

Risk Analysis for Connecting Cables for Electrical Accessories in Motor Vehicles in Accordance with the General Product Safety Regulation (GPSR)

1. Product Description

Product: Connecting cables for electrical accessories in motor vehicles

Application Area: Vehicles with operating voltages of 12 or 24 volts

Restrictions:

- Use only in vehicle interiors, protected from moisture
- Must be mechanically secured during installation
- For designated use only

Manufacturer: Ampire Electronics GmbH & Co.KG

Location: Langwadener Straße 60, 41516 Grevenbroich, Germany

2. Identification and Assessment of Hazards

Hazards are identified based on mechanical, electrical, chemical risks, and other relevant factors.

2.1 Mechanical Hazards

- **Improper Installation:** Can damage insulation and expose conductors.
 - **Risk:** Short circuits or fire hazards.
 - **Assessment:** High, particularly with unprotected installation.
- **Crushing or Abrasion:** Cables may be mechanically damaged if not properly secured or subjected to vehicle motion.
 - **Risk:** Loss of electrical functionality or ignition hazard.
 - **Assessment:** Medium to high.

2.2 Electrical Hazards

- **Short Circuits from Contact with Conductive Parts:** Damaged insulation may cause hazardous current flows.
 - **Risk:** Vehicle fires or functional failures.
 - **Assessment:** High.
- **Overheating:** Improper current loads due to incorrect cable cross-sections or poor connections.
 - **Risk:** Fire hazards.
 - **Assessment:** Medium to high.

2.3 Chemical Hazards

- **Emission of Toxic Gases:** Melting insulation in the event of a fire may release harmful gases.
 - **Risk:** Health hazards for vehicle occupants.
 - **Assessment:** Medium.

2.4 Other Hazards

- **Use Outside the Intended Application Area:** Installation outside the vehicle may lead to moisture ingress and corrosion.
 - **Risk:** Short circuits, loss of functionality.
 - **Assessment:** High.
 - **Improper Installation by Non-professionals:** Risk of faulty installations.
 - **Assessment:** Medium to high.
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3. Analysis of Potential Risks

Intended Use:

- Installation within the vehicle interior, protected from mechanical and chemical influences.
- Compliance with maximum current loads.

Foreseeable Misuse:

- Installation in exterior or damp areas.
- Overloading due to inappropriate appliances.
- Improper routing in areas subject to high mechanical stress.

Risk Analysis:

- Risks are manageable if the product is used as intended.
 - Foreseeable misuse presents significant safety risks, which must be mitigated through proper labeling and user information.
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4. Requirements and Standards under GPSR

4.1 Labeling

- Clear information on usage, maximum current load, and usage limitations.
- Warnings about risks associated with improper use.
- CE marking, where applicable, to confirm compliance.

4.2 Traceability

- Manufacturer details (name, address) must be clearly stated on the product or packaging.
- Serial number or production batch for traceability in case of recalls.

4.3 Safety Documentation

- Provision of user manuals with installation instructions and warnings.
 - Risk assessment and technical documentation proving compliance with harmonized standards (e.g., EN 60598 for electrical safety).
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5. Assessment of Compliance with EU Harmonization Legislation

The connecting cables must meet the requirements of the following directives and standards:

- **Low Voltage Directive (2014/35/EU):** Testing for electrical safety.
 - **EMC Directive (2014/30/EU):** Protection from electromagnetic interference.
 - **RoHS Directive (2011/65/EU):** Compliance with restrictions on hazardous substances.
 - **REACH Regulation:** Safety of chemical materials.
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6. Risk Mitigation Measures

1. Design Measures:

- Use of high-strength, abrasion-resistant materials for cable insulation.
- Additional protective sheathing for areas subject to mechanical stress.

2. Labeling and Information:

- Clear warnings on packaging and the product itself.
- Manuals with detailed installation instructions and safety recommendations.

3. Product Testing and Certification:

- Conducting tests for electrical and mechanical safety.
- Certification in accordance with relevant standards.

4. Traceability:

- Implementation of a system to track production batches.
- Contact option for end users in case of inquiries or issues.

5. Lifecycle Monitoring:

- Market monitoring and regular risk analyses based on consumer feedback.
 - Recall actions in case of safety defects.
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7. Recommendations for GPSR Compliance

1. **Development and Manufacturing:** Ensure compliance with relevant standards and conduct appropriate testing.
2. **Distribution:** Provide clear and comprehensive user information.
3. **Documentation:** Prepare and maintain technical documents that demonstrate product safety and compliance.
4. **Monitoring:** Establish a system for continuous market surveillance and take necessary actions as required.

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