



TECHNICAL

BULLETIN

PARALLEL VS TAPERED WIRE

Why do some ROC springs look different to OE?

Why a ROC spring may be shorter than the OE...



Parallel Wire
(Constant thickness)

Some original springs are manufactured using tapered spring wire; where the thickness of the steel reduces towards the end of the spring. This generally produces a weight saving but also increases the risk of premature spring failure.

To remove this risk of premature failure, ROC springs are made from parallel spring wire, where the steel has a consistent thickness (diameter). To compensate, a ROC spring may need to be slightly shorter than a tapered wire OE. It is designed to fit the application and, once fitted will provide the correct spring rate, and ensure the vehicle sits at the correct ride height.

There is a misconception concerning tapered wire springs; and especially concerning those with a minibloc (rugby ball shape) design, that all possess a progressive spring rate, and that progressive springs rates can only be achieved by tapered wire springs!

In reality, tapered wire springs (minibloc or otherwise) can be designed to have progressive or linear spring rate characteristics. In minibloc designs however a linear rate is usually observed since the reduced material diameter towards the end coils compensates for the reduction in the spring's external diameter - meaning that the spring rate generally stays consistent.

It is also important to note that springs made from parallel (constant thickness) wire can equally be designed to have linear or progressive spring rate characteristics; by varying the pitch (gaps between the coils) for example.

The danger with tapered wire springs however is that stresses can be almost the same throughout the total length of the material. The thinner wire coils towards the end of the spring can therefore experience stresses as high as those in the most active part of the spring, resulting in a significantly increased risk of breakage – something further aggravated by corrosion which is most likely at the end (transition) coils.

Whilst ROC only manufacture springs from parallel spring wire (constant thickness) we do offer a range of tapered wire springs, to give our customers and the installer a choice. All ROC parallel wire springs come with a 3 year warranty and are certified Matching OE Quality, providing peace of mind and allowing fitment without any warranty restrictions. Our tapered wire springs come with a 2 year warranty.



Tapered Wire
(Variable thickness)