

Product Novelty
- IP rights granted -

Charge line cooling by means of cooling sleeve

Faster charging thanks to cool cable

Problem description:

In order to achieve a high acceptance of electric vehicles, short charging times are an important component. For this reason, charging systems are constantly being further developed and made more efficient.

However, energy transmission is associated with unavoidable losses, which lead to heating of the components through which current flows, such as the battery and cables. To avoid damage, countermeasures must be taken, such as active cooling of the battery or limiting the charging power at high temperatures.

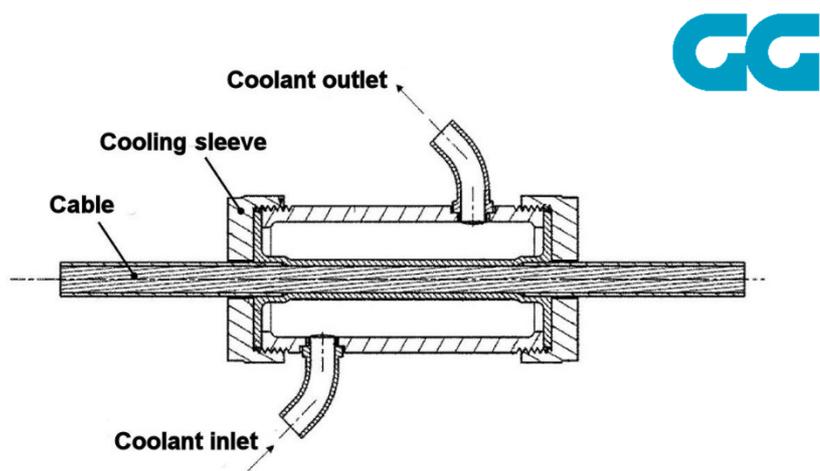
On the cable side, the high charging power and temperatures to be expected are compensated for by increased cross-sections and the associated reduction in resistivity. However, the resulting increased weight and higher stiffness of the cables is a disadvantage. The larger installation space required also makes it more difficult to accommodate the cables in the vehicle. Connectors specified by the vehicle manufacturer, which only permit a limited cross-section range, place additional limits on the method.

This means that existing compensation measures cannot be used indefinitely without having to make significant adjustments to the design of the vehicles. In addition, the increased weight leads to a reduction in the range.

When designing the cables, therefore, an attempt is made to use the smallest possible cross-section.

The new solution:

In order to permit the use of small cross-sections even at high transmission energies, the invention presented here is aimed at active cooling of the charging cables installed in the vehicle. For this purpose, a sleeve is slipped over the cable, which has a liquid flowing through it. To prevent direct contact between the line and the liquid, a sleeve surrounds the line. To improve heat transfer while keeping weight low, it is made of a plastic that conducts heat well.



The design of the invention allows free placement along the cable. Thus, it can be fixed in places of particular heat generation, such as in the connector area. Even an integration of the plug into the sleeve is a possibility. The low connector temperatures required to protect the user can thus be maintained even at higher cable temperatures.

Licensee / property right buyer wanted!

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A special advantage results from integrating the cooling sleeve into an existing cooling circuit. Concerns about an inadmissible additional load on the existing cooling infrastructure can be eliminated. Due to the compact design of the invention, it can be assumed that an insignificant amount of coolant is required.

Thus, the invention can be used in a cost- and resource-efficient manner without having to make major adaptations to the vehicle.



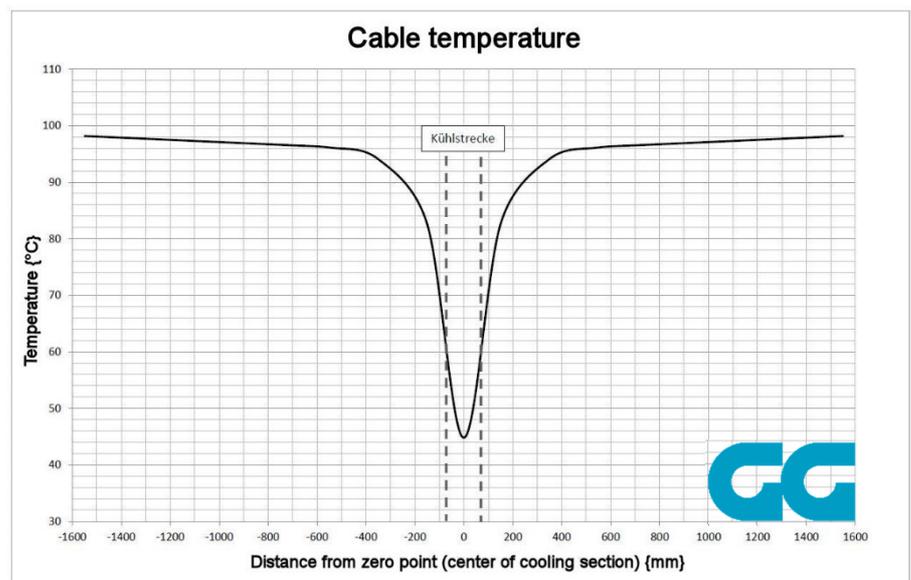
Experimental setup

Advantages of the invention:

- Higher charging power possible with the same cross-section
- Efficient cooling of cables in the vicinity of heat sources (e.g. plug area, catalytic converters in hybrid vehicles)

Possible applications:

- Charging cables
- Traction cables



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⇒ **Innovative process with unique selling propositions, patent protected**

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