Roller Design to Increase the Lifespan of Asphalt Compactor Wiper Blades
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Overview
Volvo CE’s asphalt compactors have a polymer wiper blade that is used to distribute water over the drum. This blade is wearing out way too fast, sometimes within 100 hrs. Volvo CE asked us to figure out a way to extend the life of their water distribution system.

Objectives
We came up with a new design for water distribution. We tested to make sure it would work and last longer than current design. We tested the force of their compression springs with respect to temperature.

Approach
• Visited sponsor to define problem and see system current design.
• Acquired information on materials used along with samples.
• Discussed possible options such as a new design, lubricant, new material, etc.
• Decided on new design-researched related patents.
• Created SolidWorks drawings of new design.
• Built proof of concept prototype to prove that this would distribute water as expected.
• Tested samples on belt sander to determine wear rate.
• Tested roller design on belt sander to determine wear rate.
  o Recorded length of sample vs. time.
  o Displayed all results on one graph to show improvements with roller design.
• Tested compression spring with varying temperature
  o Recorded minimum force required to compress the spring
  o Recorded maximum force where spring will re-extend
• Redesigned prototype to match actual setup more closely.

Outcomes
• The roller will extend lifespan at a very minimum of five times its current life.
  o The roller was tested five times as long as the wipers and never showed any change in diameter.
  o It only showed slight scratching.
  o Hours may be needed to test this rather than the minutes it took to test the flat blades.
• The force of the gas spring increased linearly with temperature. Equation given in final report.