

# The Engineering Column

## Winter tyres

from John Dowson

**W**inter tyres are mandatory by law in many mainland European countries after a specified winter date and, not surprisingly, questions have been asked in the UK if it would be sensible to make the fitting of winter tyres mandatory here.

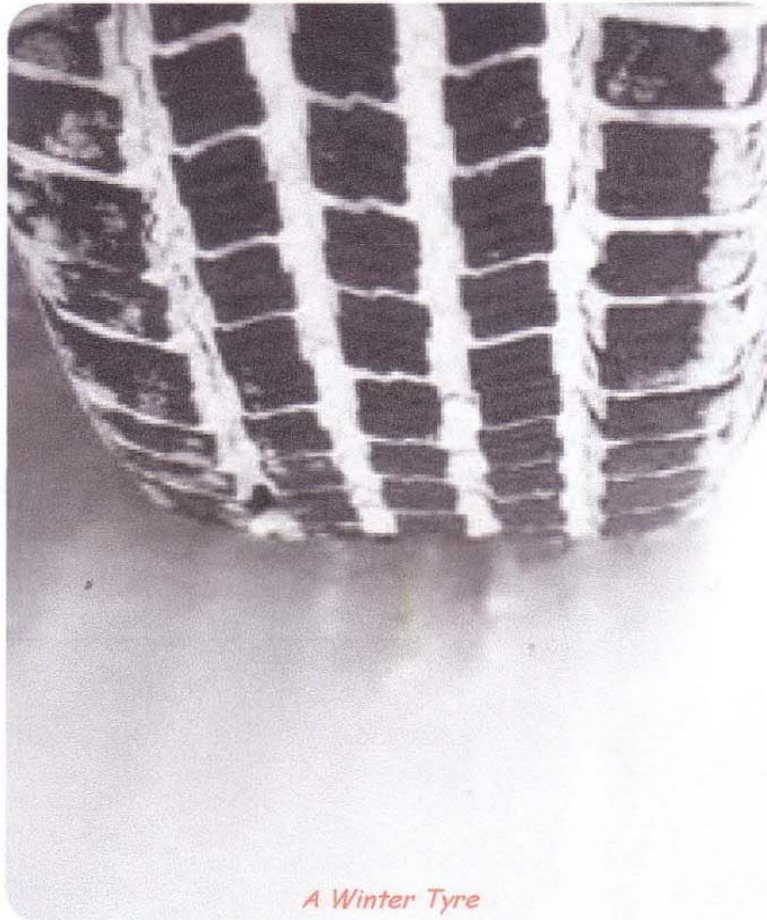
So what are the differences between winter tyres, summer tyres and all-weather tyres?

Wintertyres are constructed using a different rubber compound to summer ones. The change-over point when it is better to be running on a winter tyre is a surprisingly high  $+7^{\circ}\text{C}$  and that temperature is typical for four winter months of the year in the UK. A winter tyre has a softer compound than a summer one and will keep sticking to the road until the temperature falls to  $-8^{\circ}\text{C}$  when its performance starts to fall off. There has always been a concern about the gradual hardening of the soft rubber winter compound with age but the current advice from tyre manufacturers is that with the correct storage winter tyres are OK to use up to 10 years old.

There is an interesting point about the rather high changeover temperature. Summer tyre performance will fall off below  $+7^{\circ}\text{C}$  and although drivers will adapt their driving style to suit conditions that are visually deteriorating, they are unlikely to take falling temperatures into consideration. The increased braking distances and reduced grip of summer tyres in low temperatures could well catch you out.

The tread pattern will obviously have a big effect on tyre performance in winter conditions. Unfortunately, the ideal tread pattern for snow is different to that for ice so inevitably a compromise has to be reached. At this point it should be said that there is always the option of fitting snow chains for extreme conditions and, if local laws allow, studded tyres for ice.

For a snow tyre the ideal tread is fairly open so that it will retain snow in the tread gaps. The friction between the snow in the tyre tread and the snow on the road will provide grip. You can test out this theory by making two snowballs and rubbing the outer surfaces together. The friction is so great that the snowballs will disintegrate.



A Winter Tyre

An ice tyre will have sharp edges to the treads which are designed to remain open and clear of any surface snow so that a sharp edge is always presented to the ice, hopefully providing grip. Any open tread winter tyre will generate more road noise than a summer tyre and ideally would not be used in the summer, but tyre manufacturers' advice is that winter tyres are perfectly OK for summer use but they will have a higher wear rate.

I started this column by saying that there are summer, winter and all-weather tyres. The all-weather tyre seems to be a bit of a rare beast as a trawl of manufacturers' web sites did not produce many results although tyre suppliers' web sites do list them. It would seem, therefore, that most of us are happy running around, or at times slipping around, on summer tyres all year round. Do you know what specification tyres are fitted to your car?

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John