



Add value.
Inspire trust.

LED Retrofit Headlamp Light Sources

Ensure legal access to the German
automotive market



Your challenges

Before September 2020, the Kraftfahrt-Bundesamt (Federal Motor Transport Authority) did not permit the replacement of vehicle headlamps with LED retrofit light sources for driving beams and passing beams in Germany, as the appropriate homologation guidelines did not exist. Consequently, vehicle owners could not modify their old halogen lamps with LEDs and manufacturers were unable to sell LED retrofits for vehicles registered on German public roads.

The advantages of headlamps equipped with LED retrofit

According to a study by the Allgemeiner Deutscher Automobil-Club (ADAC), retrofitting car headlights with LEDs offers a road traffic safety gain. This is because retrofitted LED headlights are more durable, have a longer beam range and their white light improves contrast.

Overall, LEDs have been proven to increase driver safety through improved visibility and earlier detection of road

hazards. Other advantages include:

- Near-daylight luminescence for improved visibility
- Quicker response time to 100% light
- Highly resistant to vibration and shock
- Longer lifetime
- Higher efficiency (lm/W), fewer CO₂ emissions and more environmentally friendly

Why is retrofitted LED headlamp light source testing and compliance important?

All external light sources on a vehicle, such as headlights or brake lights, are considered “technical lighting equipment” and must be type approved. Any subsequent modifications to the type-approved lighting equipment will have an impact on the type approval of the entire vehicle, and result in the loss of the operating licence for public roads.

It is therefore essential that any LED updates made to headlamps are installed correctly, do not disadvantage other road users and meet current safety requirements.

To gain permission for public roads, retrofitted LED headlamp light sources must be tested according to a defined testing procedure to achieve type approval.

How can we help you?

In collaboration with the Kraftfahrt-Bundesamt, TÜV SÜD has developed the first LED retrofit test requirements and procedures in Germany. For the first time, LEDs can be safely installed in headlamps on used vehicles, allowing these retrofitted vehicles to be registered on German roads.

To obtain the general type approval (Allgemeine Bauartgenehmigung) for the illuminant, independent tests must be carried out for each individual headlamp type. We can support manufacturers to meet those testing requirements, so their LED headlamps achieve German market approval.

Our LED retrofit services for headlamp light sources

TÜV SÜD can support you throughout the defined testing procedure for the type approval of LED retrofits:

- **Photometric measurements** – to ensure ECE regulation compliance.
- **Vehicle fitting tests** – to ensure the LED headlamp light source retrofits are correctly installed.
- **Organisation of all necessary test vehicles** – that are not provided by the LED manufacturer.
- **Application range development** – that is specific to your LED retrofit and individual vehicle programme.
- **LED retrofit approval support** – by providing a comprehensive test report to the Kraftfahrt-Bundesamt.

Your business benefits

- **Increase profitability** – by working with our Technical Service team, who developed Germany's first LED retrofit testing procedure and have an unmatched understanding of gaining German market approval for your LED retrofits.
- **Gain a competitive edge** – by increasing customer trust that your LED retrofits are safe and approved for public road use.
- **Benefit from our technical expertise** – as a neutral third-party organisation with over a century of automotive testing experience, we have strong relationships with regulatory authorities and are always up to date with the latest automotive regulations.

Why choose TÜV SÜD?

In collaboration with the German Kraftfahrt-Bundesamt, TÜV SÜD created Germany's first test procedure for the homologation of LED retrofits for headlamp light sources, and the first general type approval (Allgemeine Bauartgenehmigung (ABG)) was granted to TÜV SÜD's test procedure on 25 September 2020.

As we developed Germany's first approved testing procedure, our experts' in-depth understanding of the testing criteria ensures seamless communication with the Kraftfahrt-Bundesamt, so that all relevant information for type approval of your retrofitted LED headlamp light sources for the German market is provided. Our next focus will be to develop test requirements and procedures for the homologation of LED retrofits for other lighting components.

Add value. Inspire trust.

TÜV SÜD is a trusted partner of choice for safety, security and sustainability solutions. It specialises in testing, certification, auditing and advisory services. Through more than 25,000 employees across over 1,000 locations, the company adds value to customers and partners by enabling market access and managing risks. By anticipating technological developments and facilitating change, TÜV SÜD inspires trust in a physical and digital world to create a safer and more sustainable future.

Related services

TÜV SÜD provides the following related services:

- Homologation for other lighting devices (complete headlamps, taillights, bicycle lights, etc.)
- Electromagnetic compatibility testing (EMC)
- Automotive component testing and compliance services