

Design new housing for the LoviX®

03-06-2025

Location: Terborg, Gelderland
 Internship type: Graduation
 Education: HBO/WO Mechanical engineering of Industrial Product Design
 Period: 4 – 6 - 9 months

Lovink Enertech

Lovink Enertech is part of Royal Lovink Industries BV and operates internationally, serving customers both within and outside Europe. Our key clients include energy companies, industrial firms, contractors, and installation companies. We specialise in the development, production, and supply of innovative and reliable cable accessories. Our product range includes cable joints and terminations for medium-voltage cables up to 36 kV. For over 100 years, our high-quality products have contributed to the reliability of electricity networks.

To ensure the quality of power networks, we invest heavily in product development and engineering. Lovink Enertech is equipped with extensive and modern testing facilities, including an electrical laboratory, materials laboratory, and an outdoor test site.

The Engineering & Development department is responsible for developing new products as well as optimising and maintaining our existing product portfolio. Our development projects have a strong external focus, with close collaboration with customers being essential. Additionally, we recognise that we cannot and do not wish to do everything on our own. Therefore, we continuously seek and maintain partnerships with universities, universities of applied sciences, research institutes, and suppliers.

LoviX®-R Cable joint

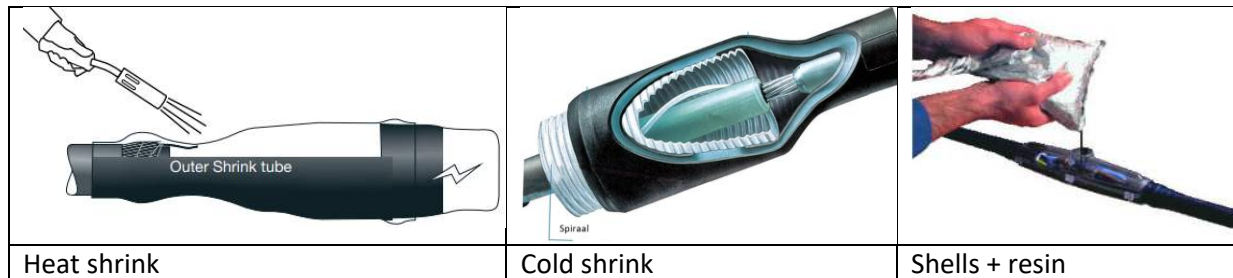


The LoviX®-R cable joint is primarily used as a straight through joint, meaning it connects two single-core polymeric cables. The LoviX® product family consists of various housings, each designed to accommodate a specific cable range.

Installation of the LoviX® cable joint begins with connecting the cables using a mechanical connector. A silicone cold-shrink body is then applied over the connection to ensure the electrical functionality of the joint. The cable screens are interconnected using a grounding braid. Finally, the joint is enclosed in an ABS housing, which is filled with Protolin®, a two-component casting resin. The resin provides mechanical protection and ensures a water- and moisture-tight seal, safeguarding the electrical connection.

Different technologies for sealing a cable joint

In the world of cable joints, there are roughly three technologies used to protect the connection from external influences—particularly moisture. These are heat shrink, cold shrink, and sealing using resin. Lovink applies the latter method.



With heat shrink technology, a heat shrink tube is placed around the connection and then shrunk using an open flame to create a water- and moisture-tight seal. A cold shrink solution consists of a pre-stretched shrink tube placed on a spiral core. The seal is achieved by positioning the tube over the connection and allowing it to shrink once the spiral is removed. In the third technology, two-part shells are mounted around the connection and then filled with casting resin.

We observe that shrink technologies have various drawbacks, particularly in terms of seal robustness and ease of installation. In addition, there is a growing trend among customers to move away from resin-based solutions—sometimes due to safety concerns, and other times due to the perception of it being an 'old-fashioned' technology. The market need is shifting towards a user-friendly, watertight sealing or housing solution that differs from the existing technologies.

The objective of this design assignment is to develop a sealing solution that differs from the conventional technologies currently used in the medium-voltage cable joint market. Specifically, the focus is on creating a (resin-free) housing for our new product range, the LoviX®-R.

Assignment

The assignment is to design a new sealing concept or housing for the LoviX® product family, which deviates from the standard technologies commonly used in the medium-voltage market. The design must be capable of sealing a range of cables in line with the specifications of the individual cable joint.

Lovink products are characterised by their ease of installation. A clear definition of installation-friendliness is available from Lovink and should be used as a guideline in the design process. Additionally, attention must be paid to Corporate Social Responsibility (CSR) aspects, for example by applying the LiDS wheel (a Life Cycle Assessment model). Finally, the design must take manufacturability and cost efficiency into account.

Results

- Documented design, including (SolidWorks) drawings
- Theoretical justification of the design with relevant calculations, e.g. external pressure, material ageing effects, thermal expansion, permeation, etc.
- Functional validation of the design
- Assessment of installation-friendliness, preferably supported by a prototype
- Explanation of CSR aspects of the design, for example using the LiDS wheel