



# FLUXO™ PUMP RETROFIT

Increased capacity, reduced energy consumption

# UPGRADE YOUR FLUXO™ PUMP AND ACHIEVE PRODUCTIVITY AND EFFICIENCY BENEFITS

Doing more with less has become the mantra of the modern cement plant, which is why we're continuously exploring opportunities to upgrade our equipment to deliver improved productivity and efficiency. The latest Fluxo Pump offers up to 47% increased transportation capacity with up to 40% reduction in power consumption, delivering on all fronts.

## KEY BENEFITS

**Increased conveying capacity**

**Reduced power consumption**

**Improved operational reliability**

**Reduced maintenance costs**

**Improved availability**

# RETROFITTING AN INDUSTRY CLASSIC

Almost 100 years since the Fluxo pump was launched in 1927, it remains a stalwart of materials handling operations worldwide. For cement plants seeking increased mill capacity, improved operational reliability and reduced power consumption, the retrofit solution developed in cooperation with Aalborg Portland Cement in Denmark gifts the Fluxo pump with new capabilities, greater capacities and reduced maintenance demands.

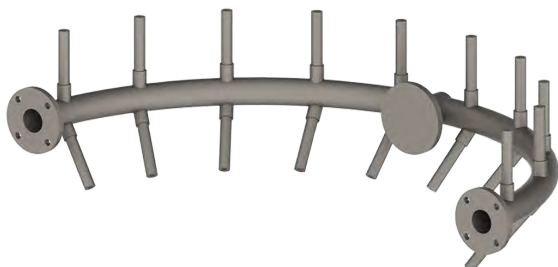
Retrofits are available for both FLSmidth and third-party pressure vessel systems using existing compressed air supply and the same transport pipe.

## What is included in the retrofit?

The comprehensive retrofit targets high-wear areas of the pump, extending service life through a range of new parts, including:

### New mechanical parts:

- Inlet valve
- Annular air pipe with nozzles
- Outlet bend
- Vent valve (de-dusting)
- Compressed air valves
- Control valve
- Safety valve
- Pneumatic control cabinet with solenoid valves and pressure switches



### New nozzle design:

Inclusion of the upwards pointing nozzles ensures aeration of the material.



### New electrical parts:

- Electrical local cabinet with PLC including HMI touch screen and CCR interface
- Pressure transmitters
- Level indicators
- Position indicators on all valves

The retrofit takes advantage not just of new and proven design elements, but also advances in automation, using a new control set-up to ensure lower power consumption and correct valve settings for sequential operation. In real life applications, this has delivered power savings of 40%. Meanwhile, feedback from sensors and position indicators combined with touch-screen control makes it easier to identify the root cause of maintenance issues, enabling speedy troubleshooting and simplifying maintenance tasks.

# SIMPLE, QUICK RETROFIT

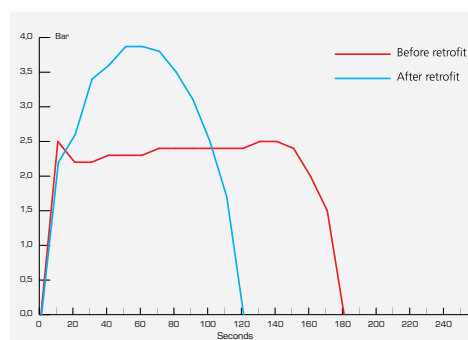
The Fluxo pump retrofit can be done without changing the existing transport pipe system and compressor installation. The work normally takes about 7 days and should be done under FLSmidth Cement supervision to ensure optimal installation and commissioning. We are also available to train both maintenance staff and operators to ensure they are familiar with the new equipment.

## Short payback time

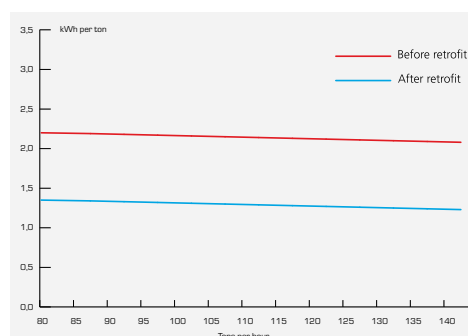
The Fluxo pump retrofit has proven itself in applications around the world, delivering speedy ROI through increased capacity, reduced power consumption and more reliable operation. For example, at the Set Ankara plant, Turkey a retrofit of Fluxo pump type E-7.5 led to a 47% improvement in transport capacity and a payback time of less than 4 months. At the Ta Luang plant in Thailand the power consumption of a Fluxo pump type D-13 was reduced by 40% after the retrofit, resulting in an ROI of about 3 months.

Results achieved with Fluxo Pump retrofits	
<b>Italcementi SET Ankara Plant, Turkey</b> Fluxo Pump E-7.5 Actual increase in transport capacity = 33% Theoretical capacity increase = 47%	<b>PPC Jupiter</b> Fluxo Pump E-10 Actual increase in transport capacity = 22% Power consumption savings = 23%
<b>Lafarge Cement Mbeya, Tanzania</b> Fluxo pump E-5 Actual increase in transport capacity = 27% Power consumption savings = 32%	<b>Cemex Santa Rosa, Colombia</b> Fluxo Pump E-10 Actual increase in transport capacity = 39% Power consumption savings = 29%
<b>Holcim Davao, Philippines</b> Fluxo Pump E-20 (Instead of FK Pump M-350) Actual increase in transport capacity = 24% Power consumption savings = 28%	<b>Siam Ta Luang, Thailand</b> Fluxo Pump D-13 Actual increase in transport capacity = 68% Power consumption savings = 40% (Guarantee = 28%)
<b>Cementos Molins, Spain</b> 2 x Fluxo Pump E-10 (cement mill 5C and 6C) Actual increase in transport capacity = 20% Power consumption savings (Cement Mill 5C) 30% with two compressors 50.6% with one compressor Power consumption savings (Cement Mill 6C) = 29%	<b>Cimentos Izmir, Turkey</b> 2 x Fluxo Pump E-10 Actual increase in transport capacity = 48% Power consumption savings = 46% (Guarantee 33%)

The immediate advantage of a retrofit is that cement can be dispatched more quickly and more efficiently, reducing kWh/t of cement moved. While the capacity improvements and power consumption savings vary from project to project, every application benefits from the improved reliability of the pump, which results in fewer unscheduled stoppages and thus a higher mill output on an annual basis. For example, Twiga Cement in Tanzania reduced their maintenance downtime from a maximum of 10 hours to a maximum of 2 hours by retrofitting their E-10 Fluxo Pump.



The diagram exemplifies the difference in dispatch time before and after a retrofit. The level of the curves indicates pump pressure during dispatch of a batch of cement.



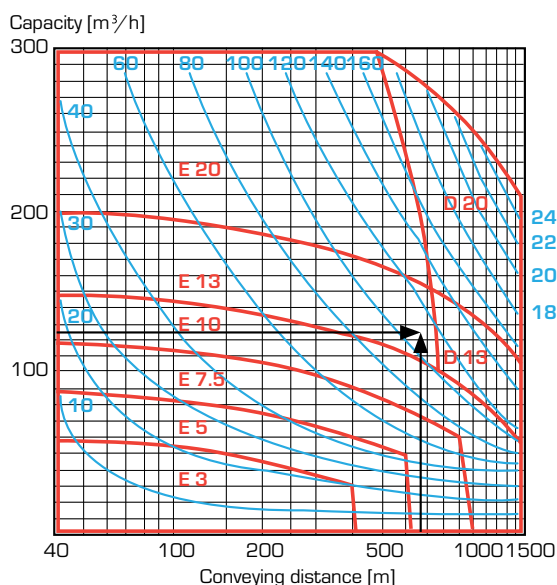
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## To retrofit or not to retrofit?

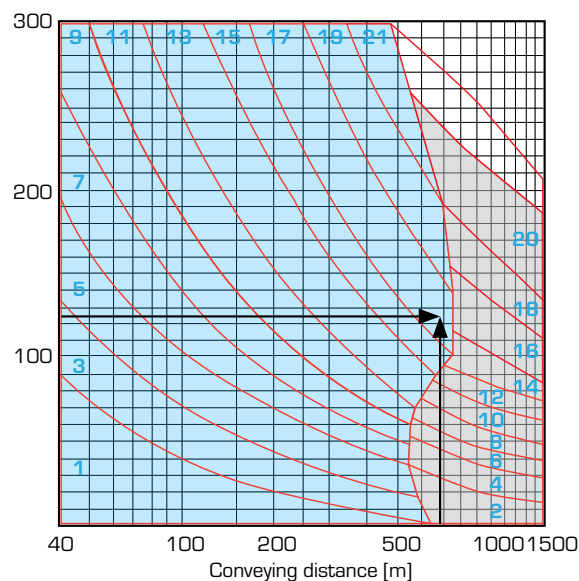
Retrofitting an existing Fluxo pump system is often a better and more cost-effective solution than replacing it with a mechanical transport, including elevators. Before moving ahead with a retrofit, though, we will evaluate your existing pumps and propose immediate improvements as well as more long-term solutions to ensure optimal operation. Service visits take approximately 2 – 3 days, giving our service team the opportunity to inspect your pump both in operation and while shut down.

# DIMENSIONING

TYPE SELECTION KEY  
 [DIAGRAM IS BASED ON A BULK DENSITY OF 1.0 KG]



Air consumption [Nm³/min]  
 Power consumption approx. 3.7 kW/Nm³/min



Pipe diameter [mm]  
 ■ Single diameter ■ Different diameters

Pipe diameters [mm]		
Code	First half	Second half
1	107.1	
2	107.1	131.7
3	131.7	
4	131.7	159.3
5	159.3	
6	159.3	182.9
7	182.9	
8	182.9	207.3
9	207.3	
10	207.3	231.9
11	231.9	
12	231.9	260.4
13	260.4	
14	260.4	284.7
15	284.7	
16	284.7	309.7
17	309.7	
18	309.7	339.6
19	339.6	
20	339.6	388.8
21	388.8	

### Example

125 m<sup>3</sup>/h pulverised material (1 kg/l) to be conveyed pneumatically 680 m with four 90 degree bends (680 m + (4 x 5 m) = 700 m)

### Solution

FLSmidth Fluxo pump type E13 with an internal pipe diameter of 309.7 mm (code 17). Air consumption 110 Nm<sup>3</sup>/min and power consumption 3.7 x 110 = 407 kW



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