ML Model Performance Report

Model: foam_training_table

Model Configuration

Parameters:

n_estimators: 370
max_depth: 6
splitpercent: 79
shuffledata: true
random_state: false

Input Features:
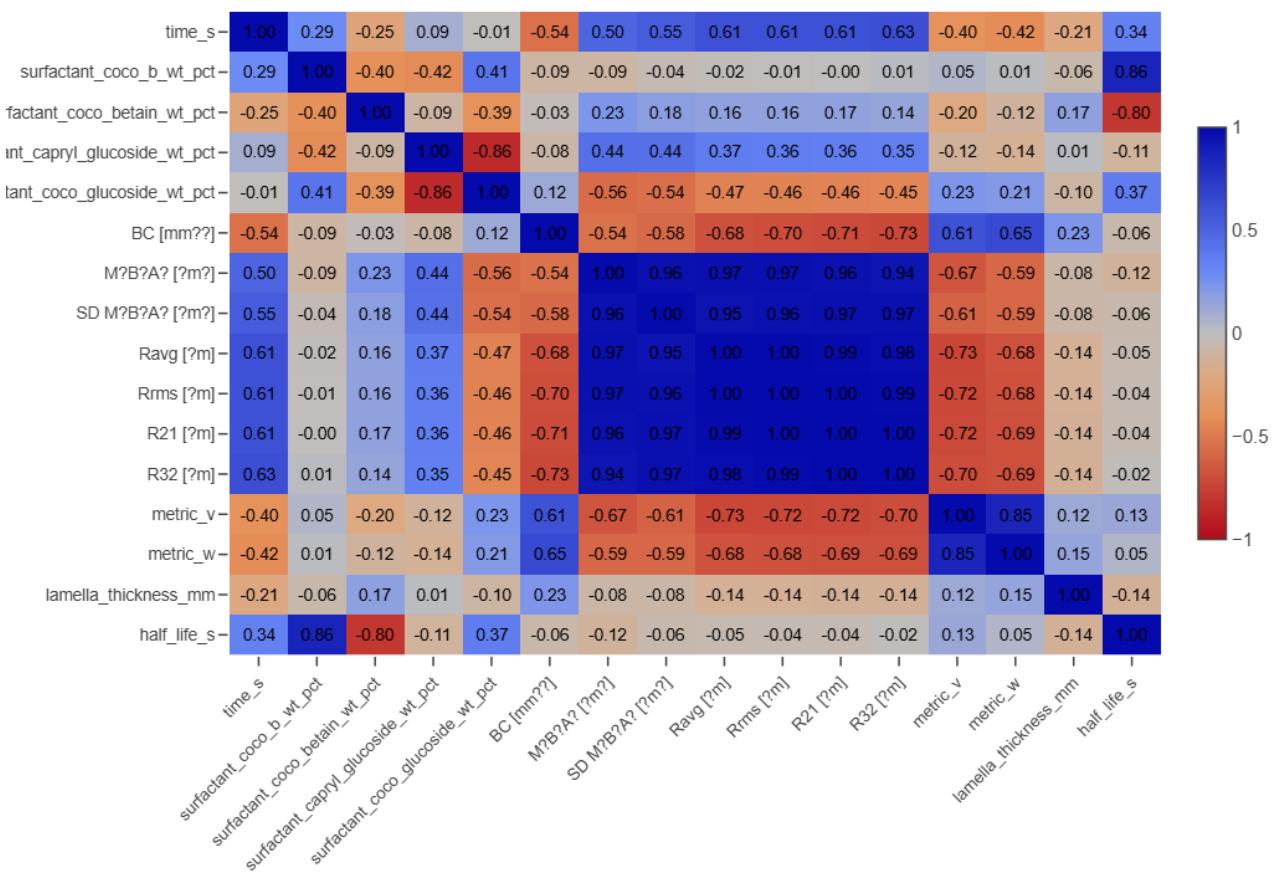
time_s, surfactant_coco_b_wt_pct, surfactant_coco_betain_wt_pct,
surfactant_capryl_glucoside_wt_pct, surfactant_coco_glucoside_wt_pct

Target Outputs:

BC [mm??], M?B?A? [?m?], SD M?B?A? [?m?], Ravg [?m], Rrms [?m], R21 [?m], R32 [?m],
metric_v, metric_w, lamella_thickness_mm, half_life_s

Feature Correlation Heatmap

Correlation Matrix

Distribution of Features

Legend:
- time_s
- surfactant_c...
- surfactant_c...
- surfactant_c...
- surfactant_c...
- BC [mm??]
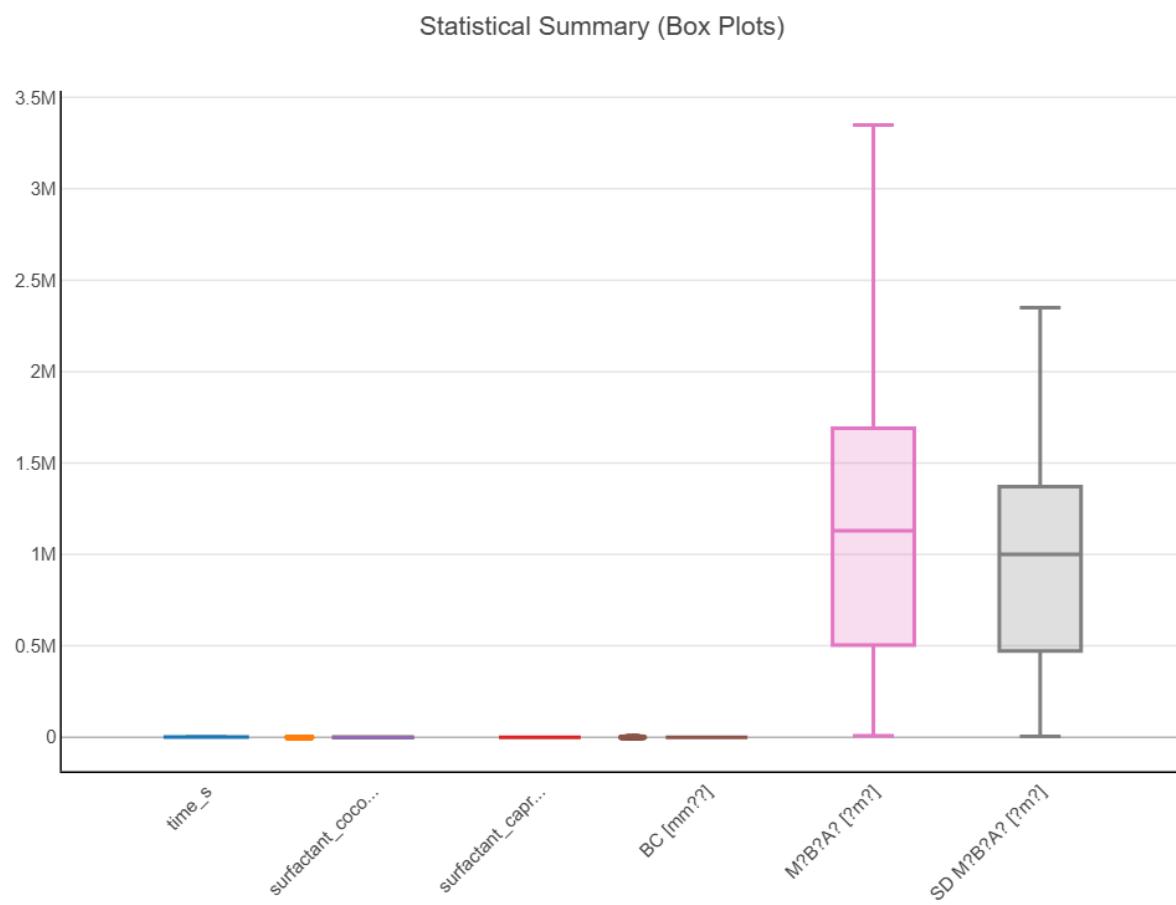
Statistical Summary (Box Plots)

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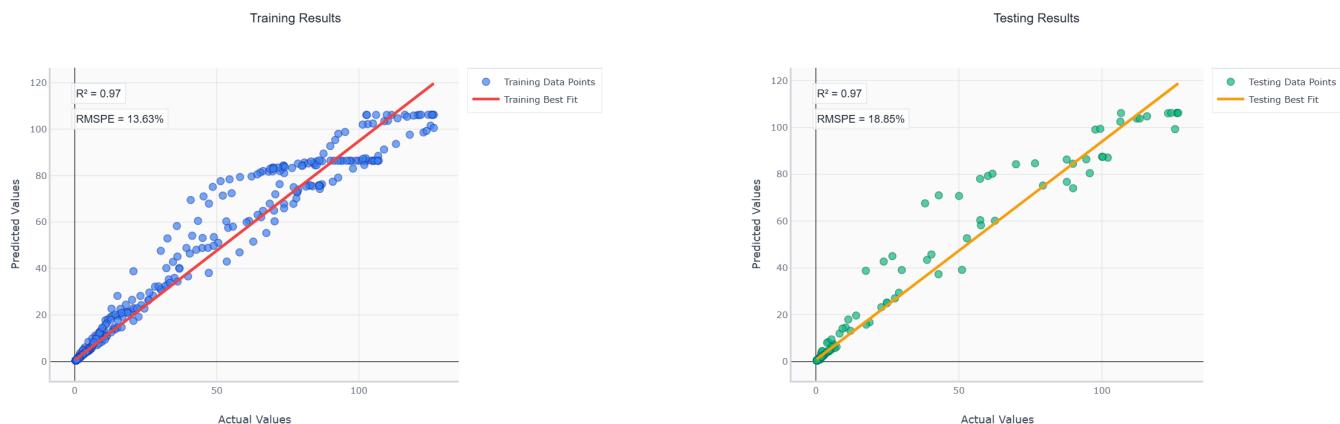
Model Performance Visualization

BC [mm??] Performance

Training
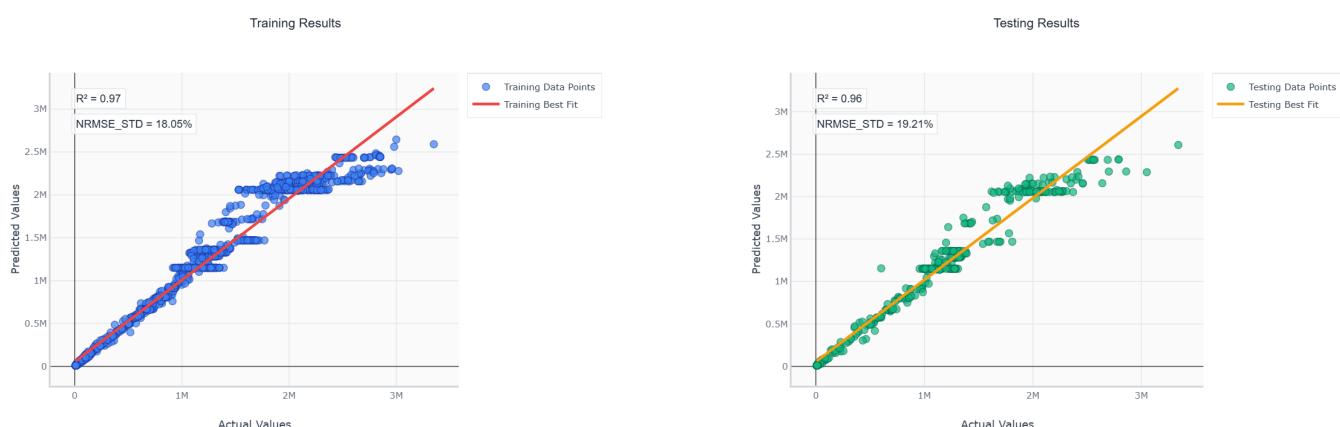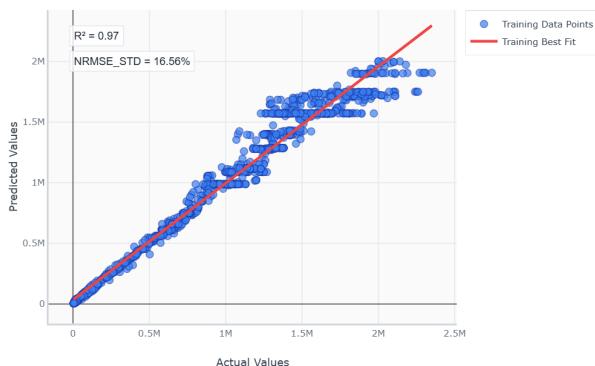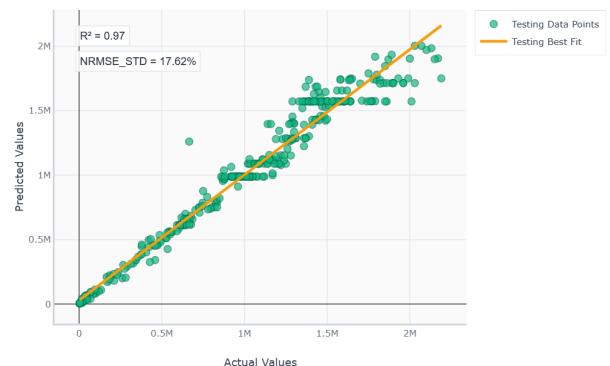
Training Results

Testing

Testing Results

M?B?A? [?m?] Performance

Training

Training Results

Testing

Testing Results

SD M?B?A? [?m?] Performance

Training

Training Results

R² = 0.97
NRMSE_STD = 16.56%

Testing

Testing Results

R² = 0.97
NRMSE_STD = 17.62%

Ravg [?m] Performance

Training

Training Results

R² = 0.98
RMSPE = 6.01%

Testing

Testing Results

R² = 0.98
RMSPE = 7.4%

Rrms [?m] Performance

Training

Training Results

R² = 0.99
RMSPE = 5.59%

- Training Data Points
- Training Best Fit

Testing

Testing Results

R² = 0.98
RMSPE = 6.87%

- Testing Data Points
- Testing Best Fit

R21 [?m] Performance

Training

Training Results

R² = 0.99
RMSPE = 5.59%

- Training Data Points
- Training Best Fit

Testing

Testing Results

R² = 0.99
RMSPE = 6.71%

- Testing Data Points
- Testing Best Fit
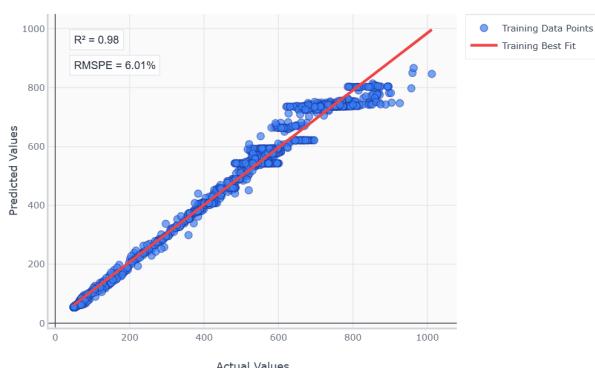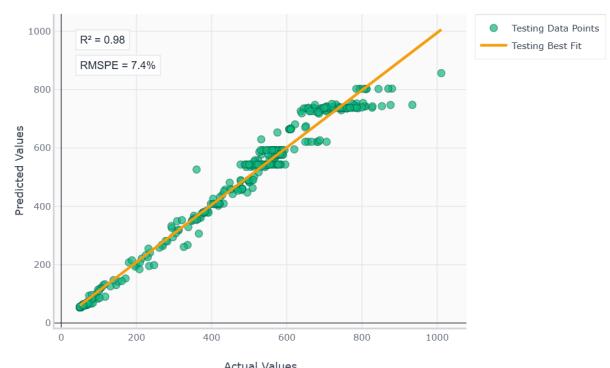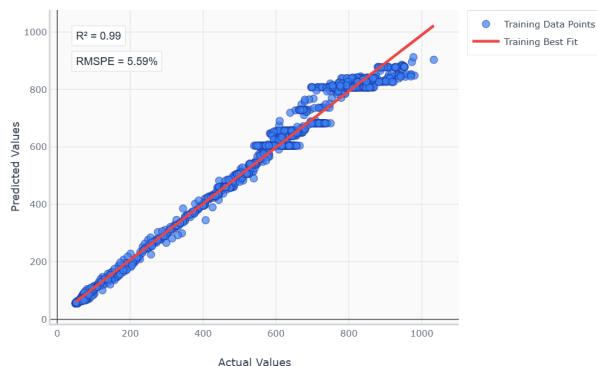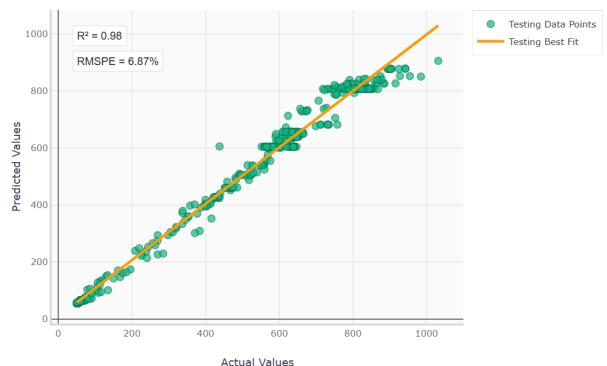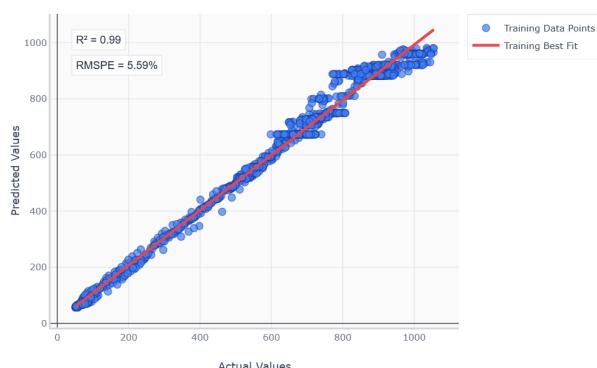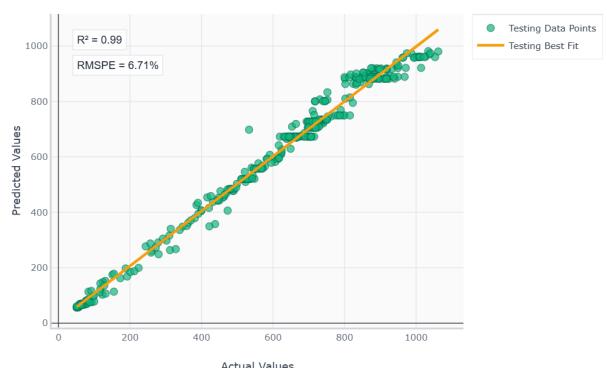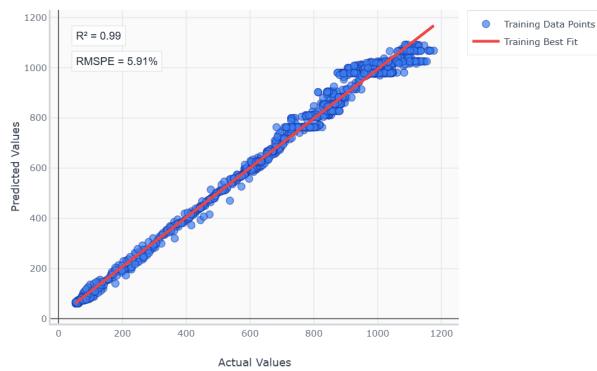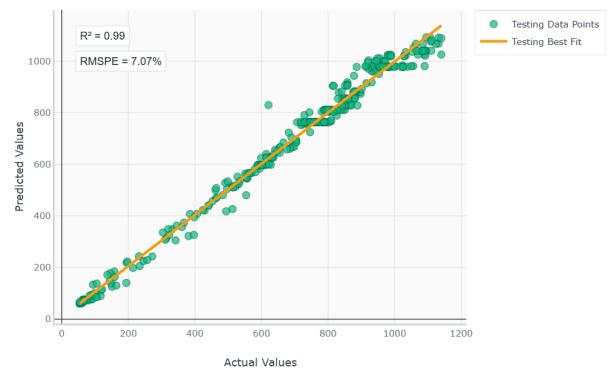
# R32 [?m] Performance

Training

Training Results

Testing
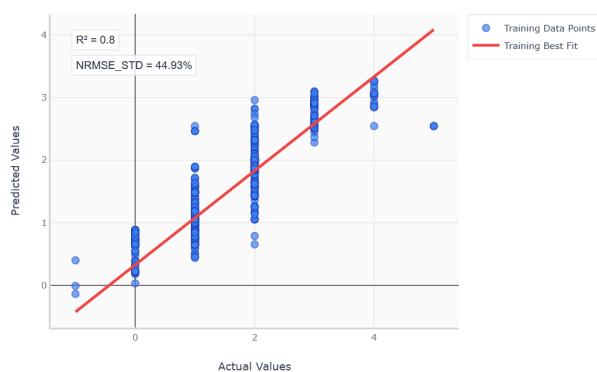
Testing Results

metric_v Performance
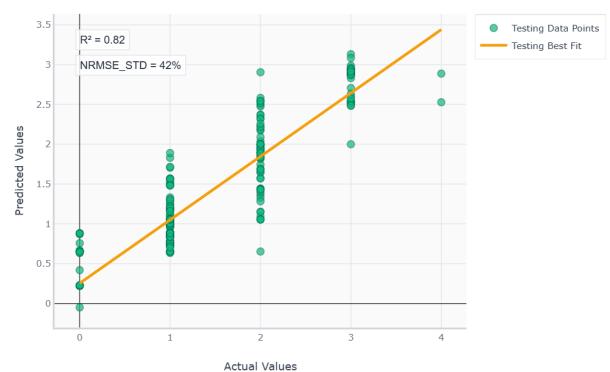
Training

Training Results

Testing
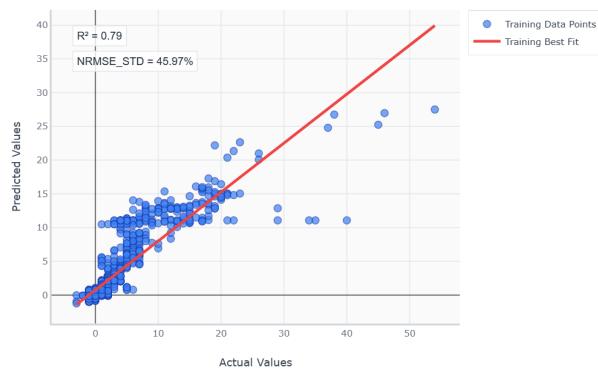
Testing Results

metric_w Performance

Training

Training Results

R² = 0.79
NRMSE_STD = 45.97%

Testing

Testing Results

R² = 0.86
NRMSE_STD = 37.96%
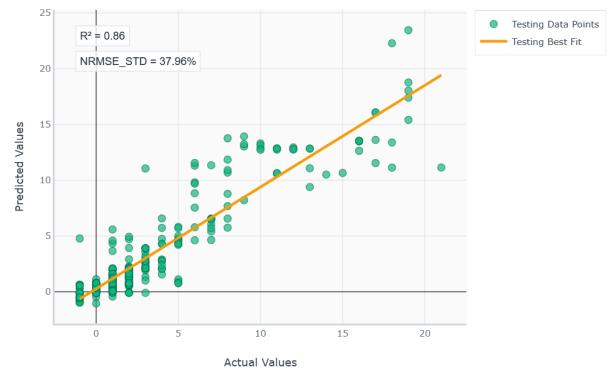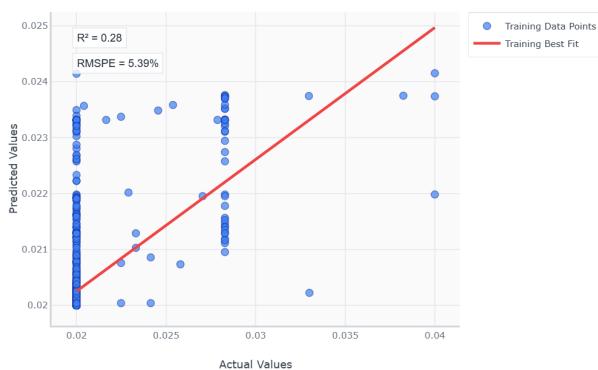
lamella_thickness_mm Performance

Training

Training Results

R² = 0.28
RMSPE = 5.39%

Testing

Testing Results

R² = 0.19
RMSPE = 5.32%
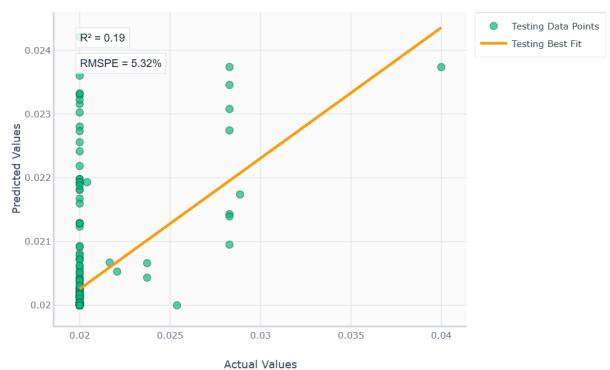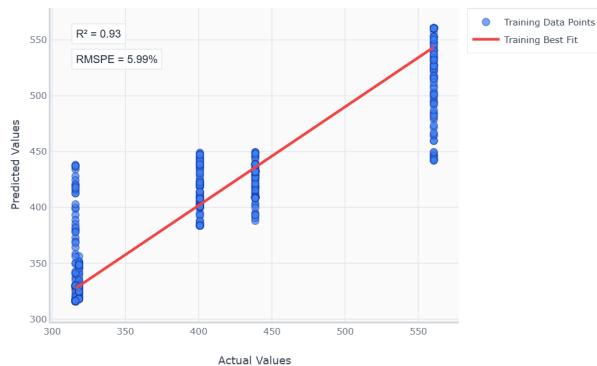
half_life_s Performance

Training

Training Results

R² = 0.93
RMSPE = 5.99%

- Training Data Points
- Training Best Fit

Testing

Testing Results

R² = 0.92
RMSPE = 6.6%

- Testing Data Points
- Testing Best Fit