THE SAFE ALTERNATIVE – LIGHT BULBS FROM HELLA

As the expert and technological leader in smart light distribution systems, halogen, xenon and full LED headlamps, and as a partner to renowned vehicle manufacturers throughout the world, HELLA always meets the highest expectations and quality standards in agriculture and forestry.

These are the specific standards we apply to our extensive range of light bulbs: Product diversity—from traditional halogen lights all the way to efficient xenon light—leading technology with rigorously tested quality without any compromises and optimum light output levels, even in the harshest weather conditions.

This ensures that our long-lasting, robust products not only prevent annoying and costly standstill time, but are also significantly safer. To brighten up your work day.
Good visibility is the most important criterion for road safety. Various circumstances can impair this visibility, including twilight, adverse weather conditions, dirty windshields, etc. The risk of accidents is comparatively high under these kinds of driving conditions.

Changing and continually increasing mobility and traffic density also contribute to a higher risk. To meet these challenges successfully, we are constantly working towards improving existing lighting systems as well as developing new technical lighting equipment.

Here is a summary of the most important basic terms in lighting technology and the respective units of measure for lamp and light evaluation.

**Luminous flux \( \Phi \)**
- Unit: lumen [\( \text{lm} \)]
- Luminous flux \( F \) is the term used to describe the complete luminous efficacy radiated from a light source.

**Luminous intensity \( I \)**
- Unit: candela [\( \text{cd} \)]
- This is the portion of the luminous flux radiating in a specific direction.

**Illuminance \( E \)**
- Unit: lux [\( \text{lx} \)]
- Illuminance \( E \) specifies the incident luminous flux per unit of illuminated area. Illuminance is 1 lx when a luminous flux of 1 lm strikes an area of 1 m².

**Luminance \( L \)**
- Unit: candela per square meter [\( \text{cd/m}^2 \)]
- Luminance \( L \) is the amount of brightness detected by the eye from a luminous or illuminated surface.

**Luminous efficacy \( \eta \)**
- Unit: lumen per watt [\( \text{lm/W} \)]
- Luminous efficacy \( \eta \) specifies how efficiently consumed electrical power is converted into light.

**Light sources**
- Light sources are thermal radiators that produce light through heat energy. This means the more a light source is heated, the higher its luminous intensity will be.
COLOR SPECTRUM SHOWING TYPICAL COLOR TEMPERATURES

The color temperature of light sources is measured in kelvin (symbol K). Color temperatures over 4,000 K are called ‘cold’ colors (bluish white), while lower temperatures (yellowish to reddish) are considered ‘warm’.

The higher the color temperature of a light source, the higher the proportion of blue in its color spectrum (see image below). An incandescent bulb has a warm white color temperature of approx. 2700 K. The following image depicts the color temperature spectrum.
All HELLA bulbs undergo thorough testing. The engineers in Hella’s Quality Assurance department have specified a clear requirement profile for every bulb type.

Headlamp bulbs, for example, are stringently tested by our engineers for their light distribution properties. The very latest in light measuring equipment is used for this.

Paint adhesion tests compliant with FAKRA guidelines (German Association of Automotive Experts), vibration and shock tests in line with IEC requirements, geometric measurements, light flux and efficacy measurements, plus endurance tests guarantee that wholesalers and garages receive perfect quality.

**Quality assurance is very important to us**
Ensuring you and your customers are satisfied. This is why HELLA’s quality assurance engineers carry out exhaustive testing of all our bulbs to ensure their high quality.

And it is thanks to these extensive tests and our OE lighting expertise that you can rely on our guaranteed quality standard.

**The results of consistent quality testing**
Renowned vehicle manufacturers have been relying on our technological innovations and trusting HELLA’s expertise, experience and quality for years.
Geometrical measurement
A measuring projector is used to check the filament geometry for compliance with the statutory standards stipulated in IEC 60810. The filament must be dimensioned and positioned within the bulb as specified in the standard. This is the only way to achieve optimum headlamp power and prevent glare to oncoming traffic.

Vibration and shock test
Here, vibration resistance of the bulbs and the filament in particular is tested on an electro-dynamic vibration table.

Paint adhesion test
The adhesion of paint on colored glass bulbs—such as the PY21W—is tested in a climate chamber at different temperatures and air humidity levels. Optimum adhesion of glass bulb paint guarantees the prescribed amber indicator light over the whole service life period.

Service life test
Sophisticated tests are used to demonstrate the high reliability of HELLA bulbs over long periods.

Luminous flux measurement
An Ulbricht sphere and goniometer are used to determine the luminous flux and luminous intensity of HELLA bulbs. This guarantees the optimum luminous efficacy of our bulbs.

These tests and measurements form the basis of our tested quality.
Safety Information

Bulb Replacement and Installation

When inserting a new lamp, you should not touch the glass bulb, because fingerprints may burn in, leaving “clouds” on the glass.

Standard bulbs and halogen lamps do not contain environmentally damaging substances and can be disposed of as household waste.

Check your local regulations to ensure correct disposal.

HELLA recommends replacing both lamps when one has blown.
XENON UPGRADE LAMPS

For more than a hundred years, HELLA has been a technological leader for drivers who want to be sure they can see and be seen. Modern xenon technology is a proven milestone for both driving safety and comfort. With a color temperature of 4300 K, twice the brightness of halogen lamps and around three times their luminous efficacy, the white light of these new generation xenon lamps guarantees safety and relaxed driving.

The newly developed HELLA Xenon +30 lamps have a color temperature of up to 5,000 K, which is almost as much as modern vehicles’ extremely white LED daytime running lights, offering maximum illumination and visibility similar to daylight.

### Advantages of HID lamps
- Bright and broad light distribution
- Long service life
- Low power consumption
- High color temperature provides whiter light
- Homogenous light distribution (no shadows)
- Vibration-resistant

<table>
<thead>
<tr>
<th>HELLA Xenon</th>
<th>ECE DIN</th>
<th>W</th>
<th>Tc</th>
<th>B</th>
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<td>4300 K</td>
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<td>4300 K</td>
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* To be used only with an approved electrical ballast
** Free of mercury
STANDARD: FOR GREATER ECONOMY

Standard bulbs for agriculture provide original equipment manufacturer quality and are a very good value for your money. Excellent luminous efficacy, reliability and durability.

→ Comprehensive range of products for all standard requirements
→ Strong luminous efficacy
→ Long service life
→ Very good value for money

<table>
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<tr>
<th>HELLA 12 V Standard halogen</th>
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<th>HELLA 24 V Standard halogen</th>
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</table>
HELLA Long Life halogen lamps (12 V) have a longer service life and are more environmentally friendly*, because they do not have to be replaced as often.

Thanks to single coil technology, HELLA Double Power halogen lamps (24 V) have greater intensity and double the service life*.

HELLA Super Long Life halogen lamps (12 V), with an operating time* of up to 3x longer, provide optimum value for money and the best selection for frequent travelers.

HELLA Heavy Duty halogen lamps (24 V) are specially designed for extreme demands, and can be found on construction equipment and agricultural machinery. Heavy Duty combines exceptional toughness and vibration resistance with impressive brightness and long service life.

**Lifetime stands for**
- Environmental friendliness through long usability
- Strong luminous efficacy
- Longer service life
- Optimum price-performance ratio
- Less frequent bulb replacement

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**HELLA Halogen Long Life**
- 8GH 002 089-351 H1 12 V 55 W P14,5s Increased service life
- 8GJ 002 525-481 H4 12 V 60/55 W P43t Increased service life
- 8GH 007 157-201 H7 12 V 55 W PX26d Increased service life

**HELLA Halogen Super Long Life**
- 8GJ 002 525-891 H4 12 V 60/55 W P43t Maximum service life
- 8GH 007 157-451 H7 12 V 55 W PX26d Maximum service life

**HELLA Halogen Double Power**
- 8GH 002 090-471 H3 24 V 70 W PK22s Twice the service life
- 8GH 007 157-231 H7 24 V 70 W PX26d Twice the service life

**HELLA Halogen Heavy Duty**
- 8GH 002 089-361 H1 24 V 70 W P14,5s Vibration-resistant
- 8GJ 002 525-281 H4 24 V 75/70 W PX26d Vibration-resistant

*Compared to standard halogen lamps.
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* Lamps to be used with electrical ballast units for 12 V and 24 V vehicles.
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<th>12 V / 24 V</th>
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