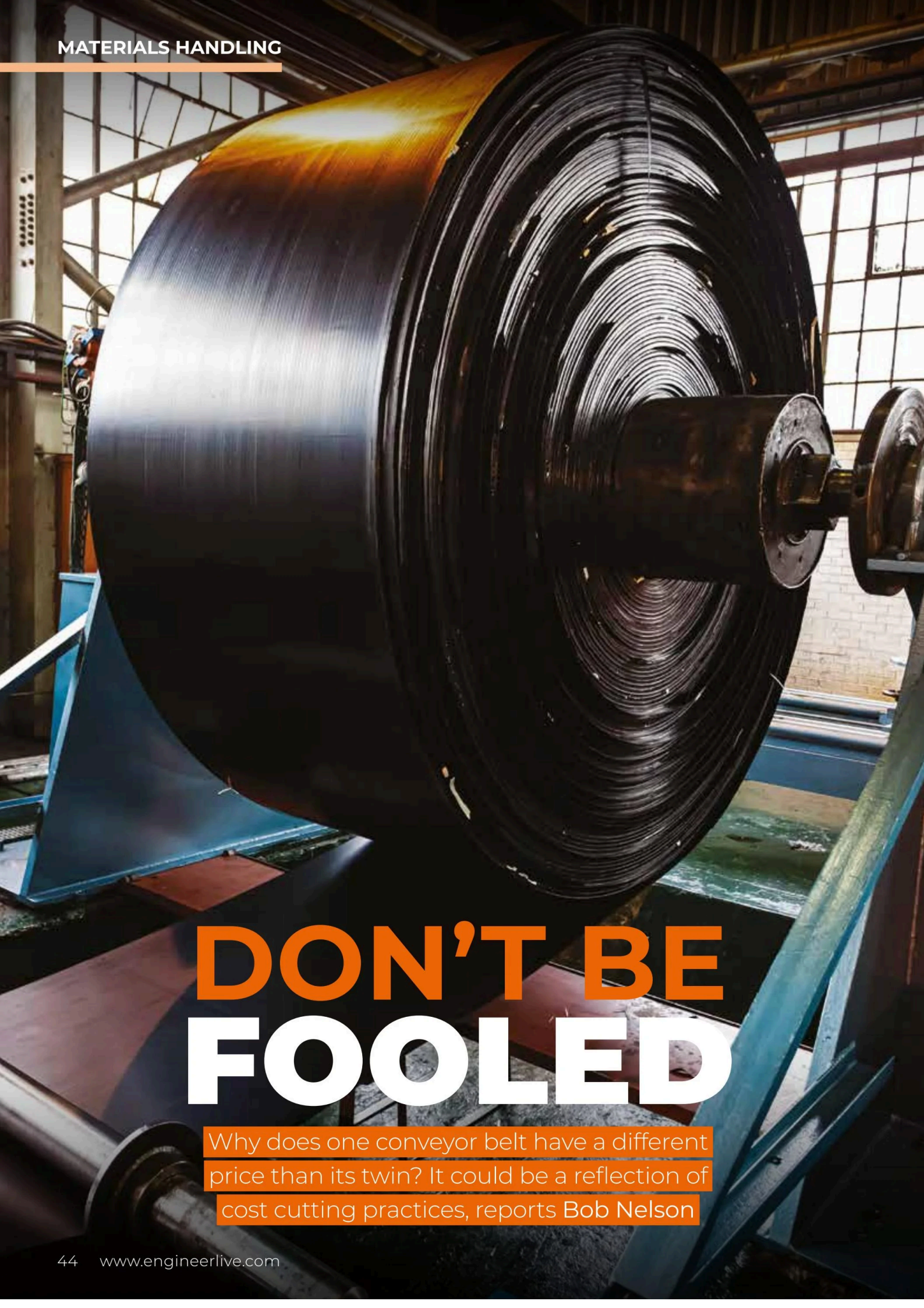

DON'T BE FOOLED

Why does one conveyor belt have a different price than its twin? It could be a reflection of cost cutting practices, reports **Bob Nelson**

The market for industrial conveyor belts has always been competitive but recent years have seen what was healthy competition become fiercer than ever, with mind-boggling price differences between belts that are claimed to be of an identical specification. Although many mine and quarry operators may not concern themselves with possible adverse consequences, if they looked deeper into the real reasons for big price differentials then they might very well begin to feel differently. Here's how and why:

THE RUBBER

When trying to establish the reasons for a huge difference in the price of one conveyor belt compared to another, the starting point is the rubber because it forms some 70% of the volume mass and more than 50% of the production cost. Consequently, it is the prime target for cost-cutting.

The vast majority of conveyor belt rubber is synthetic. Dozens of different, often very costly, additives and chemical substances are used to create compounds that can cope with the different demands placed upon them. Using low-grade, unregulated chemicals at the absolute minimum quantities or, in some cases, not using them, all contributes towards the 'lowest possible price' objective.

A good example of these omissions are the antioxidants needed to protect against the serious damage caused by exposure to ozone (O3) and ultraviolet light (UV). They are regarded by most manufacturers as an unnecessary cost, which explains why more than 80% of belts sold in Europe, Asia and Africa have no ozone & UV protection. Again, a saving for the manufacturer and a significant cause of accelerated wear life for the end-user.

CARBON BLACK

Carbon black polymer is not a colourant as some might believe but actually a critically important component of rubber, typically making up around 20% of its mass. Amongst many key functions, it prolongs belt life by slowing the ageing process and also acts as an important reinforcing compound. But despite this crucial role, it is seen as yet another cost-cutting opportunity. Good quality carbon black is costly, especially since Russia invaded Ukraine and a main supply source is now eliminated by embargoes. Belts offered at a significantly lower price almost certainly contain a low-grade version, which most likely was made by burning scrap car tyres rather than the much longer, more complex, scientific process needed to make high quality carbon black. A clue to its use can be a strong, pungent smell whereas good quality rubber should have little or no smell at all.

Even more seriously, low-grade carbon black can contain 'forever chemicals' including carcinogenic residues that are dangerous for people and the environment. Other cost reduction methods include using reject rubber of highly questionable origin and fillers such as chalk, to artificially boost the volume, despite imposing severe limitations on the day-to-day performance and the working life of the belt.

Last but certainly not least are the cost-cutting practices used when producing rubber compounds that are most important to mining and quarrying such as abrasion, cutting, ripping & tearing and fire-resistant qualities. The special chemicals and additives needed are even more complex and costly so again, the temptation to minimise costs by minimising their use seems irresistible to those wishing to compete on the basis of lowest price. The consequence is belts that are much less capable of handling aggressive materials over long periods of time and potentially unsafe fire-resistant belts that do not self-extinguish quickly enough.

Shorter belt life does, however, create a 'win-win' situation for those who manufacture them and service providers who supply, fit and repair such belts while claiming them to be much more economical than the so-called 'big name' manufacturers. ▶

The number one target – rubber represents more than 50% of the cost

Cracking up – the result of rubber not having inbuilt protection against ozone and ultraviolet light

Premature ageing – a consequence of poor quality rubber

THE CARCASS – NOT WHAT THEY CLAIM

The carcass is the backbone of any conveyor belt so, as with the quality of the rubber, when a low selling price is the driver then reliability, longevity, productivity and running costs become the proverbial 'sacrificial lambs'. Most conventional construction rubber multi-ply and single-ply belts use a combination of polyester and nylon (polyamide) synthetic fabrics, referred to as 'EP'. This is because it has the best balance of mechanical properties including allowing a conveyor belt to run straight, to trough, to flex round pulleys and drums, stretch, provide transversal rigidity, longitudinal strength and much more besides.

Unless the weave pattern has been specifically designed, as in the case of specialist, high-endurance single and dual-ply construction belts, such as Fenner Dunlop's X Series range, totally polyester (EE) fabric plies can lower transverse elasticity, reduce troughability, impact resistance and also cause tracking issues.

Unfortunately, a common deception employed by the less scrupulous manufacturers is to supply belts that have totally polyester (EE) fabric plies in a carcass that is claimed to be an EP (polyester/nylon mix) construction. The reason for this deception is that polyester costs some 30% less than nylon. This is significant because the fabric is the second highest cost component so using all-polyester fabric helps to achieve the perception of a lower 'like for like' price. The manufacturer, of course, knows that it is highly unlikely that the unsuspecting end-user will have laboratory tests carried out that would reveal their fraudulent behaviour.

In addition, inferior grade fabric plies can be prone to have an inconsistent longitudinal and/or transversal spread of tension, causing tracking, steering and handling problems. Such inconsistencies are problematic because the declared longitudinal tensile strength of a belt is the combined result of the individual fabric plies working together in tension.

For example, an EP 630/4 belt contains four layers of fabric reinforcement and has a nominal overall tensile strength of 630N/mm. Each ply has its own breaking strength, typically around 160N/mm. When the plies are bonded together to form the belt's carcass, their individual strengths effectively 'join forces' so a consistent spread of longitudinal and transversal tension is required throughout every layer.

WHO SETS THE STANDARDS

Globally there are a number of different quality organisations who set standards for conveyor belting but the most widely accepted standards are those used in Europe. These are EN standards (European Norms) maintained by CEN (Committee European de Normalization), which are the most commonly used standards in Europe, and ISO (International Organization for Standardization) test methods. The ISO is an independent, non-governmental organization. It is the world's largest developer of voluntary international standards and consists of the quality standards organizations of 168 member countries.

DON'T BE FOOLED by the common misconceptions that the reasons for big price differentials are the lower cost of labour in South and East Asia and/or that you are merely 'paying for the name'. Neither is true. Labour represents less than 6% of the cost of producing a conveyor belt while the profit margin on low-grade imported belting is substantially higher than the margins enjoyed by the premier brands.

Mis-tracking can be caused by inconsistent tensions within the fabric plies

> Globally there are a number of different quality organisations who set standards for conveyor belting but the most widely accepted standards are those used in Europe

Low-grade carbon black is most likely to have been made by burning scrap car tyres

Not what they claim – some belts are supplied totally polyester (EE) fabric plies in a carcass claimed to be EP (polyester/nylon)

Although standards vary between different countries, members of CEN are obliged to implement EN (European standards) as their national standards without modifications and must withdraw any of their own standards that may conflict with them. Standards applied in non-CEN member countries are in most cases significantly inferior.

Some words of caution here because good quality DIN Y (ISO 14890 L) rubber often has a much better resistance to abrasive wear, cutting and gouging than an inferior quality DIN X (ISO 14890 H) or even DIN W (ISO 14890 D) grade rubber. Good quality rubber will also have superior tear strength (measured as eitherN/mm2 or MPa).

Although compliance with CE quality standards is often stipulated by purchasers of industrial conveyor belts, they do not apply because conveyor belts are not a product category that is subject to specific directives requiring CE designation. The "CE" used in the CE Marking represents "Conformité Européene", meaning "European Conformity".

Don't be fooled - An almost identical mark is being used that many potential users mistakenly believe is a genuine CE mark of European quality conformity. In reality it actually stands for "China Export", meaning that the product was manufactured in China.

On the left - the real thing. On the right - China Export.

Conformité Européenne

China Export

TO CONCLUDE

There are a great many tricks and deceptions that explain why one belt has a much lower price than another. Don't be fooled. Price is what you pay but the cost is what you spend.

For more information visit:
https://www.fennerdunlop.com/