



Boral Asphalt
in your Community



Asphalt

IN YOUR COMMUNITY

The difference between asphalt and bitumen

Although often used as names for the same thing, asphalt and bitumen are in fact entirely separate materials.

Asphalt is the paving surface commonly seen on the roads people use every day. Bitumen is a black or dark brown sticky by-product of processing crude oil for petrol. The link between the two is that to make asphalt, first you need bitumen as an ingredient.

Asphalt is made by mixing bitumen with rock aggregates, sand and 'fillers' (such as lime) at around 160 degrees Celsius. The heated asphalt is then laid on a road base and cools to form road pavement. Asphalt pavement can be profiled, reheated with additional bitumen and

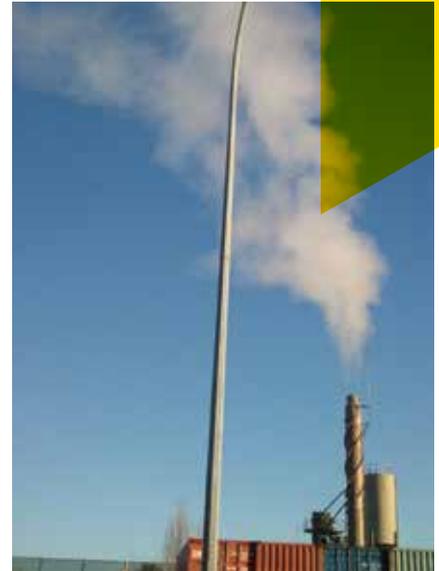
aggregates, and recycled as fresh pavement. Use of recycled asphalt product (RAP) is now common place and reduces the need for additional raw resources and energy.

Sometimes asphalt is referred to as 'tar', but this is not correct. Early asphalts (pre-1980s) were often made with tar derived from coal rather than bitumen, hence the name.

Modern bitumen asphalts are much safer to use from a worker health perspective, and old coal-tar based asphalt pavements are specifically excluded from today's modern asphalt processes and asphalt recycling processes.

What happens at a Boral asphalt plant?

Quarry aggregates (stone, sand) are dried and heated in a rotating drum, then mixed with fillers (such as lime) and coated with bitumen in a mill.



The drying of the aggregates generates steam which can be seen being emitted from the stack of the plant. This may sometimes appear dark if the sun is sitting behind the stack.

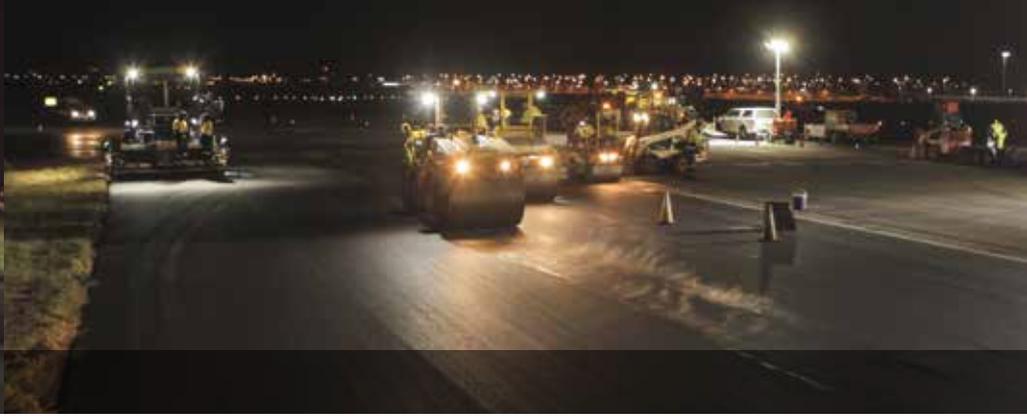
The hot mix asphalt (HMA) produced at the plant is then taken by truck immediately to the paving site, or may be put into silos for short-term storage.

Why do we need an asphalt plant near our community?

Asphalt is usually mixed at temperatures between 150 and 180 degrees Celsius and must be placed, or laid, while hot. If it gets too cool it sets and is no longer useful for paving. Accordingly, asphalt facilities must be located within a reasonable distance of the paving site.

This is why you will often see a mobile asphalt plant at major road project sites where large amounts of asphalt are needed.





What happens if there's a bitumen spill?

Bitumen starts to harden the moment it cools. Unless it's over 40 degrees Celsius outside, it simply cannot travel over the ground more than a few metres. The bitumen in asphalt will not penetrate the soil more than a few centimeters before solidifying.

Being a hydrocarbon, bitumen does not mix with, or become soluble in, water. As such, if there is a spill, it is contained to the immediate area.

A bitumen spill does not automatically mean a fire will result. A fire is more likely to result if fumes within a confined space, such as a storage tank, find an ignition source. We have extensive controls in place to prevent these occurrences.

Are there any health risks from living near a Boral asphalt facility?

There is **no** current scientific evidence that the very low levels of emissions from an asphalt facility pose any significant health risk to the community.

It should be noted, however, that there are well defined health risks associated with bitumen fume itself, particularly due to the presence of a group of chemicals known as Polycyclic Aromatic Hydrocarbons (PAHs).

These are not scientifically considered to pose a risk to the health of nearby communities given a range of

influencing factors such as the distance of housing from each site, the dilution of elements such as PAHs by the atmosphere, and required heating temperatures.

Are there any health risks to workers involved in Boral asphalt operations?

For those working at our HMA facilities, the most significant hazard is the presence of hot materials.

We have many operational controls in place to reduce the risk of incidents that could cause injury, including equipping our workers with personal protective equipment typically associated with general construction activities such as hard hats, safety glasses, gloves, and long-sleeved shirts to help protect against these and other occupational hazards.

The International Agency for Research on Cancer (IARC) provides advice on the risk of cancer due to exposure to hazardous substances. IARC classifies bitumen fume as a possible cancer risk **only** to those working with the bitumen/asphalt as it is being laid.

This is logical as workers, given their proximity to the materials when working, can be exposed at levels higher than the general public. Even so, we continually verify through monitoring programs that our workers are not exposed to fumes that exceed national occupational exposure standards.

What's that smell?

As well as general bitumen fumes, there are various chemicals emitted from hot bitumens, notably 'aromatics' like benzene or naphthalene, and highly odorous materials such as sulphides.

Sulphides are responsible for what most people recognise as the smell of asphalt or bitumen. However, as with PAHs, exposure levels to emissions from an asphalt plant at nearby residences are much less than known threshold levels, meaning health agencies believe there is **no** significant risk being posed.

The sulphides (such as hydrogen sulphide, commonly referred to as 'rotten egg gas') can be noticed at microscopic levels (parts per billion in air) or less. There is **no** direct correlation between smelling an asphalt plant and being exposed to chemicals at hazardous levels.

Playing our part for the community

We are committed to our organisational goal of 'zero harm' and are working to minimise and, where possible, eliminate adverse environmental effects.

Where it is required, we aim to go beyond simply meeting environmental compliance. Wherever practicable, we will secure improved environmental outcomes.

We also welcome any questions or comments on any matter associated with our asphalt operations. Simply email feedback@boral.com.au, or call the member of our Stakeholder Relations team responsible for your local site – visit www.boral.com.au for details.

BORAL ASPHALT
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You can offer us your thoughts in the following ways:

-  feedback@boral.com.au
-  (02) 9033 5215 (NSW/ACT)
(03) 9981 2925 (VIC/SA/TAS)
-  www.boral.com.au/feedback
or scan this QR code with your 'smart' device.

