



Symbol: C

Atomic number: 6

Nonmetal

Melting point: 3,547 °C (diamond)

Boiling point: 4,827 °C (diamond)

Sublimation point: 3,642 °C

Aggregate state under normal conditions: solid

**Density: 2.26 g/cm³ (graphite),
3.51 g/cm³ (diamond)**

**Use: energy source (coal, petroleum,
natural gas), organic chemistry**



Strong partner

Everyone is trying to lose weight these days, including trucks. That is why an increasing number of vehicle body parts are made of composite materials. These components, however, are hard to paint—but Wörwag has solved the problem.



WOLFGANG FRITZ is a lab director in charge of special coatings for the plastic auxiliary components on commercial vehicles. "Thanks to our coating systems designed for SMC surfaces, we can now provide all the variants for commercial vehicles from a single source," says Fritz—for whom the term "carbon" immediately triggers the association "diamond."

Photos: Daimler AG, Frederik Laux

What you cannot see, you still can feel. Visually, you can hardly tell the difference between a truck's metal body parts and its plastic auxiliary parts. But if you touch the paint, you can. The steel driver's cab feels cool in contrast to plastic components like bumpers, radiator grilles, cab steps, fenders, roof spoilers, and wind deflectors, all of which feel considerably warmer. The latter are made of sheet-molded compounds (SMC), which are compressed thermoset polymeric reaction resins reinforced with carbon or glass fibers. Carbon fiber-reinforced plastics are even used in racing cars.

SMC components are extremely stiff and have thermal expansion properties similar to those of steel. But they weigh a good two-thirds less. "These thermosetting components have high thermal resistance and excellent crash properties as well as a lot of

design potential," says Wörwag laboratory director Wolfgang Fritz.

In order for 400-horsepower trucks weighing nearly 26 metric tons to be easily visible, a good paint job is more important than ever. The transportation sector has long since placed a premium on visuals. Coating SMC components, however, requires a special type of paint. Why is that? Because when the components are made, it is not possible to completely prevent tiny air bubbles from forming inside them. "So we use a special base coat to prevent the air from outgassing and thereby damaging the paint during the baking process," explains Fritz. The W321 barrier primer reduces these outgases to a minimum. "This means there's much less refinishing to do," says Fritz. And that is an important consideration. After all, the diet these beefy vehicles are on should not drive costs up, but down.



Work station with 400 horsepower: a good 50% of the exterior of a driver's cab consists of auxiliary components that require a special coating.

WITH A GROSS WEIGHT OF
3,106.75
CARATS

the "Cullinan" was the largest gem-quality diamond of its time when found in South Africa on January 26, 1905.

In 1908, the raw diamond was cut into 105 gems, the largest of which weighs 530.2 carats. Known as "Cullinan I" or the "Great Star of Africa," it is now part of the British crown jewels.
