

Niiral[®]

FITTED WITH  GOETZE[®] RINGS

MORE THAN **4X**
LONGER
PISTON LIFE

DuraBowl[®]

- Enhanced microstructure in the alloy
- Improves the fatigue strength of the aluminium where it is most needed



NÜRAL[®] BRINGS ITS INNOVATIVE, OE-PROVEN TECHNOLOGY TO THE AFTERMARKET

- The DuraBowl[®] design strengthens the crown of the piston by locally re-melting the alloy around the bowl. This process provides extra fatigue strength where it is most needed
- Piston life is increased by between 4 and 7 times when compared with conventional gravity die cast aluminium pistons
- Optimised for high performance diesel and petrol engine applications where fitted as Original Equipment



AT THE HEART OF ENGINE EFFICIENCY



ADVANCED PISTONS FOR THE MOST DEMANDING DIESEL APPLICATIONS

Nüral DuraBowl® pistons help the latest generation of heavily-boosted diesel engines achieve outstanding emissions and fuel economy without compromising durability. Tests show that in the most demanding applications, Nüral DuraBowl® pistons can last at least between 4 and 7 times longer than conventional gravity die cast aluminium pistons.

To reduce CO₂ emissions and improve fuel economy, vehicle manufacturers are extracting ever increasing power outputs from smaller diesel engines. During the last ten years, typical performance outputs have risen from 50kW/litre (67bhp/litre) to around 70kW/litre (94bhp/litre) and the trend is continuing (currently the highest loaded piston is 93kW/L – with DuraBowl® in production). These heavily downsized engines are now popular choices for all types of passenger car from luxury vehicles to low-cost city cars.

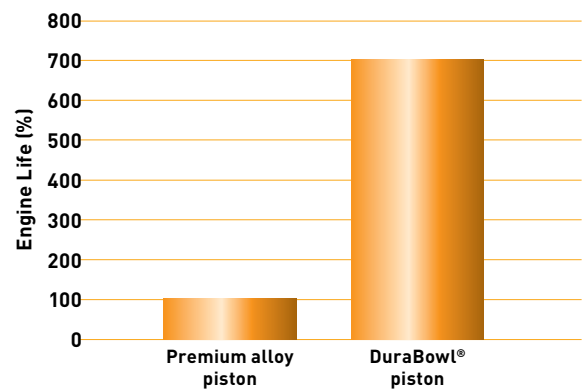
With high levels of turbo boost, downsized engines create challenging conditions for their pistons, which must withstand very high thermal and mechanical loads. In the bowl of the piston, temperatures can reach over 400 degrees Celsius (750 degrees Fahrenheit) with pressures typically reaching more than 200 Bar (200 x atmospheric pressure). Traditionally, heavier and more costly materials and processes have been required to deliver the durability that customers expect.

Federal-Mogul's DuraBowl® technology, which is specified by several of the world's most prestigious vehicle manufacturers, uses an innovative manufacturing process to address this challenge at an attractive price. The DuraBowl® process strengthens the piston rim, significantly improving the fatigue strength as well as the thermo-mechanical fatigue of the aluminium where it is most needed. The cast piston is pre-machined, then the alloy around the rim of the bowl is re-melted. Cooling it around 1,000 times faster than when it was originally cast stops grain growth quickly. This optimises the size of the free silicon particles, providing a much tougher microstructure.



Nüral
DuraBowl®

Federal-Mogul's Nüral DuraBowl® technology strengthens the crown of a piston, improving the aluminium's strength where it is most needed



NÜRAL DURABOWL® REFERENCE	VEHICLE MAKE	ENGINE DESIGNATION	TYPE
87-427400-20	MERCEDES-BENZ	OM642DE30LA, Euro5	LV, LCV
87-427400-30	MERCEDES-BENZ	OM642DE30LA, Euro5	LV, LCV



WINNER OF A PRESTIGIOUS 2010 AUTOMOTIVE NEWS PACE AWARD. THE NÜRAL DURABOWL® PISTON CAME OUT ON TOP IN THE CATEGORY THAT RECOGNISES INNOVATIONS IN NEW PRODUCTS, COMPONENTS OR SYSTEMS THAT HAVE SIGNIFICANT MARKET IMPACT AND ACT AS 'GAME CHANGERS' IN THE AUTOMOTIVE INDUSTRY.