The customer, an expert in engineering polymers, had set up a project to optimize the flow of material, work, and data at one of his plants in Western Europe. He consulted a METTLER TOLEDO team of experts and evaluated the available solutions all based on highly performing dispensing systems.

The customer needed a state-of-the-art batch dispensing system with:
- SAP R/3 connectivity
- Raw material identification from barcode readers
- Guidance of the operator with simple and legible prompts and graphics
- Local label printout
- Output signal to dosing control valves
- Automatic inventory update

An additional critical requirement was the possibility to modify the composition of any ready formulated lot of a given batch on the basis of the quality findings of another lot of the same batch coming out of production.

The final solution made use of all the capabilities of the FormWeigh.Net software package. This package offers unprecedented functionality and opens a new range of dispensing possibilities.

Consumer goods made out of plastics must fulfill very stringent quality and color specifications. Getting it right requires flexible and accurate formulation systems.
Customer benefits

Accurate and fail-proof processes
- Guide operators with the help of user-friendly weigh screens throughout the weighing process
- Handle materials, recipes, and evaluate raw material batch information in production orders
- Provide a unique labeling system for raw material identification and traceability
- By scanning the material number prior to dispensing the system ensures that only the correct materials can be weighed. The tolerances are enforced by the system ensuring that the formula is respected at all times

Electronic batch documentation
- Document automatically all batch relevant information
- Audit trail

Real-time integration with SAP
- The SAP integrated solution provides real-time data for material management purposes
- The correct bill of material is transferred from SAP PP (production planning) function directly to the dispensing workstation
- After each weighing, the consumption of raw material information is submitted to SAP. SAP stock amounts are immediately updated. Manual stock adjustment transactions are automated and therefore eliminated from the workers daily task list

Service and support by METTLER TOLEDO
- Full set-up, interconnection, calibration and configuration of all hardware components with qualification assistance

FormWeigh.Net® is a software-based formulation solution for batch manufacturing. It consists of a weighing terminal, a variety of weighing platforms, a barcode reader and a printer, and can be configured to match your individual needs. The networked solution offers the advantages of central data management, full integration with your ERP system, and full traceable paper-free formulation.
Warehouse and recipes management

Process specifications, measure and control; raw materials identification

Raw material weighing (up to three scales or balances)

Electronic batch documentation
All relevant batch information and the operator’s “signature” are electronically documented. Protected access guarantees that sensitive data can only be seen and/or changed by the authorized people.

Secure process with unique labeling system
Every raw material is identified uniquely with a barcode. FormWeigh.Net® recognizes the raw material by reading the barcode with a laser scanner, verifies its quality status and the expiry date.

The material information displayed helps operators to prepare the right ingredients for the batch. Furthermore, safety precautions and handling procedures are highlighted on the screen. FormWeigh.Net® confirms that each quantity is correct before the operator is allowed to start weighing.

Order overview: select your recipe and start weighing
An easy-to-read order list is displayed and the system is ready for production. The weighing of the required raw material can be started by simple selection.

Visualization of the weight
FormWeigh.Net® shows you graphically and numerically how far you are from the target weight. The required tolerances are clearly displayed as limits and weighing results that exceed or fall below these limits are shown in different colors. This helps to highlight potential problems and prevent mistakes.

ID30 user-friendly touchscreen flat panel
The operators select or place the order directly at the weighing station and control it simply with a light touch of the screen.
The right formula for the right quality
Have your batch formulation and your costs under control

- Do you want to minimize handling errors due to manual computation of recipes?
- Do you want to increase productivity with an intelligent formulation system?

Then FormXP formulation software hits the spot! FormXP makes your formulation process more easy, fail proof and efficient. Select one of the available filling sequences, easily create, manage and exchange recipe and raw material database, and track material usage with the embedded inventory control tool. FormXP is a software pac that runs on any IND690 weighing indicator. The additional FormToolXP PC software allows you to smoothly handle any task from your PC.

MASK Polymers is one of the leading manufacturers of rubber and PTFE products for the chemical and automobile industries in India. These customer industries have continuously increasing expectations regarding the quality of the parts they purchase. The standard operating procedures MASK had in place were not appropriate to economically achieve these markets requests.

The batch formulas for the different rubber qualities (150 recipes based on 500 components) were kept in a handwritten recipe book. Each day began with a handwritten daily production plan handed over to the mixing department. After a complete batch had been weighed according to the recipe book, it was forwarded to the kneader and after kneading was completed it was transferred to the mixing mill where rubber sheets according to desired composition were finally produced. The process was completely dependent on the skills set of the operator without any accountability leading to an unsatisfactorily high rate of batch rejection. Confronted with the increasing costs of quality and the difficulty to access new market, MASK saw the necessity to introduce a different batch formulation philosophy, based on semi-automatic operating procedures.

With the help of METTLER TOLEDO specialists, a concept was developed, taking into account the economical constraints, the precision in batch formulation, the harsh environment and the need for simplicity of operation.
A computer based production and recipe management system was introduced. The existing weighing equipment was connected to an IND690 terminal managing the communication with the central computer (batch orders are entered directly to the IND690) and the weighing equipment, and displaying clear instructions and targets to the operating personnel. For this purpose the application package Form-XP was loaded to the IND690. The formulation reports are uploaded from the IND690 to the computer for inventory control, statistical evaluation, leading to new possibilities for procedures optimization.

A significant reduction in the costs of batch rejection was rapidly achieved. The improved level of quality and the full traceability of each batch enabled MASK to introduce new product lines with complex recipes and higher requirements.

Key benefits of FormXP

- Easier handling and less paper interaction results in higher productivity
- Enhanced traceability of recipes by assigning charge-, lot- and batch numbers
- Extended safety by capturing component data via barcode scanner, displaying messages while formulating and ensuring a fail proof working sequence
- Higher efficiency by reporting the stock of raw material and using the rescaling function when overfilling components
- Quicker adaption to changing production requirements by using the PC-software FormToolXP

Manage all recipe relevant information

Raw materials database

- Up to 500 components can be stored
- Unique ID # can be assigned
- Offers inventory control tool

Recipe database

- Up to 150 recipes can be stored
- Unique ID # can be assigned

Message database

- Up to 200 messages can be stored
- Up to 5 messages can be assigned to formulas and raw materials

FormToolXP is made for ease of use

FormToolXP is a PC software allowing straightforward data entry and easy management of recipes, raw materials and messages. It offers reporting functionality including data visualization (charts, tables, etc.).

IND690

- Up to four scales/balances connectable
- Water and dust-proof
- Wide variety of software Pacs such as Count, Form, Com, Sum, Fill, Batch, Control, FormXP
- Broad interface range available: Ethernet, WLAN, USB, Bluetooth, Proflibus® DP
- Material identification through barcode reader and RFID

Courtesy MASK
A recent article in “The Manager” states that “in virtually all manufacturing companies, there is a direct correlation between inventory levels and overall business performance. Very often CEO’s and CFO’s believe that their companies consistently carry 25-40 percent more inventory than needed.”

However, improvement of business performance does not necessarily imply squeezing inventory to the bone. Such draconian measures can have a negative impact because it may create a situation were the required material is not available from stock.

**Keep your inventory under control**

Designing an efficient inventory monitoring strategy includes utilizing the right hardware to ensure that the stocked materials such as solids, liquids, and gases are quantified accurately. If it comes to the crunch, quantifying your inventory means weighing them accurately and reliably, whether they are stored in tanks, big bags, or barrels.

Starting with weigh modules and data transmitters, then combining them into expert weighing systems: with solutions from METTLER TOLEDO you are laying the foundation stone for an efficient inventory monitoring strategy.

**Key benefits**

- Full transparency of your stocked material
- Real-time inventory data availability
- Accurate planning of material usage
- Avoidance of material shortages
- Optimized material turnover

Effective inventory control is a vital function to help ensure the success of your production facility.
FlexMount® weigh modules
- Anti-lift device restrains tank from tipping
- Carbon steel and stainless steel design
- Accuracy: 3000e OIML & NTEP 5000e class III
- FlexMount™ capacity range: 113 to 20,412 kg (250 to 45,000 lb)
- Hazardous Area: ATEX and FM approvals Zone 1/21 or Division 1

IND130
- RS232, Profinet DP, Allen-Bradley® RIO
- Up to four 350 Ω load cells
- CalFREE™ calibration without test weights
- TraxDSP™ digital vibration filtering

Weighing systems provide inventory management and risk avoidance

The first choice in tank measurement weighing systems offering accuracy, longer life and flexibility, working well with liquids, slurries or dry solids.

Load cell based measurement systems make it possible to:
- Reduce chemical process variability
- Improve product quality and
- Reduce service and maintenance costs

Our customers can improve product quality by feeding the components more accurately and reliably into their mixing process. The materials utilized are stored in nine tanks, with capacities of 550 kg, 1100 kg and 2200 kg, respectively. All tanks are placed on Flexmount™ weigh modules and are connected to the Siemens S7 PLC via the IND130 load cell signal to Profibus® DP converter.

Two features of the IND130 have been well received by our customer:
1) The CalFREE™ function allowing pre-calibration of the weighing system without placing any test weights on the tank and
2) the off-line set-up capabilities allowing the reduction of both installation and start-up time.

Installed base:
- Nine sets of Flexmount™ weigh modules (three weigh modules each)
- Nine IND130 signal converters
- Stainless steel (harsh) enclosure
- Profibus® DP interface

Making weigh data available for full process control and visualization – from weighing sensors to PLC, DCS and ERP systems.
Managing measurement uncertainty

MinWeigh® ensures all weights are within the acceptable tolerance of your weighing process

The relative uncertainty of a measurement increases exponentially with decreasing weight values. As a consequence, a minimum weight limit exists for every scale, below which the measurement uncertainty becomes larger than the tolerance specified for the weighing process. Every new METTLER TOLEDO indicator has the MinWeigh® function embedded within it, warning the operator when the weight is below the minimum weight threshold. Ask your service technician to activate MinWeigh® for increased safety in your processes.

The MinWeigh® service also includes:

- On-site determination of measurement uncertainty of the weighing system within your process environment conditions
- Calculation and documentation of the minimum weight in relation to the process tolerances
- Easy and fast recalculation of the minimum weight, since tolerances may change from one process to the next

Analog scale 150kg PBA430

High precision scale KCC150

![Typical minimum weight of an analog and a high precision floor scale](example is for a 1% weighing tolerance):

Analog floor scale
- 150kg weighing range
- Readability 0.05kg

High precision digital floor scale
- 150kg weighing range
- Readability 0.001kg

MinWeigh® indication with icon on the new IND690 weighing indicator.

Typical minimum weight

4kg

146kg

[minimum weight]

[acceptable weighing range]

150kg

0.1kg

149.9kg

[minimum weight]

[acceptable weighing range]

150kg

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