

Fox Venturi Eductors at Cement Plants:

Conveying with No Moving Parts

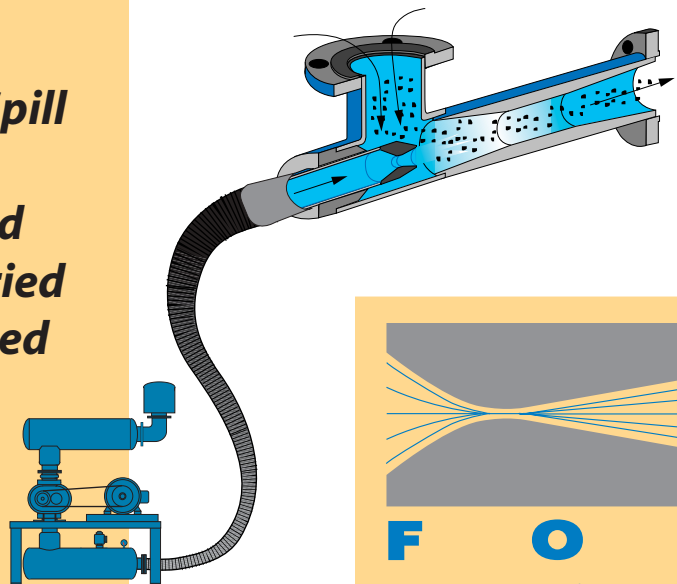
21 Years of Successful Installations

- **Injecting Alternative Fuels**
- **Handling Kiln Spill at 1500° F/800° C**
- **Conveying CKD, Flyash, Coke, Coal, Limestone**

Convey: Cement, CKD,
Limestone, Flyash, Kiln Spill

Alternative Fuel/ Waste:
Shredded Tires, Shredded
Carpet, Plastic Scrap; Dried
Sludge, Rice Hulls, Crushed
Seeds

Fuels:
Coke, Coal, Lignite



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F O X

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No Maintenance Conveying for the Cement Industry

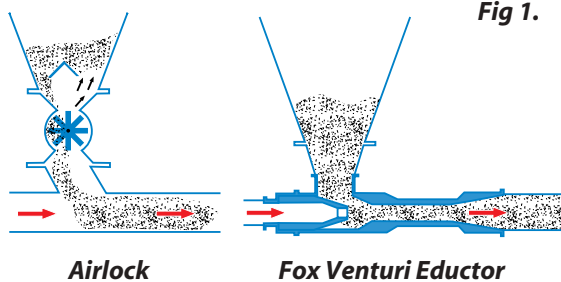
Fox Venturi Eductors are now widely used throughout the global cement industry to replace or eliminate airlocks, screw conveyors, and bucket elevators to provide highly reliable pneumatic conveying.

Dozens of Cement Plants throughout North America have a ten to twenty year track record of successful installations of Fox eductors. Fox has made over ten thousand eductor installations in all industries going back to 1963.

Where are they used?

This bulletin will split applications of Fox eductors at Cement Plants into four major categories:

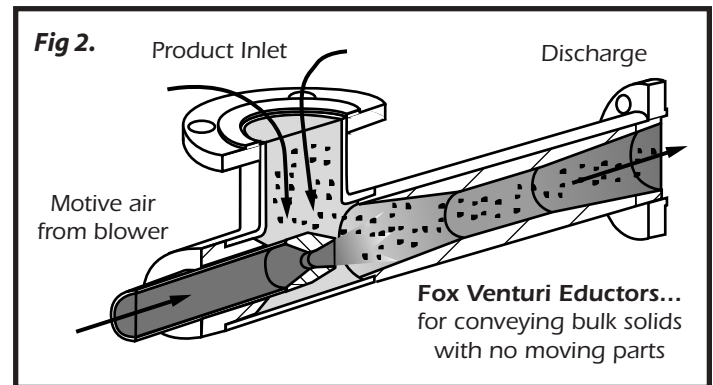
- 1) Handling CKD, Cement, Limestone, etc Beneath Dust Collectors
- 2) Injecting Waste and/or Alternative Fuels into Kilns
- 3) Kiln Spill
- 4) Additive Injection



With no moving parts, a Fox eductor, above right, is the obvious way to convey extremely abrasive, fine materials like cement, aggregate dust, CKD, and alternative fuels. Unlike the airlock, above left, they do not "blow-back" or create leakage that eventually becomes a fugitive dust problem. With no seals or bearings to wear or fail, Fox eductors can operate essentially maintenance-free for years even with extremely fine, extremely abrasive powders.

Venturi Eductors - What are they?

Fox Venturi Eductors convert the output of a blower into first a 'vacuum' that can entrain cement or dust without blowback or fugitive dust emissions. The venturi within the eductor then reconverts velocity back into adequate pressure to overcome pressure losses in the downstream piping and successfully convey product with no moving parts.



Why are eductors used in pneumatic conveying systems?

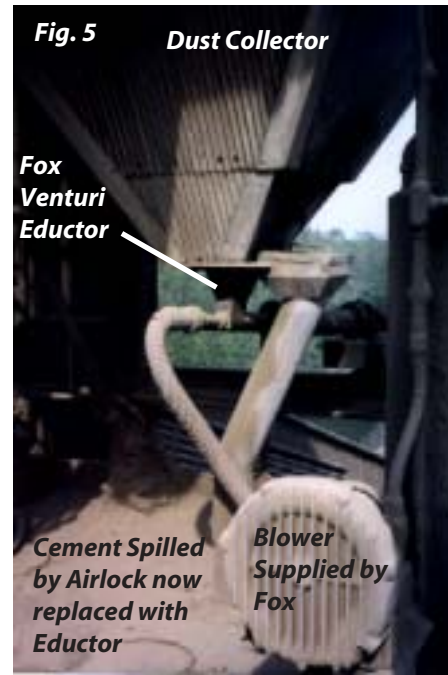
- **Fox Venturi Eductors have No Moving Parts** - allowing for maintenance-free feeding of solids. In applications involving fine, hot, or abrasive products — like cement — this is an enormous advantage. Replacement of existing rotary airlocks, screw conveyors, or bucket elevators with venturi eductors makes for simpler, more reliable conveying systems.
- **No Blowback** - All rotary airlocks have blowback. If the product conveyed is fine or abrasive, blowback can cause extreme wear problems. When installed beneath baghouses, screw conveyors, or dust collectors, airlocks can be a major source of fugitive dust emissions, which are eliminated after a retrofit to Fox eductors.
- **High Temperatures** - Fox eductors convey materials at up to 1600° F using simple, 316 ss construction. Higher temperatures can easily be handled, if necessary, using high nickel-content alloys.

Conveying Dust with No Moving Parts with Fox Venturi Eductors

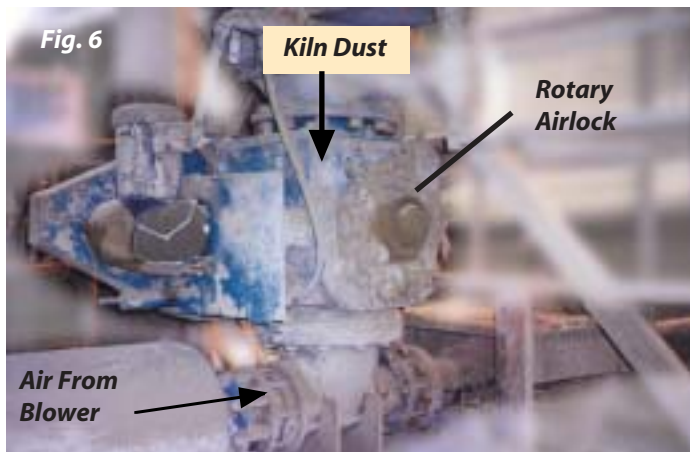
- Hot CKD
- Cement
- Limestone

Fox Eductors have been used to eliminate screws conveyors and airlocks...

...conveying dust at cement plants for well over twenty years. They can be located directly under dust collectors, and eliminate the leakage, fugitive dust, and general mess associated with airlocks and screws. Best of all, with no moving parts, they can run for years with no maintenance. Tramp metal, such as bolts and nuts, do not damage eductors. Common 1960's-style installations have one screw conveyor connecting two collector modules, which then feed an airlock, which drops into a convey line. In these cases, BOTH the screw conveyor and airlock are replaced by two eductors.

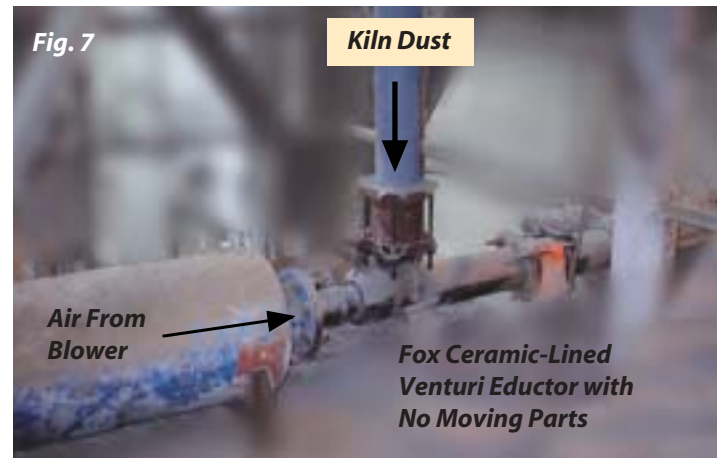


BEFORE Retrofit:

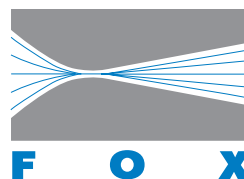


When your plant was built or your dust collectors installed, rotary airlocks were installed because "that's what we always did." Unfortunately, they must just not be adequate in today's environment when fugitive dust emissions and high maintenance costs cannot be tolerated.

AFTER Retrofit with Fox Eductor



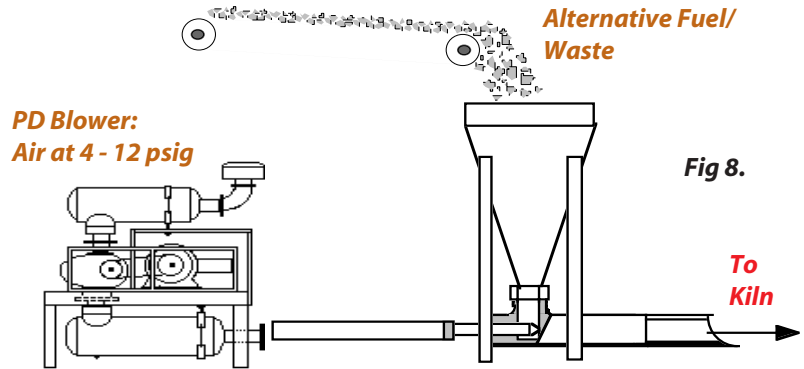
Conveying with Eductors:
No moving parts. no fugitive dust, no maintenance.



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Injecting Alternative Fuels and Solid Waste into Kilns with No Moving Parts with Fox Venturi Eductors

**Shredded Tires
Shredded Carpet
Dried Sludge
Oily Rags/Cardboard
Soybean or Rice Hulls
Crushed Cotton Seeds**



Please request our complete Cement Bulletin for detailed technical discussions.

Conveying Kiln Spill ... with Fox Venturi Eductors

Fox Eductors Are Being Installed Beneath Kilns to Catch and Convey Hot Kiln Spills Before They Hit The Ground

Material can be up to 1500° F/800° C Convey Distances up to 200 ft/70 m

With no moving parts, Fox eductors can be applied to applications that just seemed to have no solutions with the "normal" equipment used in cement plants. Fox eductors, made in 316 ss, can happily convey material at 1500° F or higher, glowing red on occasion, with no maintenance required.

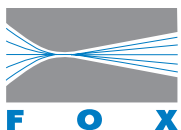
Here is a typical Case Study of such an installation:

Before Installation of Fox Venturi Eductor



Before:

The kiln spill was allowed to fall into the room shown above, cool, and then get moved with fleet of front end loaders.



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With no moving parts, Fox eductors can be applied to applications that just seemed to have no solutions with the "normal" equipment used in cement plants. Fox eductors, made in 316 ss, can happily convey material at 1500° F or higher, glowing red on occasion, with no maintenance required.

Here is a typical Case Study of such an installation:

This cement plant in the US Midwest had about 2000 lbs/hr of 1500° cement spilling from its kiln. The usual cement industry solutions offered by the usual cement industry suppliers were maintenance nightmares. The plant rejected those options, preferring to allow the spilled material to fill a large room, shown at left below, cool, and then get moved by front end loaders.

In June of 2002, they bought a blower/eductor solution from Fox, including a 4" 316 ss Fox eductor and a pd blower producing air at about 5 psig. The eductor now conveys all the material about 60 ft back to kiln with no maintenance, no fugitive dust, and no spilled material. The blower/eductor combination (with-out installation) cost below \$12,000.

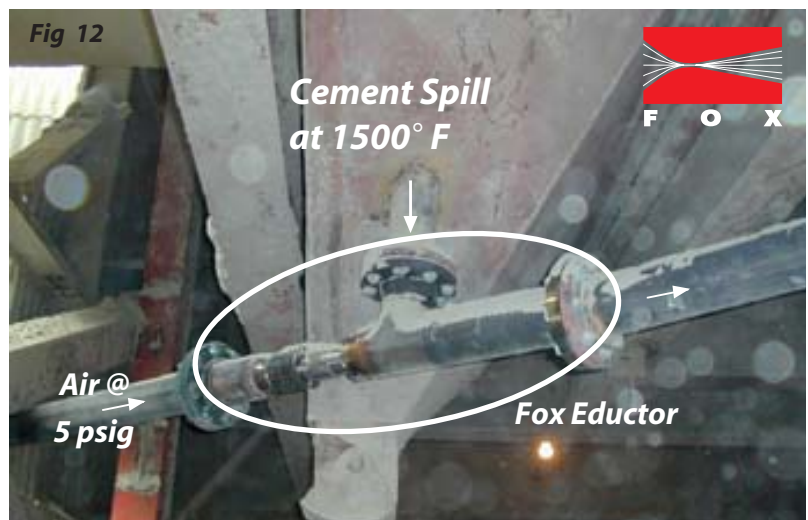
Before

Installation of Fox Venturi Eductor



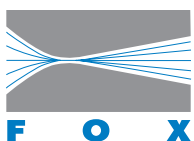
Before:

The kiln spill was allowed to fall into the room shown above, cool, and then get moved with fleet of front end loaders.



After:

Material falls directly into a 316 ss Fox eductor, where it is conveyed - at 1500° F - back to the kiln with no moving parts.



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For More Information, or to Receive a Quotation:

To receive a quotation : Please email Fox at info@foxvalve.com to request a data sheet. Complete and fax to 973-328-3651 in the USA.

Additional Technical Literature

The following are available upon request:

Product Literature:

- 301 — Solids Conveying Venturi Eductors/General
This brochure is also available in German and French.
- 307 — Fox Eductors at Cement Plants
- 308 — Fox Eductors in Power Plant Applications
- 305 — Eductors for Flue Gas Conditioning ; Injecting Activated Carbon, Limestone, etc.
- 052 — Fox Venturi Products - General Catalog (8 pages)
- 106 — Liquid Slurry Eductors for Mixing Solids/Liquids

Published Reprints

- Cement Americas, March 2004 — Waste Fuel Conveying with Fox Eductors
- WORLD CEMENT, July 2003 — Conveying Kiln Spill - clinker at 800° C with Fox Eductors;
- Powder Handling, Oct 1997: 10 Years of Conveying w/o Maintenance
- Power Engineering, July 1991 - Conveying flyash at 600° F with Fox eductors into boilers
- Powder Handling, Sept 1993 - Convey dried sludge at Sludge Combustion Facility in LA, replacing dense phase conveying system
- Powder Handling, March 1994 - Convey ing dense metal powders with Fox eductors

Installation Summary at Individual Cement Companies

Fox has created pdf's providing a summary of installations of Fox venturi eductors at the various plants owned and operated by a few of the major global cement companies. These reports can only be emailed to a domain name that includes the name of the specific cement producer. Please request from info@foxvalve.com.

French, German Literature Available

General literature about Fox eductors is available as a pdf, which we are happy to email upon request.

Case Studies :

- No. 83: Convey **Ground Cement Boards** w/ Eductors
- No. 82: Convey **Ground plastic waste** w/ Eductors
- No. 80: Convey **Clinker at 500° from dust collectors**
- No. 79: Convey **Pumice+cement mix** w/ Eductors
- No. 77: Convey **Dried Sludge into kiln** w/ Eductors
- No. 75 : Convey **Catalyst at German refinery, replacing airlocks** when 24/7 reliability is needed
- No. 74: Convey **Wate/Alternative Fuels** w/ Eductors
- No. 72: Convey **Activated Carbon** into stack gas
- No. 43 : **Ceramic-Lined Eductors, Service Life**
- No. 10: Convey **Fluid Coke** w/ Eductors

