

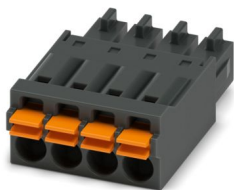
# FMC 1,5/ 4-ST-3,5 BK - PCB connector



1704999

<https://www.phoenixcontact.com/us/products/1704999>

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PCB connector, nominal cross section: 1.5 mm<sup>2</sup>, color: black, nominal current: 8 A, rated voltage (III/2): 160 V, contact surface: Sn, contact connection type: Socket, number of potentials: 4, number of rows: 1, number of positions: 4, number of connections: 4, product range: FMC 1,5/-ST, pitch: 3.5 mm, connection method: Push-in spring connection, conductor/PCB connection direction: 0 °, plug-in system: COMBICON FMC 1,5 - MCDN 1,5, locking: without, mounting method: without, type of packaging: packed in cardboard

## Your advantages

- Time saving push-in connection, tools not required
- Defined contact force ensures that contact remains stable over the long term
- Intuitive operation due to color-coded actuating push button
- Operation and conductor connection from one direction enable integration into front of device

## Commercial data

|                                      |               |
|--------------------------------------|---------------|
| Item number                          | 1704999       |
| Packing unit                         | 50 pc         |
| Minimum order quantity               | 50 pc         |
| Sales key                            | AA02          |
| Product key                          | AABFAA        |
| GTIN                                 | 4046356749244 |
| Weight per piece (including packing) | 2.44 g        |
| Weight per piece (excluding packing) | 2.18 g        |
| Customs tariff number                | 85366990      |
| Country of origin                    | DE            |

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## Technical data

### Product properties

|                       |                       |
|-----------------------|-----------------------|
| Product type          | PCB connector         |
| Product family        | FMC 1,5/..-ST         |
| Product line          | COMBICON Connectors S |
| Number of positions   | 4                     |
| Pitch                 | 3.5 mm                |
| Number of connections | 4                     |
| Number of rows        | 1                     |
| Number of potentials  | 4                     |
| Mounting type         | without               |

### Electrical properties

#### Properties

|                             |                |
|-----------------------------|----------------|
| Nominal current $I_N$       | 8 A            |
| Nominal voltage $U_N$       | 160 V          |
| Contact resistance          | 1.5 m $\Omega$ |
| Rated voltage (III/3)       | 160 V          |
| Rated surge voltage (III/3) | 2.5 kV         |
| Rated voltage (III/2)       | 160 V          |
| Rated surge voltage (III/2) | 2.5 kV         |
| Rated voltage (II/2)        | 320 V          |
| Rated surge voltage (II/2)  | 2.5 kV         |

### Connection data

#### Connection technology

|                         |  |
|-------------------------|--|
| Type                    | Standard   |
| Connector system        | COMBICON FMC 1,5 - MCDN 1,5<br>COMBICON FMC 1,5 - MCDN 1,5 |
| Nominal cross section   | 1.5 mm <sup>2</sup>  |
| Contact connection type | Socket   |

#### Interlock

|               |         |
|---------------|---------|
| Locking type  | without |
| Mounting type | without |

#### Conductor connection

|                                    |   |
|------------------------------------|---|
| Connection method                  | Push-in spring connection                   |
| Conductor/PCB connection direction | 0 °   |
| Conductor cross-section rigid      | 0.2 mm <sup>2</sup> ... 1.5 mm <sup>2</sup> |
| Conductor cross-section flexible   | 0.2 mm <sup>2</sup> ... 1.5 mm <sup>2</sup> |
| Conductor cross-section AWG        | 24 ... 16                                   |

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|   |   |
|---|---|
| Conductor cross-section, flexible, with ferrule, without plastic sleeve | 0.25 mm <sup>2</sup> ... 1.5 mm <sup>2</sup>  |
| Conductor cross-section, flexible, with ferrule, with plastic sleeve    | 0.14 mm <sup>2</sup> ... 0.75 mm <sup>2</sup> |
| Cylindrical gauge a x b / diameter                                      | 2.4 mm x 1.5 mm / 1.6 mm                      |
| Stripping length  | 10 mm   |

## Specifications for ferrules without insulating collar

|  |  |
|--|--|
| recommended crimping tool                                    | 1212034 CRIMPFOX 6   |
| ferrules without insulating collar, according to DIN 46228-1 | Cross section: 0.25 mm <sup>2</sup> ; Length: 7 mm           |
|  | Cross section: 0.34 mm <sup>2</sup> ; Length: 7 mm           |
|  | Cross section: 0.5 mm <sup>2</sup> ; Length: 8 mm ... 10 mm  |
|  | Cross section: 0.75 mm <sup>2</sup> ; Length: 8 mm ... 10 mm |
|  | Cross section: 1 mm <sup>2</sup> ; Length: 8 mm ... 10 mm    |
|  | Cross section: 1.5 mm <sup>2</sup> ; Length: 10 mm           |

## Specifications for ferrules with insulating collar

|   |  |
|---|--|
| recommended crimping tool                                 | 1212034 CRIMPFOX 6   |
| ferrules with insulating collar, according to DIN 46228-4 | Cross section: 0.14 mm <sup>2</sup> ; Length: 8 mm           |
|   | Cross section: 0.25 mm <sup>2</sup> ; Length: 8 mm ... 10 mm |
|   | Cross section: 0.34 mm <sup>2</sup> ; Length: 8 mm ... 10 mm |
|   | Cross section: 0.5 mm <sup>2</sup> ; Length: 8 mm ... 10 mm  |
|   | Cross section: 0.75 mm <sup>2</sup> ; Length: 10 mm          |

## Material specifications

### Material data - contact

|  |  |
|--|--|
| Note                                     | WEEE/RoHS-compliant, free of whiskers according to IEC 60068-2-82/JEDEC JESD 201 |
| Contact material                         | Cu alloy   |
| Surface characteristics                  | hot-dip tin-plated   |
| Metal surface terminal point (top layer) | Tin (4 µm - 8 µm Sn)   |
| Metal surface contact area (top layer)   | Tin (4 µm - 8 µm Sn)   |

### Material data - housing

|   |              |
|---|--------------|
| Color (Housing)   | black (9005) |
| Insulating material   | PA           |
| Insulating material group   | I            |
| CTI according to IEC 60112  | 600          |
| Flammability rating according to UL 94                            | V0           |
| Glow wire flammability index GWFI according to EN 60695-2-12      | 850          |
| Glow wire ignition temperature GWIT according to EN 60695-2-13    | 775          |
| Temperature for the ball pressure test according to EN 60695-10-2 | 125 °C       |

### Material data – actuating element

|                           |               |
|---------------------------|---------------|
| Color (Actuating element) | orange (2003) |
|---------------------------|---------------|

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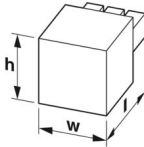


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|  |      |
|--|------|
| Insulating material                    | PBT  |
| Insulating material group              | IIIa |
| CTI according to IEC 60112             | 275  |
| Flammability rating according to UL 94 | V0   |

## Dimensions

|                     |  |
|---------------------|--|
| Dimensional drawing |  |
| Pitch               | 3.5 mm   |
| Width [w]           | 14.75 mm   |
| Height [h]          | 7.75 mm  |
| Length [l]          | 22.9 mm  |

## Mechanical tests

### Conductor connection

|               |                     |
|---------------|---------------------|
| Specification | IEC 60999-1:1999-11 |
| Result        | Test passed         |

### Test for conductor damage and slackening

|               |                     |
|---------------|---------------------|
| Specification | IEC 60999-1:1999-11 |
| Result        | Test passed         |

### Repeated connection and disconnection

|               |                     |
|---------------|---------------------|
| Specification | IEC 60999-1:1999-11 |
| Result        | Test passed         |

### Pull-out test

|   |   |
|---|---|
| Specification   | IEC 60999-1:1999-11                     |
| Conductor cross-section/conductor type/tractive force setpoint/actual value | 0.2 mm <sup>2</sup> / solid / > 10 N    |
|   | 0.2 mm <sup>2</sup> / flexible / > 10 N |
|   | 1.5 mm <sup>2</sup> / solid / > 40 N    |
|   | 1.5 mm <sup>2</sup> / flexible / > 40 N |

### Insertion and withdrawal forces

|                                     |                        |
|-------------------------------------|------------------------|
| Specification                       | IEC 60512-13-2:2006-02 |
| Result                              | Test passed            |
| No. of cycles                       | 25                     |
| Insertion strength per pos. approx. | 8 N                    |
| Withdraw strength per pos. approx.  | 6 N                    |

### Resistance of inscriptions

|               |                        |
|---------------|------------------------|
| Specification | IEC 60068-2-70:1995-12 |
|---------------|------------------------|

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|                         |                        |
|-------------------------|------------------------|
| Result                  | Test passed            |
| Polarization and coding |                        |
| Specification           | IEC 60512-13-5:2006-02 |
| Result                  | Test passed            |
| Visual inspection       |                        |
| Specification           | IEC 60512-1-1:2002-02  |
| Result                  | Test passed            |
| Dimension check         |                        |
| Specification           | IEC 60512-1-2:2002-02  |
| Result                  | Test passed            |

## Environmental and real-life conditions

### Durability test

|  |                       |
|--|-----------------------|
| Specification                                | IEC 60512-9-1:2010-03 |
| Impulse withstand voltage at sea level       | 2.95 kV               |
| Contact resistance $R_1$                     | 1.5 m $\Omega$        |
| Contact resistance $R_2$                     | 1.6 m $\Omega$        |
| Insertion/withdrawal cycles                  | 25                    |
| Insulation resistance, neighboring positions | > 5 M $\Omega$        |

### Climatic test

|                                   |   |
|-----------------------------------|---|
| Specification                     | ISO 6988:1985-02  |
| Corrosive stress                  | 0.2 dm <sup>3</sup> SO <sub>2</sub> on 300 dm <sup>3</sup> /40 °C/1 cycle |
| Thermal stress                    | 100 °C/168 h  |
| Power-frequency withstand voltage | 1.39 kV   |

### Vibration test

|                        |                             |
|------------------------|-----------------------------|
| Specification          | IEC 60068-2-6:2007-12       |
| Frequency              | 10 - 150 - 10 Hz            |
| Sweep speed            | 1 octave/min                |
| Amplitude              | 0.35 mm (10 Hz ... 60.1 Hz) |
| Acceleration           | 5g (60.1 Hz ... 150 Hz)     |
| Test duration per axis | 2.5 h                       |
| Test directions        | X-, Y- and Z-axis           |

### Ambient conditions

|   |   |
|---|---|
| Ambient temperature (storage/transport) | -40 °C ... 70 °C                                    |
| Relative humidity (storage/transport)   | 30 % ... 70 %                                       |
| Ambient temperature (assembly)          | -5 °C ... 100 °C                                    |
| Ambient temperature (operation)         | -40 °C ... 100 °C (dependent on the derating curve) |

## Electrical tests

### Thermal test | Test group C

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|                            |                       |
|----------------------------|-----------------------|
| Specification              | IEC 60512-5-1:2002-02 |
| Tested number of positions | 20                    |

## Insulation resistance

|  |                       |
|--|-----------------------|
| Specification                                | IEC 60512-3-1:2002-02 |
| Insulation resistance, neighboring positions | > 5 MΩ                |

## Air clearances and creepage distances |

|  |                     |
|--|---------------------|
| Specification  | IEC 60664-1:2007-04 |
| Insulating material group                              | I                   |
| Comparative tracking index (IEC 60112)                 | CTI 600             |
| Rated insulation voltage (III/3)                       | 160 V               |
| Rated surge voltage (III/3)                            | 2.5 kV              |
| minimum clearance value - non-homogenous field (III/3) | 1.5 mm              |
| minimum creepage distance (III/3)                      | 2 mm                |
| Rated insulation voltage (III/2)                       | 160 V               |
| Rated surge voltage (III/2)                            | 2.5 kV              |
| minimum clearance value - non-homogenous field (III/2) | 1.5 mm              |
| minimum creepage distance (III/2)                      | 1.5 mm              |
| Rated insulation voltage (II/2)                        | 320 V               |
| Rated surge voltage (II/2)                             | 2.5 kV              |
| minimum clearance value - non-homogenous field (II/2)  | 1.5 mm              |
| minimum creepage distance (II/2)                       | 1.6 mm              |

## Packaging specifications

|                   |                     |
|-------------------|---------------------|
| Type of packaging | packed in cardboard |
|-------------------|---------------------|

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## Drawings



Type: FMC 1,5/...-ST-3,5 with MCV 1,5/...-G-3,5



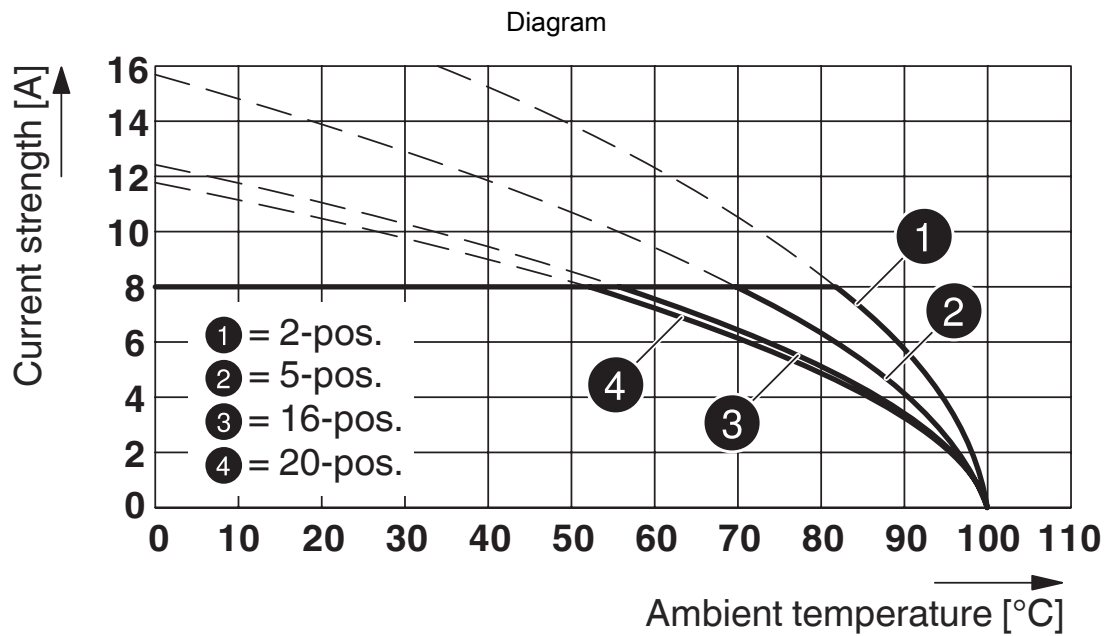
Type: FMC 1,5/...-ST-3,5 with MCV 1,5/...-G-3,5 P... THR

# FMC 1,5/ 4-ST-3,5 BK - PCB connector

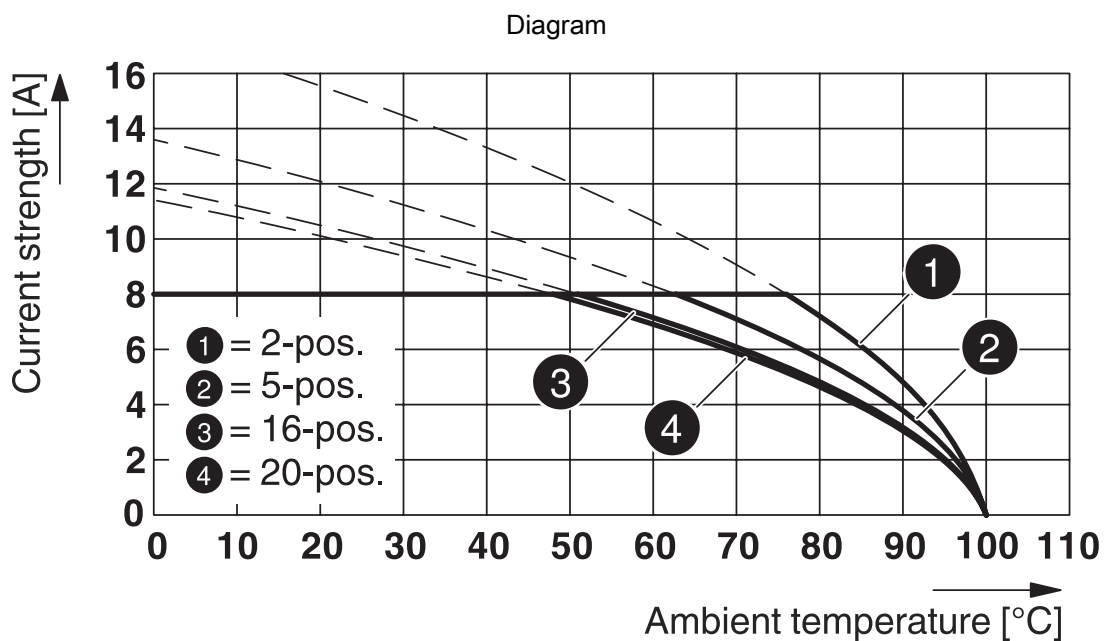


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Type: FMC 1,5/...-ST-3,5 with MCDNV 1,5/...-G1-3,5 P...THR



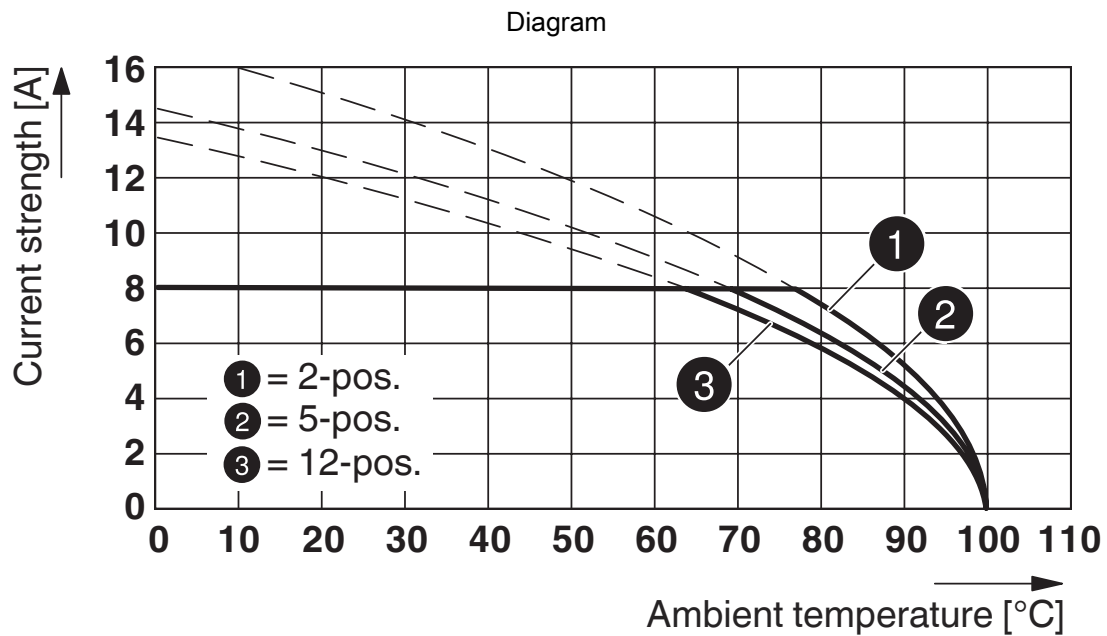
Type: FMC 1,5/...-ST-3,5 with MCDN 1,5/...-G1-3,5 P26THR

# FMC 1,5/ 4-ST-3,5 BK - PCB connector

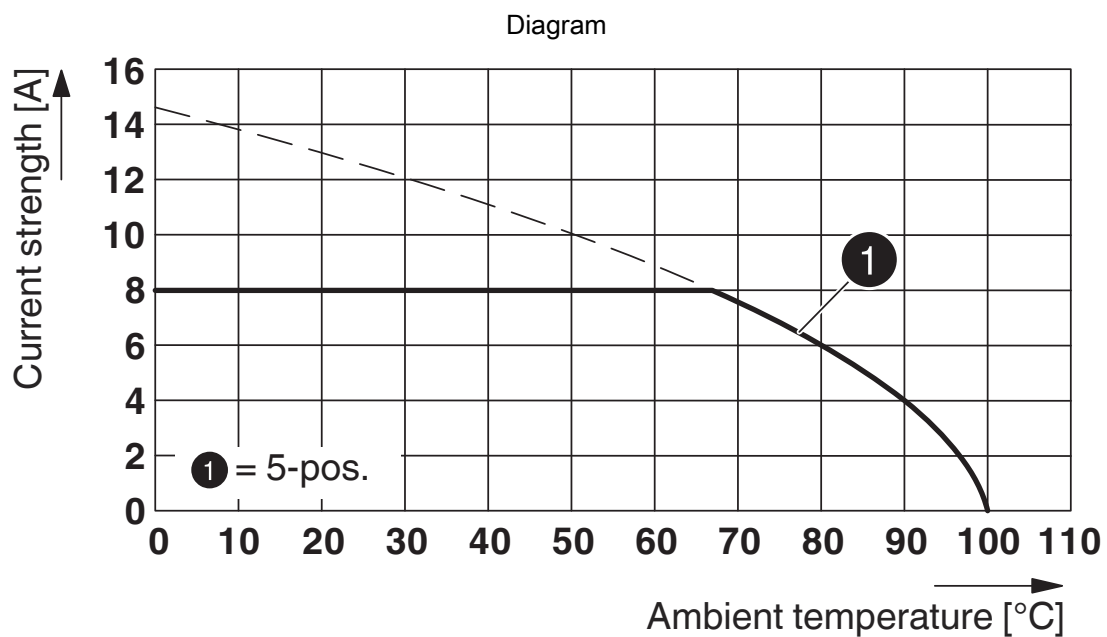


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Type: FMC 1,5/...-ST-3,5 with IFMC 1,5/...-ST-3,5



Type: FMC 1,5/...-ST-3,5 with MCD 1,5/...-G3-3,5 P26 THR MAG

# FMC 1,5/ 4-ST-3,5 BK - PCB connector



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Type: FMC 1.5/...-ST-3.5 with MCO 1.5/...-G1L-3.5 KMGY



Type: FMC 1,5/...-ST-3,5 with MC 1,5/...-G-3,5 P... THR

# FMC 1,5/ 4-ST-3,5 BK - PCB connector



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Type: FMC 1,5/...-ST-3,5 with MCV 1,5/...-G-3,5 THT

# FMC 1,5/ 4-ST-3,5 BK - PCB connector




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## Approvals

To download certificates, visit the product detail page: <https://www.phoenixcontact.com/us/products/1704999>

|  <b>cULus Recognized</b><br>Approval ID: E60425-19920306 |       | Nominal voltage $U_N$ | Nominal current $I_N$ | Cross section AWG | Cross section $\text{mm}^2$ |
|---|-------|-----------------------|-----------------------|-------------------|-----------------------------|
| <b>B</b>  |       |                       |                       |                   |                             |
| Field wiring  | 150 V | 8 A                   | 24 - 16               | -                 |                             |
| <b>C</b>  |       |                       |                       |                   |                             |
| Factory wiring  | 50 V  | 8 A                   | 24 - 16               | -                 |                             |

 **VDE approval of drawings**  
Approval ID: 40011723

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Approval ID: 40011723

# FMC 1,5/ 4-ST-3,5 BK - PCB connector



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## Classifications

### ECLASS

|             |          |
|-------------|----------|
| ECLASS-13.0 | 27460202 |
| ECLASS-15.0 | 27460202 |

### ETIM

|           |          |
|-----------|----------|
| ETIM 10.0 | EC002638 |
|-----------|----------|

### UNSPSC

|             |          |
|-------------|----------|
| UNSPSC 21.0 | 39121400 |
|-------------|----------|

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## Environmental product compliance

### EU RoHS

|   |                    |
|---|--------------------|
| Fulfills EU RoHS substance requirements | Yes, No exemptions |
|---|--------------------|

### China RoHS

|  |  |
|--|--|
| Environment friendly use period (EFUP) | EFUP-E                                   |
|  | No hazardous substances above the limits |

### EU REACH SVHC

|                                     |                            |
|-------------------------------------|----------------------------|
| REACH candidate substance (CAS No.) | No substance above 0.1 wt% |
|-------------------------------------|----------------------------|

### EF3.1 Climate Change

|         |               |
|---------|---------------|
| CO2e kg | 0.052 kg CO2e |
|---------|---------------|

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