

String Stretch and Creep

Technically, *creep* is non-recoverable elongation, whereas *stretch* is the recoverable elongation (or elasticity). Creep is a problem, stretch is a blessing. Thus, what we generally refer to as stretch is actually creep. Stretch is the natural elasticity of the string as it is loaded through the shot cycle and returns to its pre-shot length. Anyone who used Kevlar strings will know how harsh a string with zero stretch is (and how soon it breaks). So we actually need our strings to stretch to 'soften' the shot cycle and prolong the life of the string. Creep occurs when the string material is taken past the point where stretch can recover it. This is a problem and leaves the material in a damaged state. The fibers used for modern bowstrings are purpose designed, often with specific performance and usage parameters, creep being one of those parameters.

With the advent of custom made, "prestretched" strings, many thought that the days of bowstrings stretching were long gone; unfortunately it is not so. 'Prestretching' the string, as done by most of the custom string manufacturers, involves many techniques that take much of the creep out of the bowstring material prior to production. The string is then wound and served under tension, thus giving us a string that shouldn't creep, once "shot in". The string needs to be shot in to allow the fibers to settle against one another, to take account of any tight bends (around cams, etc) and tight/loose spots in the serving. Usually 30 - 40 shots is all that is required. Waxing the string allows the strands to slide over each other and bed in properly; keeping the string waxed helps smooth the fibers against each other as the string is rotated around the wheel or cam.

So why, if we've done as the string manufacturer instructed, does it creep sometimes? Almost invariably there is one cause, heat. It doesn't need to be much or for long, but heat will ruin your nice (expensive) new string and cables in a very short time. Just how short a time are we talking about? If the heat is established and the strung bow is placed in the container, the damage may be done in less than 10 minutes, and a suitable pre-heated container is your car's trunk! The amount of heat required is relatively small and most countries are capable of easily reaching a temperature that will cause failure to start. A temperature in excess of 140° F is enough to start the process in most modern strings, which is not that hot at all, nor is this a difficult temperature to attain. If there is strong sunlight about it may well be reached when the bow is left in a bow rack whilst waiting turns to shoot. If fitted, a metal peep will quickly reach over 150 degrees, causing a localized weakening in the string, and creep will set in. This change due to heat is of great importance.

We should all try to develop habits to stop us from putting our equipment in a position where it can be damaged. I have mentioned target archers, but bowhunters can get the same from hanging the bow in the sun, and anyone can get it traveling with the bow inside a hot car. Once the elastic properties of a string have been exceeded, it loses its ability to restore itself to its original length; you've exceeded the 'elastic limit' of your string, or rephrased, it's junk now. Once the elastic limit has been exceeded, it will take very little to break the string, although it may hold out for while, it has been irreparably damaged. Of course, creep lengthens the string, which changes your tune, and your score is going into the toilet as you discover the problem. So to prolong the length of string/cable life, wax them, keep your bow cool, and get in the habit of shading your bow when it is not being shot.