# LA-ICP-MS Throughput Simulation Report

Generated: 2025-05-28 17:30:45

## Experiment Parameters:

Config File : C:\Users\lsummerfield\Documents\ESL Data Analytics\20250522_ALON throughput sim\config\tv3_bas

Scan Length (mm): 10.0

Step Size (mm): 0.005

Array Height (mm): 5.0

Number of Lines: 1001

Index Time (s): 0.02

Settle Time (Linear, s): 0.01

Settle Time (Stepper, s): 0.05

Comms Overhead (s): 0.001

Canonical Max Velocity (Linear, mm/s): 100

Canonical Max Velocity (Stepper, mm/s): 50

Canonical Acceleration (Linear, mm/s^2): 2000

Canonical Acceleration (Stepper, mm/s^2): 8000

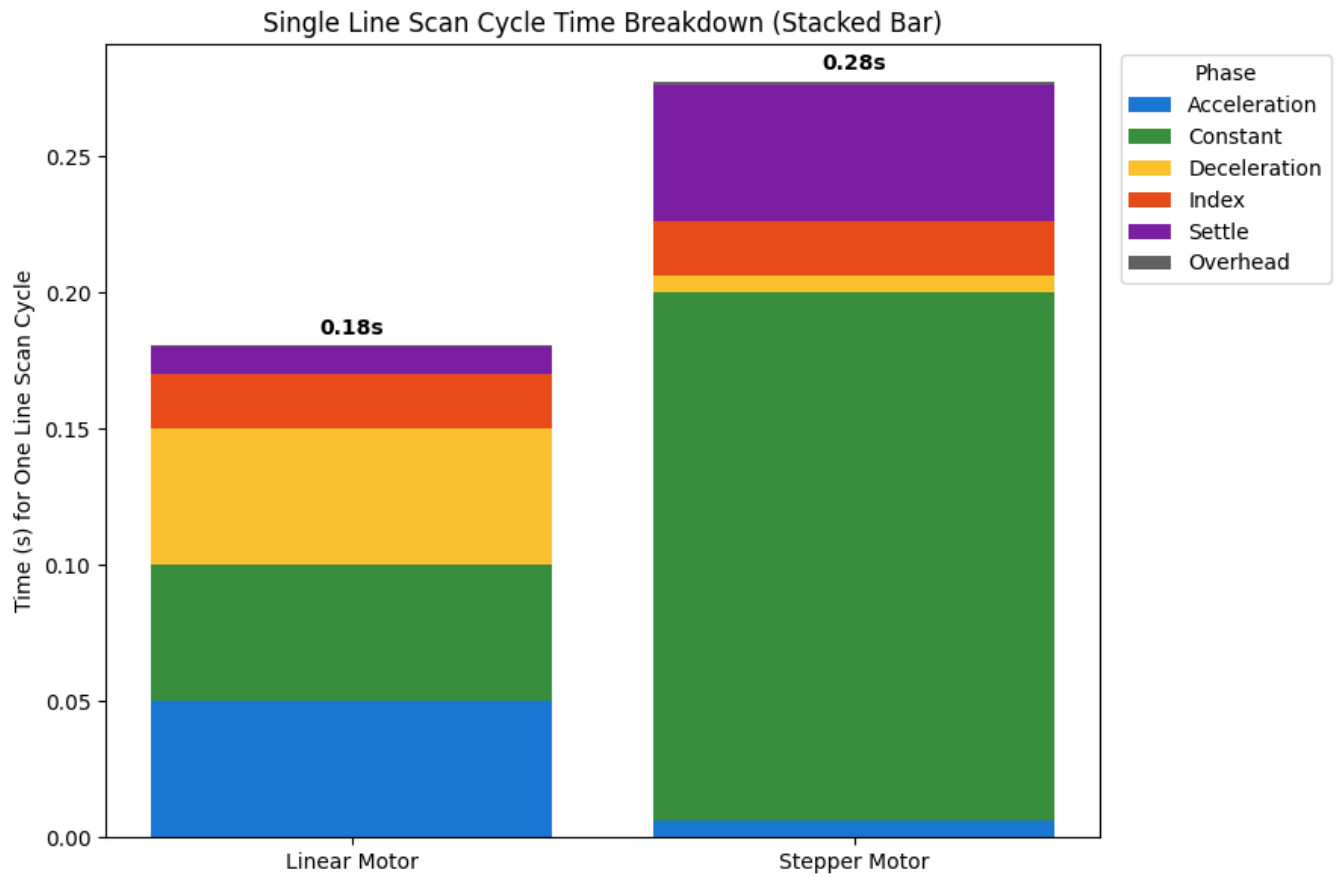Velocity Sweep Range (mm/s): 10.0 to 400.0

Acceleration Sweep Range (mm/s^2): 500.0 to 12000.0

Vendor Table Source: C:\Users\lsummerfield\Documents\ESL Data Analytics\20250522_ALON throughput sim\data\
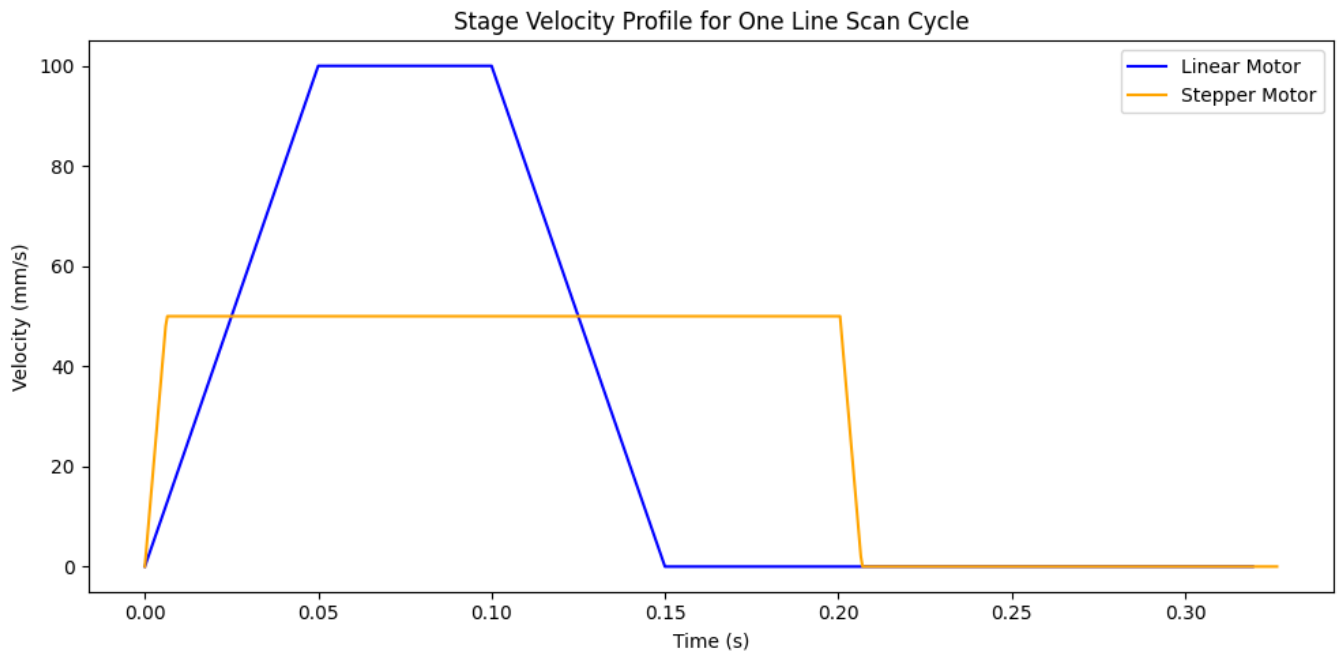
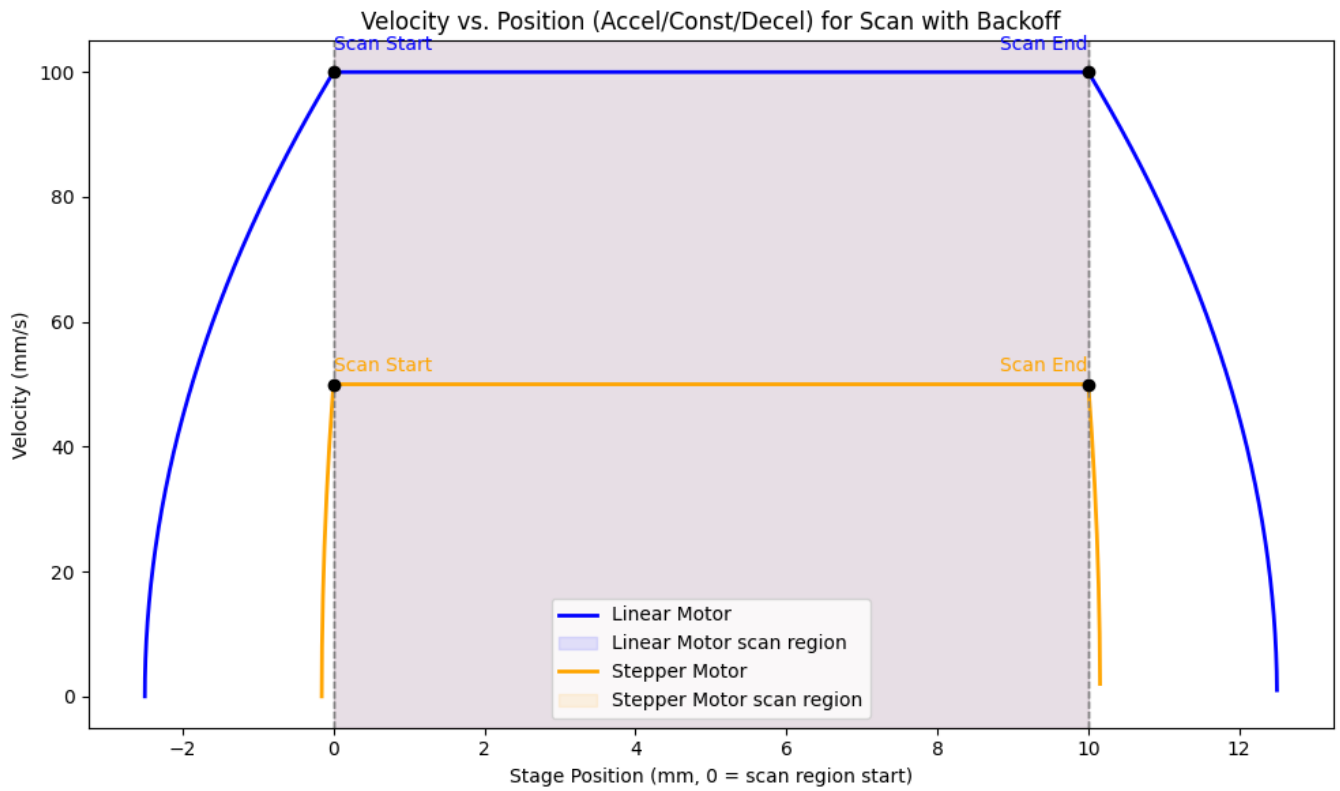## Experiment Notes:

Config: tv3_baseline | Automated batch run.

**Single cycle time breakdown stacked bar**



Single Line Scan Cycle Time Breakdown (Stacked Bar)

# Velocity single cycle

## Stage Velocity Profile for One Line Scan Cycle

# Velocity vs position with backoff



Velocity vs. Position (Accel/Const/Decel) for Scan with Backoff

# Velocity vs time with backoff



Classic Motion Profile: Velocity vs. Time (with Backoff)
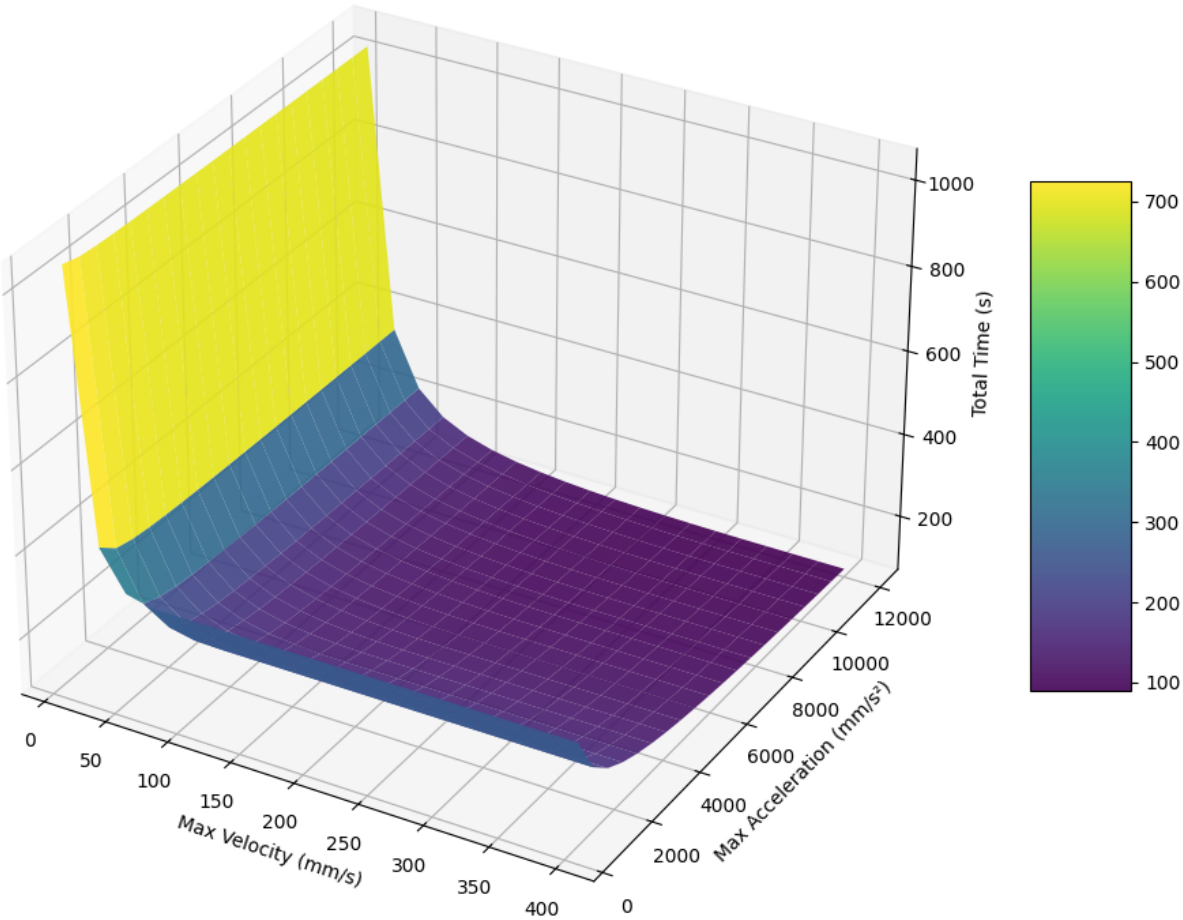
# Acceleration vs time
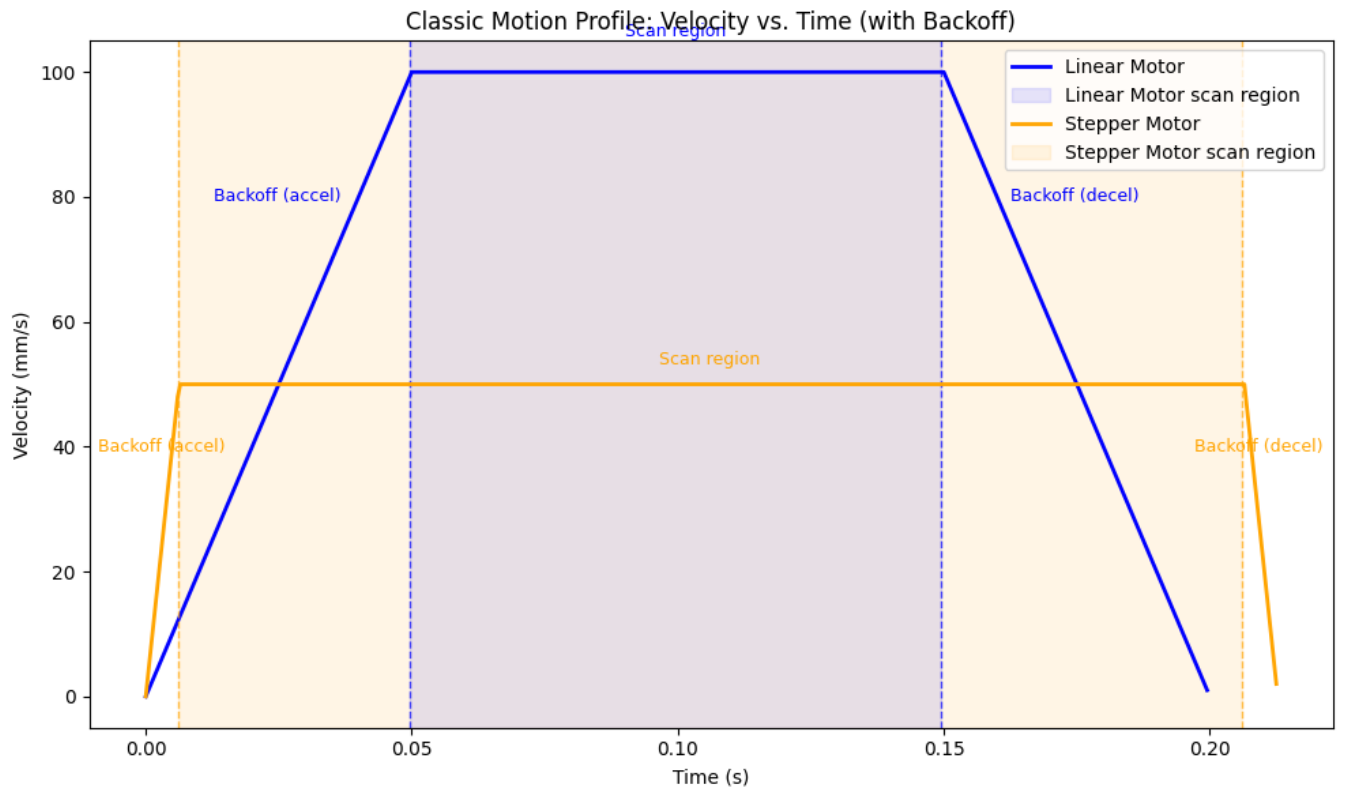


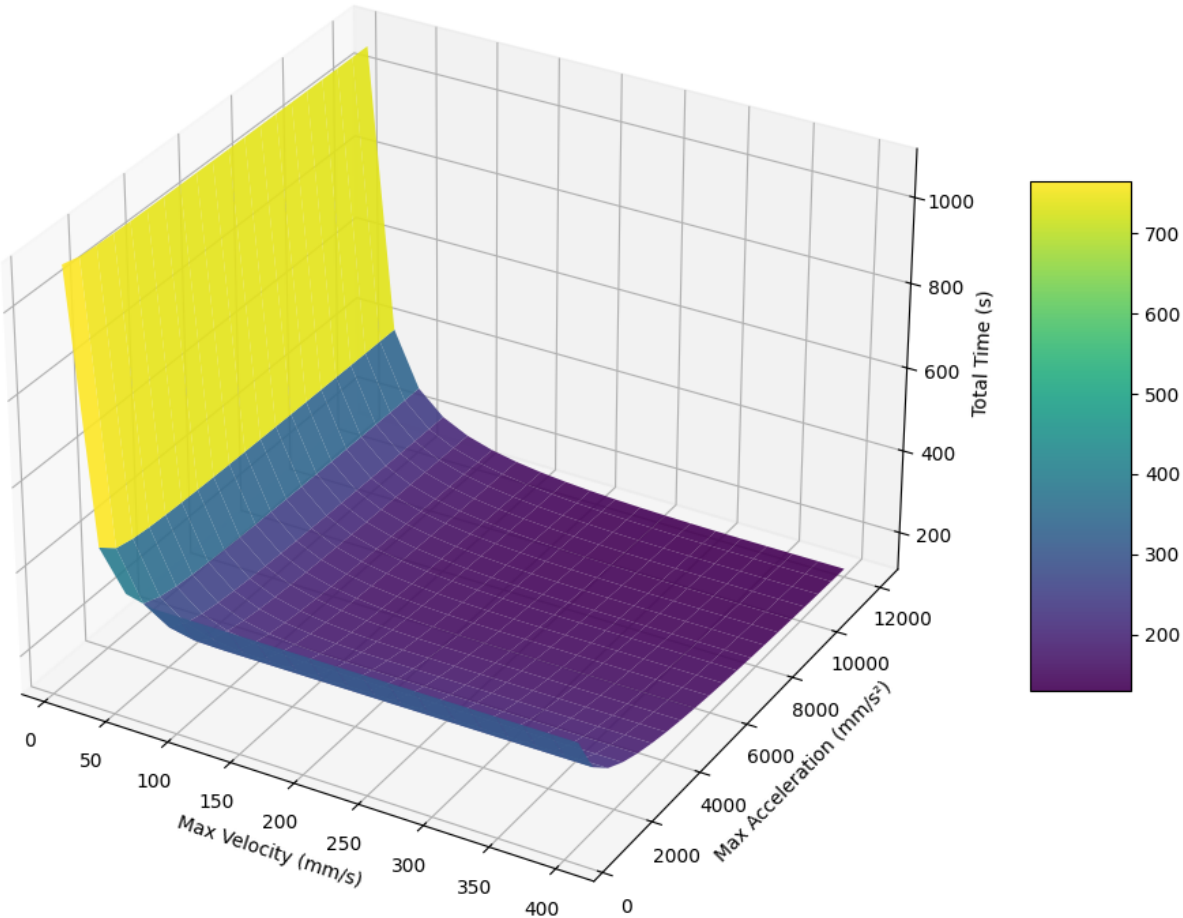Acceleration vs. Total Experiment Time
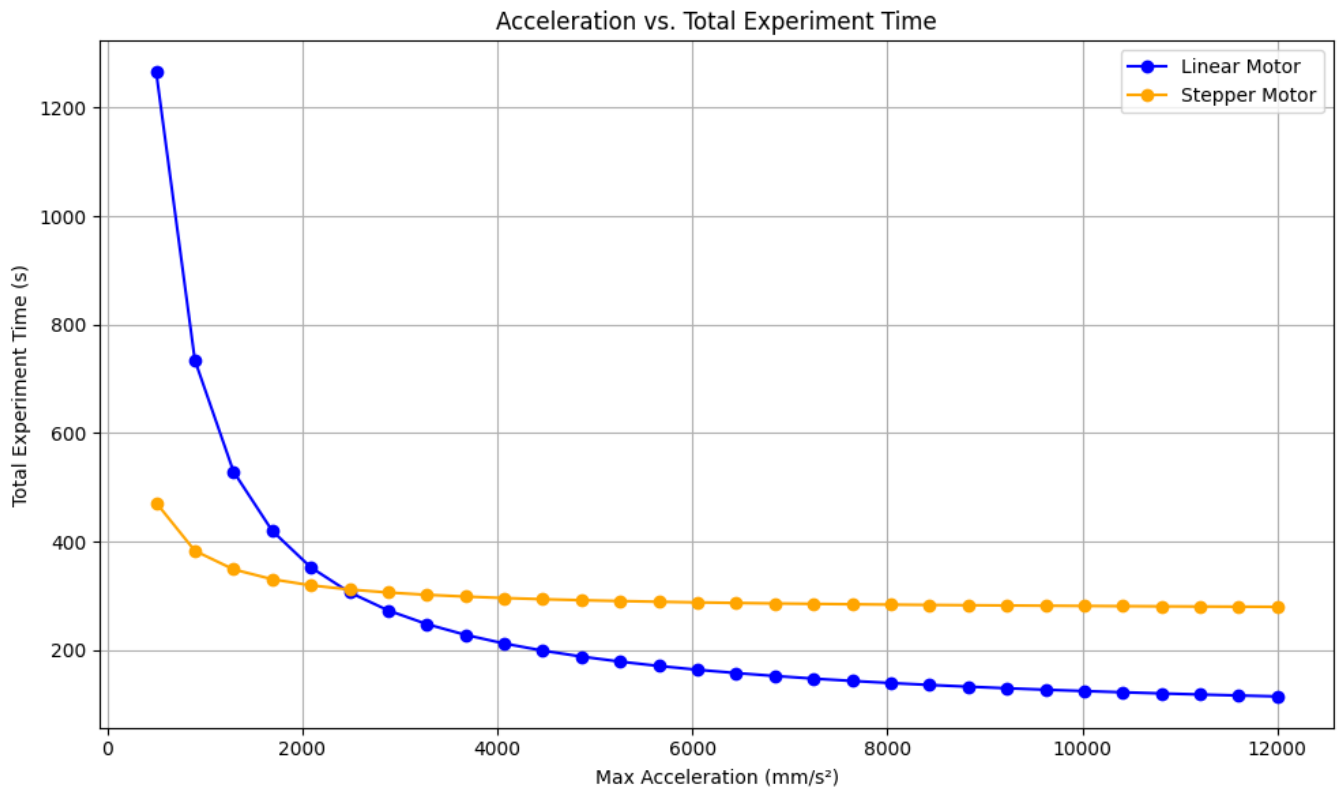
# Velocity accel surface linear
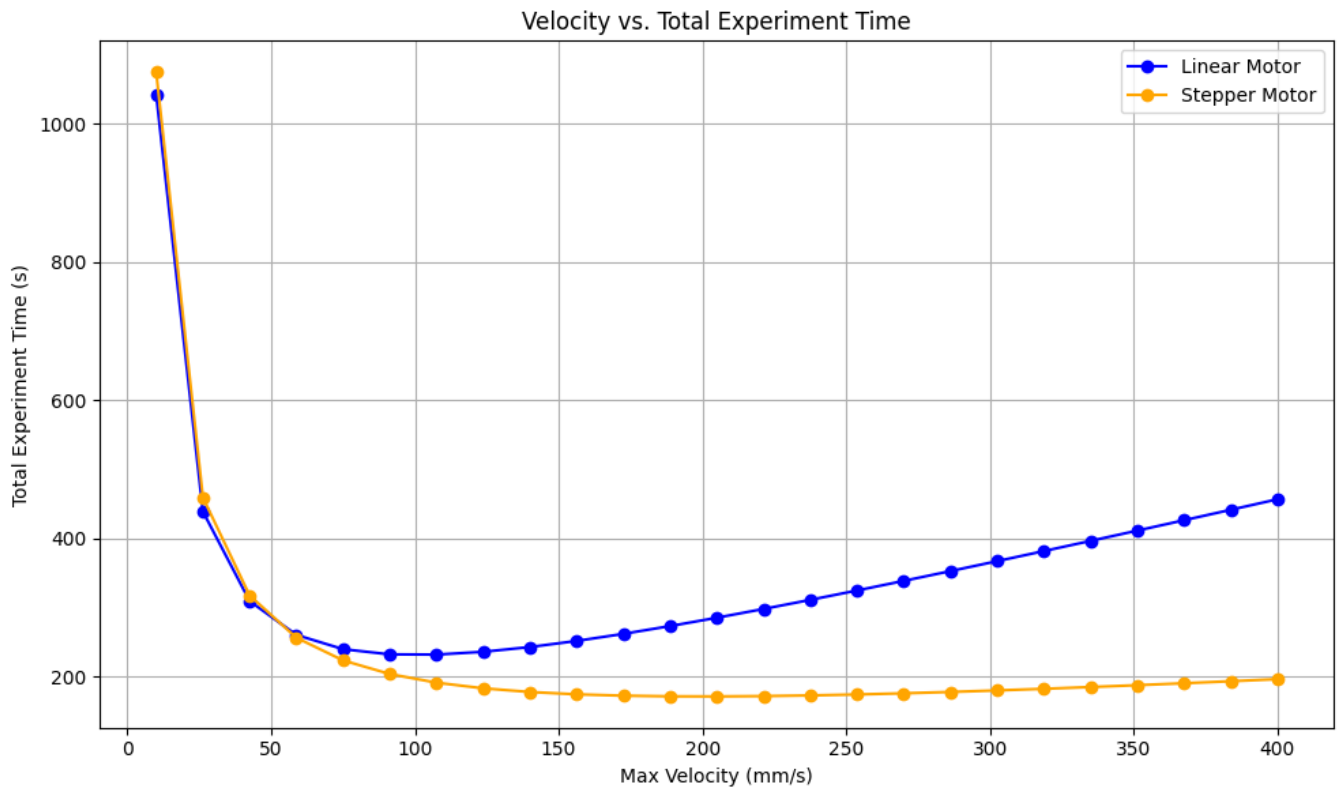
Total Time vs Velocity and Acceleration (Linear Motor)

# Velocity accel surface stepper

## Total Time vs Velocity and Acceleration (Stepper Motor)

# Velocity vs time



Velocity vs. Total Experiment Time

# Vendor stages time breakdown



Vendor Stage Performance Comparison: Time Breakdown by Phase

**Phase**
- Acceleration
- Constant
- Deceleration
- Index
- Settle
- Overhead