

Tyre Staining on Floor Coatings

1.3.9

What Causes It?

Tyres are basically made of a mixture of synthetic and natural rubbers, fillers and additives.ⁱ The major fillers are carbon black and silica. Carbon black not only gives the tyre its characteristic black colour, but also improves the strength of the tyre. If there is friction between the tyre and the floor surface, a black mark sometimes appears. This is not the type of tyre marking that this Tech Note refers to, however.

A **yellow to brown stain** occasionally occurs after certain types of tyre has been in direct contact with a **light coloured floor coating** over a period of time.

The stain is due to the presence of one or more **additives**, such as **6PPD**ⁱⁱ used in the manufacture of certain tyres. **6PPD** is an effective antioxidantⁱⁱⁱ and antiozonant^{iv}, preventing the degradation of the tyre rubber from UV light and ground level ozone. **6PPD** also provides high temperature stability, strength, and resistance to flex cracking and chemical and electrical resistance.^v As **6PPD** adds to the cost of tyre production, its use is generally limited to more expensive, high performance tyres.

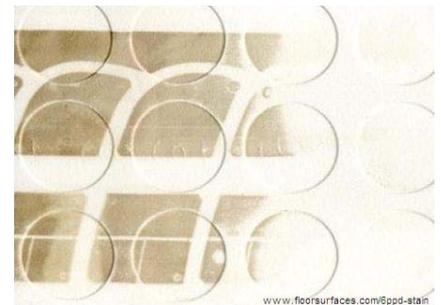


The staining occurs between the **tyre additive(s)** and a floor covering, such as vinyl sheeting or vinyl tiles, or a floor coating, such as water-borne urethanes or acrylics. Epoxies (such as Luxafloor® HS and Luxafloor® ECO₂) appear to be more resistant. The tendency of the tyre to stain and the extent will depend on both the **nature of the tyre** and the **type of floor coating**. The **yellow to brown stain** is the product of a **chemical reaction** with the plasticizer in the vinyl or a component in the coating. The lighter the floor covering or coating, the more obvious the stain.

What can be done to Prevent Tyre Staining?

There are several things you can do to minimize tyre marking when specifying a floor coating system:

- Try Luxafloor® HS or Luxafloor® ECO₂ – a site test area may be required initially to confirm tyre-marking resistance where a particular vehicle is known to stain the floor coating.
- Choose dark colours.
- Where light colours are required, paint dark coloured strips where the tyres are likely to rest.
- Place a mat or other material on the floor area where the tyre is most likely to rest to prevent the tyre from making contact with the floor coating.



For more information, please contact the Dulux Protective Coatings Technical Consultant in your state.

ⁱ http://www.maxxis.com/Services/how_a_tire_is_made.asp

ⁱⁱ Chemical name is N- (1,3-dimethylbutyl) - N'-phenyl-p-phenylenediamine.

ⁱⁱⁱ An antioxidant is a chemical additive that inhibits oxidation of the base material (in this case, rubber), by oxidizing itself sacrificially.

^{iv} An antiozonant is a chemical additive that prevents the degradation of the base material (in this case, rubber) with ground level ozone

^v <http://chemicaland21.com/specialtychem/finechem/6PPD.htm>