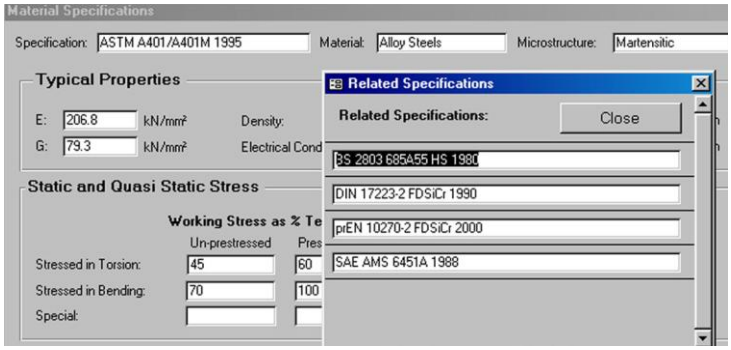
Cautionary Tale XXX

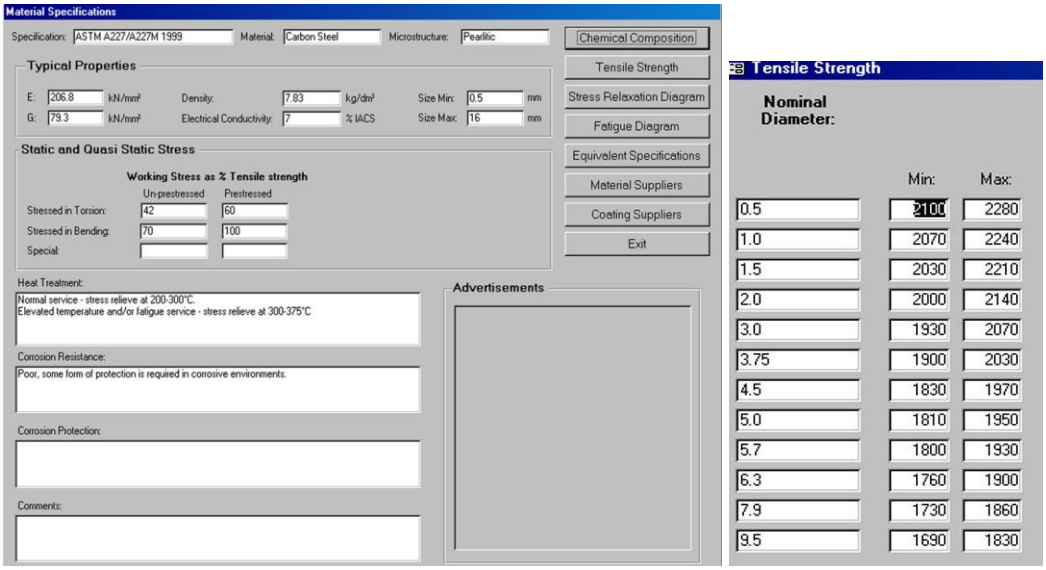
Spring Materials

It is IST's experience that selection of the material from which a spring is to be designed is usually accomplished by the end user of the spring. The selection is usually based upon the designers' knowledge of springs that have worked satisfactorily in the past. Hence one end user will have experience of CrV steel working well and will tend to design all future springs in this material. Another very similar end user will have experience of 302 stainless steel working satisfactorily, and so will base all their designs on this grade.

This leads to company A, a manufacturer of pneumatic valves, say, having all their springs made from CrV perhaps with Dacromet coating when corrosion protection is required, and their main competitor, company B, having all their springs made from 302 stainless steel. Both companies are happy that their springs are reliable, and have the philosophy that 'if it isn't broken, don't fix it'. Their springmaker will take a similar view - each grade of spring steel is readily available, works well for their respective companies and so why should a cheaper alternative be offered to either? Until company B asks for a year on year price reduction with no loss of quality or reliability. The springmaker will have confidence in offering the cheaper CrV as a substitute for the stainless steel and the spring should work o.k. But then company A also asks for a price reduction. Will drawn carbon steel or music wire function well enough, and will company A accept this new material as a viable means to achieve their ends? They probably won't pay for the testing to prove whether or not the new material is satisfactory. To provide all the data to persuade company A that the new material will do the job, the spring manufacturer might produce CAD printouts for all their springs in the new material. Still, company A will be uncertain about the relative merits of the reliable material they are used to and the new material that they are being offered.

To provide a comparison of materials, the ESF commissioned IST to develop a Spring Material Selector CD ROM and this has very recently been completed. The CD ROM contains information about all the international specifications for spring wire and strip materials from Europe, USA, Japan, including many obsolete specifications, as well as some proprietary grades. It enables the opportunity to compare directly the chemical analysis and tensile strength of a particular size. It also has indicative data about the fatigue, relaxation and corrosion performance of each spring material. Finally the CD contains information about many of the major international suppliers of each grade of spring material.





Typical pages from the new Spring Material Selection CD-ROM

The moral of this cautionary tale is that spring materials may not be selected by the most informed person in the supply chain, and this may lead to non-optimum materials being used. Now, for the first time, there exists an authoritative and independent tool that spring manufacturers may use to help their customers to select the best material for their springs. It will be featured on IST's stand 17A24 at Wire 2006 in Düsseldorf, and can be viewed on IST's website.

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Readers are encouraged to contact him with comments about this cautionary tale, and with subjects that they would like to be addressed in future tales, by telephone at (011) 44 114 252 7984, fax (011) 44 114 2527997 or e-mail m.hayes@ist.org.uk.