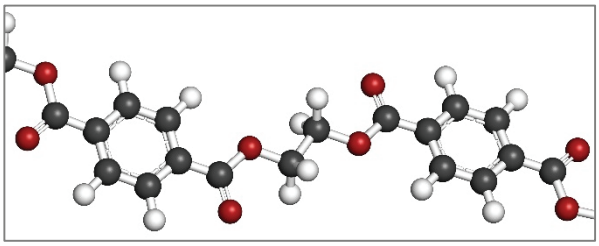
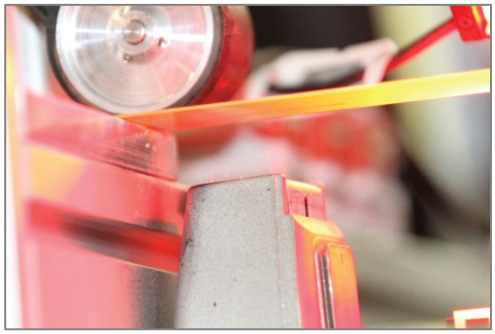


Producing plastic is a much less energy-intensive process. Plastic is made from petroleum or natural gas which is piped to refineries and separated into its various components through a distillation process. A method called "cracking" uses heat to break down the molecular structure of the hydrocarbons into smaller compounds. Through "polymerization" a chemical reaction combines the molecules to form repeating long chains or "polymers." As with steel, other chemicals can be added to give the material specific properties.

While producing plastic also generates carbon dioxide and other GHG emissions, the volume is substantially less than that created during steel production. An EPA study on plastics done in March, 2015 found that *the CO2 emissions for a variety of the most common plastics (including doctor blade materials) ranges from .06 tons to .30 tons*.



Manufacturing and fabrication

The process of turning steel or plastic into doctor blades has little additional impact on the environment. Steel doctor blades are made from carbon strip or tool steel which are types of carbon alloy steel engineered for hardness, resistance to abrasion and deformation. Once he receives the material, the doctor blade manufacturer grinds the edge and cuts the material to desired blade lengths.

To create plastic doctor blades, the polymer resin is extruded by pushing it through a mold to form strips. The material is engineered into doctor blades with desired widths and lengths and machined with an edge profile according to customer specifications.

Transportation

Transportation is another source of pollution for both types of doctor blades. Whether it's plastic or steel, moving raw materials and products consumes fuel and generates carbon emissions.

Most steel doctor blades are produced in Sweden. However, much of the iron ore is sourced from China, Africa and South America. The bulk of coal reserves are mined in the US, Russia, China and India. These materials are heavy and require a lot of energy to move them to the steelmaking plants. Transporting the steel to the blade manufacturing sites and then the doctor blades to market consumes even more fuel and expands the carbon footprint.

Due to its production process, local sources of raw materials and relative lightness, transporting plastic materials has a much lower impact on the environment in terms of carbon emissions. The primary method of transporting petroleum and natural gas is by pipeline, which costs only a fraction of hauling. Plastic doctor blades also generally last longer than steel blades in the press, so printers need fewer order deliveries.