Studer Cables
Connected to HARTING

# **BETA**trans® Hybrid Solutions

## Unique, Flexible, and Reliable – Even in Fixed Installations

Modern rail vehicles, electric buses, and other vehicles are expected to provide comfortable, sustainable travel and advanced communication without compromising safety. However, the increase in cables contradicts the demand for sustainability. Our weight- and space-optimized **BETA**trans® HYBRID cables combine various cable types into one, solving this problem.

Our customer-specific flexible, mobile, and hybrid cables are ideal for applications with continuous bending and limited torsional stress inside and outside rail vehicles, electric buses, and other vehicles. With optimized diameters, they are suitable for tight spaces, such as in traction motors, converters, switchgear, and auxiliary systems, as well as for special applications in bogies, car transitions, underframes, and module installations.

In our in-house testing laboratory, we use state-of-the-art equipment to test requirements according to current standards and regulations and to simulate movement profiles together with our partners.

Thanks to our specially developed compounds and electron beam crosslinking, our hybrid combinations meet the highest fire and smoke standard EN 45545 HL3 (Hazard Level). This ensures maximum protection in the event of a fire. Avoid costly failures by choosing durable, reliable, and sustainable products from Studer Cables AG.

swiss made

**Vehicle manufacturers opt for hybrid solutions when they face the following challenges:**

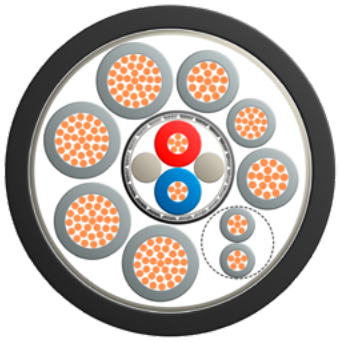
- Limited space
- Weight restrictions
- Cable conduits that need to be sealed
- Cable conduits prone to condensation
- Underframe and module installations
- Dynamic and flexible cable design
- Compliance with standard EN 45545-2 HL3

Rely on our expertise, experience, and products for the railway industry and related fields. Thanks to our extensive in-house production in Swiss quality, we can flexibly respond to individual customer needs. **Studer Cables stands for customized cable solutions and innovative products.**

Choose our products to ensure a safe, future-oriented, and sustainable connection for your rail vehicles, electric buses, and other vehicles.

For maximum product safety and quality, we rely on state-of-the-art production facilities and continuously develop innovative polymer plastics in our laboratories. This allows us to achieve superior insulation properties, higher temperature tolerances, longer lifespan, easy handling, and additional safety features.

Studer Cables is your partner for customized, sustainable, durable, and reliable hybrid cable solutions. Our engineering provides quality in consulting, calculations, design, concepts, simulation, and testing.



Example of a hybrid cable: **BETA**trans® UIC flex 11-core

## Hybrid cables (examples of custom designs)

| | Design | Certification |
|---|---|---|
| **BETA**trans® GKW-ENX flex R FM UV | 2x(5x1,5mm²) + 6x(1x1,5mm²) + 2x(4xAWG22)C 100 Ω CAT 5/5e + 1x(4x0,75mm²)C + 2x(2x1,5mm²)C | EN 45545-2 HL3 / EN 50264-1 / EN 50306-1 |
| **BETA**trans® GKW-ENX flex R FM UV | 3x(6x1,5mm²) + 1x(4x(2XAWG 26/7)St)C 100 Ω CAT 7 + 1x(4x0,5mm²)C + 120 Ω MVB + 2x(2x0,5 mm² + 1x0,5mm²)C 120 Ω MVB | EN 45545-2 HL3 / EN 50264-1 / EN 50306-1 |
| **BETA**trans® 3 GKW-ENX flex FM | 36x1,5mm² + 2x(2x1,5mm²)C | EN 45545-2 HL3 / EN 50264-1 / EN 50306-1 |
| **BETA**trans® DATA-ENX flex FM | 2x(4x0,5mm²)C 120 Ohm + 2x(2x2x0,5mm²)C + 100 Ω + 4x(2x2x0,5 mm²)C 120 Ω | EN 45545-2 HL3 / EN 50264-1 / EN 50306-1 |
| **BETA**trans® UIC-ENX C-flex FM | 4 X 4 X 1,0 mm² NR + 1 X (2 X 0,75 mm²)C 120 Ω WTB | EN 45545-2 HL3 / EN 50264-1 / EN 50306-1 |

Further information can be found in our datasheets on our website:
**https://studercables.com/en/products/**



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