
| ZH-03-99/E | 3 | 30 | 30.0 |
| ZH-06-99/E | 6 | 15 | 15.0 |
| ZH-10-99/E | 10 | 10 | 10.0 |
| ZH-13-99/E | 13 | 8 | 8.0 |

Other information

| Length tolerance | ± 1.5% | |
|---|--------------------|--|
| Thickness tolerance | 3 - 6mm: ± 1.0mm | |
| | 10 - 13mm: ± 1.5mm | |
| Reaction to fire Hazard level 2, R1 acc. to EN 45 3mm sheets: HL3, R1 | | |

Accessories

| Item | Carton content | Article description |
|------|----------------|--|
| | [m] | [m²] |
| | | ArmaFlex Rail ZH Tape (3mm thickness x 50mm width x 15m length) |

ARMAFLEX RAIL ZH-C

The first halogen-free, closed-cell insulation material for rail applications with the highest hazard level requirements.

- Halogen-free insulation minimises corrosive effects and smoke toxicity in the event of fire
- Resistant to UV, salt water and chemicals
- Wash-down waterproof and easy to clean
- Factory-applied, silver metallic look with reinforced coating for increased hygienic requirements
- Achieves HL2, R1 classification under EN 45545



Product range

2m length pre-covered tubes, rolls, self-adhesive rolls and tape.

Tubes (Length: 1.0m, Colour: Dark grey with silver covering) 9mm insulation thickness

| Item | Carton content | Pipe maximum outside diameter |
|------------|----------------|-------------------------------|
| | [m] | [mm] |
| ZHC-09X012 | 96 | 12 |
| ZHC-09X015 | 82 | 15 |
| ZHC-09X018 | 75 | 18 |
| ZHC-09X022 | 61 | |
| ZHC-09X028 | 45 | |
| ZHC-09X035 | 34 | 35 |
| ZHC-09X042 | 28 | 42 |

| Other | intorm | ation |
|-------|--------|-------|
|-------|--------|-------|

| Length tolerance | ± 1.5% | |
|---------------------|---------------------------------------|--|
| Thickness tolerance | 9mm ± 1.5mm | |
| Reaction to fire | Hazard level 3, R1 acc. to EN 45545-2 | |

Self-adhesive sheets, precovered

(Width: 1.0m, Colour: Dark grey with silver covering)

| Item | Insulation thickness | Dimension (length) | Carton content |
|------------|-------------------------|--------------------|----------------|
| | [m] | [m] | [m²] |
| ZHC-06MM/A | 6 | 2 | 50.0 |
| ZHC-10MM/A | 10 | 2 | 34.0 |
| ZHC-13MM/A | 13 | 2 | 24 |
| ZHC-19MM/A | 19 | 2 | 16 |
| ZHC-25MM/A | 25 | 2 | 12 |

Other information

| Length tolerance | ± 1.5% | |
|---------------------|---------------------------------------|--|
| Thickness tolerance | 6mm: ± 1.0mm | |
| | 10 - 19mm: ± 1.5mm | |
| | 25mm: ± 2.0mm | |
| Reaction to fire | Hazard level 3, R1 acc. to EN 45545-2 | |
| | | |



All data and technical information are based on results achieved under the specific conditions defined according to the testing standards referenced. It is the customer's responsibility to verify if the product is suitable for the intended application. The responsibility for professional and correct installation and compliance with relevant building regulations lies with the customer. Armacell takes every precaution to ensure the accuracy of the data provided in this document and all statements, technical information and recommendations contained within are believed to be correct at the time of publication. By ordering/everying product you accept the **Armacell General Terms and Conditions of Sale** applicable in the region.

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ABOUT ARMACELL

As the inventors of flexible foam for equipment insulation and a leading provider of engineered foams, Armacell develops innovative and safe thermal, acoustic and mechanical solutions that create sustainable value for its customers. Armacell's products significantly contribute to global energy efficiency making a difference around the world every day. With 3,100 employees and 24 production plants in 16 countries, the company operates two main businesses, Advanced Insulation and Engineered Foams. Armacell focuses on insulation materials for technical equipment, high-performance foams for high-tech and lightweight applications and next generation aerogel blanket technology.

