



**MATERIAL MANAGEMENT**  
Blending | Control | Analytics



**OPTIX**

EXTRUSION

CONTROL

INNOVATION

LINEPILOT

ANALYTICS

OPTIMIX

INFORMATION

INDUSTRY 4.0

INDUSTRY 4.0

LINE VIEW

MATERIAL

INSIGHT

MANAGEMENT

INSIGHT

LINE VIEW



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TSM's reputation and prominence within the Plastics industry is gaining strength every year. We are now a critically important partner to some of the best known plastics producers in the world.



- Regional Offices in Ireland, USA, Taiwan and China
- Global TSM Sales Network & Partners

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## Intelligent Solutions from TSM

TSM has an enviable 42 year record of being the Blender provider of choice to Plastics processors all over the world. Continuous innovation resulting in unique patents and outstanding performance has ensured TSM maintains its status as world leader in this category.

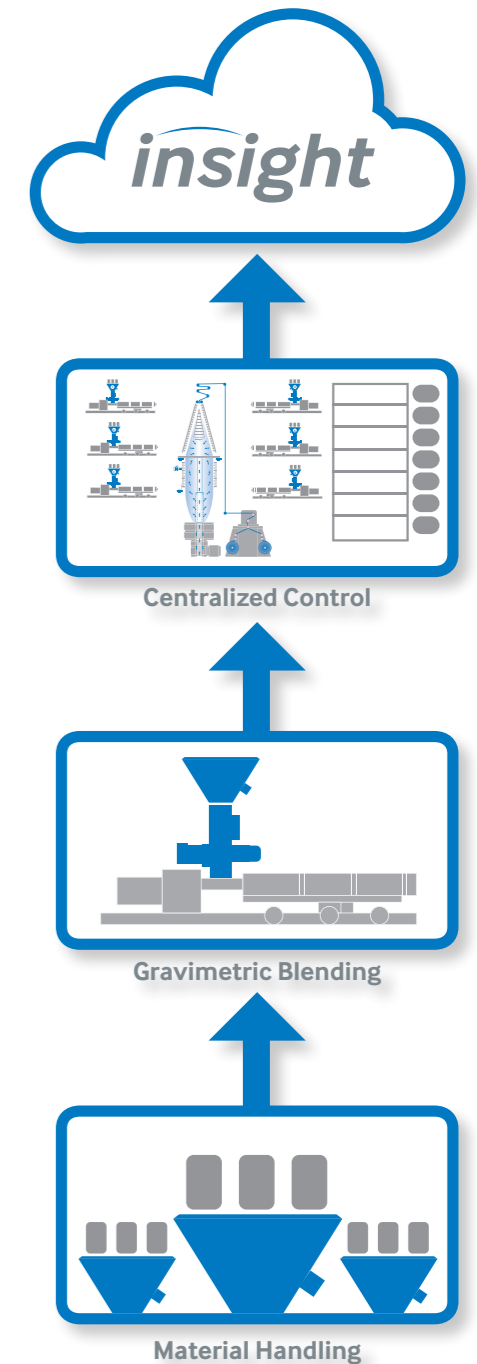
Our 10,000 installations worldwide are backed up by local service and spare parts availability that guarantees our systems keep performing to the highest level 24 hours a day 365 days a year.

With five product ranges to choose from plus associated controls and options, all industry applications are catered for. Throughputs up to 3000kg/hr (6,600lbs/hr) and utilizing up to 12 components are available to cope with the increasing flexibility and complexity demanded by the industry today.

Our offices in Ireland, USA, Taiwan and China are backed up by a network of sales partners who are always available to support our customers wherever they may be.

Our new generation OPTIX range of Blenders transform this product category by incorporating, for the first time in the industry, IoT (Internet of Things) functionality that leverages critical data residing within the blender and converts this to valuable business information relating to materials, energy, downtime analysis and Overall Equipment Efficiency. (OEE)

TSM has built on the organisation's core expertise and using this knowledge and expertise in Plastics processing now deliver full turn key solutions from silo to machine for our customers in all markets.



# Product Overview

TSM automation solutions assist plastic producers face challenges like stringent quality demands from customers and higher raw material, labour and maintenance costs. We leverage our extensive process knowledge and technological expertise to deliver the most reliable and accurate blending products in the industry.

Our Blenders and auxiliary equipment are the industry's strongest and smartest, providing a robust solution that works comfortably in plant environments yet delivers exceptional control and performance in all applications.

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## OPTIMIX

Multi Component Gravimetric Batch Blender



TSM's OPTIMIX range of Batch Blenders offer throughputs up to 3,000kg/hr (6,600lb/hr) and can accommodate up to 12 components. The OPTIMIX range utilizes TSM slide valve design and the patented reverse-flight mixing auger technology. This combination provides superior accuracies, blend ratios and mixing homogeneity that is not achievable by competitive systems.

## OPTIX

Multi Component Gravimetric Batch Blender with Loss-in-Weight based Extrusion Control



TSM's OPTIX range of extrusion control blenders combine, in a unique way, accurate gravimetric batch blending together with integrated extrusion control using Loss-in-Weight principle. This results in exceptional ultra fast throughput measurement and control of the extrusion process. The OPTIX range can handle throughputs up to 800kg/hr (1,760lb/hr) and a maximum of 8 components of varying bulk densities.

## OPTIBLEND

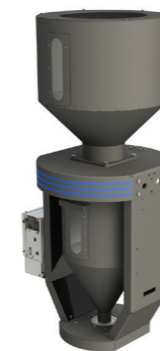
Multi Component Continuous Loss-in-Weight Blending



TSM's OPTIBLEND family of Continuous Blenders deliver perfect cascade mixing with the ability to blend extremely low material percentages. OPTIBLEND controls the blend percentages and can also maintain extruder throughout at a desired level i.e. kg/hr (lb/hr). Haul-off speed measurement can be added to ensure that the weight per length is controlled to the desired specification (Yield Control). The OPTIBLEND range offers throughputs up to 2,000kg/hr (4,400lb/hr) and can accommodate up to 7 components.

## OPTIYIELD

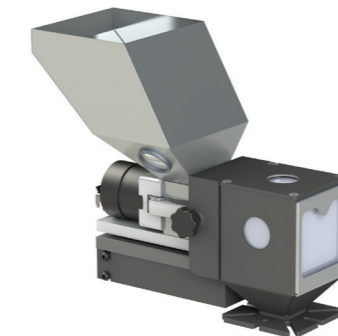
Single Component Continuous Loss-in-Weight Measurement + Control



TSM's OPTIYIELD family of single component Loss-in-Weight Measurement feeders offers precise measurement, utilizing TSM's continuous Loss-in-Weight technology, with precise control of the feeding speed. Total reliability and advanced process control options to ensure consistent end product quality. Throughputs from 50kg/hr (110lb/hr) to 2,000kg/hr (4,400lb/hr) are available.

## OPTIFEED

Gravimetric Additive Feeder



TSM's OPTIFEED is an economical color and additive feeder delivering exact dosing rates and precise measurement. OPTIFEED's unique design, employing the patented dosing cylinder combined with stepper motor, ensures that the additive is metered evenly and extremely accurately.

The product portfolio is designed to suit all applications and requirements and range from standard products to highly customized, bespoke solutions.

We leverage our extensive process knowledge and technical expertise to deliver the most reliable and accurate blending products in the industry.



# OPTIMIX

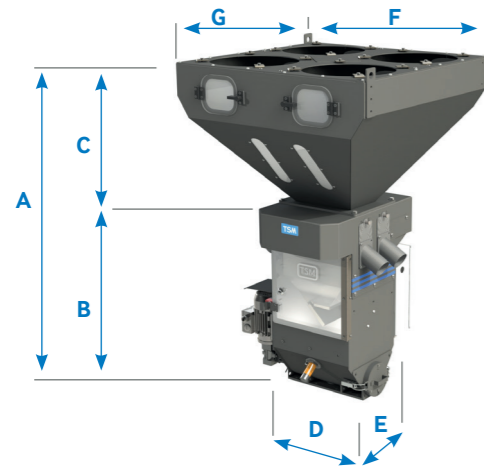
The **OPTIMIX** range of blenders is the perfect solution where precise mixing, dosing, weighing and control is needed. Applicable across all process applications and throughput requirements, they are renowned for their reliability, performance and simplicity of operation. The **OPTIMIX** range provides the perfect choice for all your blending requirements and can be tailored to suit either simple or complex applications.

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OPTI-MIX 350-650



**OPTIMIX** Batch Blenders range can accommodate up to twelve components while providing throughput rates from 50kg/hr (110lb/hr) - 3000kg/hr (6600lb/hr). **OPTIMIX** utilizes **TSM** slide valve design and patented reverse-flight auger mixing technology. This combination provides superior accuracies, blend ratios and mixing homogeneity that is not achievable by competitive systems. All components are blended by weight, based on the preset blend ratios entered on the touch screen. Each component is metered separately into a single weigh hopper, which measures and controls their dosing percentage.

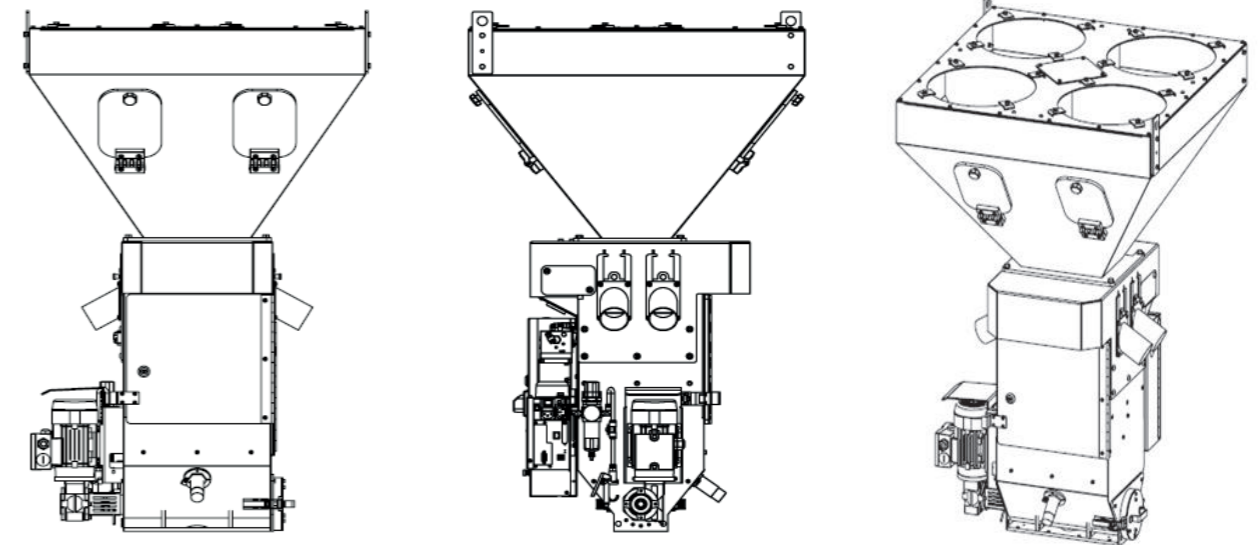
**Benefits**

- Faster Product Changes
- Continuous Homogeneous Mixing
- Increased Regrind Usage
- Product Consistency
- High Accuracy Dispensing

### Material Receiver Options

	TVR-6	TVR-10	TVR-15	TVR-35	TVR-50
150	✓	✓	✗	✗	✗
250	✓	✓	✗	✗	✗
350	✓	✓	✓	✓	✓
650	✓	✓	✓	✓	✓
1000	✓	✓	✓	✓	✓
1500	✓	✓	✓	✓	✓
3000	✓	✓	✓	✓	✓

TSM Gravimetric Batch Blender Specification	OPTIMIX 50	OPTIMIX 150	OPTIMIX 250	OPTIMIX 350	OPTIMIX 650	OPTIMIX 1000	OPTIMIX 1500	OPTIMIX 3000
<b>CHARACTERISTICS</b>								
Reservoir Hopper Volume per comp. (LT)	12	14	14	35	35	32	32	110
Standard No. Material Components	4	4	4	4	4	4/6	4/6	6/8
Optional Additional Material Components	+2	+2	+2	+2	+2	+4	+4	+4
Standard Batch Weight Capacity (KG)	0.5	0.9	1.2	2	4	7.5	12	25
Mixing Motor	1 Ø	1 Ø	1 Ø	1 Ø/3 Ø	1 Ø/3 Ø	3 Ø	3 Ø	3 Ø
Motor (HP)	0.25	0.25	0.25	0.25	0.25	0.36	0.36	1
Motor (KW)	0.18	0.18	0.18	0.18	0.18	0.27	0.27	0.75
Blender Weight (KG)	50	50	50	75	80	115	125	225
Max Material Temp (°C)	70	70	70	70	70	70	70	70
* Max Optional Material Temp (°C)	130	130	130	130	130	130	130	130
* Contact TSM for more details on high temperature applications								
<b>DIMENSIONS</b>								
A Blender Height (mm)	737	737	737	1094	1159	1415	1465	1820
B Mixing Chamber Height (mm)	445	445	445	586	651	915	965	1010
C Reservoir Hopper Height (mm)	368	368	368	508	508	500	500	810
D Blender Front Width (mm)	205	205	205	562	562	470	470	894
E Blender Side Width (mm)	335	335	335	500	500	680	680	761
F Hopper Bin Front Width (mm)	650	650	650	750	750	760	760	1350
G Hopper Bin Side Width (mm)	650	650	650	750	750	760	760	1050



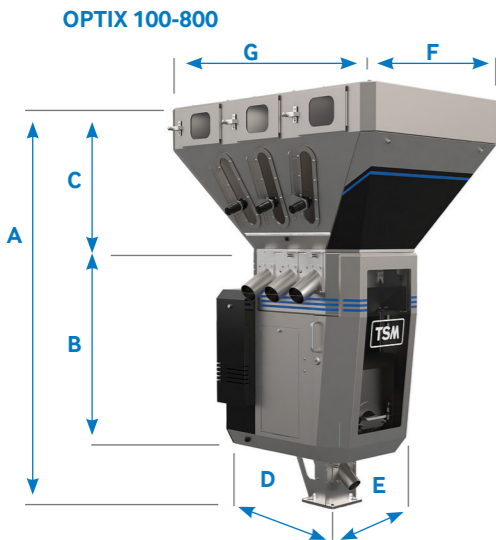


# OPTIX

TSM's new generation blender transforms the Blender category in an entirely new space. All the fundamental capabilities are enhanced in this new range and packaged in a sleek, robust, user friendly design. In addition TSM has incorporated TSM's patented **INSIGHT** ready functionality which allows the vast amount of critical data resident within the blender to be accessed by TSM's Industry 4.0 based Business Information System **INSIGHT**. Important business metrics relating to material usage, energy usage, downtime analysis and OEE (Operational Equipment Efficiency) are available across single or multiple lines and factories.

insightready.com

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OPTIX range of blenders are specifically designed for Extrusion applications and incorporates patented Insight enabled technology based on Industry 4.0 platform. With enhanced functionality across all aspects providing superior accuracies, blend ratios and mixing homogeneity not achievable by competitive systems. OPTIX blenders utilize TSM slide valve design and patented reverse-flight auger mixing technology combined with continuous Loss-in-Weight measurement. TSM's extrusion control blenders combine, in a unique way, accurate gravimetric batch blending with integrated extrusion control using Loss-in-Weight techniques. This results in exceptional, ultra fast throughput measurement and control of the extrusion process. OPTIX range can accommodate up to eight components at throughputs up to 800kg/hr (1760 lbs/hr).

## Material Receiver Options

	TVR-6	TVR-10	TVR-15	TVR-35	TVR-50
100	✓	✓	✗	✗	✗
200	✓	✓	✓	✓	✓
400	✓	✓	✓	✓	✓
800	✓	✓	✓	✓	✓

Other loader sizes and layout configurations available on request.

TSM Gravimetric Batch Blender Specification	OPTIX 100	OPTIX 200	OPTIX 400	OPTIX 800
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CHARACTERISTICS				
Reservoir Hopper Volume per comp. (LT)	15	15	23	32
Standard No. Material Components	6 / 4	6	6	6
Optional Additional Material Components	+2	+2	+2	+2
Standard Batch Weight Capacity (KG)	1	2	4	8
Mixing Motor	1 Ø	1 Ø	1 Ø	1 Ø
Motor (HP)	0.25	0.25	0.25	0.25
Motor (KW)	0.18	0.18	0.18	0.18
Blender Weight (KG)	60	70	75	90
Max Material Temp (°C)	70	70	70	70
* Max Optional Material Temp (°C)	130	130	130	130

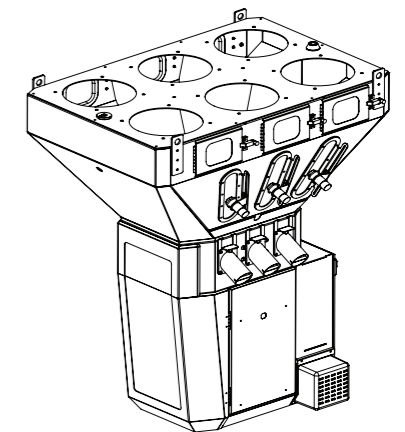
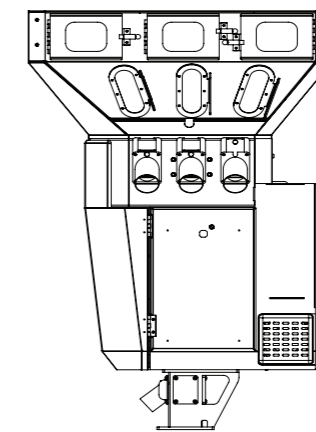
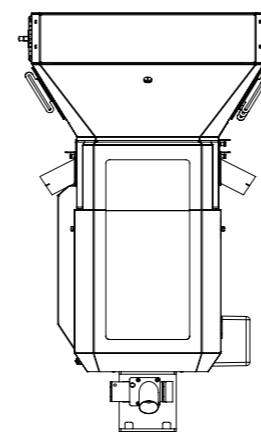
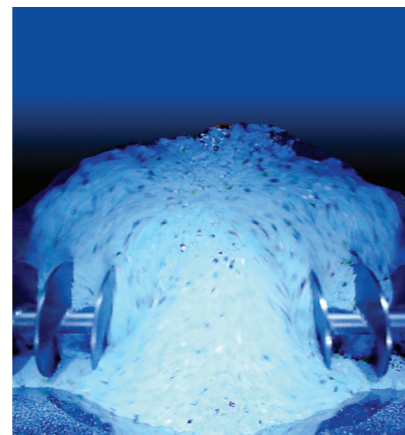
\* Contact TSM for more details on high temperature applications

DIMENSIONS				
A Blender Height (mm)	1259	1328	1449	1553
B Mixing Chamber Height (mm)	695	765	765	765
C Hopper Bin Height (mm)	384	384	505	609
D Blender Side Width (mm)	616	616	616	616
E Blender Front Width (mm)	385	385	385	385
F Hopper Bin Front Width (mm)	610	610	610	750
G Hopper Bin Side Width (mm)	800	800	975	1129

### Benefits

- Insight Ready
- Faster Product Changes
- Continuous Homogeneous Mixing
- Product Consistency
- High Accuracy Dispensing up to 0.01% of batch

Patented Mixing Technology  
Reverse Flight Auger



# OPTIBLEND

TSM's OPTI-BLEND family of Continuous blending solutions provide control options for all process requirements large and small and have in common the critical features of total reliability and precision ensuring material homogeneity and consistent product quality.

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## OPTIBLEND



TSM's OPTI-BLEND range of Continuous blending solutions offer total reliability, precision and process control options ensuring material homogeneity and guaranteeing consistent product quality. They provide continuous gravimetric and throughput control of up to seven components.

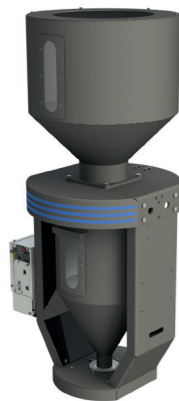
The OPTI-BLEND controls the blend percentages and can also maintain the extruder throughput at a desired level, i.e. kg/hr control. Haul off speed measurement can be added to ensure that the weight per length is controlled to the desired specification (yield control).

OPTI-BLEND RANGE	THROUGHPUT
OPTI-BLEND 400	400 kg (880 lbs) / hour
OPTI-BLEND 1000	1000 kg (2200 lbs) / hour
OPTI-BLEND 1800	1800 kg (3960 lbs) / hour

### Environmental

Blender Weight	(kg / lb)	250 / 550
Max Ambient Operating Temp	(°C / °F)	50 / 122
Max Material Temp	(°C / °F)	70 / 158
Max Optional Material Temp	(°C / °F)	130 / 266

## OPTIYIELD



TSM's OPTI-YIELD range of Loss-in-Weight systems offer precise measurement, total reliability and advanced extrusion control options to ensure consistent end product quality with reduced material usage. The Opti-Yield system provides continuous throughput measurement and automatic throughput control.

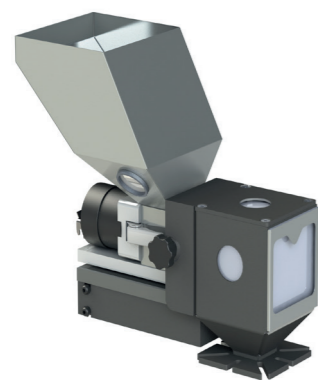
Haul off speed measurement can be added to ensure that the Weight per Length is controlled to the desired specification (yield control). This ensures that the product being produced is maintained at the desired average thickness or unit weight without operator intervention. This mode can be extended to weight per area control through entry or automatic measurement of material width.

OPTI-YIELD RANGE	THROUGHPUT
OPTI-YIELD 200	200 kg/h - 440 lbs/hr
OPTI-YIELD 400	400 kg/h - 880 lbs/hr
OPTI-YIELD 1000	1000 kg/h - 2200 lbs/hr

### Environmental

System Weight	(kg / lb)	80 / 176
Max Ambient Operating Temp	(°C / °F)	50 / 122
Max Material Temp	(°C / °F)	70 / 158
Max Optional Material Temp	(°C / °F)	130 / 266

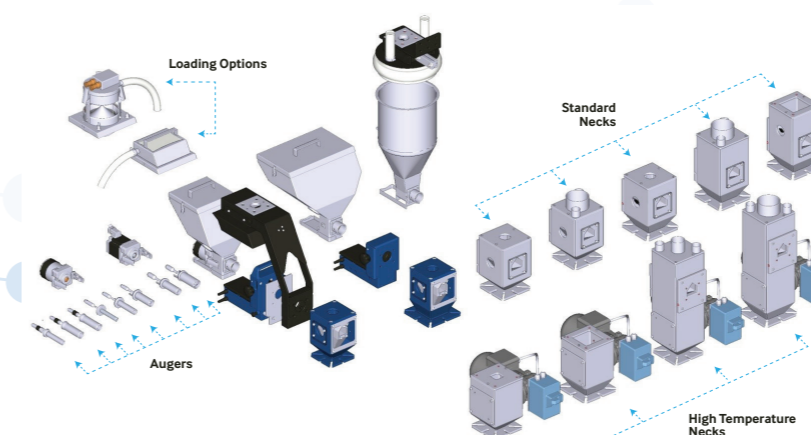
## OPTIFEED



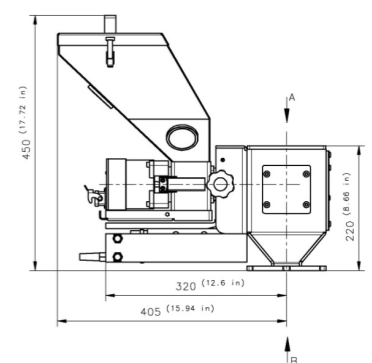
TSM's OPTI-FEED's unique design, employing the patented dosing cylinder combined with stepper motor, ensures that the additive is metered evenly and extremely accurately. The dosing cylinder eliminates any pulsation during metering into the main plastic stream, thus offering maximum control of the process and the end product.

- Prevents additives becoming lodged between mechanical parts, i.e. less downtime and efficient use of expensive additives.
- Actively prevents pulsating, i.e. guarantees consistent output.
- Reduces additive usage due to its superior metering characteristics - direct cost reduction.
- Dosing rate ranges from 70g/hr to 180kg/hr. Higher torque motors available for metering large quantities of material.

### Modular Construction:



### Dimensional Drawing:





# Extrusion Control

TSM's extrusion control software is designed to ensure that productivity improvement and scrap reduction is achieved consistently during the production process. This is achieved by making high-speed adjustments to changes in extruder and/or take off speeds. The system also enables manufacturers to save costs by achieving tighter control tolerances over material consumption.

## TSM Extrusion Control

Maximizing Savings By Reducing Setpoints To A Minimum !

TSM Gravimetric Blenders continuously monitor material throughput (kg/hr), (lb/hr) and will optimize yield (weight per length control) on extrusion lines. As part of a job recipe entry, the extrusion / haul-off control setpoints are entered via the remote operator panel. The TSM system monitors the line speed and extruder output to guarantee precise on-specification and consistent output quality, therefore reducing waste considerably while operating at optimum yields. The system also provides roll, order and shift summaries by component, allowing precise calculation of material costs and net profit margin analysis per order.

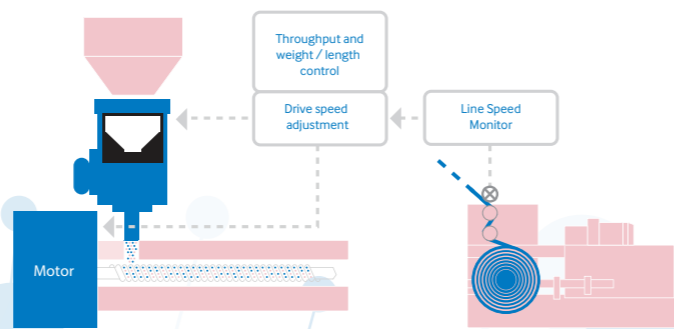
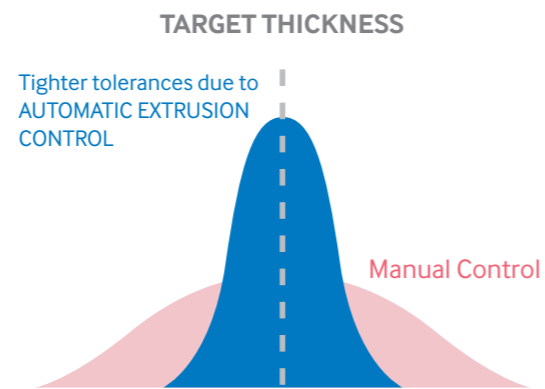
## Material Down-Gauging

Normally extruder throughput is reduced gradually due to blocking at the screen filter. TSM blenders detect when the product weight per length (yield) or throughput varies from the target setpoint and automatically adjusts the extruder screw speed to bring the throughput back on target. Furthermore, the system allows the process to run at the lower tolerance values for the product while all the time monitoring the output and individual material dosing consistencies. This will result in real savings in production costs for producers who sell by length. If selling by weight your customers can benefit by increased length being offered at no additional cost giving you a significant competitive advantage.

## DOWN-GAUGING CAN YIELD AN EXTRA 2% OR 3% ON THE ROLL

### Automatic Extrusion Control can compensate for:

- ◆ Screen Packing
- ◆ Voltage Fluctuations
- ◆ Melt Flow Temperature Fluctuations
- ◆ Worn Screws and Barrels
- ◆ Material Mix, Geometry and Density Changes.



# Options

TSM provides an extensive range of options that are designed to ensure full compatibility with the onsite requirements which can vary from site to site. The range of options are designed to adapt TSM products to customer's individual process and plant situation.

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Name	Description	Features	Benefits
<b>High Accuracy Option</b>	Additional option to achieve extremely low setpoint targets with repeatable accuracy.	<ul style="list-style-type: none"> <li>Air pressure stabilization on units</li> <li>Material Flow restrictors</li> <li>High Accuracy dosing software</li> </ul>	<ul style="list-style-type: none"> <li>High Accuracy dosing</li> <li>Material savings</li> <li>Consistent Quality</li> <li>Extremely low dosing setpoints achievable</li> </ul>
<b>Auto Clean</b>	Allows virtually instant automatic order changes and remote cleaning of elevated TSM OPTI-MIX blenders using a simple touch screen.	<ul style="list-style-type: none"> <li>Vacuum receiver filter clean</li> <li>Automatic Hopper Clean</li> <li>Automatic Easy-Drain</li> <li>Dosing &amp; Mixing Chamber Cleaning</li> <li>Automatic Material Bypass</li> </ul>	<ul style="list-style-type: none"> <li>Fast product changes</li> <li>Reduced downtime</li> <li>Reduced waste</li> <li>No contamination</li> </ul>
<b>Blender Necks</b>	All TSM units can be fitted with additional necks below the blender, just above the extruder to provide maximum adaptability to customer process	<ul style="list-style-type: none"> <li>Auto/manual Shutoff valve</li> <li>Material drain Chute</li> <li>Auto material bypass valve</li> <li>Built-in material level sensor</li> <li>Sight glass for system inspection</li> </ul>	<ul style="list-style-type: none"> <li>Fast product changes</li> <li>No extruder stop for order changes</li> <li>Easy material Cleanout</li> <li>Offline Blending Applications</li> </ul>
<b>Powder Dosing</b>	TSM powder dosing unit mounts directly onto the side of the blender. Integrated Control allows operator to easily adjust the percentage of powder needed by the recipe	<ul style="list-style-type: none"> <li>High Torque AC motor</li> <li>Std. 4 litre powder hopper</li> <li>Dosing range between 0.1% up to 10% (Dependent on throughput required)</li> <li>Built in powder agitator</li> </ul>	<ul style="list-style-type: none"> <li>High Accuracy dosing</li> <li>Consistent mixing</li> <li>Simple integrated control</li> <li>No over dosing</li> <li>Easy material change</li> </ul>
<b>Micradose Side Feeders</b>	TSM's Micradose Side feeders provide accurate and repeatable blend control for low percentage additives on any TSM Gravimetric batch Blending system. They can easily be retro-fitted to your existing TSM equipment.	<ul style="list-style-type: none"> <li>Patented TSM design</li> <li>Robust construction</li> <li>Several viewing windows</li> <li>Retrofittable</li> </ul>	<ul style="list-style-type: none"> <li>High Accuracy Dosing</li> <li>High reliability</li> <li>Integrated Control</li> <li>No Over Dosing</li> </ul>
<b>High Temperature Kits</b>	An upgrade on the standard system components to deal with dried materials that are required to be blended at a high temperature	<ul style="list-style-type: none"> <li>High Temp Access Hatches</li> <li>High Temp Loadcells</li> <li>High Temp Bearings</li> </ul>	<ul style="list-style-type: none"> <li>Enable processing of engineered polymers</li> <li>Enable pre heating / drying of materials in advance of the dosing and blending process</li> </ul>
<b>Material Flow Solutions</b>	These are a selection of options designed to aid the dosing and blending of difficult materials	<ul style="list-style-type: none"> <li>Material flow assist vibration units</li> <li>Material flow assist agitation units</li> <li>Material flow assist aeration units</li> </ul>	<ul style="list-style-type: none"> <li>Enable effective processing of difficult flowing materials</li> <li>Enable effective processing of lower cost materials</li> </ul>
<b>High Throughput Flake Blending</b>	An option design to enable the processing of low bulk density flake materials	<ul style="list-style-type: none"> <li>Enlarged slide valves</li> <li>Increased blender discharge opening</li> <li>Material flow assist vibration units</li> </ul>	<ul style="list-style-type: none"> <li>Enable processing of 100% flake material</li> <li>Reduce production costs</li> <li>Enable the processing of low bulk density materials</li> </ul>
<b>Floor Standing Blending Kit</b>	Optional blender kit that enables each blender to be used on a floor stand	<ul style="list-style-type: none"> <li>Floor stand</li> <li>Material flow control valve</li> <li>Offline blending software option</li> </ul>	<ul style="list-style-type: none"> <li>Enables blending to take place beside machine</li> <li>Reduced operator interaction</li> <li>Easier clean down of machine for order changes</li> </ul>

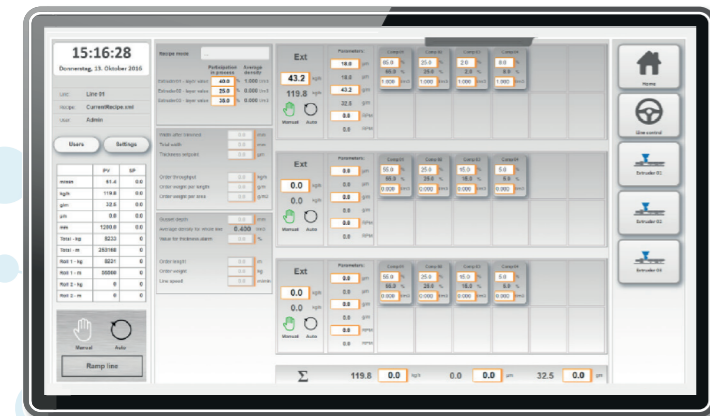
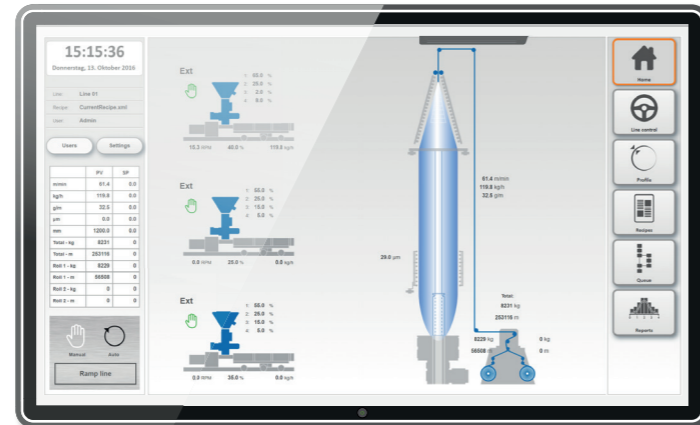


# Line Management & Control

TSM's new Line Management and Control system provides a supervisory and single window to all key operating parameters associated with the extrusion production process. All information is presented in an intuitive interface allowing for easy operator navigation. Systems can be provided with core functionality and add-on configurable options. TSM offers two platform versions **LINEVIEW** and **LINEPILOT** to suit large and small applications.

## LINEVIEW:

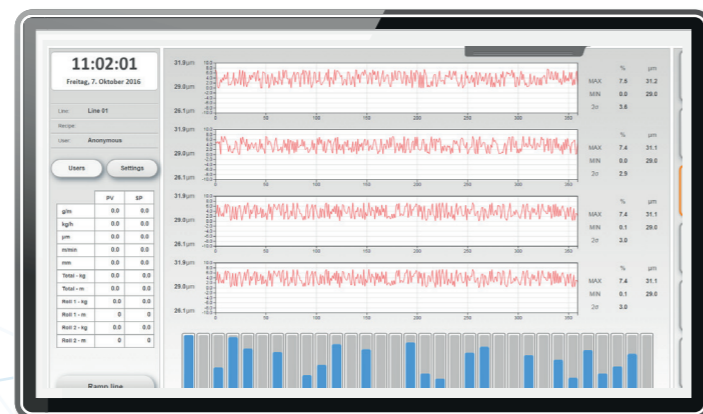
- ◆ 19" Touch Screen
- ◆ B&R PLC
- ◆ Layer Ratio Control (max 7 layers)
- ◆ Gravimetric Blending (max 12 components)
- ◆ Yield Control
- ◆ Line Recipe Management
- ◆ Roll, Order, Shift, Reporting
- ◆ Trending and History Management
- ◆ Line and Extruder Ramping
- ◆ Alarm History



## LINEPILOT:

- ◆ 10" Touch Screen
- ◆ B&R PLC
- ◆ Layer Ratio Control (max 3 layers)
- ◆ Gravimetric Blending (max 6 components)
- ◆ Yield Control
- ◆ Blender Recipe Setting
- ◆ Order, Reporting
- ◆ Line and Extruder Ramping
- ◆ Synchronised multi-drive Speed Control

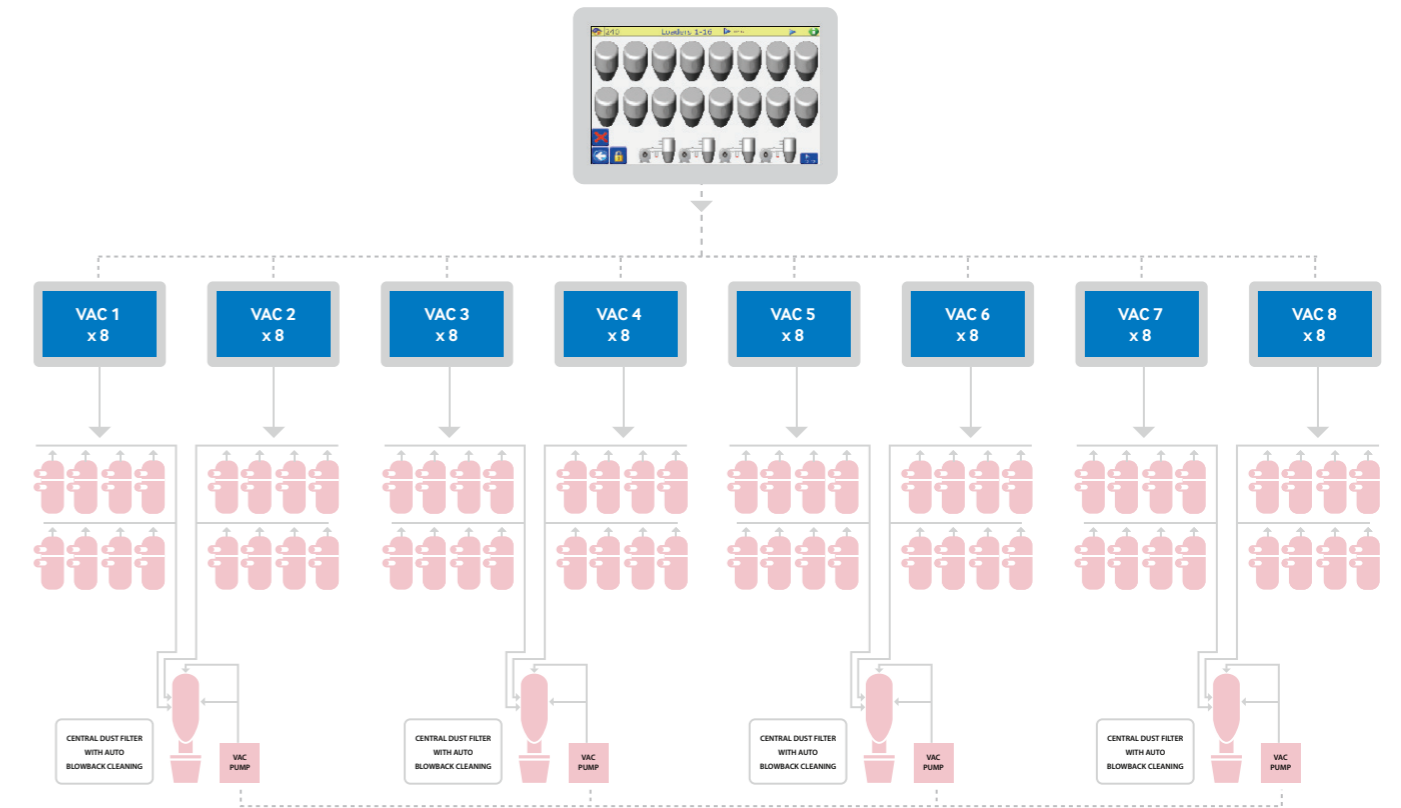
TSM Line View hardware platform is Window's 10 web-enabled, ethernet ready and is equipped with the latest "pinch and zoom" multi-touch graphic interface.



# Central Vacuum Conveying



TSM VAC3000 Material Handling Systems incorporates a new HMI interface with multiple communication protocols available. TSM VAC8 remote I/O modules can supervise up to eight vacuum receivers each. Ease of expansion is key to any TSM material handling system.



## Central Vacuum Loading System

The central control panel communicates to TSM VAC8 remote I/O modules that supervise up to eight vacuum receivers each and all associated pumps and controls. Additional VAC8 modules can be connected simply allowing multiples of 8 receivers to be connected to the system.

## SYSTEM CAPABILITIES

	Min	Max
Pump(s)	1	4
Vacuum Breaker Valve(s)	1	4
Central Dust Filter(s)	1	4
Vacuum Receivers	1	64
Vacuum Receivers per pump	1	64
VAC8s per System	1	8



Vacuum Receivers



# Complete Turnkey Solutions

Employing a highly trained and engaged workforce, proven technology and world class partners TSM has the knowledge and experience in Plastics processing to deliver full turnkey solutions from Silo to machine allowing our clients to focus on what they do best.

From concept through realisation TSM is with you all the way to ensure all project objectives are fully delivered. The strength and depth of TSM's process knowledge gained on similar projects worldwide ensures we can bring best in class solutions to our customers.

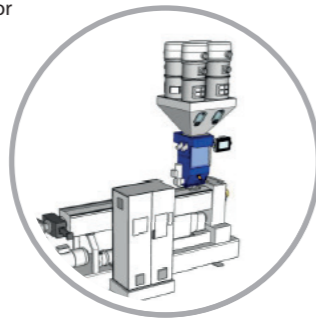
**MATERIAL MANAGEMENT**  
Blending | Control | Analytics



## 1 Gravimetric Blending

OPTI-X range of Extrusion Control blenders provide superior accuracies, blend ratios and mixing homogeneity. OPTI-X blenders utilize TSM's patented technologies in slide valve design and reverse flight auger mixing with continuous Loss-in-Weight measurement, result in ultra fast throughput measurement and control of the extrusion process. OPTI-X range can accommodate throughputs up to 3000kg/hr (6600lbs/hr).

- Fast, accurate control response
- High accuracy dispensing to 0.01% of batch
- Fast throughput measurement
- Instantaneous response to process disturbances
- Superior weighing and patented mixing
- Throughput and weight/length extrusion control options
- Material usage / Inventory statistics
- Control accuracy up to +/- 0.5% of target setpoint



## 2 Vacuum Receivers

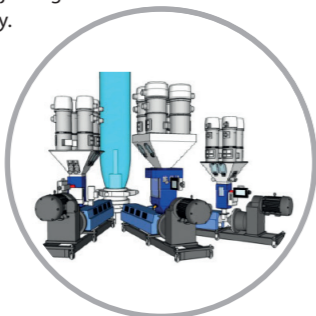
- 0.2 to 6 cuft capacities
- Stainless steel contact surfaces
- Dedicated and common material line
- High heat optional
- Modular construction for maximum flexibility



## 3 Extrusion Control

TSM has continually invested in best in class extrusion control technologies, which allow's TSM to bring to market the fastest and most accurate control technologies available on the market. Incorporated as standard in the OPTI-X extrusion control blender, producers can choose from: Throughput Control – varying the extruder speed to control output rate. Weight per Length Control – maintains product yield by adjusting the Extruder or Extruder and/or Haul-off speeds simultaneously.

- Improved quality
- Fast start up
- Reduce material usage
- Less waste
- Simple intuitive operator interface
- Comprehensive reporting
- Compensates for bulk density variations
- Tighter tolerances achievable



## 4 Railcar Unloading

- Modular or Push-Pull Systems
- Cyclone & Filter Receivers
- Custom Manifolds
- Transfer Stations
- Rotary Airlocks
- Rates 5,000-100,000 Lb/hr

## 5 Automatic Thickness (gauge) Control

The Automatic Gauge Control System, VARIOcool, alters the volume of cooling air to provide a uniform thickness around the bubble. TSM-Kdesign VarioCool ensures uniformity in machine and cross directions of blown film. The profile is measured using either a contact or non-contact thickness measurement sensor. Capacitive or Radioactive thickness sensors are available. The system maps the bubble to specific control zones on the air ring. Any deviation in film thickness is corrected by automatic adjustment of these control zones.

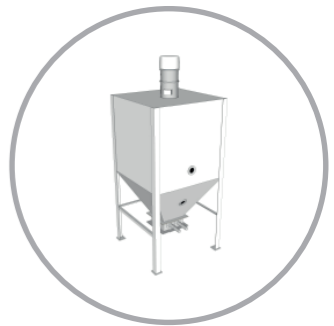
- Increased output (25-60%)
- Fast return on investment (ROI)
- Remote diagnostics
- Uniform cross direction thickness profile
- Contact and non-contact profile measurement systems

## 6 Custom Silos

- Silos for storage of Shipped Resin
- Welded, Bolted or Corrugated Silos
- Standard Cone Design 45 & 60 Degree
- Full Installation Services
- Continuous Level Sensors
- Vacuum Take-Off Boxes
- 40,000 Lb up to 250,000 Lb
- Carbon Steel, Stainless Steel or Aluminum
- Point Level Sensors, High & Low Level Alarms
- 10 Degree Top Slope
- Angel Hair Traps • Load Cells
- Magnets • Air Pads

## 7 Surge Bins

- Custom capacities
- Aluminum, Stainless Steel & Carbon Steel
- Standard Cone Design 45 & 60 Degree
- Point Level Sensors, High & Low Level Alarms
- Angel Hair Traps
- Vacuum Take-Off Boxes
- Magnets
- Air Pads



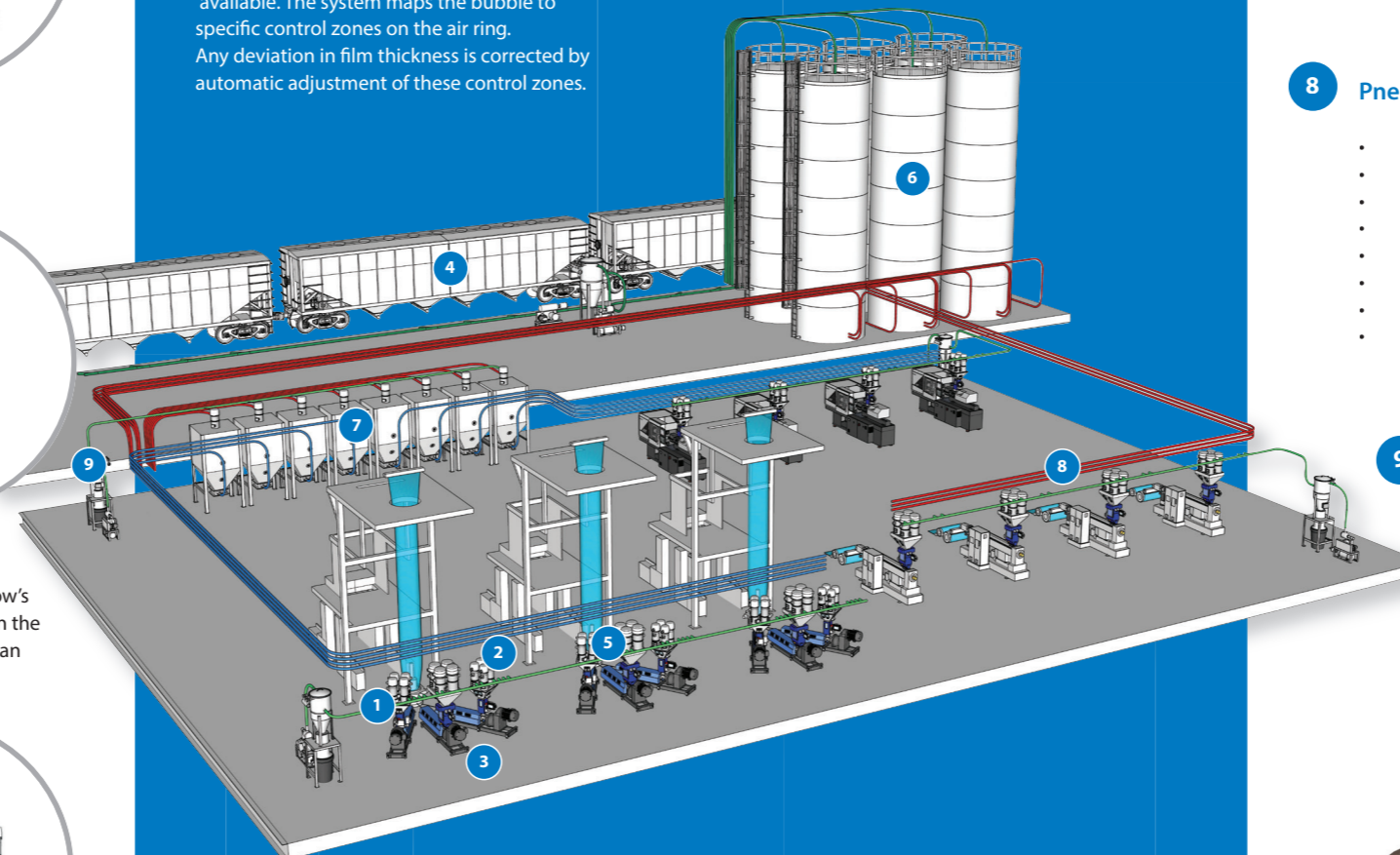
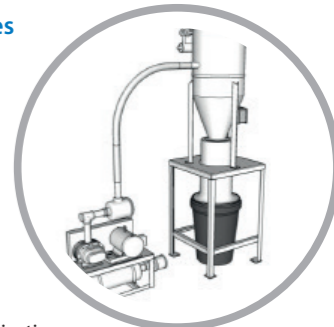
## 8 Pneumatic Conveying

- Vacuum & Material Lines
- Aluminum, Stainless Steel & Carbon Steel
- Tubing 1" to 14" OD
- Elbows, Laterals, Wyes, Couplers, etc.
- Anti-Static Flexible Hose 1" to 10" ID
- Dedicated and Common Material Lines
- Sizing & Installation
- Custom Manifolds



## 9 Positive Displacement Pump Packages

- Vacuum & pressure pumps available
- 3 - 60 HP TEFC MOTORS
- 500 - 50,000 Lb/hr capacities
- Positive displacement lobe blower
- Inlet safety filter standard
- Exhaust filter and silencer standard
- Liquid filled vacuum gauge standard
- Optional sound enclosures
- Central dust collection
- Pump, filter & material lines sized for application





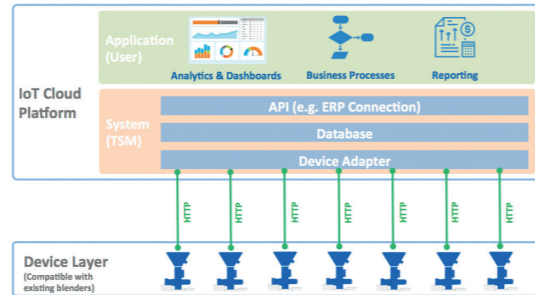


## insight

### Analytics For Plastics

#### TSM INSIGHT

Within the overall **INSIGHT** Cloud architecture **TSM** Blenders are located at the Device Layer and, as they are Insight enabled, allow direct communication to the Device adapter which interrogates the data being transmitted from the blender(s). This data in turn is passed through the Database and API layers which provides unlimited, storage and translation of the data into useful information that is displayed in the user interface as trends, metrics, history and reports.



#### Materials & Energy Consumption:

- Real-Time/Historically
- Recipe/Order
- Line/Plant(s)
- Energy Monitoring (W/Kg)



#### Analytics:

- Trending Key Measurements
- Line/Plant Comparison
- Downtime Analysis
- Role Based Reports



#### Production Health:

- Status Monitoring
- Preventative Maintenance
- Performance History
- Service Planning



#### Metrics:

- Material Usage
- Energy Monitoring
- Production Performance
- Quality Tracking



One of our highest priorities is ensuring that plastic producers achieve the greatest possible performance from their **TSM** investment. To do this, we work hard to understand your business and provide you with the products and support you need.

Our goal is to ensure you achieve the highest possible Return on your investment with **TSM**. We have the resources to help your plant increase productivity in a sustainable way. Because our entire company is focussed on the needs of plastics producers we can address the specific application demands and lifecycle requirements appropriate to your investment.

“**TSM’s** full portfolio of field services - from spare parts to installation and lifecycle management improves equipment productivity, minimizes equipment costs and extends useful life”.

#### Support for the life of your system.

**TSM** maintenance and field services help reduce costly downtime and maximise the performance of the blending system. Our service team is trained and certified in the latest diagnostic, repair and maintenance practises, ensuring you receive the maximum value for your maintenance investment. **TSM** Service portfolio offers the following value added options for our customers:

- Installation and Start Up Services
- Maintenance & Field Services
- Service Level Agreements (SLAs)
- Process Optimization Services
- Telephone Support
- Remote Services
- Spare Parts
- Lifecycle Management
- Training/Skills Development



Service...  
... Completes the Picture





**MATERIAL MANAGEMENT**  
Blending | Control | Analytics

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