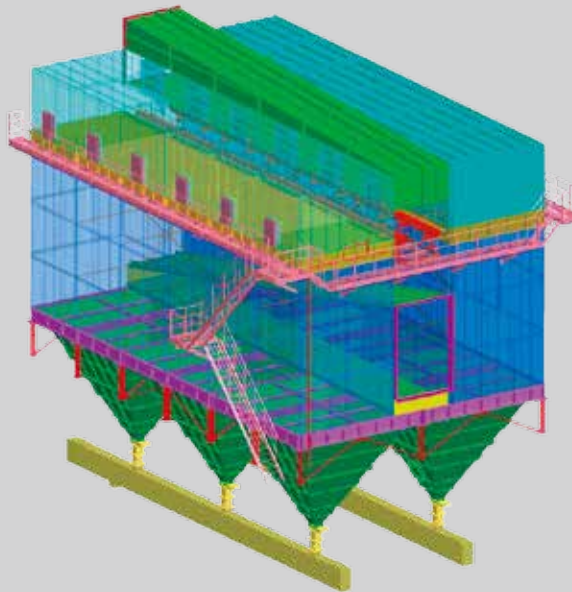




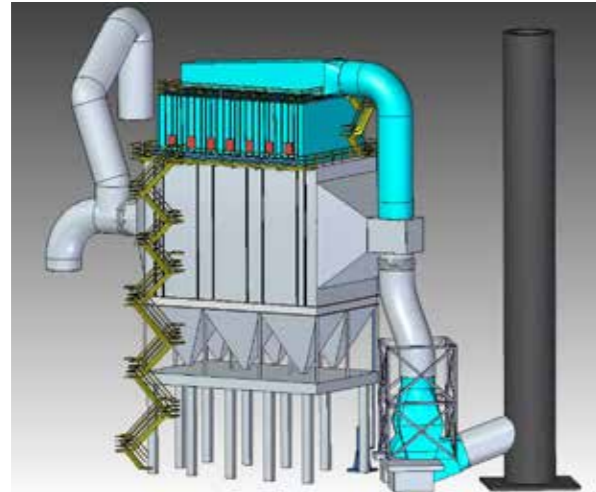
**sinoma** Sinoma International  
Engineering Co., Ltd.

# Conversion of ESP to Bag Filter



**SINOMA INTERNATIONAL ENGINEERING CO., LTD.**

## 1 PROCESS



### Conversion of the system:

- 1) Modify ESP fan with a higher pressure.
- 2) Add fresh air valve on inlet duct to prevent bags from high temperature.
- 3) Add opacity monitor on outlet chimney to monitor the dust emission real-timely.
- 4) Add air compressor if needed.
- 5) Add air-air heat exchanger or water spraying system for cooler modification.

### Conversion of the ESP:

- 1) Keep the casing and hoppers. Sometimes keep the inlet and the first electric field according calculation.
- 2) Take out the internal components of electric fields.
- 3) Install new pulse jet device inside and divide the space into several clean air plenums.
- 4) Install different gas-distribution devices between compartments and avoid high local velocity of gas and reduce the internal resistance of gas.
- 5) Install outlet duct.
- 6) Modify discharging device if needed.

### Performance:

Dust emission	5 mg/Nm <sup>3</sup>
Pressure loss	800 Pa
Bag Life	> 4 years
Air leakage	< 2.5% (walk-in structure)

## 2 TYPICALS

### Conversion of ESP to bag filter for kiln of Tianrui Group Ruzhou Cement Co., Ltd. (5,000 t/d)

—Model Case for conversion of ESP with heavy dust-laden gas to hybrid filter



### ESP technical data

ESP Size	I2×31/12.5/4×9/4 BS780 LURGI		
Gas volume	900,000 m <sup>3</sup> /h (120 °C)	Section area	315 m <sup>2</sup>
Gas inlet temp.	Normal: 120 °C; Upset: 300 °C	Gas component	For kiln and raw mill
Inlet dust cont.	<=600 g/Nm <sup>3</sup>	Outlet dust emission	<100 mg/Nm <sup>3</sup>

### Bag house technical data

Bag house Size	TDM-374/12	Quan. of compart.	12
Gas volume	900,000 m <sup>3</sup> /h (150 °C)	Bags/compartament	374
Gas inlet temp.	Norm.: 100-150 °C Upset: 240 °C	Bag size	Ø160x7,000
Inlet dust cont.	<=600 g/Nm <sup>3</sup>	Total filtering Area	15,300 m <sup>2</sup>
Outlet dust emission	<10 mg/Nm <sup>3</sup>	Bag material	P84
ΔP between inlet and outlet flange	700 Pa (after 3 years' operation)	Quan. of pulse valve	264, Goyen Ca76mm
Actual bag life	6.5 years	Kiln standstill	12.5 days



## Conversion of ESP to bag filter for kiln of Dalian Onoda Cement Co., Ltd. (4,000 t/d)

—Case for conversion of ESP with heavy dust-laden gas to bag filter



### Bag house technical data after conversion

Bag house Size	TDM-312/12	Quan. of compart.	12
Gas volume	720,000 m <sup>3</sup> /h (150 °C)	Bags/compartment	312
Gas inlet temp.	Norm.: 100-150 °C Upset: 240 °C	Bag size	Ø160x6,500
Inlet dust cont.	<=600 g/Nm <sup>3</sup>	Total filtering Area	3,895 m <sup>2</sup>
ΔP between inlet and outlet flange	1,600 Pa	Bag material	P84
Outlet dust emission	<10 mg/Nm <sup>3</sup>	Quan. of pulse valve	312, Goyen Ca76mm
Actual bag life	5 years	Kiln standstill	15 days

## Conversion of ESP to bag filter for cooler of Qianye Cement 5,000 t/d

—Model case of ETB for cooler of new-type dry production line



### Bag house technical data:

Bag house Size	TDM-204/12	Quan. of compart.	12
Gas volume	500,000 m <sup>3</sup> /h (150 °C)	Bags/compartment	204
Gas inlet temp.	Norm.: 120 °C Upset: 200 °C	Bag size	Ø160x7,000 mm
Inlet dust cont.	<= 50 g/Nm <sup>3</sup>	Total filtering Area	8,600 m <sup>2</sup>
ΔP between inlet and outlet flange	700 Pa (after 3 years' operation)	Bag material	Nomex
Outlet dust emission	< 10 mg/Nm <sup>3</sup>	Quan. of pulse valve	144, Goyen Ca76mm
Actual bag life	5.5 years	Kiln standstill	12 days
Method of cooling	Water spraying		

## Conversion of ESP to bag filter for Kiln of Hailaer Mengxi Cement 2000t/d Production Line

—Model case of ETB for kiln in extreme cold area



### ESP technical data:

ESP Size	28/12.5/3x10/.4 BS780 LURGI		
Gas volume	480,000 m <sup>3</sup> /h (120 °C)	Section area	142 m <sup>2</sup>
Gas inlet temp.	Normal: 120 °C; Upset: 300 °C	Gas component	For kiln and raw mill
Inlet dust cont.	<=80 g/Nm <sup>3</sup>	Outlet dust emission	<100 mg/Nm <sup>3</sup>

### Bag house technical data:

Bag house Size	TDM-180/12	Quan. of compart.	12
Gas volume	480,000 m <sup>3</sup> /h (150 °C)	Bags/compartment	180
Gas inlet temp.	Norm.: 100~150 °C Upset: 260 °C	Bag size	Ø160x7,500 mm
Inlet dust cont.	<= 80 g/Nm <sup>3</sup>	Total filtering Area	8138m <sup>2</sup>
ΔP between inlet and outlet flange	800 Pa (after 3 years' operation)	Bag material	glassfibre@PTFE membrane
Outlet dust emission	<10mg/Nm <sup>3</sup>	Quan. of pulse valve	120,Goyen Ca76mm
Actual bag life	5 years	Kiln standstill	12 days

## Conversion of ESP to bag filter for Kiln of Xiahe Anduo Cement 2500t/d Production Line

—Model case of ETB for kiln in high sea level area



### ESP technical data:

ESP Size	CDPK-E173/4		
Gas volume	480,000 m <sup>3</sup> /h (100~130 °C)	Section area	173 m <sup>2</sup>
Gas inlet temp.	Normal: 120 °C; Upset: 300 °C	Gas component	For kiln and raw mill
Inlet dust cont.	<=80 g/Nm <sup>3</sup>	Outlet dust emission	<50 mg/Nm <sup>3</sup>

### Bag house technical data:

Bag house Size	TDM-320/8	Quan. of compart.	8
Gas volume	570,000 m <sup>3</sup> /h(150 °C)	Bags/compartment	320
Gas inlet temp.	Norm.: 100~150 °C Upset: 260 °C	Bag size	Ø160x7,200 mm
Inlet dust cont.	<=80 g/Nm <sup>3</sup>	Total filtering Area	9,265 m <sup>2</sup>
ΔP between inlet and outlet flange	800 Pa (after 3 years' operation)	Bag material	glassfibre@PTFE membrane
Outlet dust emission	<10 mg/Nm <sup>3</sup>	Quan. of pulse valve	128, Goyen Ca76mm
Actual bag life	5 years	Kiln standstill	12 days

## Conversion of ESP to bag filter for kiln and cooler of Kazakhstan Standard Cement LLP. (2,500 t/d)

—Model oversea case of ETB retaining the original casing



### Cooler bag filter technical data:

ESP Size	25/10/3×9/0.4 BS780 LURGI	Gas volume	
Bag house Size	TDM-280/2x3	Quantity of compart.	6
Gas volume	320,000 m <sup>3</sup> /h (150 °C)	Bags/compartment	280
Gas inlet temp.	Norm.: 130~150 °C Upset: 200 °C	Bag size	Ø160x6,500 mm
Inlet dust cont.	<=30 g/Nm <sup>3</sup>	Total filtering Area	5,489 m <sup>2</sup>
ΔP between inlet and outlet flange	800 Pa	Bag material	Nomex
Outlet dust emission	<10 mg/Nm <sup>3</sup>	Quantity of Pulse valve	108, Goyen Ca76mm

### Kiln technical data:

ESP Size	33/12.5/3x10/0.4 BS930 LURGI	Gas volume	480,000 m <sup>3</sup> /h (max 300 °C)
Bag house Size	TDM-460/2x3	Quantity of compart.	6
Gas volume	480,000 m <sup>3</sup> /h (150 °C)	Bags/compartment	460
Gas inlet temp.	Norm.: 130~180 °C Upset: 250 °C	Bag size	Ø160x6,000 mm
Inlet dust cont.	<=30 g/Nm <sup>3</sup>	Total filtering Area	8,320 m <sup>2</sup>
ΔP between inlet and outlet flange	800 Pa	Bag material	glassfibre@PTFE membrane
Outlet dust emission	<10 mg/Nm <sup>3</sup>	Quantity of Pulse valve	120, Goyen Ca76mm

## Conversion of bag filter to bag filter for kiln of Liantian Yaobai Cement Co., Ltd. (2,500 t/d)

—Model case for conversion of walk-on structure to walk-in structure



Problem	Broken bag; over emission standard
Proposal	Replace hole plate, deducting system; Replace walk-on structure with walk-in structure; Lengthen bag reducing filtering velocity
Date put into operation	2011.3
Emission	< 9mg/Nm <sup>3</sup>
Actual bag life	5 years

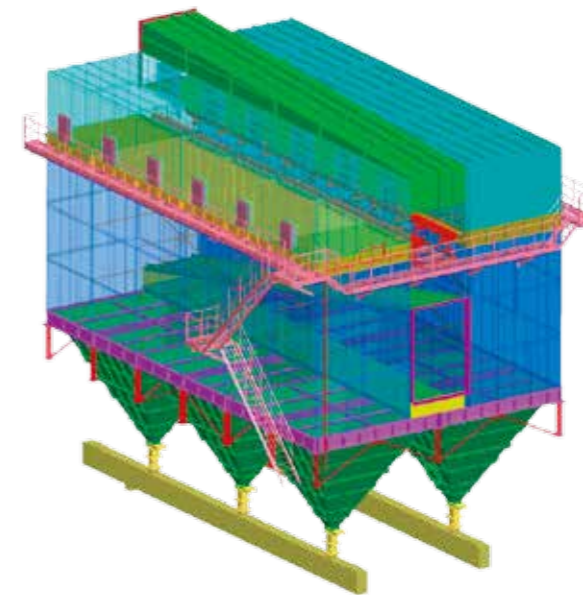
### Bag house technical data:

New Bag house Size	TDM-180/2x7	Quan. of compart.	14
Gas volume	480,000 m <sup>3</sup> /h(150 °C)	Bags/compartment	180
Gas inlet temp.	Norm.: 100~150 °C Upset: 260 °C	Bag size	Ø160x6,500 mm
Inlet dust cont.	< 80 g/Nm <sup>3</sup>	Total filtering Area	8,233 m <sup>2</sup>
ΔP between inlet and outlet flange	800 Pa (after 3 years' operation)	Bag material	glassfibre@PTFE membrane
Outlet dust emission	< 10 mg/Nm <sup>3</sup>	Quan. of pulse valve	168, Goyen Ca76mm
Actual bag life	5 years	Kiln standstill	10 days



## Conversion of bag filter to bag filter for kiln of Zanhuang Jinyu Cement Co., Ltd. (5,000 t/d)

—Model case for conversion of air-reverse bag filter to pulse jet bag filter



Conversion of ESP to Bag Filter

Problem	Broken bag; over emission standard
Proposal	Replace hole plate, deducting system; Replace air-reverse structure with pulse jet structure
Date put into operation	2015.1
Emission	< 7.8 mg/Nm <sup>3</sup>
Pressure loss	1300 Pa
Actual bag life	> 3 years without exchanging bags from 2015.1

### Bag house technical data

Original Bag house Size	FGM192-36		
New Bag house Size	TDM-380/2x4	Quan. of compart.	8
Gas volume	680,000 m <sup>3</sup> /h(150 °C)	Bags/compartment	380
Gas inlet temp.	Norm.: 100~150 °C Upset: 260 °C	Bag size	Ø160x7,500 mm
Inlet dust cont.	< 30 g/Nm <sup>3</sup>	Total filtering Area	11,461 m <sup>2</sup>
ΔP between inlet and outlet flange	800 Pa (after 3 years' operation)	Bag material	P84
Outlet dust emission	< 10 mg/Nm <sup>3</sup>	Quan. of pulse valve	160, Goyen Ca76mm
Actual bag life	> 3 years	Kiln standstill	10 days

