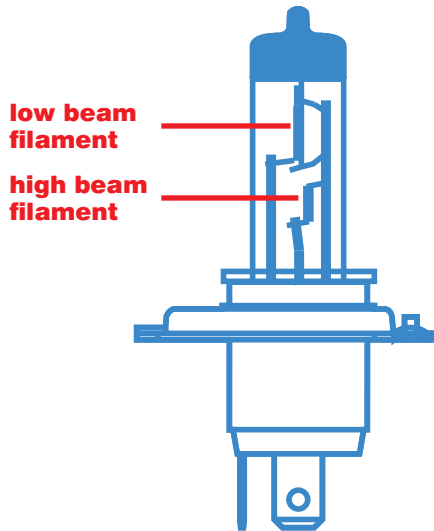


H4, HB2, and 9003 bulbs

9003 and HB2 are different names for the same bulb, so these numbers apply to just two kinds of bulb: H4 and 9003/HB2.



9003 and H4 bulbs look alike, fit in all the same headlamps, have the same wattage rating and seem to be completely interchangeable, but in some places, the law says that only one or the other type must be used.

In 1971, the H4 bulb was introduced in Europe as the world's first halogen headlamp bulb that could produce both low and high beam from a single bulb. It quickly became the world's most popular headlight bulb except in the USA, where cars had to have sealed beam headlamps with non-replaceable bulbs. Motorcycles in the USA have never been required to use sealed beam headlamps, and so the H4 bulb became popular for motorcycles in the US and worldwide. It is widely used to this day.

In 1983, the US Department of Transportation (DOT) first permitted cars in the US to use non-sealed-beam headlamps with replaceable bulbs, but DOT requirements differ from those in force outside the USA. One of the US requirements is that the beam aim must not change when a bulb is replaced. This can happen if a low quality replacement bulb is installed, because in a poorly made bulb, the filament is often improperly positioned. Headlamps are optical instruments, and

they depend on the filament being very precisely placed. If the filament is not precisely where it's meant to be, the beam pattern will be shifted or changed.

Like all engineered products, headlight bulbs are built to a technical standard which specifies all mechanical, electrical and dimensional aspects of the bulb. This blueprint makes sure all bulbs of a given type are interchangeable, and provides allowable ranges, or manufacturing tolerances, for each aspect.

In 1991, automakers wanted to use H4 headlight bulbs on cars in the US, but the DOT decided engineering blueprints for H4 bulbs allow too much variance in the position of the filaments within the bulb. So a new blueprint was made, with all the electrical and dimensional properties the same, but with stricter limits on filament placement variance. Because of the limits in the US on beam intensity in effect in 1991, the maximum allowable light output tolerance was also reduced. This new bulb specification was called "9003/HB2", because at the time, two numbering conventions were in use. Many 9003/HB2 bulbs also carry the "H4" marking, and vice versa, because it is possible to meet the specifications in both blueprints at the same time. The first headlamps with 9003 bulbs were on 1992 model cars.

Filament placement variance is not a problem with high quality bulbs made by reputable companies. At **Candlepower**, we make sure all our bulbs are better than the law requires. Our filaments are all precision focused inside each bulb to ensure a properly placed, properly formed beam in any headlamp. In areas where there is no legal preference for 9003 bulbs over H4 bulbs in cars, any **Candlepower** H4 or 9003 bulb can be used with confidence in any headlamp.

Technical bulletin: H4, HB2, & 9003 bulbs.

Who may use HB2 or 9003 bulbs?

9003 or HB2 bulbs marked "DOT" may be used in the US and Canada in any car headlamp that is marked "DOT HB2," and in any motorcycle headlamp designed to take an H4, 9003 or HB2 bulb. They can also be used in any car headlamp designed to take an H4 bulb.

Who must use HB2 or 9003 bulbs?

Automakers must install only 9003/HB2 bulbs marked "DOT" in the USA in headlamps marked "DOT HB2." To make sure such headlamps remain in compliance with Federal standards in the USA, use only replacement 9003 or HB2 bulbs marked "DOT." This is especially important in areas where headlamp bulbs are checked for "DOT" markings as part of a state vehicle inspection program.

Who may use H4 bulbs?

H4 bulbs may be used in H4 headlamps, in any country where such headlamps are permitted on cars or motorcycles. Outside the USA, they may be used in headlamps designed to take HB2/9003 bulbs in areas where there is no requirement or inspection for bulbs marked "DOT."

Who must use H4 bulbs?

H4 bulbs with a circle-E mark are required in many countries outside North America.



Candlepower Incorporated
14626 Southlawn Lane
Rockville, Maryland, USA
20850-1317

ph 301.340.0224
fax 301.762.2518
www.candlepowerinc.com