
 MDEC 2003




# NO<sub>2</sub> Behaviour in Diesel Exhaust Gas Purifiers for Mining


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[www.finnkat.com](http://www.finnkat.com)

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 **FINNKATALYT**

- FinnKatalyt is a provider of exhaust gas purification solutions for diesel and petrol engines.
- The solutions are designed to improve customers products with regard to emissions, performance and cost.
- The solutions are based on proprietary know-how and patents and they are based on deep understanding of the relevant technologies and their applications.



**FinnKatalyt, Finland**

Oulu office

Tampere office


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**FINNKATALYT** **DEVELOPMENT CASE: Mining**

**Setting target for development**

High priority:

1. No increase of NO<sub>2</sub>
2. High PM conversion
3. CO conversion
4. Durability with different fuels
5. Maintenance free



Lower priority:

6. Surface temperature
7. Productability
8. Noise attenuation

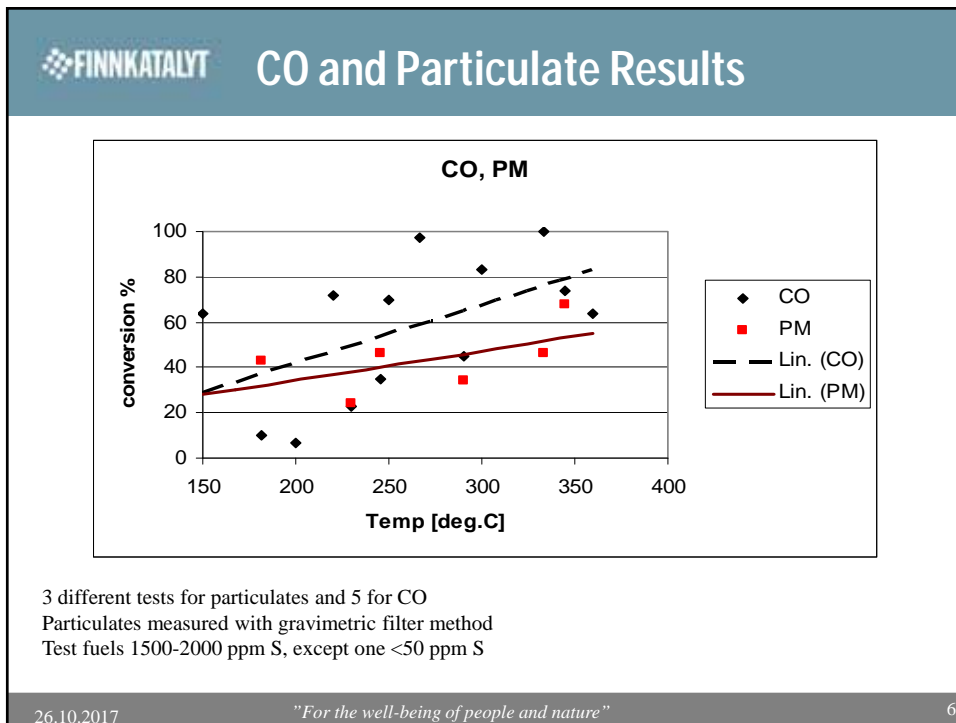
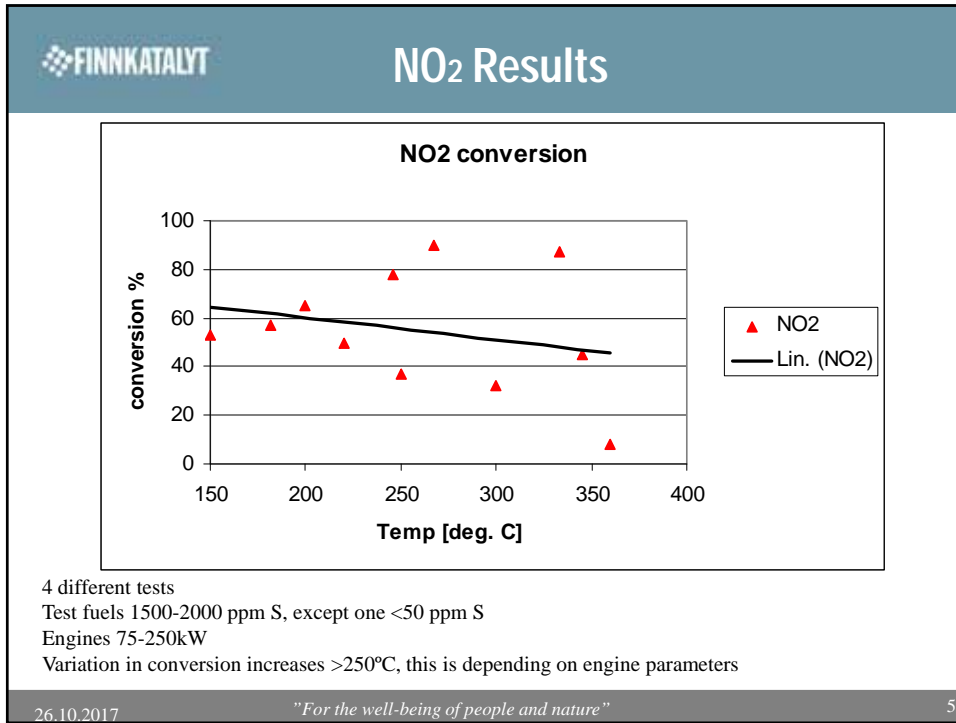
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**FINNKATALYT** **DEVELOPMENT PROCESS**

- Worst case testing with <2000 ppm S fuel
- Basic knowledge on NO/NO<sub>2</sub> emissions with different catalyst chemistries
- Detailed testing with chosen catalysts, target low NO<sub>2</sub> formation
- Modifications for better PM conversion
- Presentation of test results to customer
- Testing by customer
  - Results were similar than our own testing
- Modifications of complete exhaust system for better service access to the engine
- Series production

**The development process took time about 9 months**

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**FINNKATALYT** **CONCLUSIONS**

- NO<sub>2</sub> decrease and efficient particulate matter decrease with precious metal catalyst is possible
- NO<sub>2</sub> formation is sensitive to several factors and design parameters
  - *need for high particulate and NO<sub>2</sub> conversion might be in conflict*
- Fuel sulfur levels up to 2000 ppm are acceptable, no blocking or increase of back pressure.
  - *High sulfur concentration in fuel results lower PM conversion (depends strongly on the engine)*
  - *Long durability*
- FinnKat D has been tested with ISO 8178 C1 and seems that there is no increase of nanoparticulates
  - *Dilution tunnel measurement to simulate real dilution conditions*

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**FINNKATALYT** **FINNKAT D**



FinnKat D-MT (mining), <240 kW, purifier size Ø350 x 625mm.  
Back pressure is possible to design between 40-100mbar to meet engine manufacturer's specifications

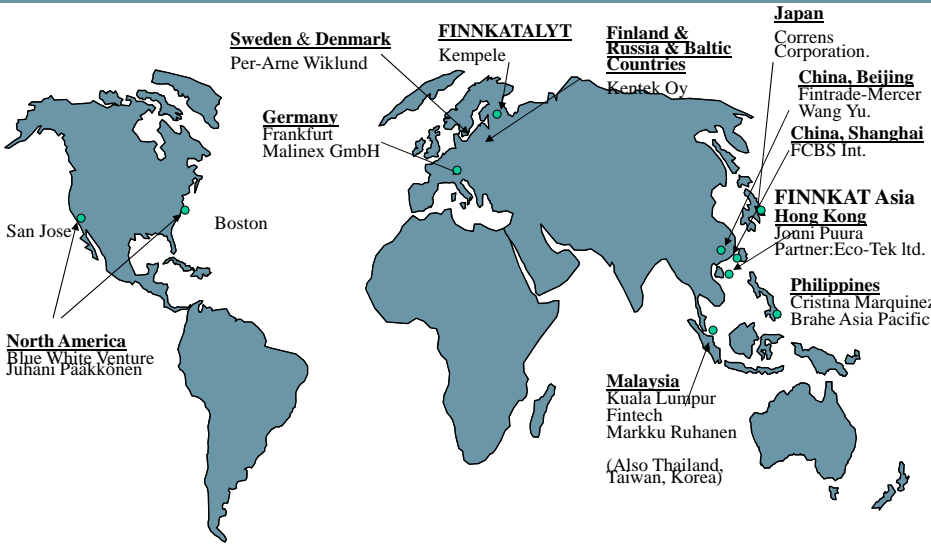
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**FINNKATALYT** **FINNKAT D**



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**FINNKATALYT** **NETWORK – 2003**



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Blue White Venture  
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