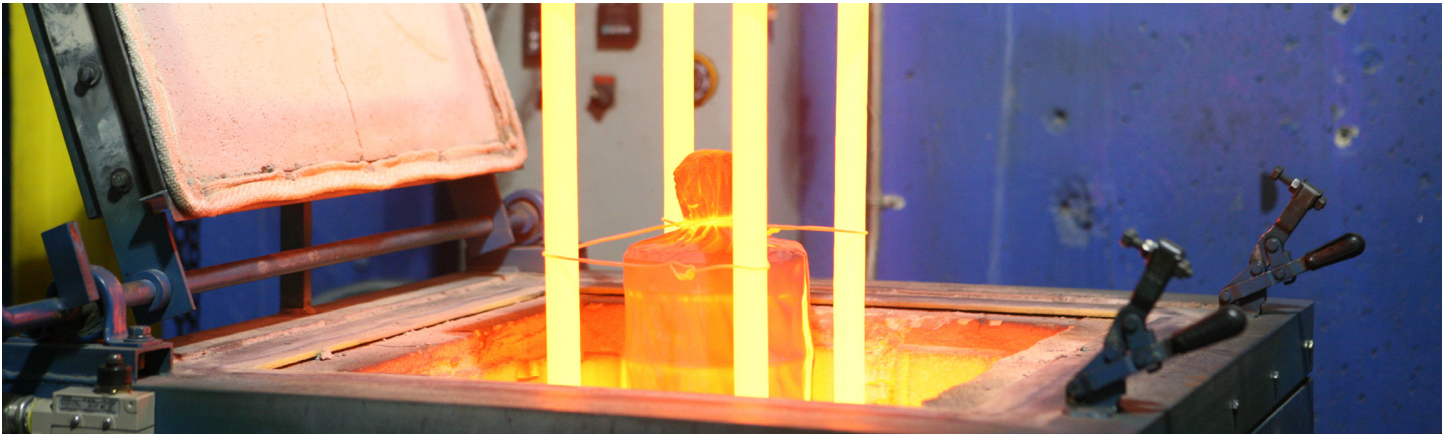


STEEL?



At Wilson, we're always focused on the technical aspects of flexography. TechTalk is your quick snapshot of key topics in our industry. Let us know what you think.

Carbon | Chromium | Vanadium

Not All Steel is Created Equal

Steel is an alloy of iron. An alloy takes a basic element—in this case, iron—and adds other elements to it to enhance certain properties. For applications in our industry, these additional elements include carbon, chromium, and vanadium.

The impact of elements

Carbon is the first key element. It is added as a hardening agent in the steel. The harder steel gets, the greater the impact resistance and wear resistance. However, if steel becomes too hard it is difficult to provide a “clean blade angle.”

Chromium is a very hard substance used to provide wear resistance and oxidation (rust) prevention. Both of these properties are important in our applications.

Vanadium is an extremely hard substance and provides the best wear resistance available. Alloys with very high concentrations of vanadium are used in extreme friction applications.

Different steels, different applications

Low carbon steel with no chromium or vanadium can be used for short run pressure-sensitive applications. The more abrasive the material is that you are cutting, the shorter the life of the die. Materials that need an extremely sharp blade are very poor candidates for this type of steel as the tip of the blade will wear quickly and stop cutting.

Steels with medium carbon, low amounts of chromium and no vanadium can be used for medium runs of pressure-sensitive and short runs on metal-to-metal dies. The medium carbon allows the steel to harden enough for metal-to-metal runs. The low amount of chromium allows for wear resistance on the pressure sensitive die cutting. 2

Steels with higher carbon, medium amounts of chrome and low amounts of vanadium can be used for long runs of pressure sensitive and medium runs on metal-to-metal dies. The higher amount of carbon allows for more impact resistance on metal-to-metal dies. Medium amounts of chrome and low amounts of vanadium give it the wear resistance for long runs of pressure-sensitive dies.

Steels with a high carbon content, high amounts of chromium, and medium amounts of vanadium are used for long run metal-to-metal dies. Again, it is difficult to get a “clean blade angle” on these tools, so it is not the best steel for pressure-sensitive dies. The higher amounts of all three elements added to the iron makes this steel very hard and provides the impact resistance needed for long runs on metal to metal.

Chromium plating can be added to no-chromium and low-chromium steels. This plating will enhance the wear resistance on these tools and extend their die life on pressure-sensitive applications.