

Aspen Unified Scheduling™ : Multi-Blend Optimization

Overview

Multi-Blend Optimization (MBO) is an advanced solution that enables seamless scheduling and optimization of refinery product blending operations. It is a layered product requiring **Aspen Unified Scheduling**.

MBO brings blending optimization directly into the scheduling workflow—enabling a unified, real-time environment for optimizing tank usage and product blends.

MBO generates optimal blend recipes and schedules across gasoline, distillates, fuel oils and other refined products—while ensuring compliance with quality specifications, operational constraints and market requirements.

Use Case: Optimizing Blending in a Dynamic Market

Challenge: Refineries must maximize value from available component streams while meeting increasingly complex product specifications and adapting to changing market conditions. Manual or disconnected systems make it difficult to consistently achieve optimal blending outcomes.

Solution: Multi-Blend Optimization, embedded within Aspen Unified Scheduling, provides an integrated optimization environment that aligns blending decisions with planning economics, real-time scheduling and operational constraints.

Result:

- Increased blending margins
- Improved operational efficiency and execution reliability
- Reduced quality giveaway
- Better coordination across planning, scheduling and trading

Features & Benefits

Blending Optimization

Multi-Blend Optimization is now offered as a layered product that is natively integrated within Aspen Unified Scheduling, eliminating the need for separate systems and enabling a seamless workflow between planning, scheduling and blending decisions.

Unified Scheduling and Optimization Environment

Schedulers can now optimize blending decisions directly alongside crude and product scheduling, leveraging a consistent data model, shared constraints and synchronized schedules.

Improved Collaboration Across Planning and Scheduling

Enhanced integration enables tighter alignment between planners, schedulers and blending operations—supporting more informed and consistent decision-making across the refinery.

Modern, Streamlined User Experience

A unified interface simplifies workflows, improves usability and reduces the time required to analyze scenarios and generate optimal results.

Key Capabilities

Event-Based Multi-Blend Optimization

MBO is an event-based, multi-period optimization system that generates optimal blending schedules for both short- and long-term campaigns.

- Optimizes multiple blends simultaneously
- Accounts for all relevant events, including blends, shipments, receipts and transfers
- Supports user-defined scheduling horizons

Advanced Nonlinear Optimization

MBO solves complex nonlinear blending problems across time, ensuring all constraints are satisfied.

- Handles correlations and blending properties
- Incorporates tank constraints and discrete volume limits
- Generates executable blend schedules

Integrated Scheduling and Blending

MBO is now embedded within Aspen Unified Scheduling:

- Uses a shared scheduling model and data foundation
- Aligns blending decisions with real-time schedule updates
- Enables coordinated optimization across crude, intermediates and products

Flexible Blend Planning and Execution

- Generate optimal recipes for individual blends or time-partitioned blending campaigns
- Schedule blends across single or multiple tanks

Scenario Analysis and Case Comparison

- Create and compare multiple operating scenarios
- Evaluate different pricing, supply and operational conditions
- Identify best-case outcomes for blending operations
- Selectively or entirely promote cases

Enabling Technologies for Implementing the Blend Schedule

- Blend control interface (BCI) connects blend schedules to control systems (DCS/APC) for execution.
- AspenTech Workflow enables the required BCI integration—a low code/no code solution that translates MBO blend schedules into controller ready data while also automating key business processes.
- For more information about AspenTech Workflow, please [contact us](#).

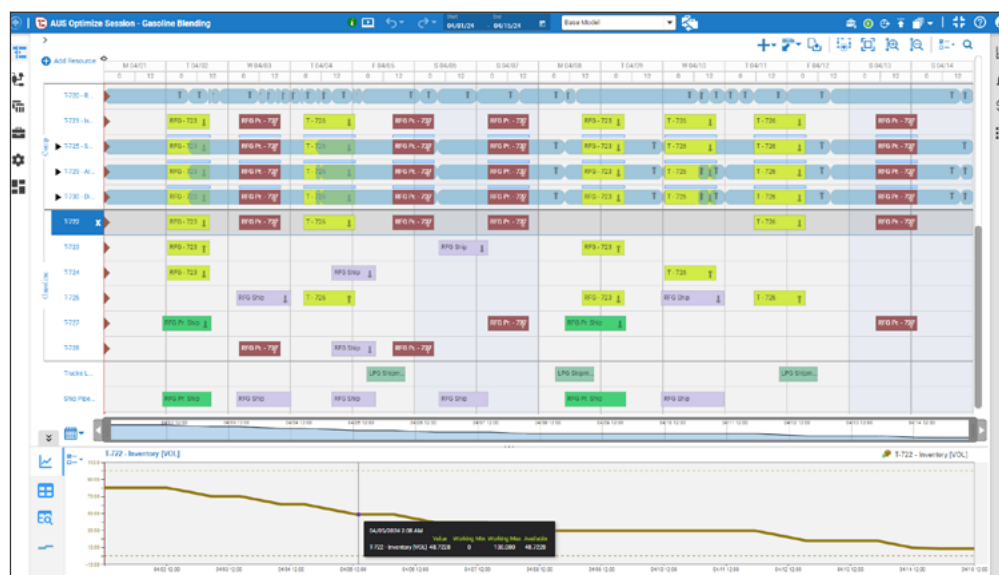


Figure 1. Gantt and stock charts showing gasoline blending campaigns in MBO. Top section shows the component tanks, with the middle section showing the blended gasoline tanks. The bottom section of the Gantt shows trucks and pipeline shipments from the refinery.