

FİLTEK - AYMAŞ



**INDUSTRIAL FILTERS DUST
COLLECTING SYSTEMS**

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Establishment History Of Filtek Ltd. Şti.

Our founders started their business life in the dedusting department of ÇİM-HOL Company, which established and operated a state-owned cement factories in Turkey until privatization, and worked in the establishment and commissioning of 6 complete cement factories during their time in this company. In 1984, during the privatisation of state-owned cement factories, 3 cement factories were transferred to the Italian company and continued in the same task with European information and technology. Our founders left the company in order to use their knowledge in this company and their past experiences more comprehensively, and in 2002 he left the company with their friends, each of whom he worked with and who were experts in their own field, and founded the FILTEK Company. During this period, FILTEK has been a comprehensive solution partner and cooperation with FLS Denmark in domestic and international projects.

Joined forces with Aymaş A.Ş. in 2021 which was established in 1978 with the aim of providing services in other sectors and abroad is the engineering and contractor of industrial facilities.



Establishment History Of Aymaş A.Ş.

AYMAŞ MACHINERY AND TRADING CORP.

AYMAŞ was founded in Ankara in 1978 and is situated 24 kms to the city centre on the Ankara - Çubuk state Highway. Aymaş facilities are located on 20.000 sq. Metres and operate with high - technology and up - to - date wquipment. AYMAŞ manufactures equipment and machinery as well as steel constructions needed by various industrial facilities. So far AYMAŞ has manufactured ab endless number of products combining different metals and giving it different functions. AYMAŞ's particularity as well as its productivity, effiviency and speed in manufacturing the backbone equipments of industrial facilities make it one of the leading companies in its area. AYMAŞ specializes manufacturing augers, feeders, sifters, mobile and cranes and elevation equipments, technological steel and mechanics manufacturing, as well as equipments used in mining, cement and iron and steel plants like seperators, crushers, grinders and coolers. In addition to these AYMAŞ manufactures everpasses, bridges, top covers and wide span steel constructions roofs and sheds. Motivated by an understanding that manufacturing in these areas do not tolerate errors, AYMAŞ has come a long way in its sector and continues to excel i its reputation.



REFERENCE LIST FOR AYMAŞ MACHINERY A.Ş.

2007	AYTAŞ ALÇI	Gypsum factory, project design, manufacturing, installation and commissioning
2008	MEGATÜRK İNŞAAT	Kentpark Shopping Centre Architectural Steel Structures
2008	EREĞLİ DEMİR VE ÇELİK FABRİKASI A.Ş.	15 ^M /Ton Capacity Hydraulic Slab Transportation Equipment
2008	İSKENDERUN DEMİR VE ÇELİK FABRİKASI A.Ş.	Blast Furnace Discharge Line Sound Absorber Complex Manufacturing
2010	PARK TEKNİK A.Ş.	Afşin-Elbistan Thermal Power Plant, Çöllolar Management, Coal Band Distribution Centre Manufacturing and Installation
2011	ERDEMİR MADENCİLİK A.Ş.	Ekinbaşı Underground Management, Iron Ore Transportation Conveyor (Project, Manufacturing, Installation, Electrical Automation and Commissioning)
2011	EREĞLİ DEMİR VE ÇELİK FABRİKASI A.Ş.	Coking Plant, Battery Gates and Safes Cleaning System Manufacturing and Installation
2011	YAYLA YATIRIM GIDA LTD. ŞTİ.	Iraq Sinjar Cement 4400mm Rotary Kiln and Equipment
2011	MEGATÜRK İNŞAAT	Kentpark Shopping Centre Architectural Steel Structures Manufacturing and Installation
2012	ANAGOLD MADENCİLİK A.Ş.	Erzincan / İliç - Gold Mine Site, Trippered Conveyor and Equipment (Project, Manufacturing, Installation, Electrical Automation and Commissioning)
2012	PARK TERMİK A.Ş.	Çayırhan Thermal Power Plant Underground Mine G Site Cap Manufacturing
2012	YAYLA YATIRIM GIDA LTD. ŞTİ.	Iraq Sinjar Cement Factory - Klinker Cooler, Electro-Filter Manufacturing
2013	EREĞLİ DEMİR VE ÇELİK FABRİKASI A.Ş.	Rotary Stacker / Reclaimer Manufacturing
2013	FEECO INTERNATIONAL - AMERİKA	Anagold Gold Mine, Rotary Dryer Manufacturing
2013	ADULARYA ENERJİ A.Ş.	Eskisehir, Koyunagili Thermal Power Plant, Coal Preparation, cleaning and enrichment plant equipment (project, manufacturing, montage)



2013	YAYLA YATIRIM GIDA LTD. ŞTİ.	Iraq Sinjar Cement Plant, Manufactures
2014	ERDEMİR MADENCİLİK A.Ş.	Pelleting Plant, Main Product Conveyor System (Project, Manufacturing and Installation)
2014	KARABÜK DEMİR VE ÇELİK SAN. VE TİC. A.Ş.	Stacker / Reclaimer Scraber Complex Manufacturing
2014	KARABÜK DEMİR VE ÇELİK SAN. VE TİC. A.Ş.	Injection Coal Storaget and Charge System Plant Set-up (Steel Construction Building, Conveyor, Tripper Car, Overhead Crane, Crane Grab, Project Design, Manufacturing, Installation and Commissioning)
2014	KARABÜK DEMİR VE ÇELİK SAN. VE TİC. A.Ş.	185 Crane Bridge and Architrave Manufacturing for Steel Mill
2014	PARK TERMİK A.Ş.	Çayırhan Thermal Power Plant Underground Mine B Site Side Cap Manufacturing
2015	VENTI OELDE - GERMANY	Fan manufacturing in various high capacities
2016	AYTAŞ ALÇI	Micronised Calcite Production Line Set-up (Project, Manufaturing, Installation and Commissioning)
2016	KARABÜK DEMİR VE ÇELİK SAN. VE TİC. A.Ş.	Topedo Desulphurisation Plant Manufacturing and Installation
2016	KARABÜK DEMİR VE ÇELİK SAN. VE TİC. A.Ş.	Circular Coal Storage System, Project, Manufacturing, Installation and Commissioning



REFERENCE LIST FOR FILTEK LTD. ŞTİ.

Client	Project Description	Project Start Date	FLS joint solution	FİLTEK solution
Adana Çimento Sanayii T.A.Ş.	8.000 -50.000 m ³ /h capacity 24 unit filtered dedusting system solution	05.07.2010		×
Adoçim Çimento ve Beton A.Ş.	8.000 -30.000 m ³ /h capacity 9 unit filtered dedusting system solution	15.12.2010		×
Akçansa Büyük Çekmece Çimento Fabrikası A.Ş.	8.000 -80.000 m ³ /h capacity 12 unit filtered dedusting system solution	01.12.2013		×
Anagold Madencilik A.Ş.	10.000 -30.000 m ³ /h capacity 6 unit filtered dedusting system solution	01.05.2013		×
Başer Grup	15.000 -50.000 m ³ /h capacity 8 unit filtered dedusting system solution	22.06.2021		×
Baştaş Başkent Çimento San. Tic. A.Ş.	Klinker Stockhall dedusting system solution	1.06.2019		×
Bolu Çimento Sanayii A.Ş.	Kdz. Ereğli Grinding Packaging Facility Mill Filter	28.05.2010		×
Bursa Çimento San. Tic. A.Ş.	12.000 -80.000 m ³ /h capacity 6 unit filtered dedusting system solution	1.01.2020		×
Çimentaş Çimento San. Ve Tic. A.Ş.	İzmir Cement Factory Coal feeding system bag filter	01.03.2012		×
Çimko Çimento Adıyaman A.Ş.	10.000 -60.000 m ³ /h capacity 8 unit filtered dedusting system solution	01.05.2014		×
Çimsa Çimento San. Ve Tic. A.Ş.	10.000 -80.000 m ³ /h capacity 24 unit filtered dedusting system solution	01.11.2010		×
Ereğli Demir ve Çelik A.Ş.	New coke crushing plant dust collecting system (Capacity: 70.000m ³ /h)	1.06.2021		×



Eti Bakır İşletme- leri A.Ş.	150.000 m ³ /h capacity 1 unit filtered dedusting system solution	01.07.2015		×
FLSmidth Airtech	Tarascon project dedusting system solution	01.02.2018	×	
FLSmidth Airtech	Zenica and Tungstead project dedust- ing system solution	01.08.2018	×	
FLSmidth Airtech	Various filter manufacturing for Europe	9.10.2020	×	
Göлтаş Isparta Çimento A.Ş.	Packeging Facility bag Filter Manufac- turing and Installation	15.12.2016		×
GR Engineer- ing - Hellas Gold Mining	10.000 -40.000 m ³ /h capacity 4 unit filtered dedusting system solution	01.02.2016		×
Hayat Kimya Cezayir Deterjan Fabrikası	6 Units various bag filter manufactur- ing	01.08.2016		×
Hayat Kimya Cezayir Deterjan Fabrikası	İran detergent factory dedusting filters manufacturing	01.07.2017		×
Heidelberg Çimento Ka- zakistan	Bukhtarma factory transfer towers de- dusting system solution	9.10.2021		×



İskenderun Demir ve Çelik A.Ş.	Sinter Factory Dedusting works turn-key delivery	20.12.2010		×
İskenderun Demir ve Çelik A.Ş.	Conveyor Emptying Points Dedusting	01.02.2014		×
İskenderun Demir ve Çelik A.Ş.	429 cruching Unit complete Dedusting	25.12.2014		×
İskenderun Demir ve Çelik A.Ş.	Coal Crushing Building complete Dedusting	05.01.2015		×
Kazan Soda Elektrik A.Ş.	10.000 -30.000 m ³ /h capacity 6 unit filtered dedusting system solution	01.01.2018		×
Limak Çimento Ergani	Ergani Cement Factory ESP conversion turn-key	01.02.2011	×	
Meb-Co Ltd. / Kazakistan	Shymkent Cement Factory dedusting system solution	01.02.2018		×
Mor Endüstri LTD. ŞTİ.	Georgia 35.000 -55.000 m ³ /h capacity 4 unit filtered dedusting system solution	21.06.2011		×
Nuh Çimento A.Ş.	Klinker Stockhall dedusting project design	1.05.2019		×
Oyak Aslan Çimento A.Ş.	Roller Press Process Filter Manufacturing- Unit 250.000 m ³ /h	01.06.2016		×
Öztüre Madencilik A.Ş.	30.000 -60.000 m ³ /h capacity 6 unit filtered dedusting system solution	7.05.2021		×
Partner Teknik Genel Müt. İnş. San. Ve Tic. Ltd. Şti.	15.000 -45.000 m ³ /h capacity 6 unit filtered dedusting system solution	03.05.2010		×
Polimeks İnşaat Taah. Ve San. Tic. A.Ş.	Türkmenistan Cement factories 50 unit bag filter manufacturing	16.03.2010		×
Procter Gamble A.Ş. Gebze Deterjan Fabrikası	1 unit 30.000 m ³ /h stainless bag filter manufacturing	1.02.2020		×
Süperateş Tuğla Fabrikası	15.000 -40.000 m ³ /h capacity 8 unit filtered dedusting system solution	07.02.2012		×
Şişecam A.Ş.	7,500 -35.000 m ³ /h capacity 6 unit filtered dedusting system solution	01.12.2014		×
Votorantim Nevşehir Çimento Fabrikası A.Ş.	7,500 -35.000 m ³ /h capacity 8 unit filtered dedusting system solution	01.11.2016		×

REFERENCE LIST FOR SYSTEM FILTERS FLS



No	Client	Description of works	Details	Year
1	SCHEUCH	Oyak Çimento - Cement mill filter	500.000m ³ /h - 8960m ² BF EPC works	2010
2	FLSmidth	Conversion works from ESP to bag house filter	Rotary kiln no:1 ESP conversiton (690.000m ³ /h) Rotary kiln no:2 ESP conversiton (695.000m ³ /h) Rotary kiln no:3 ESP conversiton (968.000m ³ /h) Trass dryer mill ESP conversion works (445.000m ³ /h) Cement mill 1/2/3 ESP conversion works	2008-2011
3	FLSmidth	Conversion works from ESP to Hybrid filter	Rotary kiln ESP conversion works to HYBRID filter 996.000m ³ /h	2013
4	Göltaş Çimento fabrikası	Conversion works from ESP to bag house filter	Rotary kiln no:1 ESP conversiton (709.000m ³ /h) Rotary kiln no:2 ESP conversiton (600.000m ³ /h) Rotary kiln no:3 ESP conversito (750.000m ³ /h)	2013-2014
5	Göltaş Çimento fabrikası	Drying mill filter	400.000m ³ /h - 6050m ² BF EPC works	2015
6	Erdemir A.Ş.	ESP upgrading works	Sinter plant ESP's (2 unit) has been upgraded by us. All design engineering works were done by FLSmidth and Fil-Tek manufactured, pre-installed and installed all parts at site with FLSmidth supervisor.	2013-2014
7	Üst Yapı A.Ş. - Sintek	Kavak Cement plant - system filters and bag house filters for grinding unit	50.000m ³ /h - 720m ² 70.000m ³ /h - 1175m ² 95.000m ³ /h - 1645m ² 120.000m ³ /h - 2084m ² 242.000m ³ /h - 4168m ² 360.000m ³ /h - 6315m ² BF's design, manufacturing works	2015-2016
8	Oyak Çimento	Aslan Cement factory - system filter of new roller press unit	480.000m ³ /h BF for roller pres seperator unit	2016
9	Şişecam Lukovac	De-dusting filter for warehouse	400.000m ³ /h - 5974m ² BF design and manufacturing works	2017
10	Sarralle Group	Befesa İskenderun - Waelz oxide plant off gass system EPC contractor	According to off gas system which capacity is 187.000m ³ /h Conditioning tower, Production filter, Recirculation filter, Reactor unit, ID fan, All duct works, Active carbon silo, Dust conveying systems has been done by us as EPC contractor.	2018-2019

11	Adolerya Enerji	Biomass plant filter system	According to off gas system which capacity is 176000m ³ /h Axial cyclone, Bag house filter, Mixer unit, ID fan All duct works and chinmey, CEMS system, Ash silo and pneumatic transport line works, will be done as EPC contractor.	2020
12	ERDEMİR A.Ş.	Steel plant secondary de-dusting filter	EPC contractor for 1.610.000.0m ³ /h filter, cyclone, fans, canopy hoods etc.	On-going
13	FLSmidth	Clinker cooler ESP upgrading works at Kipaş Cement plant	Rotary mill no:1 cooler ESP has been upgraded by us. All design engineering works were done by FLSmidth and Fil-Tek manufactured all local parts and site works will be finalize in April.	2021
14	Oyak Çimento	Adana Cement fabric filter for 4th rotary mill cooler	EPC contractor for 750.000m ³ /h new heat exchanger + fabric filter	2021

LATEST REFERENCES FOR ESP TO FF

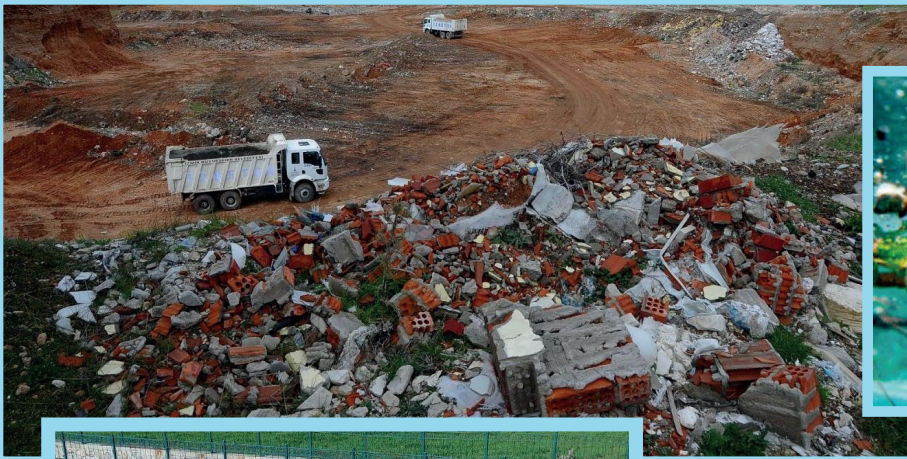
No	Client	Description of works	Details	No. Of filter which were converted	Filter Types	Achieved emission level	Year
1	Oyak / Aslan Cement Plant	Conversion works from ESP to bag house filter	Rotary kiln no:1 ESP conversion (595.000m ³ /h) Rotary kiln no:2 ESP conversion (730.000m ³ /h)	2	On-line maintenance FF	<10mg/m ³	2007-2008
2	Nuh Cement Plant	Conversion works from ESP to bag house filter	Rotary kiln no:1 ESP conversion (690.000m ³ /h) Rotary kiln no:2 ESP conversion (695.000m ³ /h) Rotary kiln no:3 ESP conversion (968.000m ³ /h) Trass dryer mill ESP conversion works (445.000m ³ /h) Cement mill 1/2/3 ESP conversion works	7	On-line maintenance FF	<10mg/m ³	2008-2011
3	Limak / Diyarbakır Cement	Conversion works from ESP to bag house filter	Rotary kiln no:1 ESP conversion (495.000m ³ /h)	1	On-line maintenance FF	<10mg/m ³	2011

4	Erdemir / Ereğli Iron&-seteel	Upgrading works of Sinter ESP's	2*1.110.000m ³ /h capacity ESP were upgraded by changing all internals	2	ESP	<10mg/m ³	2012-2013
5	Cementir / İzmir Cement Plant	Conversion works from ESP to bag house filter	Rotary kiln no:1 ESP conversion (830.000m ³ /h) Rotary kiln no:2 ESP conversion (640.000m ³ /h)	2	On-line maintenance FF	<10mg/m ³	2011-2013
6	Titan / Adoçim	Conversion works from ESP to Hybrid filter	Rotary kiln ESP conversion works to HYBRID filter 996.000m ³ /h	1	Hybrid Filter	<10mg/m ³	2013
7	Göлтаş Cement Plant	Conversion works from ESP to bag house filter	Rotary kiln no:1 ESP conversion (709.000m ³ /h) Rotary kiln no:2 ESP conversion (600.000m ³ /h) Rotary kiln no:3 ESP conversion (750.000m ³ /h)	3	Semi-off line maintenance / On-line maintenance FF	<5mg/m ³	2013-2015
8	Isken / Power plant	Upgrading works of Sinter ESP's	2*869.000m ³ /h capacity ESP were upgraded by changing all internals	2	ESP	<10mg/m ³	2018-2019
9	Kipaş / Kahramanmaraş Plant	Clinker cooler ESP upgrading works at Kipaş Cement plant	Rotary mill no:1 cooler ESP has been upgraded by us. All design engineering works were done by FLS-midth and Fil-Tek manufactured all local parts and site works will be finalize in April 2021	1	ESP	<10mg/m ³	2021

DUST AND ENVIRONMENT

With the increase in the world population, the needs of the people increase and industrialisation accelerates.

First of all, dust from cement, iron and steel and mining facilities affects the environment and causes irreversible damage to human health, agricultural lands and existing plant formation. For example, in a cement factory with a single kiln capacity of 3500 tons per day, releases 66 tons of cement dust into the environment per minute.



What is dust:

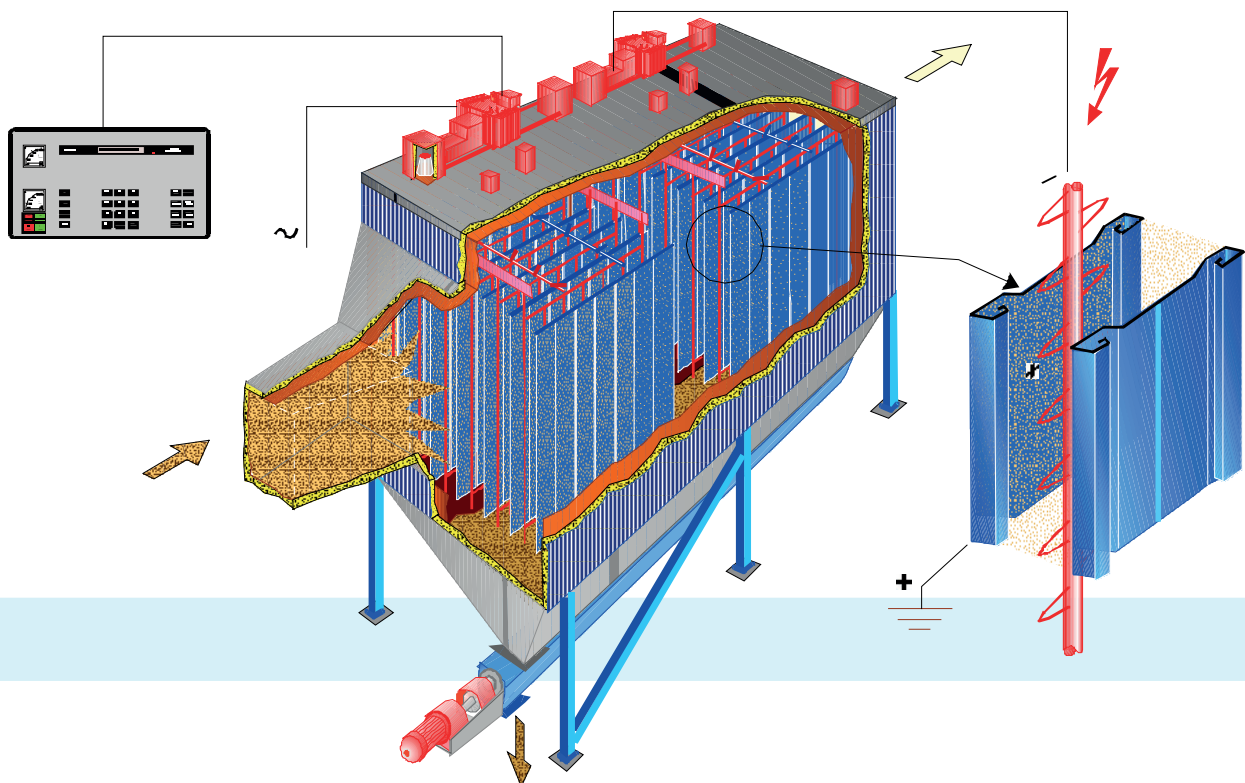
They are micron-sized particles that come out during the production process and cannot be held by gravity. Particles larger than this remain in the system with the effect of gravity and do not spread to the environment. But small particles are emitted into the atmosphere. Just like the dust rising from the ground when the wind blows. In order not to spread the dust around, it should be controlled where it comes out. In places and systems where water problems and sludge are not important, water is controlled by spraying or covering it. However, in systems and processes that have water problems or are sensitive to sludge, dust is retained by filters. In general, there are 2 types of filters in the industry.

1) Electrical Filter:

As the name suggests, it works with the principle of loading the (+) and (-) ends of the electricity to the dust and body. By giving a tip to the steel electrodes in the filter body, the dust adheres to the electrodes. Then these electrodes are shaken and the dust is poured from the electrodes.

With this type of filter, only the materials that can be eliminated can be retained. Materials such as food, wood shavings or chips and large-sized items cannot be held.

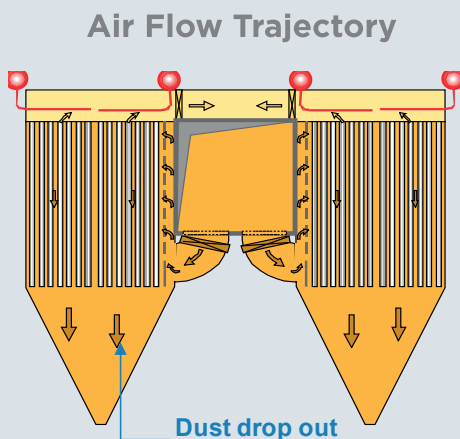
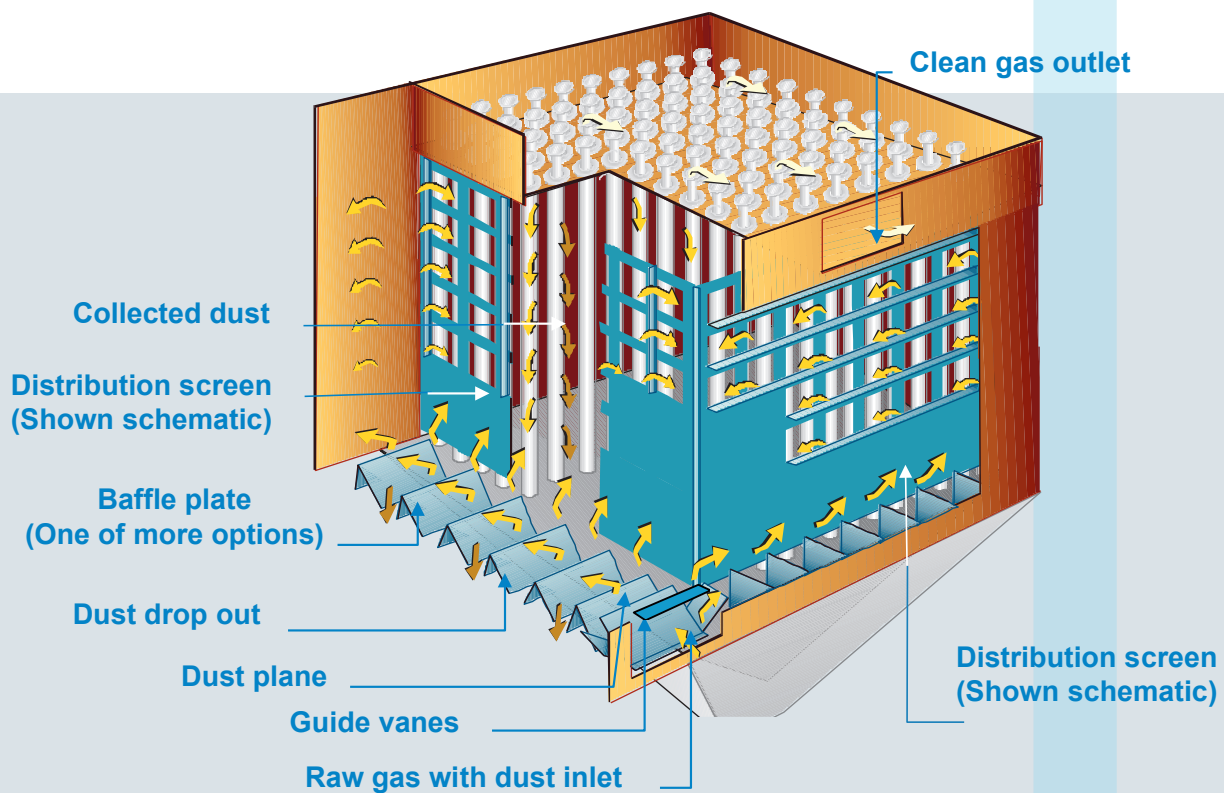
System Visuals;



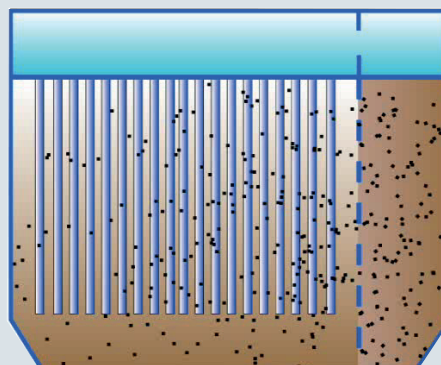
1) Bag Filter;

The working system of this Filter is like a vacuum cleaner used at home. By vacuuming the dust source, the dust/air mixture is kept out of the bag by passing it through specially made filters. When the surface of the filter bag retains a certain amount of dust, high-pressure blast air is injected into the clean area of the bags and the dust is poured into the bunker. The dedusted clean air is vented to the atmosphere. These systems hold materials of all shapes and sizes.

SYSTEM VISUALS;



Particle flow towards the bunker





Bag Filter Cage Installation Form ;



Different styles of surface protection are available. (Epoxi, galvanising)



Divided cages



Cage for Glass Bag



Cage for Needle Felt Bag

Cages up to 8 m bag design

Venturis



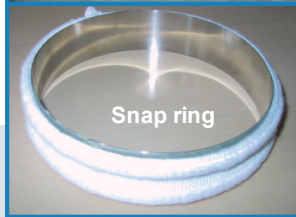
Cages with venturis

A feature of each cage is a venturi, a spun section, located at the top of the cage, designed to enhance the pulse cleaning of the filter bag.

Filter Bag Installation Form and Bag Types

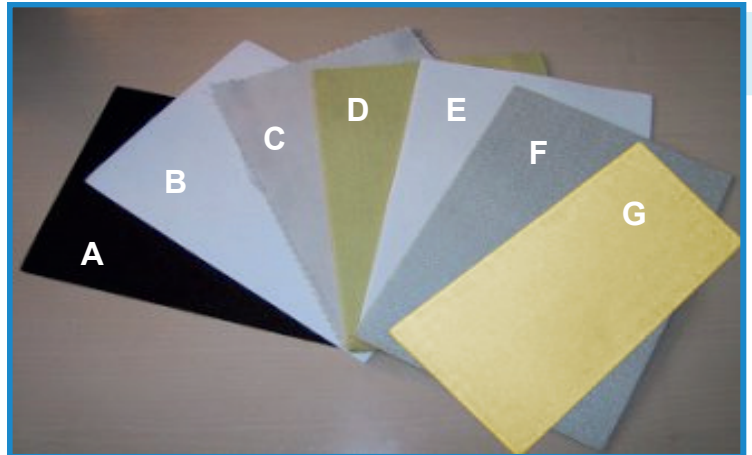


Installation



Snap ring

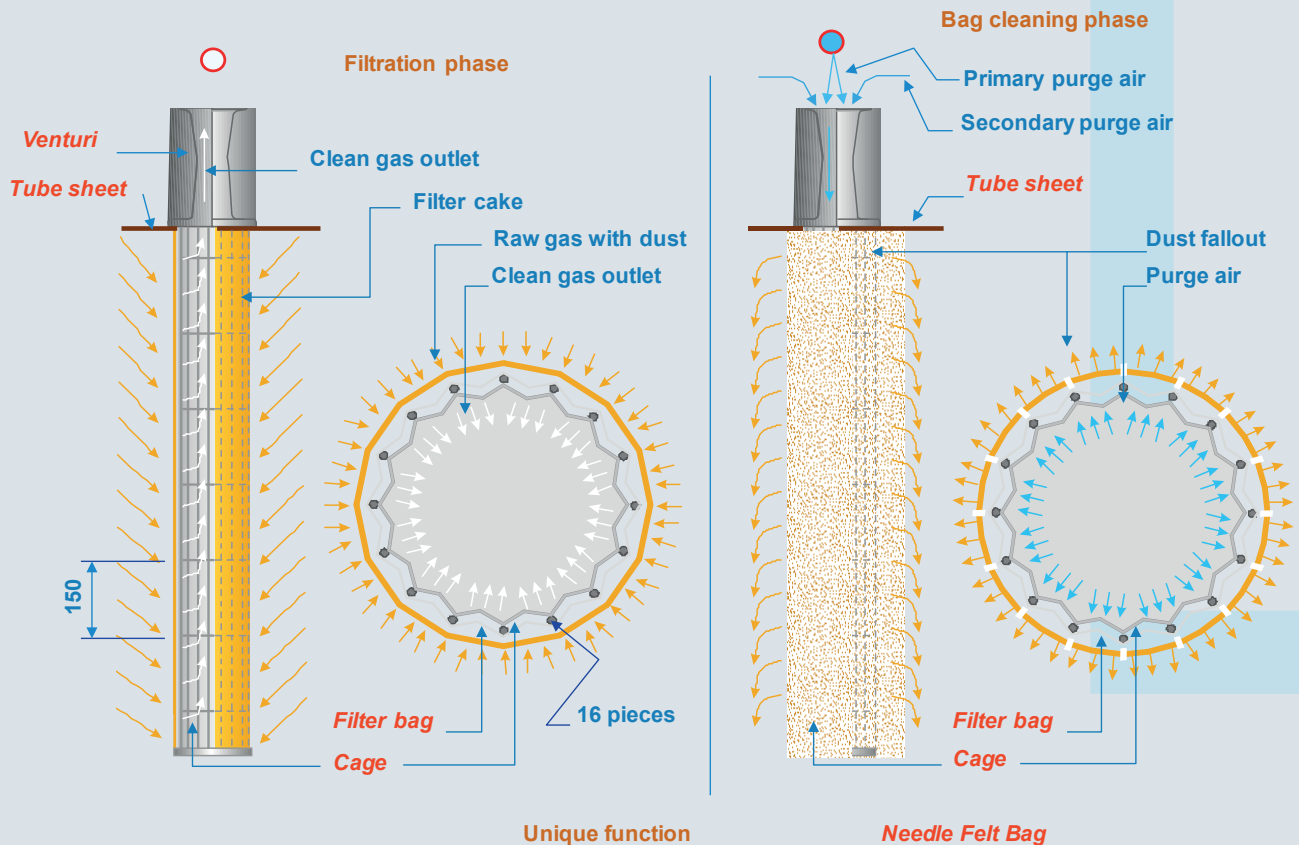
Correct bag/cage fit is
Essential for long bag life



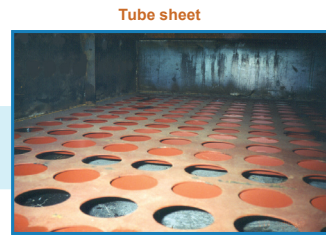
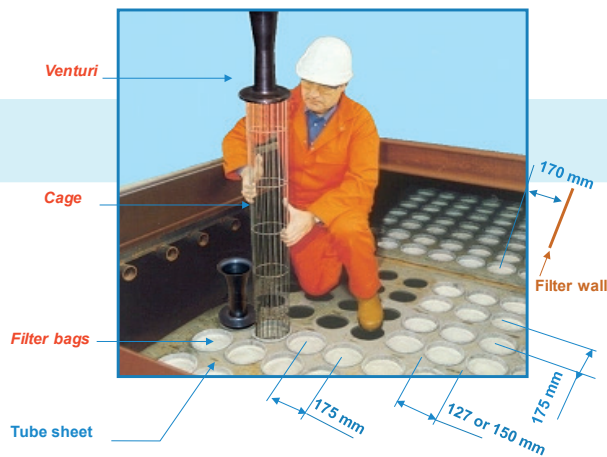
Bags pre-erected with cages
Up to 8 m bag design

Typical bag material	Temperature limits ° C
A: PTFE needle felt	260
B: PPS needle felt	190
C: Woven glass with e-PTFE membrane	260
D: Polyimide needle felt	240
E: Polyester needle felt	150
F: m-Aramid needle felt	200
G: Pan	125

Schematic illustration of bag filter filter cleaning

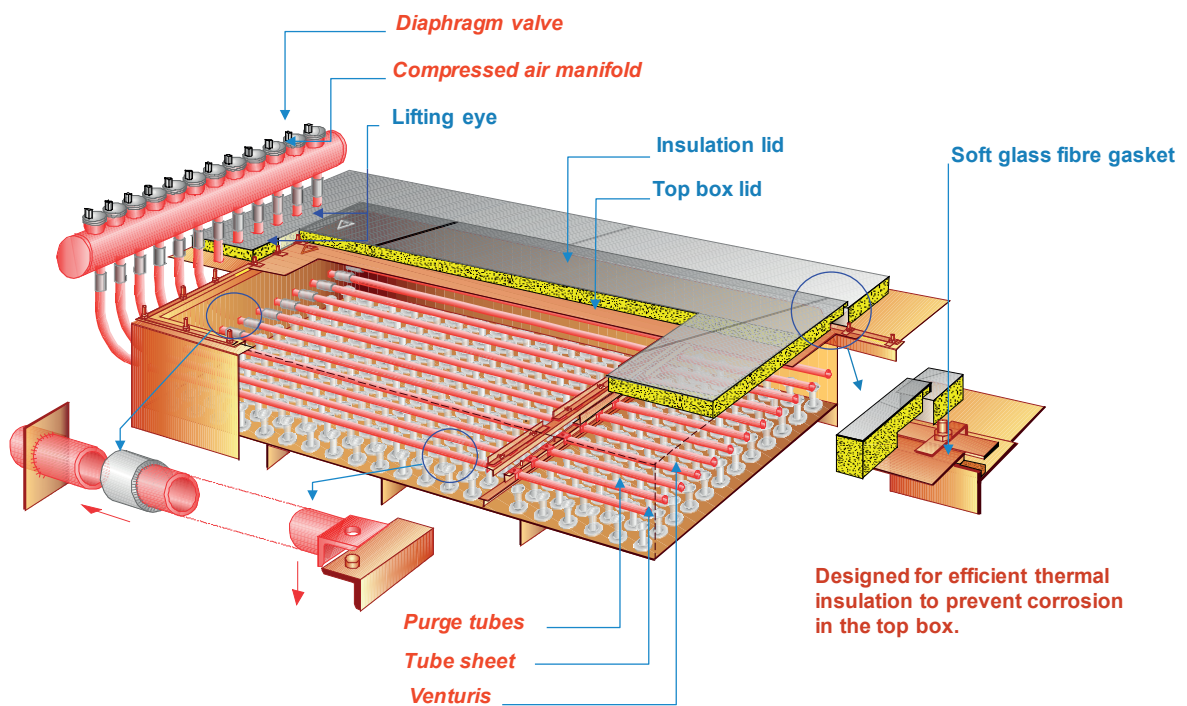


Upper Flange Wire Installation No:4

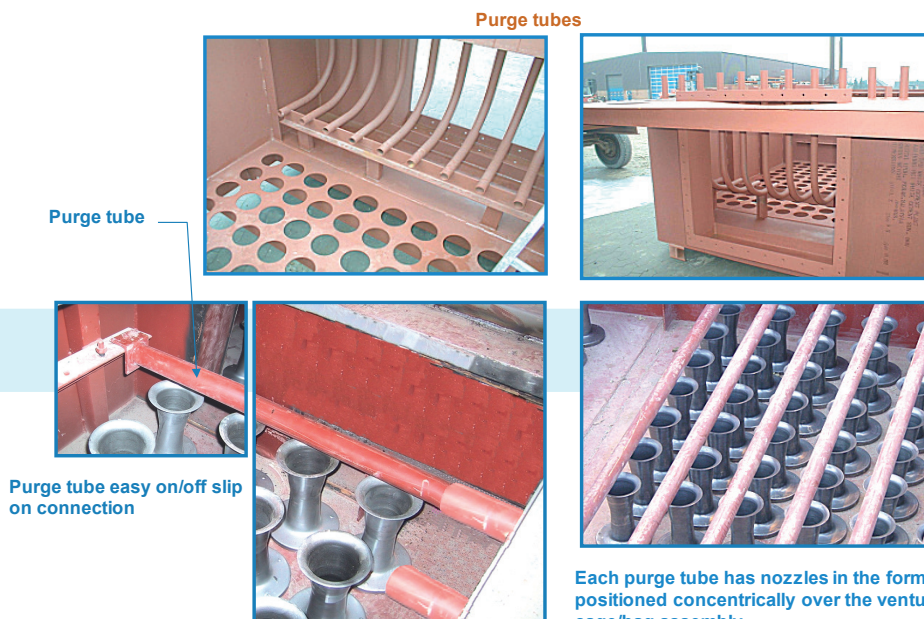


- Minimum 4 mm thickness
- Stiffened to reduce distortion
- Precision cut holes
- Mild or stainless steel

Upper Flange General View ;



General Control System

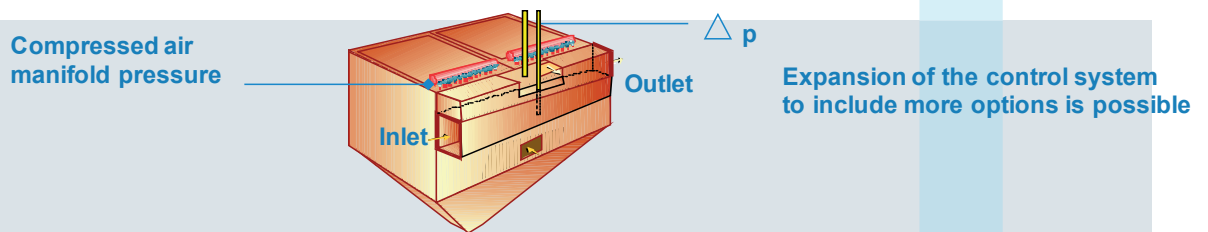


Filter control system

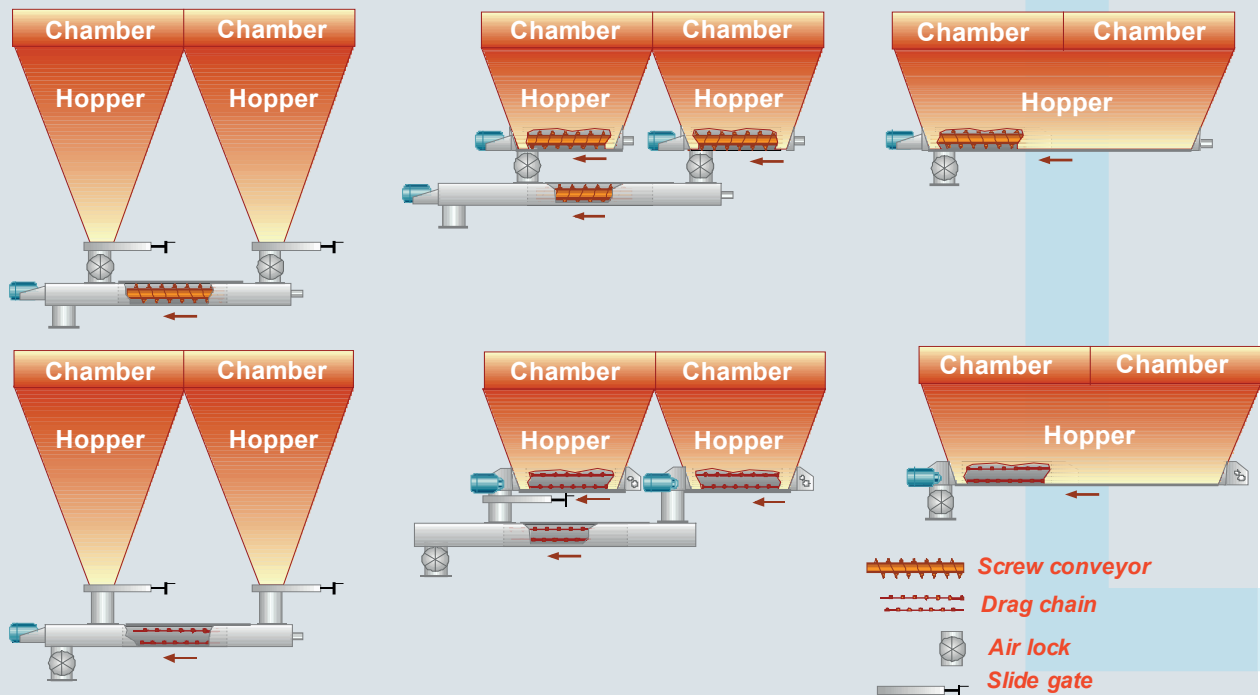
Measurement	Result
1) Filter Δp between inlet & outlet manifold	Optimized air consumption, filter wear of bags p and minimum
2) Compressed air manifold pressure	Check of correct valve operation and compressed air supply
Detection	Result
1) Dust content in clean gas and next row to be cleaned (optional)	Able to detect and locate bag failure
2) Damper position (open/closed)	Information regarding which compartments are in operation

Plant control system

Measurement/Detection	Result
1) Hopper level indicator	Warning/Alarm in case of high level
2) Hopper temperature (optional)	Avoid condensation in hopper by control of heating



Various Operation Combinations





Filter Selection Criteria

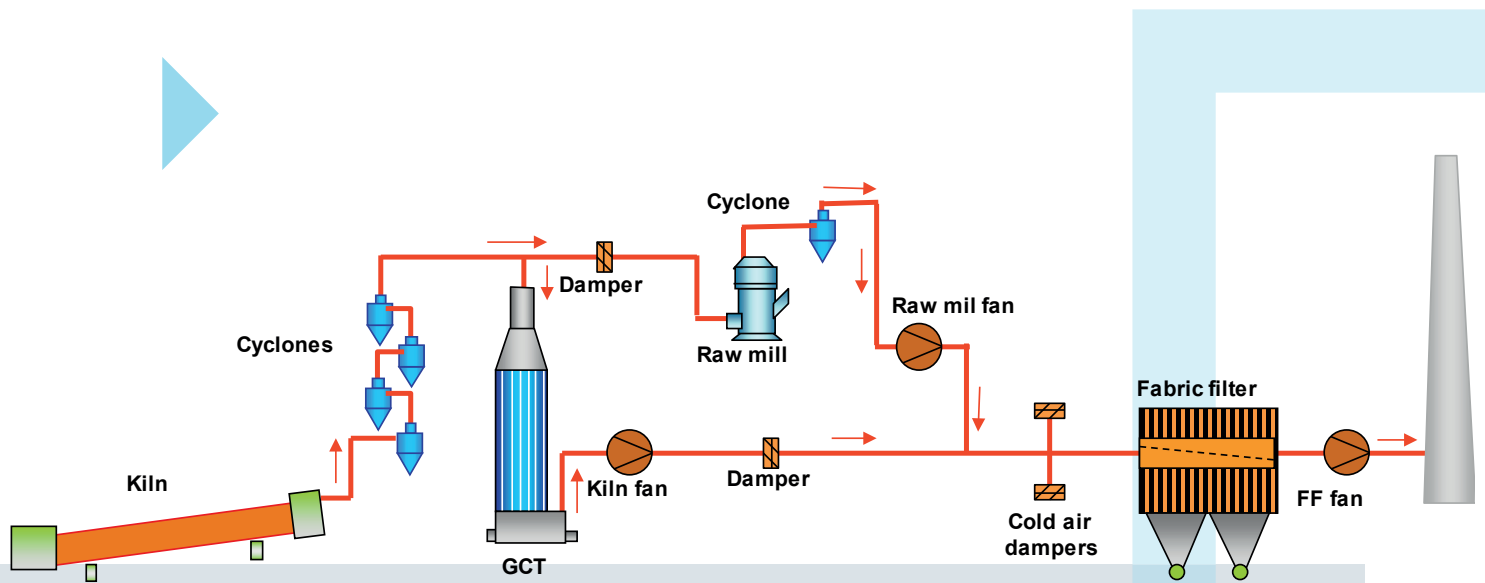
Very Bad	Bad	Good	Very Good

	Polyester	Acrylic	Fiberglass	Aramid (Nomex)	PPS	P84*	PTFE
Max. Continuous Operating Temperature oC	135	130	260	204	190	260	260
Abrasion							
Energy Absorbtion							
Filtration Properties							
Moist Heat							
Alkalines							
Mineral Acids							
Oxygen > 15%							
Relative Cost	15	30	40	55	70	85	100

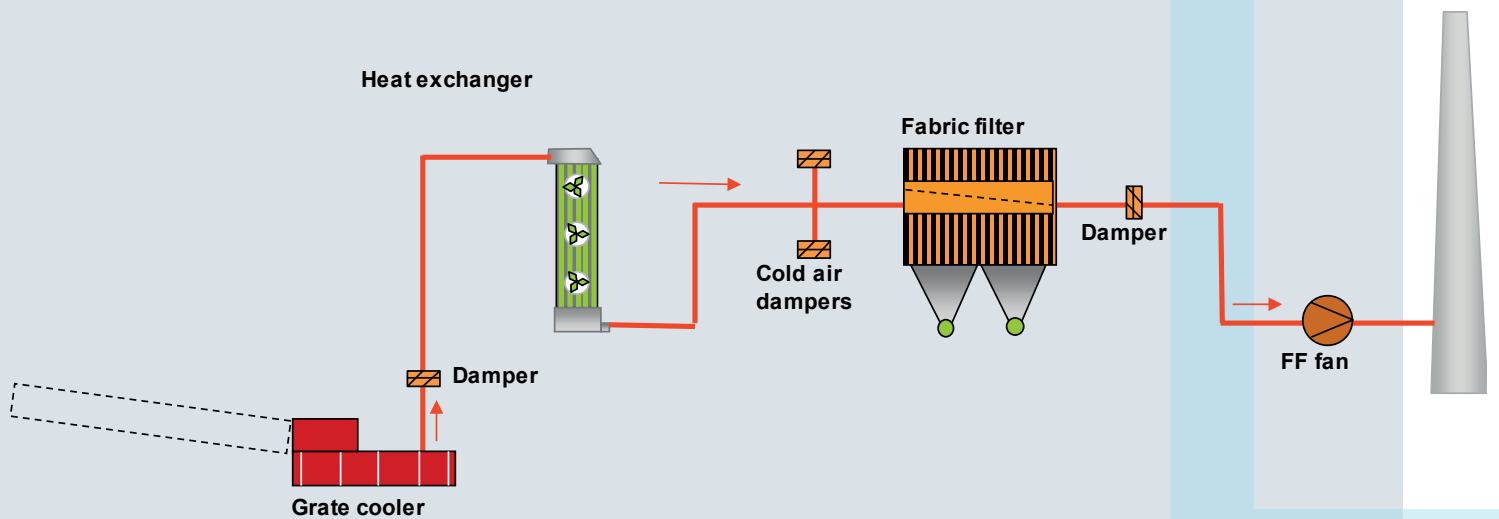
* For Cement process gas $T_{\max}=180\text{ }^{\circ}\text{C}$

He System Placements of Bag Filters

For Calcination System :



For Klinker cooling system ;





Parameter for Cement kiln 3000 tpn

Air amount	m ³ /min	2,900
Temperature	°C	150
Max temperature	°C	350/210
Dust amount	g/Nm ³	40

Parameter for Cement kiln 5000 tpn

Air amount	m ³ /min	2,900
Temperature	°C	150
Max temperature for filter bag	°C	240
Input dust	g/Nm ³	80
Dew point	°C	49/55



Adana Cement HEX and Bag Filter



ZORLU ENERJİ - BOILER FILTER



GÖLTAŞ CEMENT HEX AND BAG FILTER



ADANA CEMENT HEX AND BAG FILTER



JEBEL CEMENT TURKMENISTAN



NUH CEMENT ESP CONVERSION



AS ÇİM FARİN



FARINE RAW MEAL



AYTAŞ ALÇI A.Ş.



SIEVE



ROTARY KILN

FİLTEK - AYMAŞ

INDUSTRIAL FILTERS DUST
COLLECTING SYSTEMS

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