

What Is A CARBOB Model?

- Objective Is To Certify CARBOB, Rather Than Hand Blends
- Model Predicts Blend Properties Based On CARBOB Properties, Ethanol Properties, and Ethanol Content
- Front End To Predictive Model
 - Input CARBOB Properties
 - Output Blended Properties For Input To Predictive Model

How Do You Develop A CARBOB Model?

- Model RVP, T_{50} And T_{90}
 - Gather BOB/Blend Data
 - Deal With Non-Ideal Behavior
- Calculate Aromatics, Olefins, Sulfur, Benzene And Oxygen

The Data

- 523 Blends: Paired BOB/Blend Data
- Obtained From Several Companies
- Mixture Of Lab And Production Data
- CARB / RFG / Other
- Blend Property Ranges:
 - 1 - 15% Ethanol
 - 6 - 16 psi RVP
 - 140 - 250 T50
 - 275 - 362 T90

Analysis Methodology

- SAS Least Squares Multiple Regressions
 - Blended Property = $f(\text{Base HC Property})$
 - “All Possible Subsets” Of Primary And Interaction Terms
 - True Stepwise (Forward + Backward) Elimination
- Include Only Significant Terms And Exclude Terms That Increase R^2 / Decrease RMSE By A Small Amount
- Diagnostic Plots For Checking Non-Random Patterns And Goodness-Of-Fit

Summary

- Have Developed Workable Models
- Models Still A Work In Progress
- Current Models Useful For
Development Of Implementation