Petroleum Products Specifications: Fuel Testing, Blending and Quality Release

19 – 23 September 2027
Riyadh - KAFD district five-star



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Introduction:

Petroleum products specifications are breached when samples are drawn badly, test results are read without their precision, blends are cut with heavy giveaway and cargoes are released on certificates nobody has checked. This Core Concept course gives laboratory, blending and inspection staff a working grasp of LPG, gasoline, jet fuel, diesel, fuel oil and base oil properties, the test methods behind each limit, sampling, blending to specification, custody transfer certificates and off-specification recovery. Participants build a Product Quality Control and Release Plan for a product line they handle.

Course Objectives:

- Interpret the specification sheet of LPG, gasoline, jet fuel, diesel, fuel oil and base oils and link each limit to the property it protects in use
- Select and apply the laboratory test for distillation, density, flash point, octane, cetane, sulphur, vapour pressure, cold flow and viscosity and judge a result against its repeatability and reproducibility
- Draw, label and retain representative samples from tanks, pipelines and ships using running, spot and composite sampling routines
- Calculate a blend recipe to meet octane, vapour pressure, sulphur and cold flow limits while measuring and reducing quality giveaway
- Verify a certificate of quality and a custody transfer inspection report and decide on release, reblend or rejection of an off-specification or contaminated batch
- Run laboratory quality control charts and proficiency testing results to show that product release data can be relied on

Target Audience:

- Laboratory analysts and chemists who run fuel and lubricant tests and report results for product release
- Blending and oil movements staff who prepare component recipes and transfer finished grades between tanks
- Product quality staff who own specification compliance, certificates and customer quality complaints
- Terminal and cargo inspectors who gauge, sample and witness custody transfer of petroleum cargoes
- Shift laboratory supervisors who review test data, control charts and retained samples before sign-off

Course Outline:

Day 1: Petroleum Product Families and Specification Sheets

- Product Slate Map: LPG, Naphtha, Gasoline, Kerosene, Jet Fuel, Diesel, Fuel Oil and Base Oils
- Reading a Specification Sheet: Property, Unit, Limit Type and Referenced Test Method
- Hydrocarbon Composition Effects on Volatility, Combustion and Cold Behaviour
- LPG Quality Properties: Composition, Vapour Pressure, Residue and Odorant Checks
- Fuel Oil and Base Oil Grade Properties: Viscosity Class, Pour Point and Viscosity Index

Day 2: Fuel Specifications and Laboratory Test Methods

- Gasoline Octane Testing: RON and MON Engine Methods and Anti-Knock Index
- Reid Vapour Pressure to ASTM D323 and Seasonal Volatility Classes
- Jet Fuel to ASTM D1655 and DEF STAN 91-91: Freezing Point, Flash Point and Water Checks
- Diesel to EN 590 and ASTM D975: Cetane, Density, Viscosity at 40 C and Cold Filter Plugging Point
- Distillation Curve, Density at 15 C and Sulphur Analysis as Release Tests

Day 3: Sampling, Blending to Specification and Giveaway Control

- Tank, Line and Ship Sampling: Running, Spot, Composite and Retained Sample Routines
- Sample Containers, Labelling, Chain of Custody and Retention Periods
- Blending Indices and Linear Versus Non-Linear Property Blending
- Blend Recipe Calculation for Octane, Vapour Pressure, Sulphur and Cold Flow Limits
- Quality Giveaway Measurement Sheet and Recipe Trimming Against Specification Margins

Day 4: Custody Transfer, Off-Specification Product, Clean Fuels and Additives

- Custody Transfer Inspection Report: Gauging, Temperature, Sampling and Witnessed Results
- Certificate of Quality Verification Against Contract Specification and Test Precision
- Off-Specification and Contaminated Batch Handling: Water, Particulates, Cross-Contamination and Reblend
- Clean-Fuel Limits for Sulphur, Aromatics and Benzene and Biodiesel Blends to EN 14214 and ASTM D6751
- Fuel Additive Types: Anti-Oxidants, Conductivity Improvers, Cold Flow Improvers and Detergents

Day 5: Case Study: Laboratory QC Data and the Product Quality Control and Release Plan

- Laboratory Quality Control Charts: Check Samples, Control Limits and Out-of-Control Rules
- Proficiency Testing and Inter-Laboratory Comparison Result Review
- Case Study: Disputed Cargo Certificate and Diverging Load and Discharge Test Results
- Case Study: Off-Specification Diesel Tank Recovery Decision and Customer Notification
- Product Quality Control and Release Plan Drafting and Peer Review Panel

Skills You Will Gain:

- Specification Sheet Interpretation
- Fuel Test Method Selection
- Test Precision Judgement
- Representative Sampling Practice
- Blend Recipe Calculation
- Quality Giveaway Reduction
- Certificate of Quality Verification
- Off-Specification Batch Recovery

Why Attend This Course:

- Take back a Product Quality Control and Release Plan covering tests, sampling, blending checks and release rules for a product line you handle
- Settle disputes over cargo quality with test precision evidence rather than argument between load and discharge laboratories
- Recover value from off-specification and contaminated batches by choosing between reblend, downgrade and rejection with clear criteria
- Compare laboratory, blending and inspection practice with peers from refineries, terminals, fuel importers and independent inspection firms

Conclusion:

Product quality is proven one sample, one test and one certificate at a time. The week moves from product families and specification sheets, through octane, vapour pressure, jet fuel, diesel, distillation, density and sulphur testing, to sampling routines, blend recipe calculation and giveaway control. It then covers custody transfer inspection, certificate checks, off-specification recovery, clean-fuel limits and additives, and closes with laboratory control charts, proficiency testing, dispute cases and a Product Quality Control and Release Plan for each participant.