Cautionary Tales

Part XI Cultural Influences – Spring Materials

Have you ever thought “I wonder if my competitors at home and abroad have better spring materials available to them?” The answer to this question is almost certainly a flat “no”.

It may be re-assuring to hear that the materials used for making springs are very similar the world over. There are no super spring materials used in one country that are not available elsewhere. In Japan, China, Germany, Korea, Sweden, Italy, the spring materials used are so similar as to be indistinguishable. There are small differences in aspects such as tensile strength and surface quality in the standards for spring materials, but even these differences are being erased. Throughout Europe there is now only one EN standard for the supply of spring steel wire and spring grades of copper alloys, and soon there will be EN specifications for all spring materials. The DIN, BS, AFNOR, SIS specifications are being declared obsolete and are being replaced.

So, it must follow that the usage of spring materials is the same everywhere? Not quite, but globalisation of procurement by multi-national companies, the most important purchasers of springs, will further erode cultural differences in the selection of spring materials.

IST observe that there are small differences in spring material usage – in the US more oil tempered wire tends to be used rather than music wire. In Japan the 302 stainless steel is nearly always nickel coated, but nickel coating is much less common elsewhere in the world. In the US 17/7PH stainless steel is more popular than in other countries. But these differences are slight.

The most important cultural influence on the spring materials used is the fact that it is large end using companies who generally decide what material should be used, and not the spring manufacturer. That is the point of this cautionary tale it is not the expert who selects, but the end user. As already hinted at, globalisation of purchase policies is going to increase this trend. It is not the expert spring manufacturer that decides on spring materials – they may supply advice – but the ultimate responsibility for selecting spring materials (and spring designs for that matter) lies with your customers. It is *IST*’s experience that between 10 and 20% of all springs are made from non-optimum materials.

It is the users of springs who need better education in spring material selection. Commercially it is often advantageous to quote for manufacture against a requirement clearly stated on a drawing. Of course if the spring won’t work, the spring manufacturer will point this out, but if the spring will work, but the spring material is not the best for the job, then the commercial reaction in most countries around the world is to quote for supply of exactly what our customer has specified, especially when the application for the springs is not disclosed. The end result is all too often as presented in figure1.

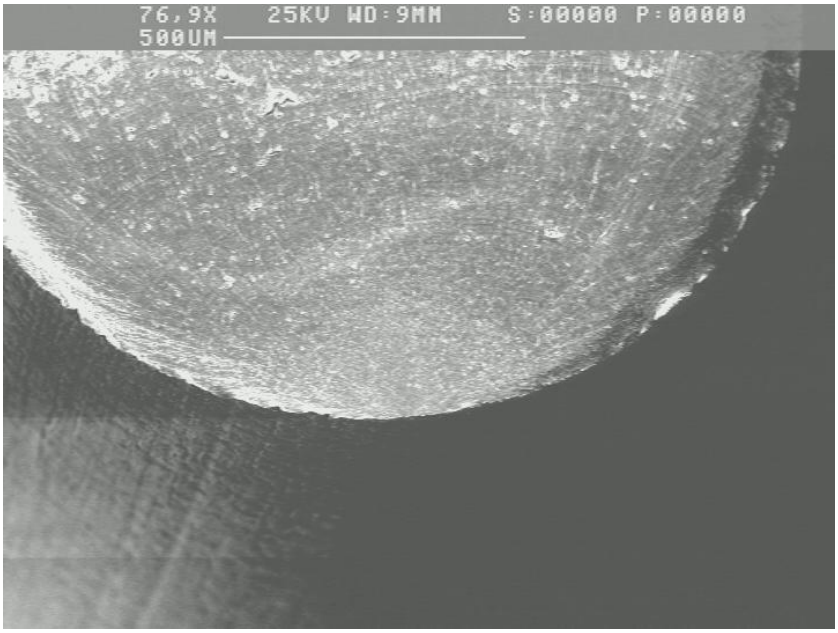

Figure 1 This spring, designed within normal design rules, was made to drawing for an application that was not disclosed by the end user, so the spring maker could not advise of the risk of fatigue failure after 120 thousand cycles. If material suitable for a dynamic application had been used the spring would have survived for the required 200 thousand cycles.

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