

# THEREC

**PNEUMATIC CONVEYING SYSTEMS**

**SEA BULK LOADING SYSTEMS**

**PROCESS DUST POLLUTION CONTROL SYSTEMS**

**DUST EXPLOSION PROTECTION & CONTROL SYSTEMS**

**AIR & GAS BOOSTING & HANDLING SYSTEMS**

**BULK MATERIAL FLOW MEASUREMENT & WEIGHTING SYSTEMS**

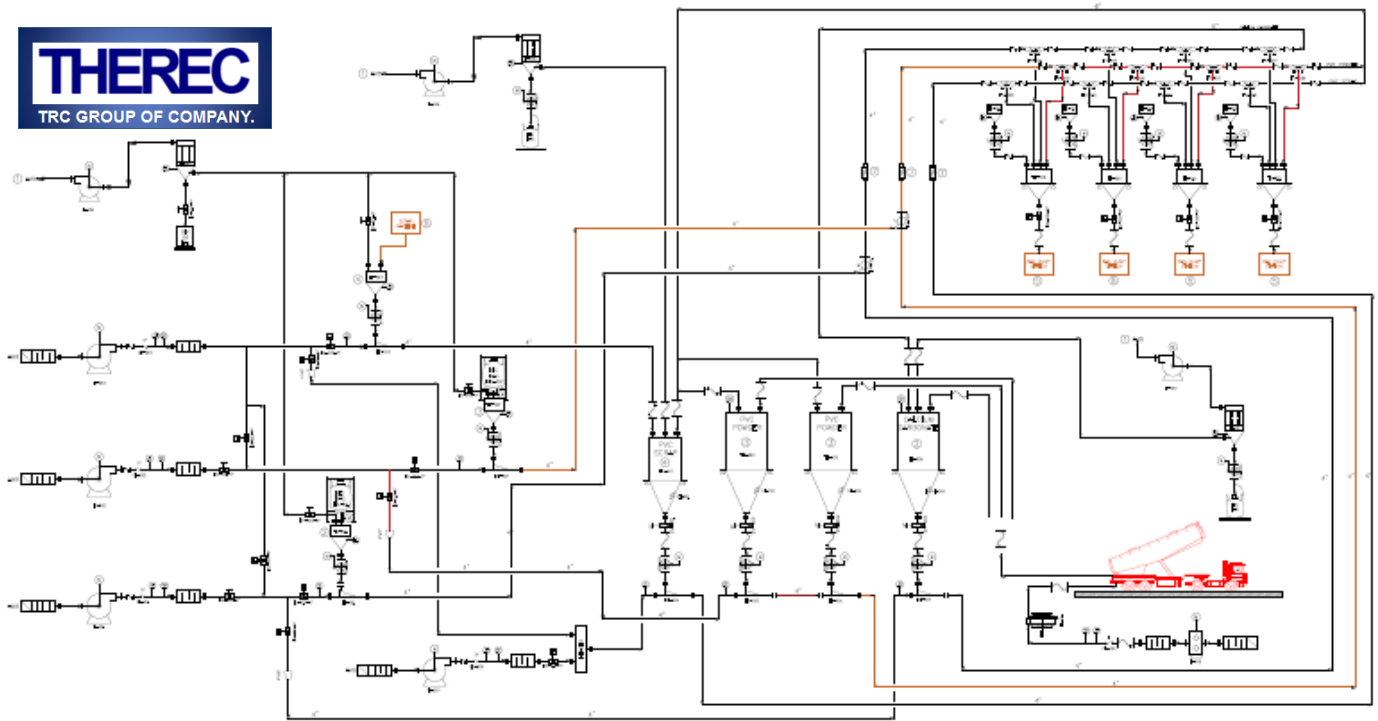
**BULK MATERIAL SILOS SYSTEMS**

**BIG BAG & SMALL BAG HANDLING SYSTEMS**

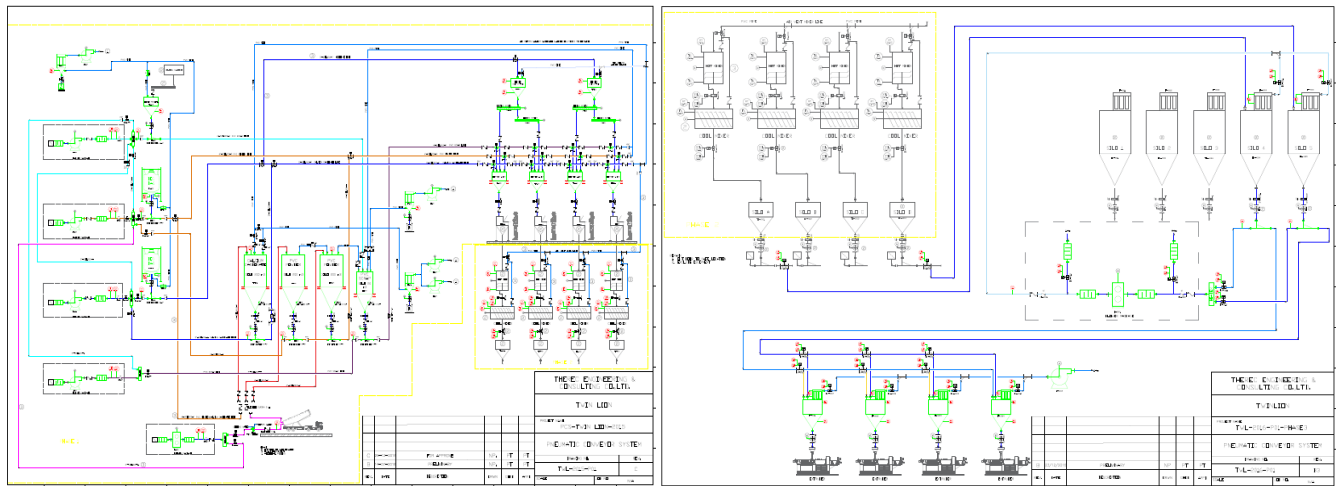
**Process Systems Design**

# PVC pipe (PVC resin, PVC scrap and CaCa<sub>3</sub>) processing system

## Raw material Storage, Handling & Weighting system



## Dry mixed material Mixing & Handling system



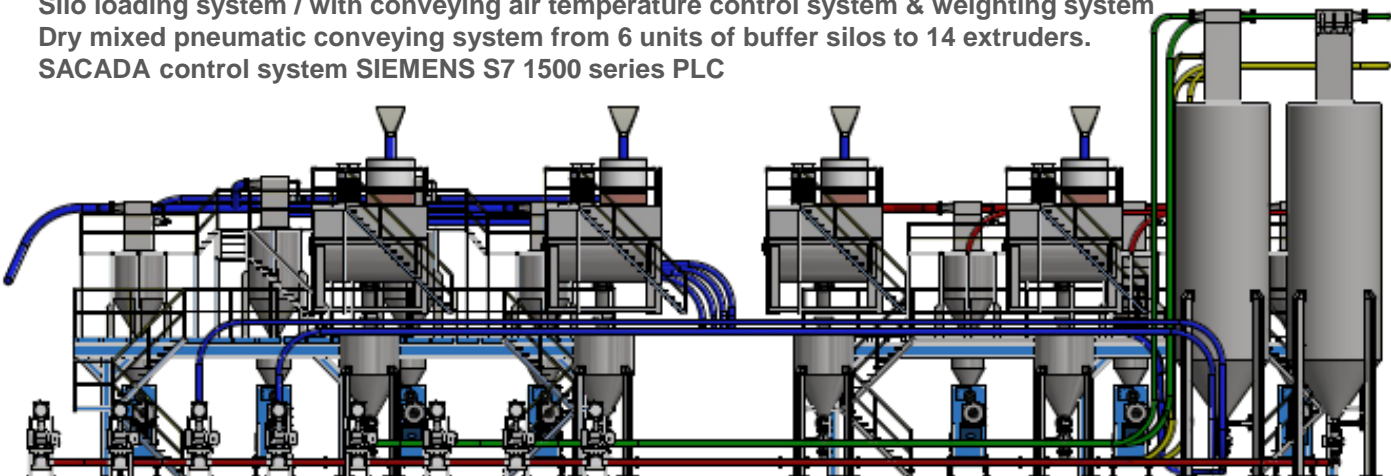
Sahaaree Co., Ltd. / PVC Pipe manufacturer

Raw material pneumatic conveying system with/ Big bag unloading system / weighting & mixing system

Silo loading system / with conveying air temperature control system & weighting system

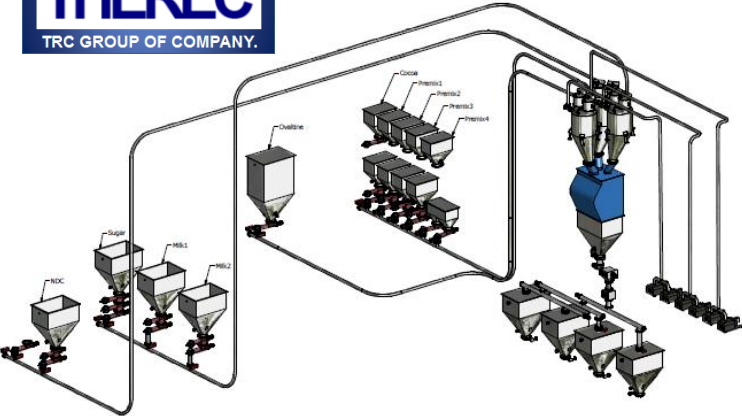
Dry mixed pneumatic conveying system from 6 units of buffer silos to 14 extruders.

SACADA control system SIEMENS S7 1500 series PLC

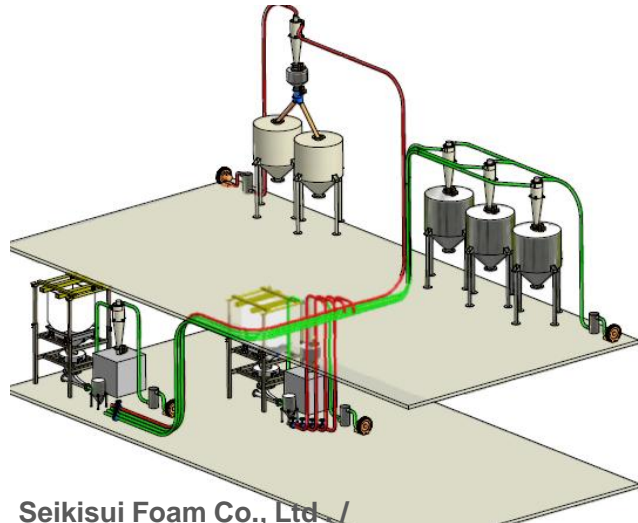


# Pneumatic Conveying Systems

**Lean (Loose, Dilute) phase negative pressure / vacuum / system**  
(Mass ratio up to 1:4)

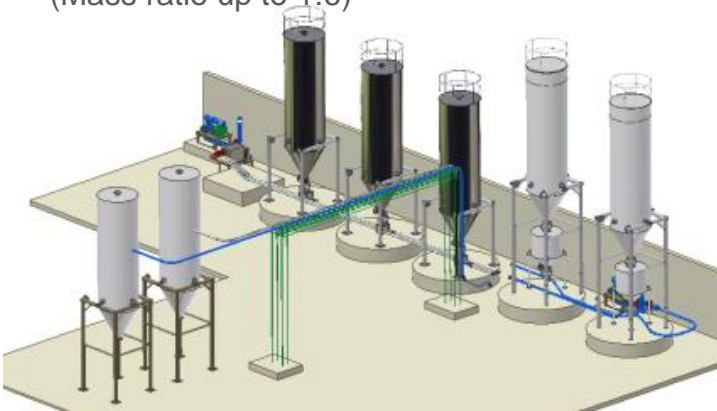


**AB Food (Thailand) Co., Ltd. / Ovaltine**  
Three in one raw material conveying system  
Sugar, Coco powder, Milk powder

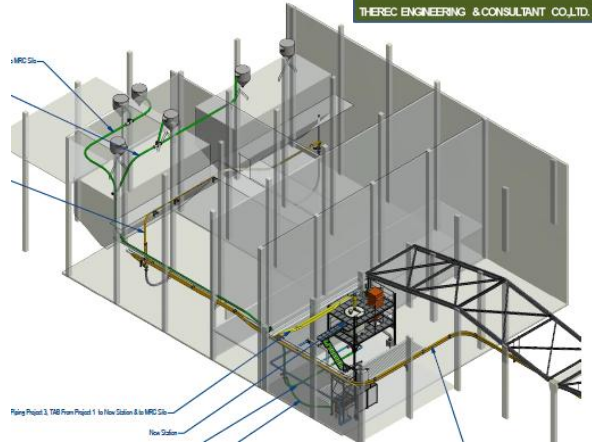


**Seikisui Foam Co., Ltd. /**  
Poly ethylene powder conveying system.

**Lean (Loose, Dilute) phase positive pressure system**  
(Mass ratio up to 1:6)



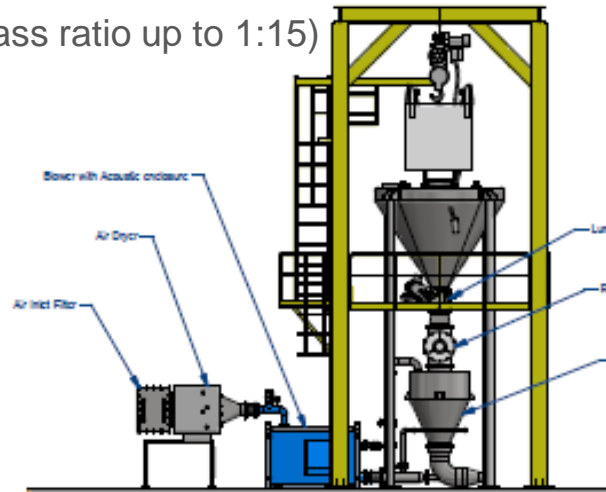
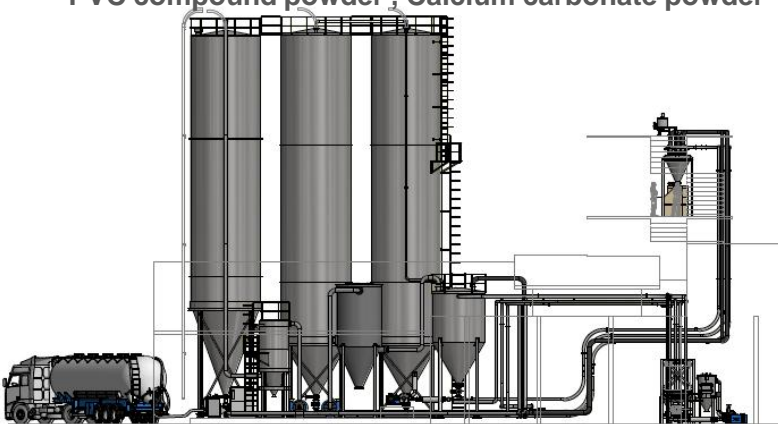
**Bangkok PVC Co., Ltd.**  
PVC door raw material conveying system  
PVC compound powder, Calcium carbonate powder



**Quality Coffee Co., Ltd. / Nest Café**  
Roasted coffee bean conveying system

**Mixed phase positive pressure system** (Mass ratio up to 1:15)

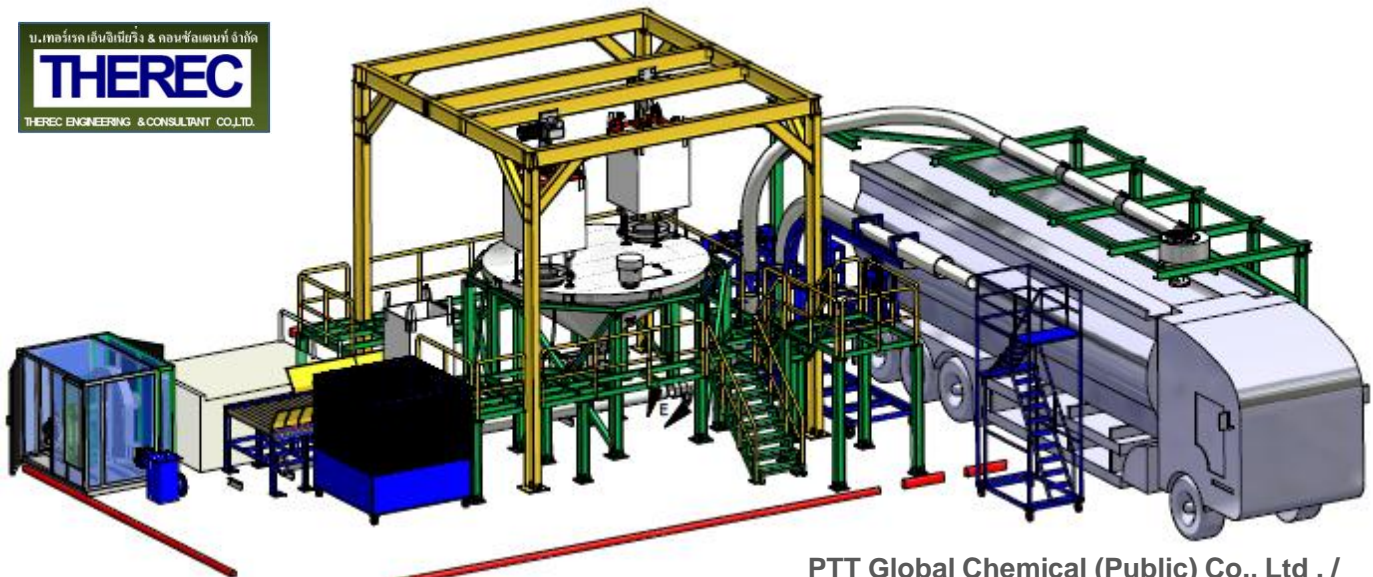
**Saha Aree Industry Co., Ltd./ PVC Pipe raw material conveying Bulk truck to Silo loading system**  
PVC compound powder, Calcium carbonate powder



**Mitrphol Sugar Co.,Ltd.**  
Sugar loading system from big bag unloading station to container loading station

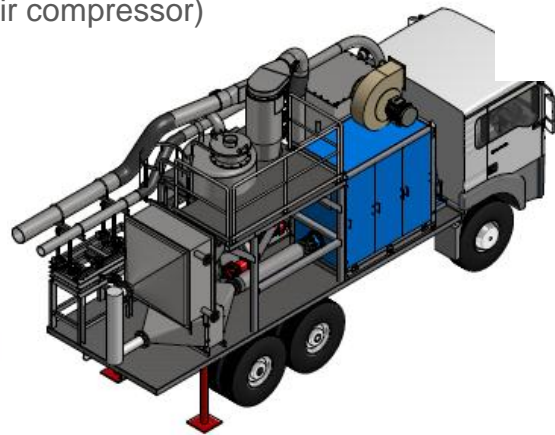
# Sea Bulk (Container & Bulk truck) Loading Systems

Low pressure Loading system (Centrifugal blower)



PTT Global Chemical (Public) Co., Ltd. /

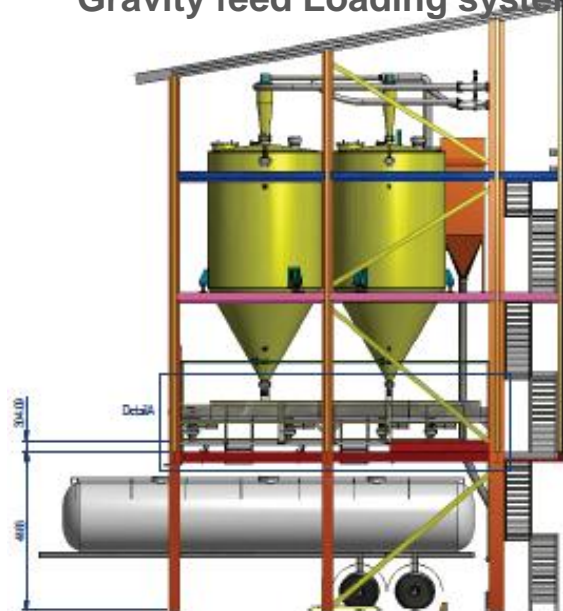
Poly ethylene Pellet Seal bulk loading systems , from big bag to container and bulk truck  
High pressure loading system (Roots blower / Air compressor)



Thai Plastic and Chemicals PCL. / SCG Chemical

PVC powder container loading system , from 100 tons storage silos to container  
Mobile (on truck) special design for inter plant movement

Gravity feed Loading system

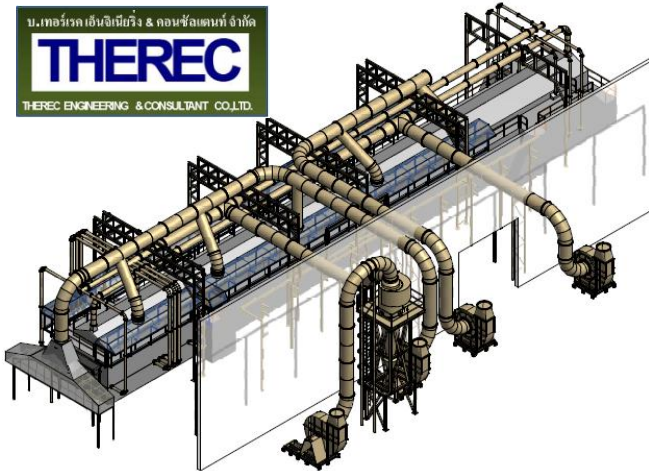


Quality Coffee Co., Ltd. / Nest Café

Roasted coffee bean Bulk truck loading system  
With chain conveyor and loading bellow ,no need to move the truck during the loading period of time.

# Process Dust pollution Controlling Systems

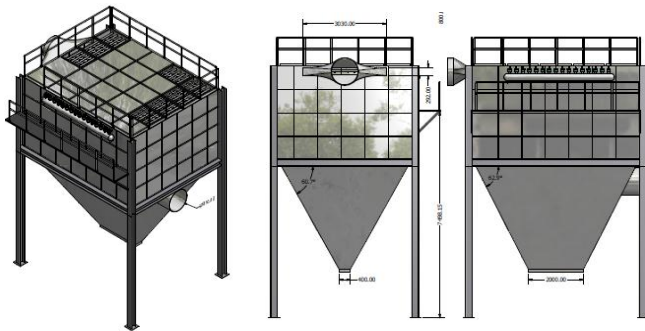
## Bulk Material process Loading & Unloading Dust Controlling system



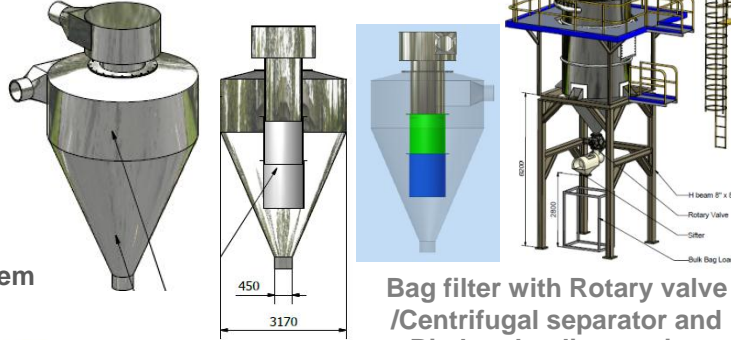
Noble NC Co., Ltd . /  
Paper dust Separating  
and Collecting system  
Paper Piece / Dust  
separation cyclone and  
Bag filter with  
Centrifugal separator  
and Big bag loading  
station



Rayong MDF Co., Ltd . /  
MDF Wood dust pollution control system  
with Explosive panel protection set



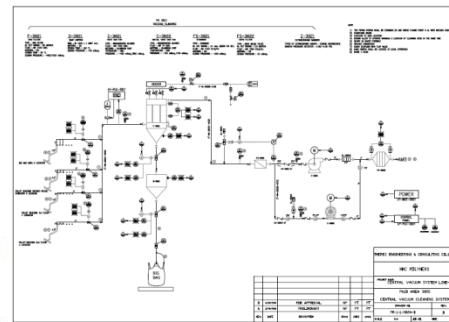
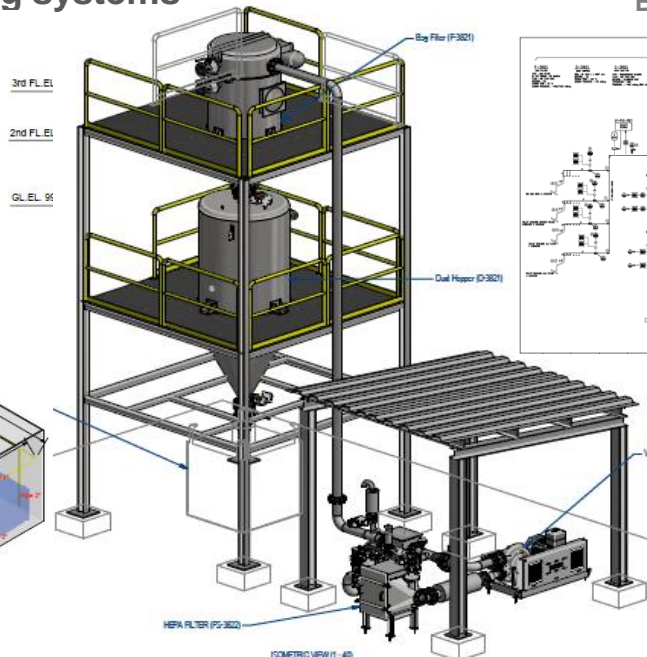
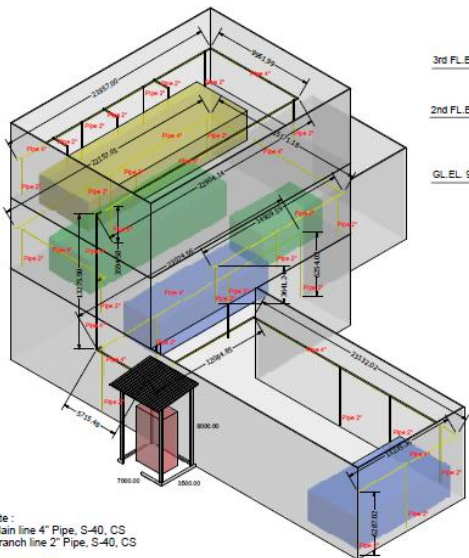
Particle / Dust Separation Cyclone



Evonik United Silica Co., Ltd  
Air volume 50,000 m<sup>3</sup>/hr / body in SUS 304  
Bag filter/ Silica powder dust pollution control system

Bag filter with Rotary valve  
/Centrifugal separator and  
Big bag loading station

## Central Vacuum Cleaning systems



Note :  
- Main line 4" Pipe, S-40, CS  
- Branch line 2" Pipe, S-40, CS  
  
Pipe line floor#1  
Line no.1 Total = 54482.01 mm.  
Line no.2 Total = 35011.06 mm.  
  
Pipe line floor#2  
Line no.1 Total = 77635.26 mm.  
  
Pipe line floor#3  
Line no.1 Total = 76000.09 mm.

HMC Ploymer(Public) Co., Ltd. / PTT Group/ in cooperation with CR Asia Co., Ltd.  
PP powder dust cleaning system , 20 suction points, with 3 points on operate in the same time  
Full automatically operation with full dust explosion protection system , in hazardous area zone 22



# Process Dust Explosion Protection & Control Systems

## Explosion Prevention system

- Early fire detection of burning products (ATEX CO Monitoring)
- Infrared spark detection systems
- Rapid fire extinguishing systems



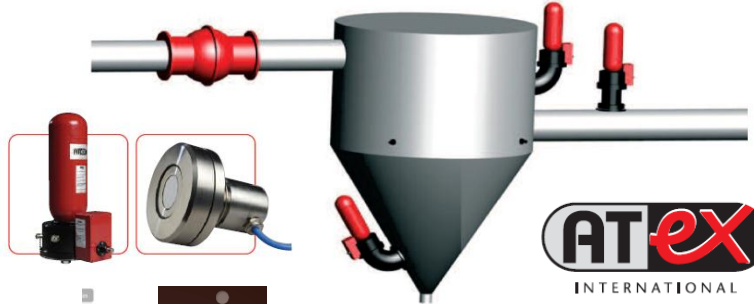
## Explosion Isolation system

- Active Quick Sliding valves
- Passive Barrier valves
- Explosion diverters
- Extinguishing barriers



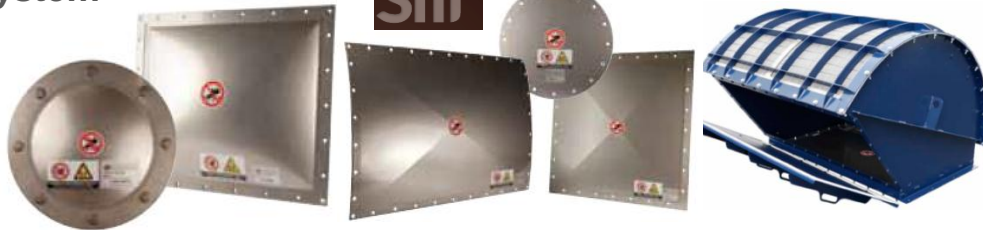
## Explosion Suppression system

- Pressure detection (dynamic/static)
- Infrared detection
- Suppression systems with reusable valves
- Hot Water Advanced Inserting Systems
- ATEX Powder Suppression



## Explosion Venting system

- Explosion Bursting discs
- Explosion doors
- Q-Pipe (flameless venting)



## Explosion Component and Machine

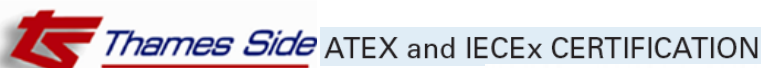
- Blowers and Exhauster
- Rotary and Diverter valve
- Load cell & Indicator
- Mass flow Sensor & Meter
- Electrical & Control panel



The **Original** Roots Blower  
ATEX Conformity Certificate



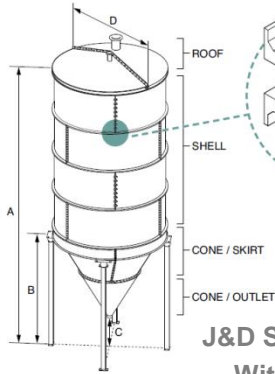
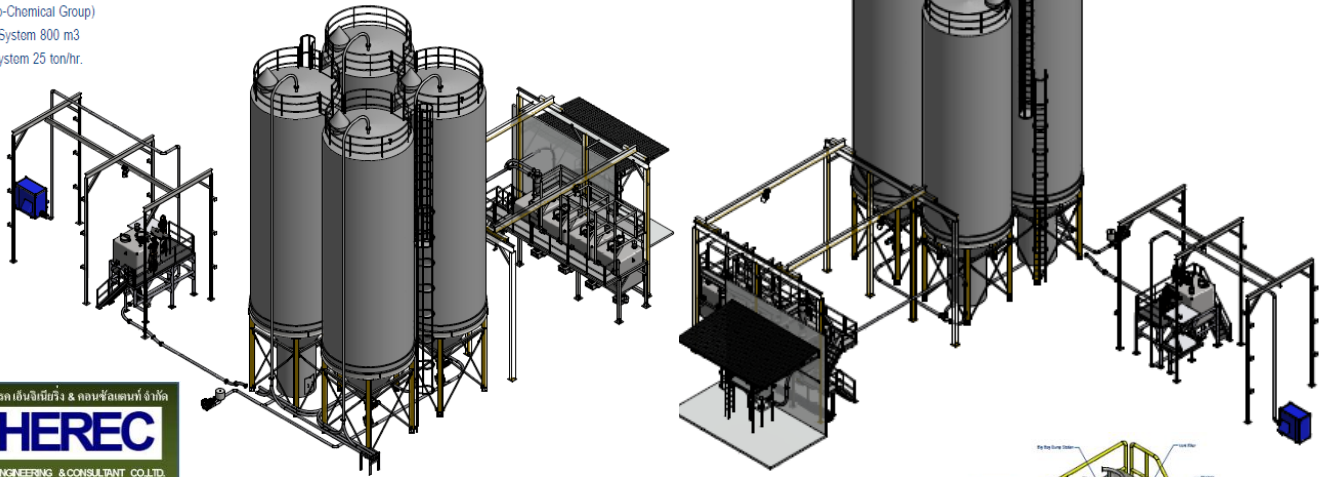
- Versions conforming to ATEX 94/9/EC available



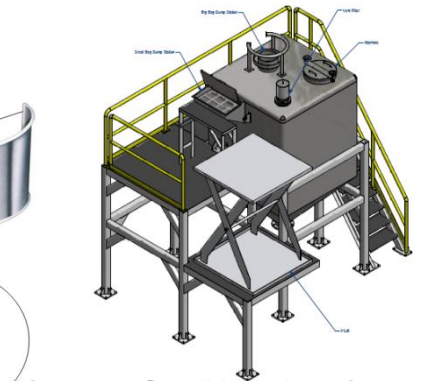
# Bulk Material Silos Systems

## Silo Loading & Unloading system

CNC (CP Petro-Chemical Group)  
PE Pellet Silo System 800 m<sup>3</sup>  
Silo Loading System 25 ton/hr.

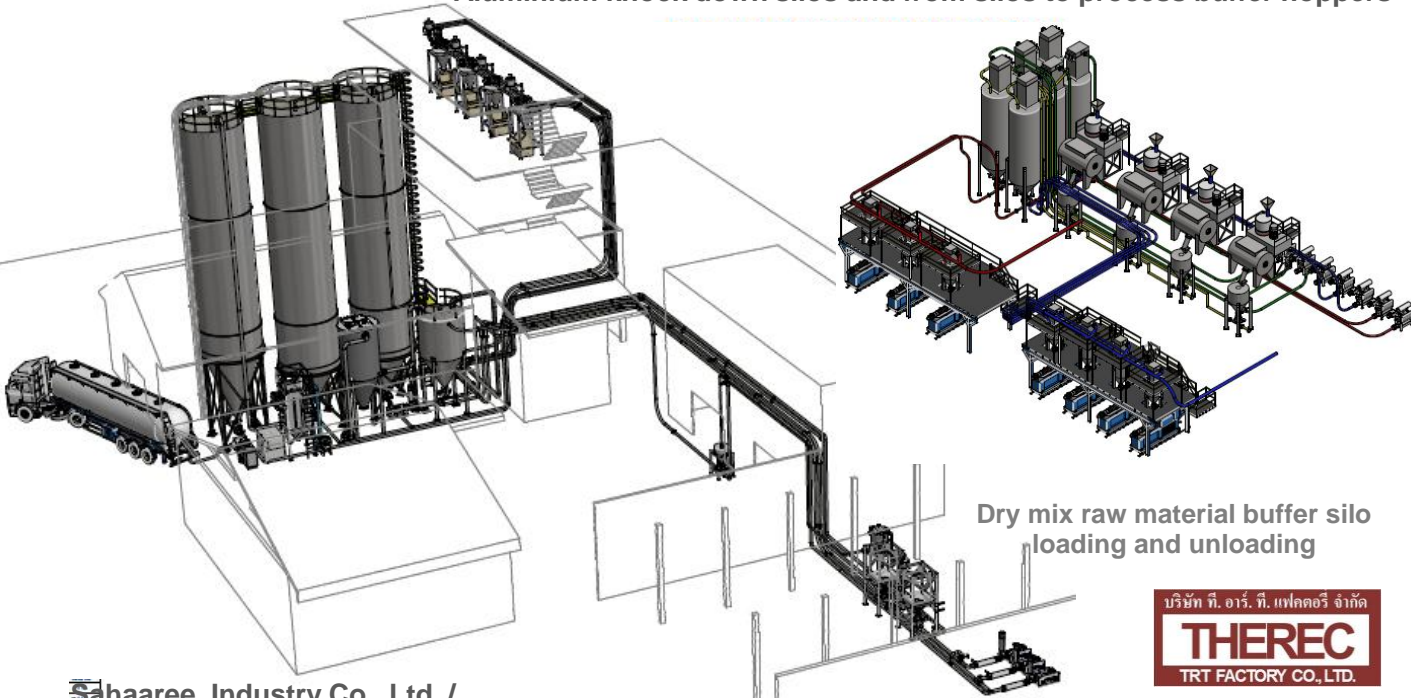


J&D Stanriv Silos, Size 200 m<sup>3</sup>  
With load cell monitoring



Big bag & Small bag dumping station  
With over head crane and X lifter

CNC International (Public) Co., Ltd . / CPPC Group of company  
Poly propylene Pellet Silo loading & unloading systems , from big bag and bulk truck to J&D Stanriv Aluminium knock down silos and from silos to process buffer hoppers



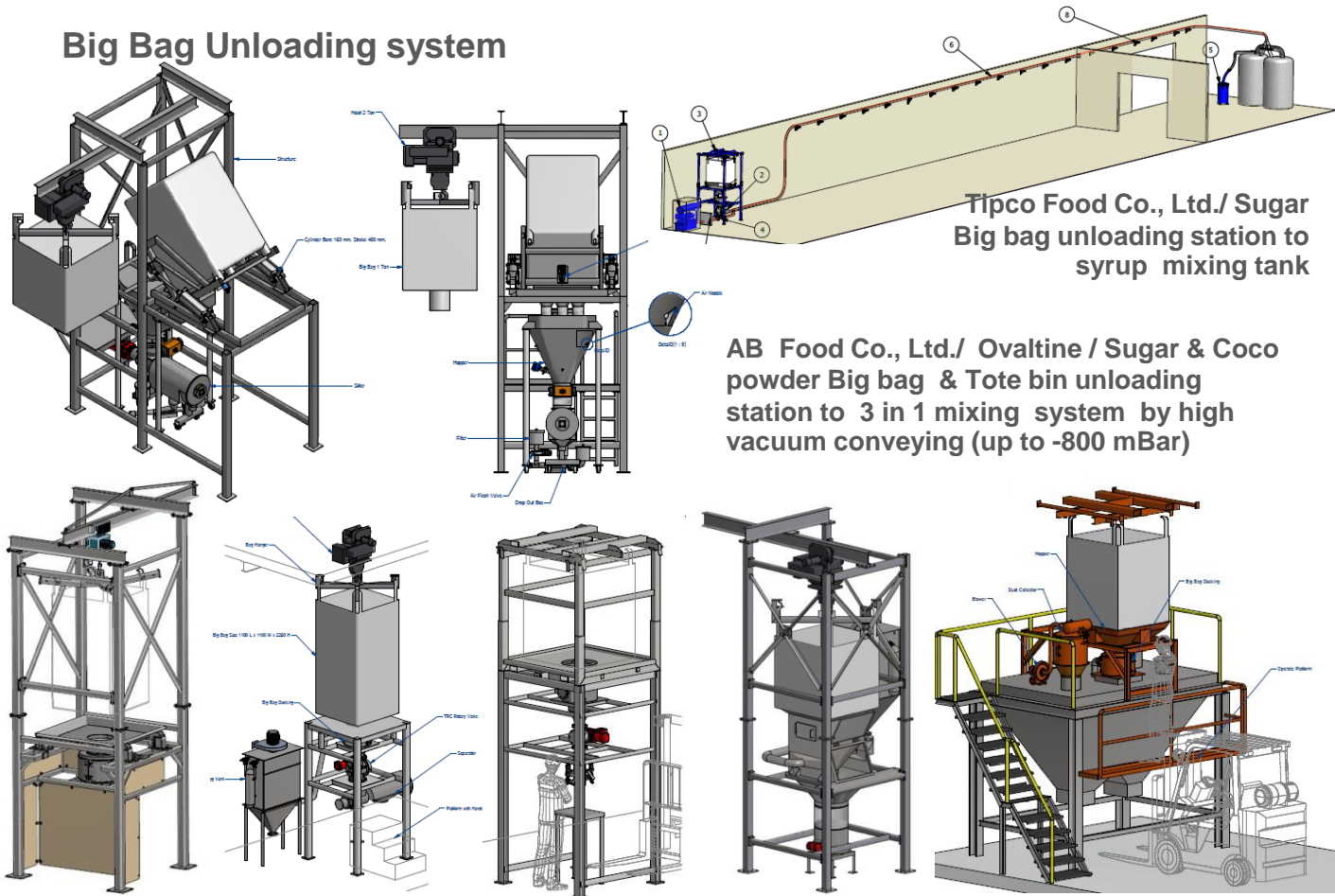
Dry mix raw material buffer silo  
loading and unloading



Sahaaree Industry Co., Ltd. /  
PVC powder and Calcium carbonate powder Silo loading & unloading system ,with load cell and dust collecting bag filters, from big bag and bulk truck to Stainless steel 304 storage silos and from silos to weighting and mixing system in the process line.

# Bulk bag & Small bag Unloading Systems

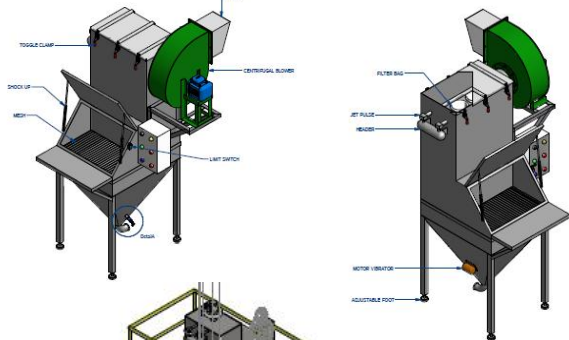
## Big Bag Unloading system



AB Food Co., Ltd./ Ovaltine / Sugar & Coco powder Big bag & Tote bin unloading station to 3 in 1 mixing system by high vacuum conveying (up to -800 mBar)

Various design of Big bag Unloading station to be suit with the individual need of process operation  
With dust free and clean environmental

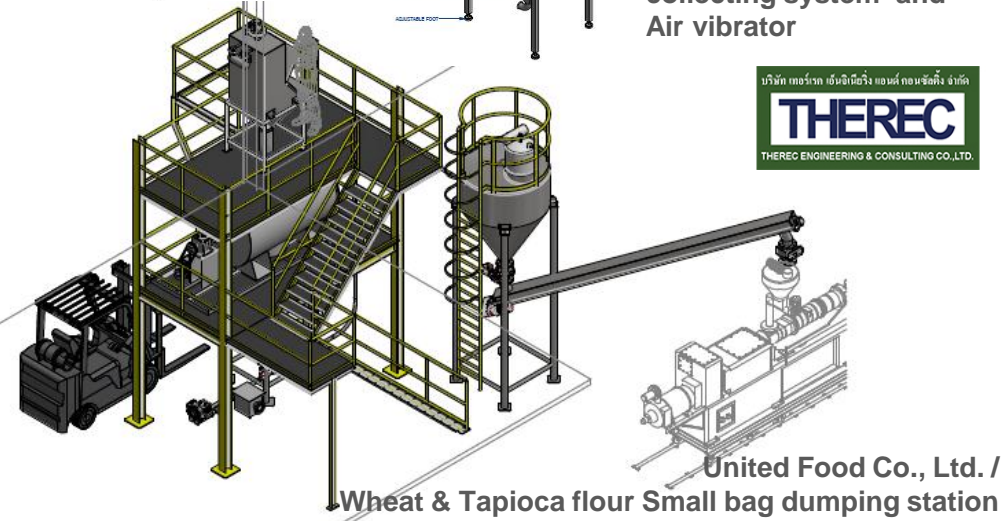
## Small bag dumping system



F&N food Co., Ltd. / Milk powder / Small bag dumping station with Integrated dust collecting system and Air vibrator



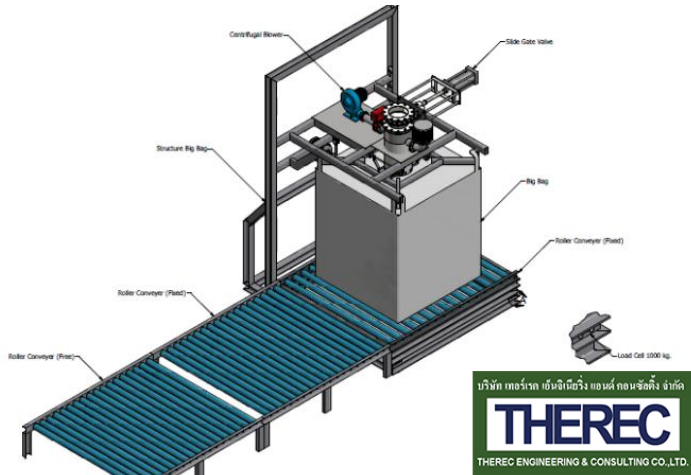
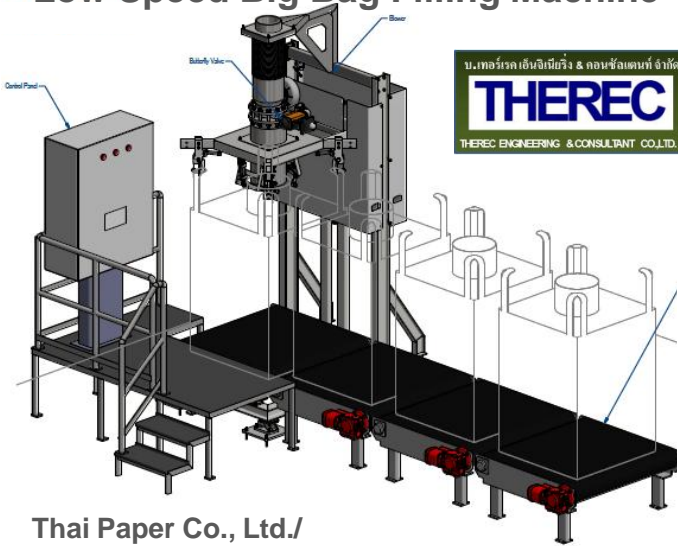
Nestle (Thailand) Co., Ltd. / Nest Vita / Wey powder Small bag Dumping station with dust collector, Lump breaker & Moving head to Tote bin





# Bulk bag Filling Machine & Loading Systems

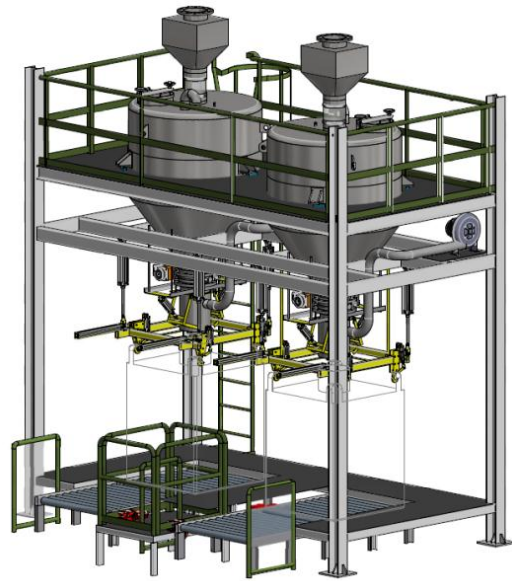
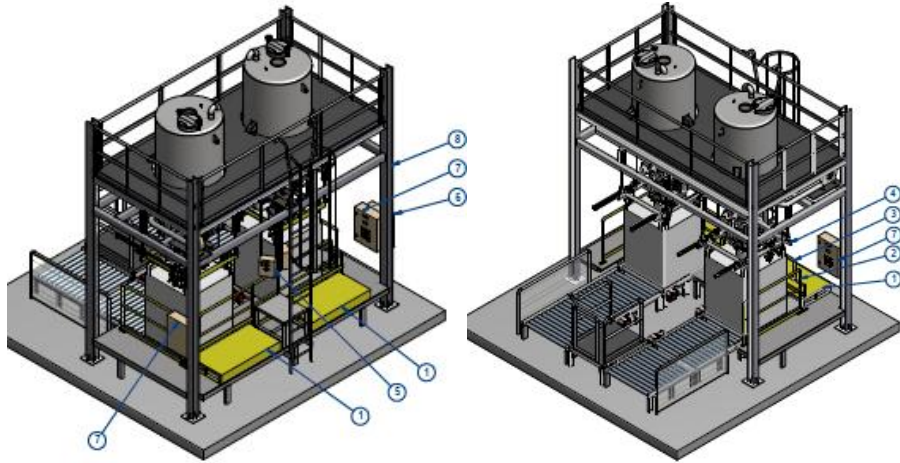
## Low Speed Big Bag Filling Machine



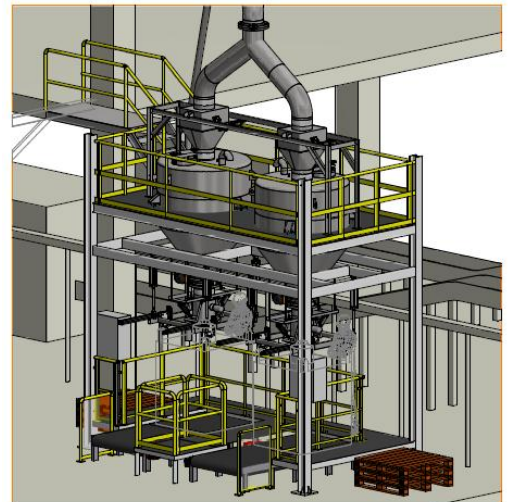
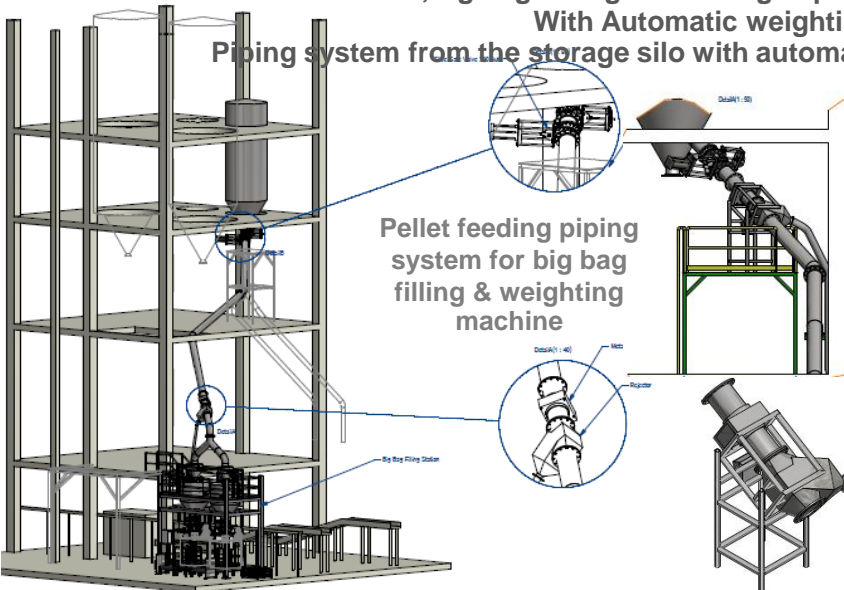
Thai Paper Co., Ltd./  
SCG Paper Group Recycle Paper Pulp Big bag Filling station Low speed machine, 16 bags/ hr, 360 kg/bag With Automatic weighting & feeding system

In-Tech Feed Co., Ltd./  
Feed mill raw material ,Big bag Filling station Low speed machine, 10 bags/ hr, 1200 kg/bag With Automatic weighting & feeding system

## High Speed Big Bag Filling Machine

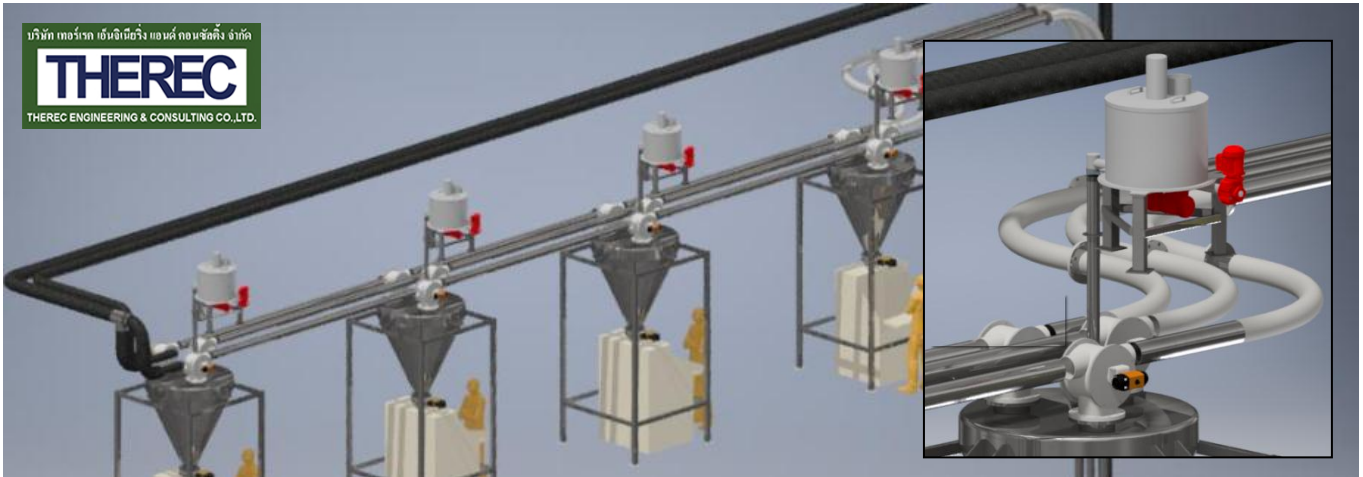


Thai Polyethylene(Public) Co., Ltd./SCG Chemical group  
LLDPE Pellet ,Big bag Filling station High speed machine,60 to 90 bags/ hr, 735 kg/bag With Automatic weighting system and check weight load cell set Piping system from the storage silo with automatic shut off valve and metal detector set



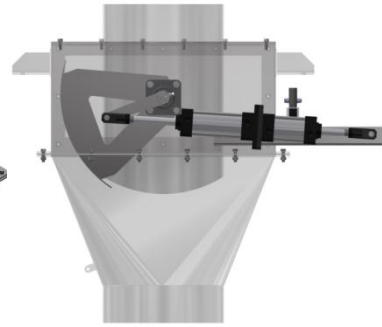
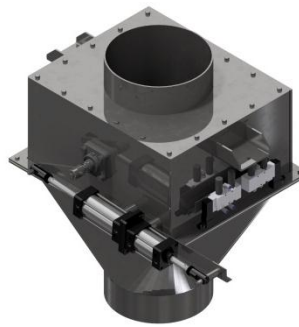
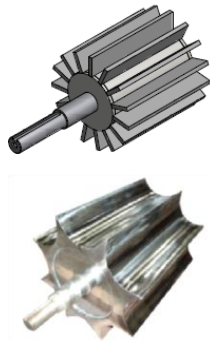
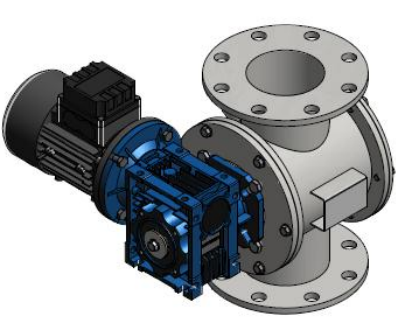
# Bulk Material flow Measurement & Weighting system

## Mixing & Filling process weighting system



Saha aree Co., Ltd./ PVC and Calcium carbonate powder weighting system by Scale (Fill vent) valve

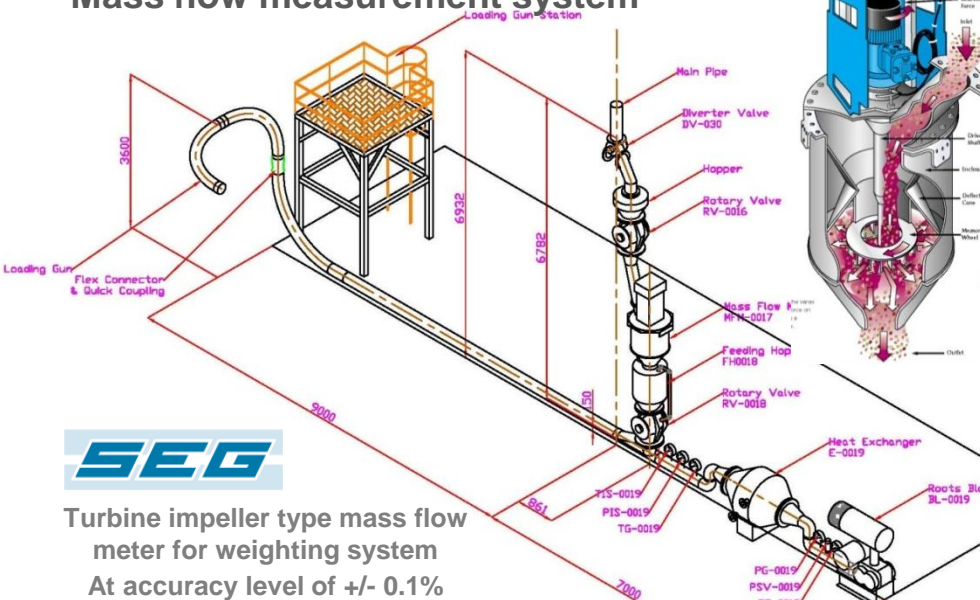
Saha aree Co., Ltd./ PVC pipe Additive powder weighting system by Dosing screw feeder



Thai Plastic Bag Co., Ltd./ Calcium carbonate powder weighting system by Dosing rotary valve

Thai Poly Ethylene Co., Ltd./ LLDPE Big bag filling station weighting system by Cut off valve

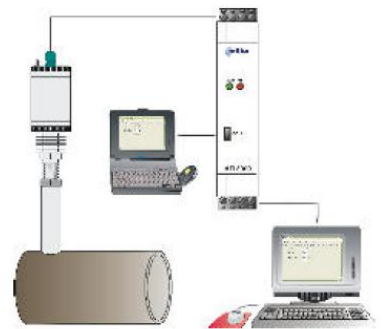
## Mass flow measurement system



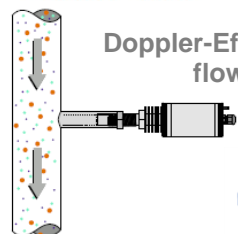
Turbine impeller type mass flow meter for weighting system  
At accuracy level of +/- 0.1%

Thai Polyethylene(Public) Co., Ltd./SCG Chemical group  
HDPE Pellet ,container loading station flow measurement system by Mass flow meter

## System components



A complete measuring system MF3000 contains the sensor, a cable, a DIN-rail transmitter and the software MF-SMART .

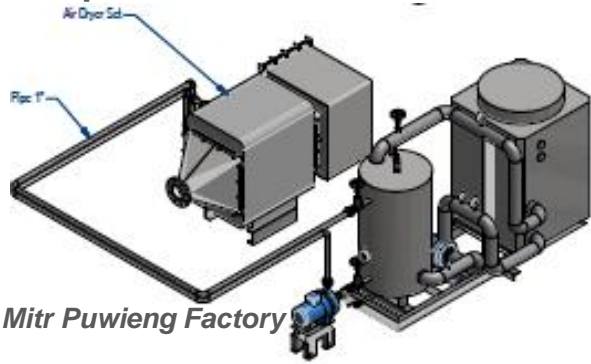


Doppler-Effect type mass flow meter

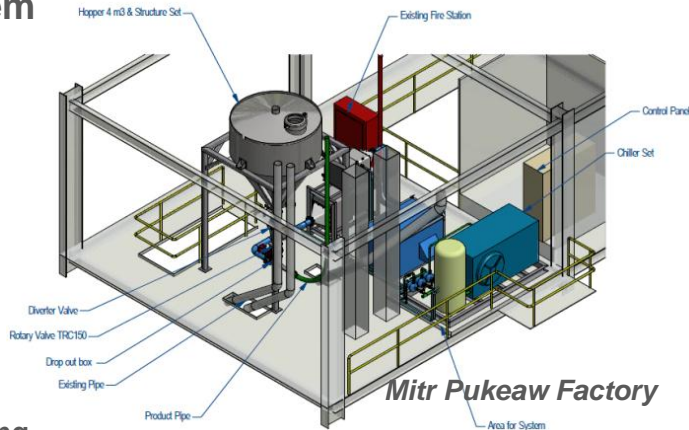


# Air & Gas Boosting & Handling system

## Temperature & Moisture control system



Mitr Puwieng Factory



Mitr Pukeaw Factory

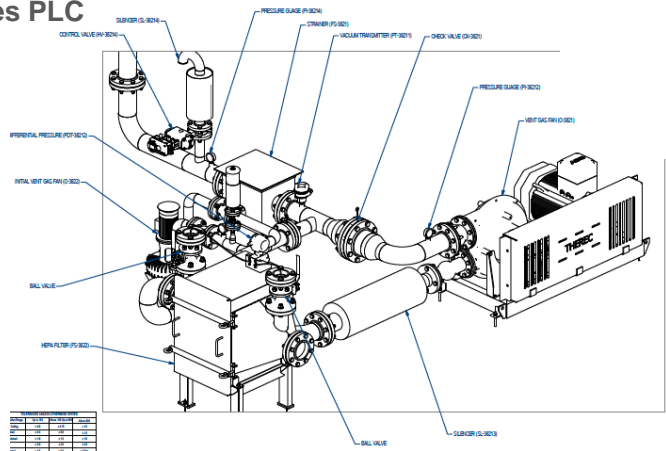
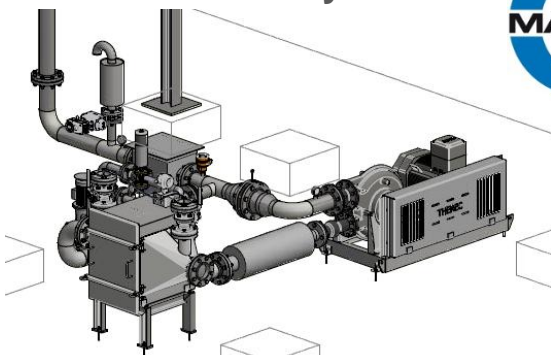
Mitrphol Sugar Co., Ltd./ Sugar pneumatic conveying

Contacted conveying air moisture control to the level below 35% relative humidity to protect the sugar lump and stickiness from ambient moisture.

Contacted temperature to be under 38 degree C, to protect the internal moisture from flashing out and make the crystal to be dim.

SCADA control system with SIEMENS S7 300 series PLC

## Vacuum control system

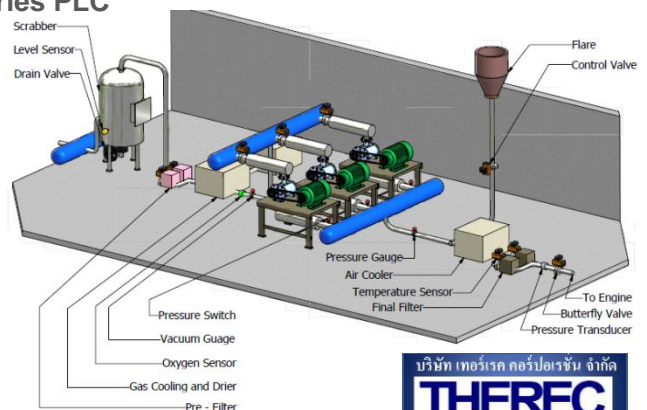
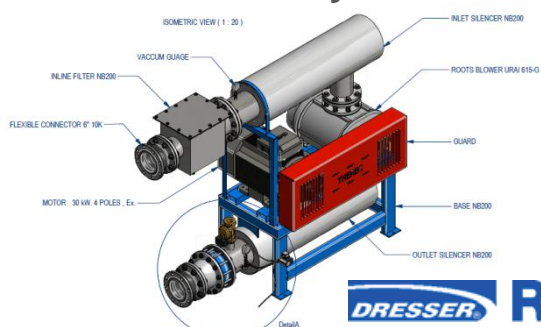


HMC Polymer Co., Ltd./ PTT Group of company, job in cooperation with CR Asia

Vacuum control system for central vacuum cleaning system operation, operated by vacuum transmitter and pneumatic control valve to maintain the vacuum level of the system at -300 mBar and maintain the averaged suction air volume of each individual suction point at around 200 cfm of all working condition. Also the differential pressure switch for the filters.

SCADA control system with ALAN BRADLEY 500 series PLC

## Pressure control system



Chareon Sompong Co., Ltd./ Underground Biogas from landfill site

Pressure control system for bio gas boosting station / supply to gas engine of electrical generator By pressure transmitter and pneumatic control valve to maintain the pressure of 7 PSI supply to engine regulator and over supply gas to the flare with gas cooler and cooling tower set to maintain the feed in gas to be under 50 degree C and reduced the water content level in the biogas.

Also with oxygen sensor/transmitter and safety vacuum switch.

SCADA control system with SIEMENS S7 200 series PLC

**TRC / The High Pressure Blower Company**  
Total solution for high pressure blower application

**TRS / The Service Company**  
Premium quality of service and repair work

**TRTT / Therec's Knowledge Base Company**  
Production with fully specific knowledge and experience  
Rotary & Diverter Valve maker / High pressure blower packer

**TRT / Stainless Steel Tank Making Company**  
Food grade stainless steel work shop.  
Stainless steel Hopper Tank and Silos

**TRPM / Bulk Material Processing Machine Company**  
Bulk Bag filling & unloading station / Weighting system  
/Bulk Material Handling equipment and Machines

**TRE&C / The Pneumatic Conveying System Company**  
Bulk material handling process turn-key solution

**C**lear & **C**omplete engineering process design with the main components of the process coming from a single group, precisely matched for the influences system operation with the full reliable service team.

*“Over all knowledge summation of the 20 years experience”*

**Therec Engineering & Consulting Co, Ltd.**

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