

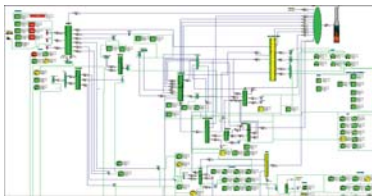
Sigmafine in Refining

Domain:

- Improve data quality for better business decision
- Apply first principles to achieve consistent data
- Monitor energy efficiency
- Track composition and qualities of crudes and semi-finished products

Refining world is facing challenges of uncertain oil price in the foreseeable future, new fuel specifications and limited investments which are putting pressure on the existing capacity. Capability of using the actual resources in the most efficient way requires more careful decisions both in planning and in operations. Availability is not enough for data driven decisions: consistency and accuracy are imperative requirements to achieve better sensitivity and judgment: **data quality matters!**

Sigmafine, the state-of-the-art data validation and reconciliation software, puts in relation raw process data, material transactions and business data in one model constrained by first principles equations, to get a refined set of consistent and more accurate information to support your decisional process. Sigmafine is currently used in major refineries worldwide to drive the daily business, material accounting, inventory reporting, integration with ERP and business intelligence till supporting corporate governance.



Sigmafine balance model
(colors according to data quality)

Modeling flexibility and a wide range of data analyses make Sigmafine the ideal solution to target:

- ✓ **Production and yield accounting**
- ✓ **Composition and quality tracking** of crudes and semi-finished materials
- ✓ **Movement Management**
- ✓ **Energy management and emission monitoring**

Production and Yield Accounting

U_ID_CD	Material	Description	Quantity [t]	%
	CRUDE	Crude to be processed	6991,76	100,0
CONSUMPTION			6991,76	100,0
	Total IN		6991,76	100,0
	FG	Fuel gas	285,60	4,1
	LIGHT_NAFTA	Light Nafta	2112,44	30,2
	HEAVY_NAFTA	Heavy Nafta	3750,20	53,6
	ATM_RESIDUE	Residue from ATM distillation	843,52	12,1
PRODUCTION			6991,76	100,0
	Total OUT		6991,76	100,0

Example of unit balance report

Sigmafine is daily used in production and yield accounting of refineries with many production units, tank farms and thousands of flow meters.

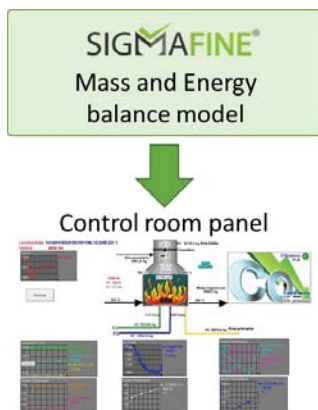
Sigmafine supports the daily work of the accountant in identifying inconsistencies, bad values or gross errors. By including multiple source of information (historicized data, laboratory data, external inputs) in one single integrated environment, empowers accountants to get one version of the truth, spending time in analyzing cause of deviations rather than feeding data into a system.

Energy Management

Accurate monitoring of energivorous equipment is critical to improve usage and decrease emissions. Sigmafine is actively used to provide KPIs based on reconciled data solving mass and energy balance of the plant and/or of the equipment under monitoring, such as furnaces, relevant heat exchangers or big rotating equipment supported by rigorous thermodynamic modeling.

Sigmafine KPIs are provided on dashboards to enable operators and engineers to take timely action and save energy.

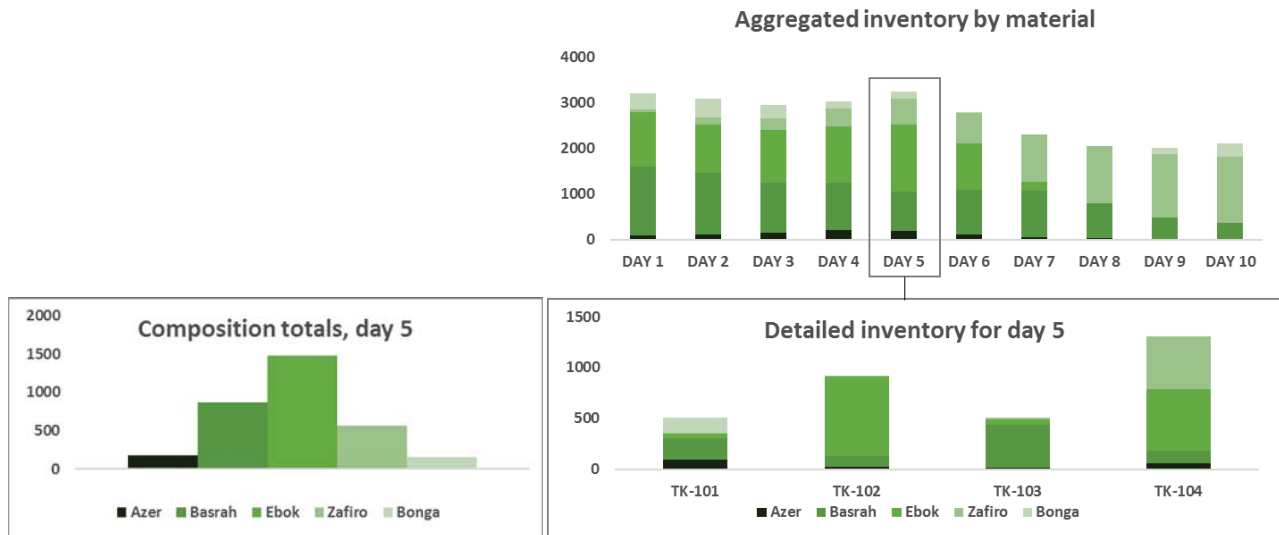
Moreover, since data are historicized and fully auditable, Sigmafine supports energy managers duties in complying with energy directives and standards such as ISO 50001:2011.



Support Planning and Operations

Knowledge of crude or intermediate inventories in terms of material quantity is crucial for better planning and yield estimation (evaluate mixtures feeding the units, optimize inventory allocation, etc.).

Sigmafine composition tracking analysis supports the planning department with up-to-date estimation of material allocation.



A further step is the quality tracking analysis that provides in addition an estimation of physical properties of mixtures (e.g. density, viscosity, flash point, Sulphur content etc.), stored in inventories or fed to the process units. Operations can monitor the properties and choose better routing to improve mixture characteristics and minimize out-of-spec semi-finished or finished products and planning decide how to better allocate the inventory based on mixture properties.

SAP Integration

Sigmafine comes with an Integration Framework component allowing data exposing to external systems and facilitating integration with most common ERP systems, including SAP. Most common SAP modules integrated with Sigmafine are:

- PPPI: post reconciled figures of Productions, Consumptions & Losses and compare with Planned/Business figures
- SD: download from SAP inbound raw material receipts and outbound final product shipments
- WM / MM: align physical or logical SAP inventories with Sigmafine ones

If data quality really matters, discover how Sigmafine has improved the business of our Customers visiting our website sigmafine.pimsoftinc.com and contact our team for a tailored solution.



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