

# Better fan wear resistance

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The 4000tpd Buzzi Unicem Greencastle cement plant was commissioned in 2000. After start-up, the new 5000hp kiln ID fan was experiencing a high wear rate due to a high dust load, requiring costly repairs every few months. Additionally, the fan could not reach its design capacity.

In November 2003, AirStream Systems was called in to look at the problems and propose solutions to improve the fan. AirStream Systems is an engineering company specialising in improving the efficiency, resistance to wear and dust build-up in fans.

AirStream studied all aspects of the challenge including system effects, and proposed a turnkey upgrade with a guaranteed simple payback of 1.2 years.

### Project results

In June 2004, a new rotor designed by AirStream was installed in the existing housing. Immediately the fan efficiency increased, and the original design capacity was reached. An on-site performance test confirmed the fan performance improvement. By 2008, the new rotor was still in service, having proven itself to be over five times more wear resistant

than the original equipment.

### Project benefits

The AirStream rotor's higher efficiency significantly reduced the plant's power consumption, saving more than 1000kW. The increased wear life reduced maintenance cost and eliminated production losses due to unplanned fan shutdowns. Turnkey project cost was kept to a minimum by using



Figure 1: AirStream impeller fan

**Table 1: November 2003 – performance of old non-AirStream fan**

	Tested	Maximum with 5000hp motor
Flow	583 000acfm	594 000acfm
Pressure	31.58"WG	32.5"WG
Speed	864rpm	880rpm
Fan power required	4 725hp	5 000hp

the existing housing, bearings and motor.

Tables 1 and 2 summarise the project parameters.

### Guarantees and benefits

Other plants within the Buzzi Unicem group have selected AirStream to upgrade their process fans. AirStream Systems expertise and experience is applied on problem process fans. █

**Table 2: June 2004 – performance of new AirStream impeller fan**

	AirStream impeller test	Non-AirStream impeller to obtain test flow	Power use improvement
Volume	618 410acfm	618 410acfm	
Pressure	29.22"WG	29.22"WG	
Speed	809rpm	916rpm	
Motor power input	3161kW	4198kW	1037kW

Achieved simple payback of 1.06 years with a 1000kW power reduction.  
 Impeller wear life increase to-date is over five times, reducing maintenance costs.  
 Eliminated production losses due to unplanned fan shutdowns.