Edge Deletion for Thin-Film Solar Cells

Keeping Track: 4JET Systems for Tire Marking
No hairy matter

While the classic masculinity of a three-day-beard may be just what some products need to make them look appropriately marketable, shagginess in modern tyre design is really the last thing you want. However, it is a fact of life that this annoying rubber residue forms at all the points in the mould where air escapes, as a matter of principle.

Nothing beats a close shave
The most obvious solution for removing this unsightly stubble is simply to cut it off immediately after the curing of the tyre. This is, however, an expensive matter, because the flexible rubber prongs are highly resistant to cutters, and there is also the problem of what to do with the waste – each tyre produces on average around 40 g of waste rubber, which, assuming a standard annual rate of production, amounts to 400 tonnes of these little black spikes.

The secret of smooth skin
So the question is: how can these rubber spikes be prevented from forming in the first place? One possibility is to employ a so-called puzzle mould, which removes the majority of the air by way of numerous gaps positioned between the mould segments (the puzzle pieces). But the need for additional air ducts means that some stubble remains behind even with this method. Not to mention that puzzle-type moulds are highly complex, and therefore rather expensive to produce. Another method, which is far more successful and more extensively tested, is to use a complex valve system. This constitutes a highly effective and technically sophisticated way of ensuring that the surface of the tyre remains smooth and flawless. It can be employed in any kind of tyre mould, regardless of whether it is new or old. The spring valves obviously cost money, adding around 5-10 % to the price of the mould, but this still places it well under half of the price of a puzzle mould. The installation of these valves requires a certain level of experience, but after a while, the process can be performed without any problems. A bigger disadvantage is the increase in the maintenance requirements of a mould employing valve technology. It is no longer possible to sandblast the mould, and valves need to be replaced every now and then, or additional valves installed. Another alternative worth considering is the so-called micro vent. This method employs micro-fine slits which allow the air to escape while retaining the rubber in position. Unlike the valve system, this technique involves no moving parts in the mould, which makes the installation and replacement of the components considerably simpler. Since they are also far less complicated to produce, micro vents represent the greatest cost-saving potential. However, as a recent technology, it is as yet not in widespread use, and there is a lack of user experience data for some application fields.

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