Cooper Standard engaged Uncountable to help formulate a new rubber compound with extreme physical property requirements from a pool of seldom-used and new ingredients.

The Need:
- End-product specifications required performance across 16 different physical properties
- Typical rubber compounds have 10-12 components, including active chemistries like cross-linkers, selected from a pool of 25 potential ingredients.

The Solution:
- Uncountable used its Artificial Intelligence platform to suggest new formulations to Cooper Standard using its 3-step process

CooperStandard

CUSTOMER PROFILE

Cooper Standard (NYSE: CPS)
Market Cap: $2.1 B USD
Employees: 30,000+

Cooper Standard is a leading global supplier of systems and components for the automotive industry. Products include rubber and plastic sealing, fuel and brake lines, fluid transfer hoses and anti-vibration systems.

Step 1: Ingest historical recipes with experimental data and set the objective function for the new material.

Step 2: Build custom Machine Learning model that learns ingredient interactions, and encode chemist's prior knowledge of the material space into the model. Then, use the Artificial Intelligence engine to suggest the best possible formulations.

Step 3: Incorporate experimental results from Uncountable suggestions to continuously improve the model and suggest the next round of formulations to test. Iterate step 3 until objective is complete.

Key Results:
2.5x reduction in testing time and **2.5x reduction** in experimental trials

"Uncountable was able to identify novel compounds that were outside of our normal box of experimentation and delivered significant improvements in performance."
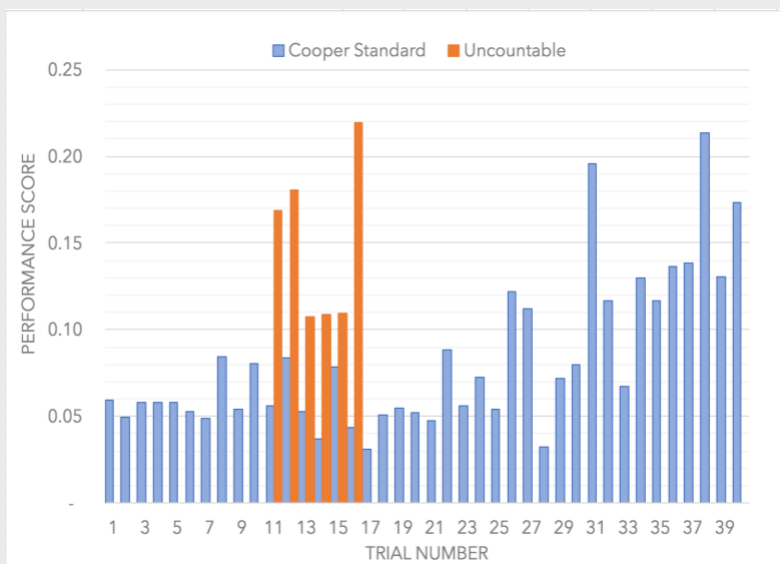*Chris Couch, VP of Innovation and Product Groups*

Cooper Standard sees significant improvement in less than 1/2 of trials

Cooper Standard had tested 40 formulations (blue bars) using partial factorial DOEs.

As a way to backtest the Uncountable approach as a head-to-head comparison, Uncountable only used the first 10 experiments as training data.

The A.I. engine suggested 6 new formulations, which were mixed and tested by Cooper Standard, with the results displayed to the right (orange bars).

One of Uncountable's experiments (orange bars) exceeded the performance level seen in the first 40 experiments conducted by Cooper Standard.

The "performance score" is a weighted average of the measured values of all 16 properties to-be-optimized. A higher score indicates better performance.