DAIMLER ARGILLON Johnson Matthey Catalysts

Long term experiences with HDD SCR Catalysts

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ENVIRONMENTAL CATALYSTS AND TECHNOLOGIES

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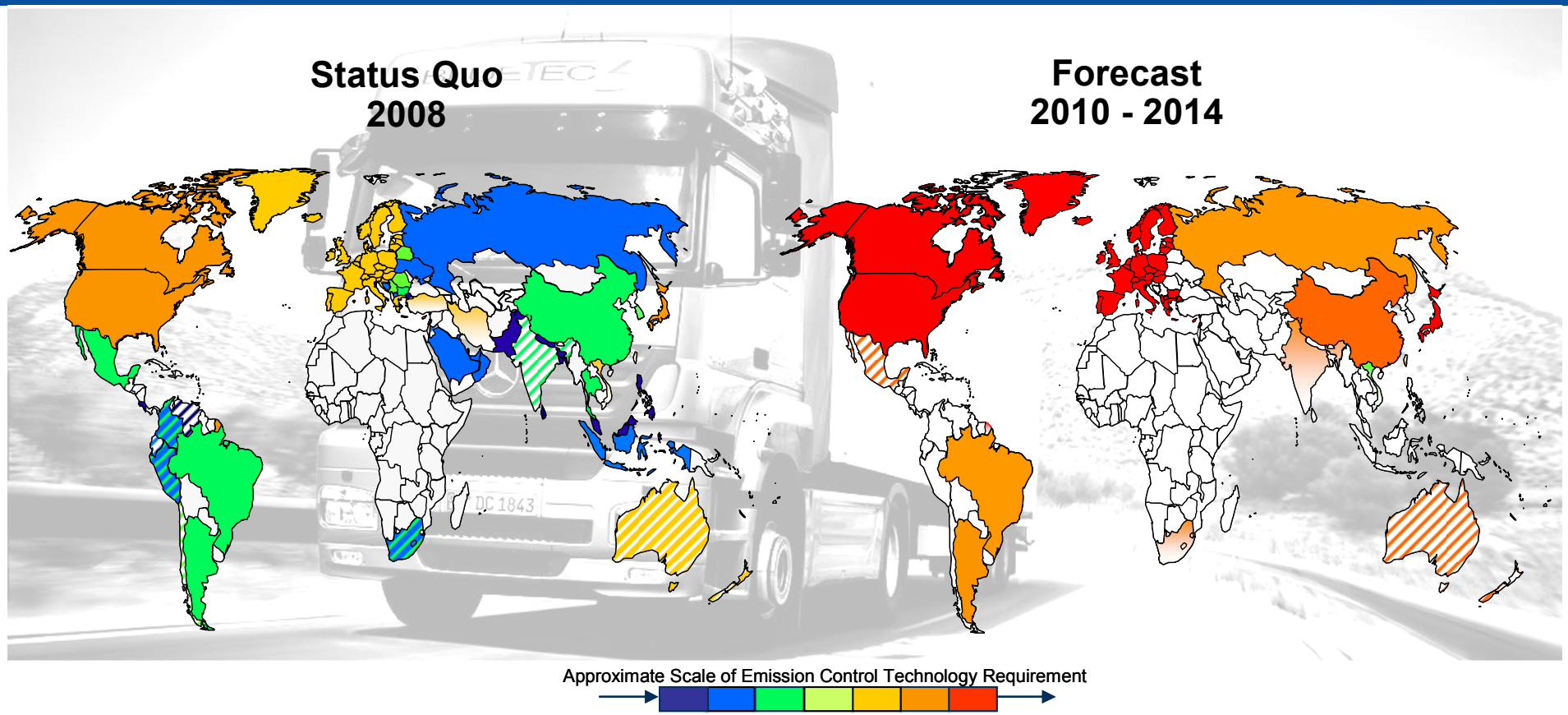
Emission Standards all over the world



Source: DAG, M.B. country representatives, Internet, German Embassy

Euro 2 Euro 3 Euro 4 Euro 5 Euro 6

EPA 94 EPA 98 EPA 04 EPA 07 EPA10

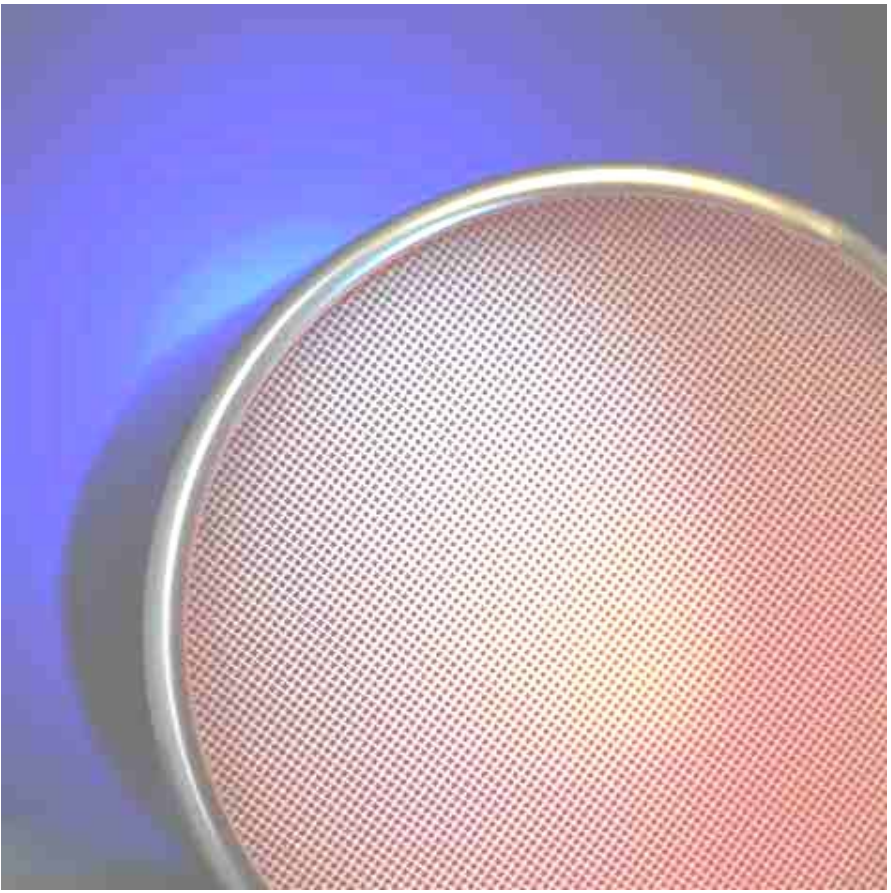
N/A

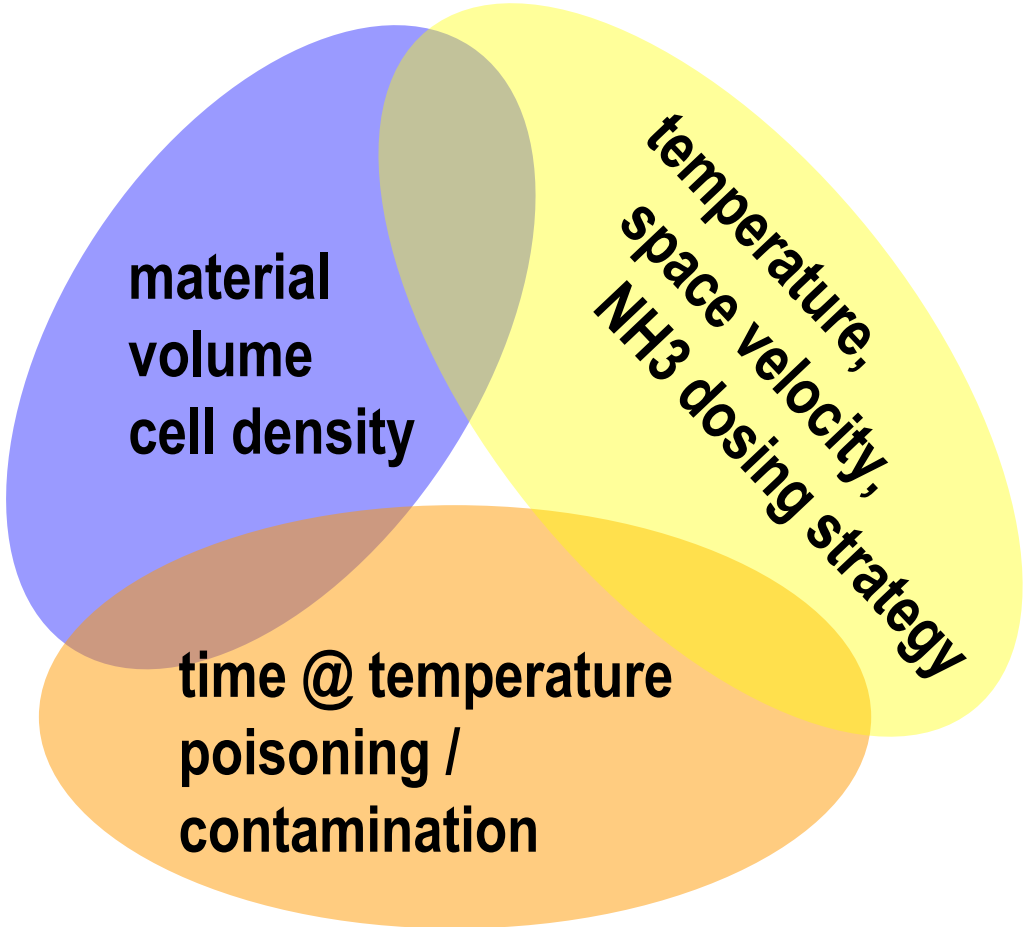
Shaded area: not decided yet

Hatched area: more standards apply

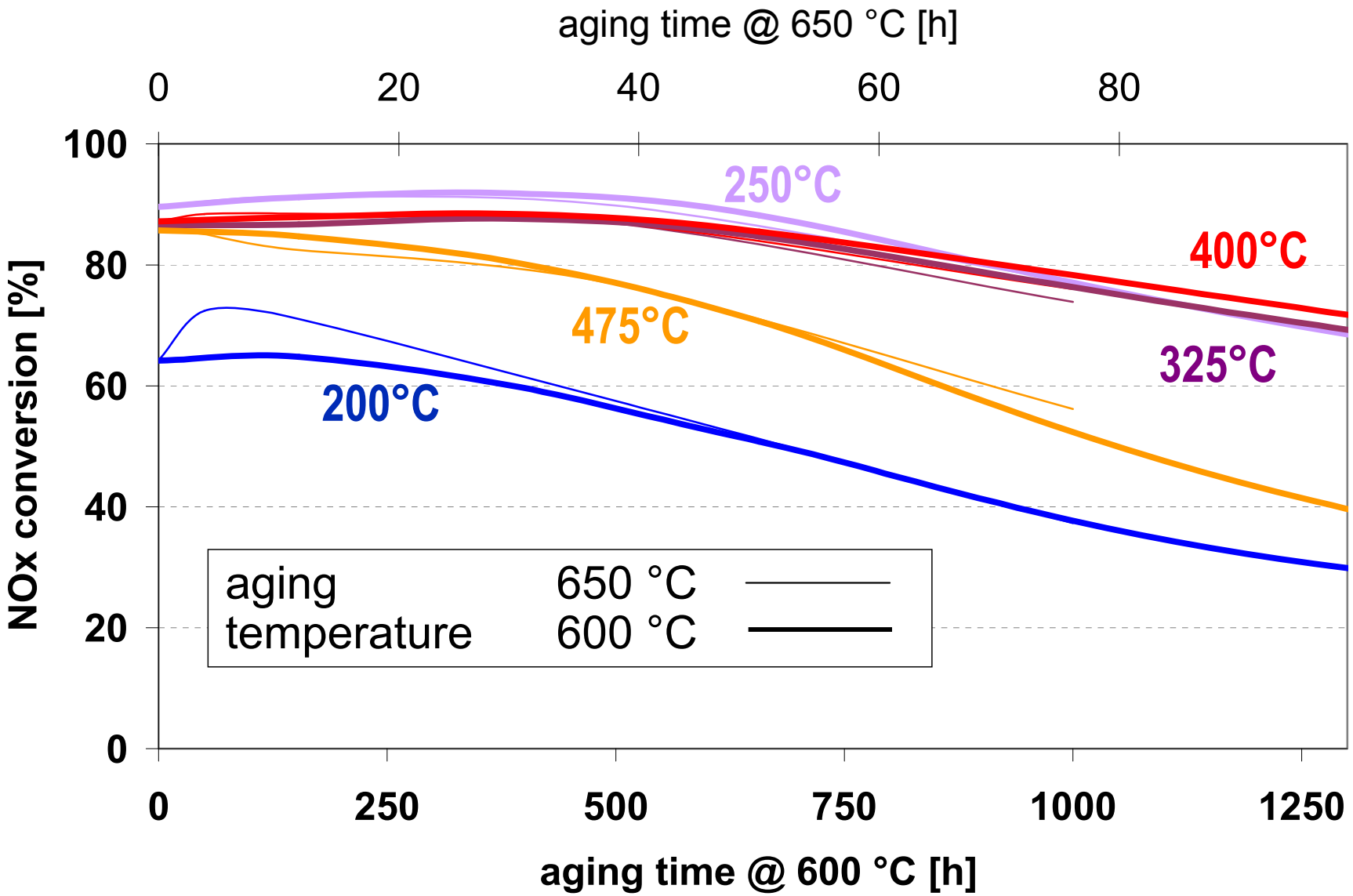
=> *NOx emission control is indicated all over the world*

NOx conversion performance is result of various parameters





Activation or deactivation by thermal aging ?

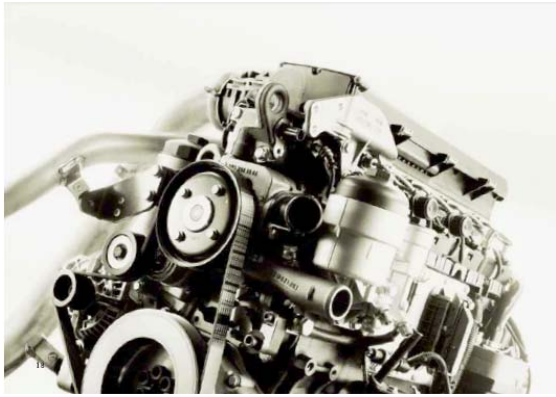


Evaluated long term test programs

3000h

Medium Duty Application Durability Test

- Test Bench Program



750 000km (466 kMiles)

3 Years Heavy Duty Durability Test

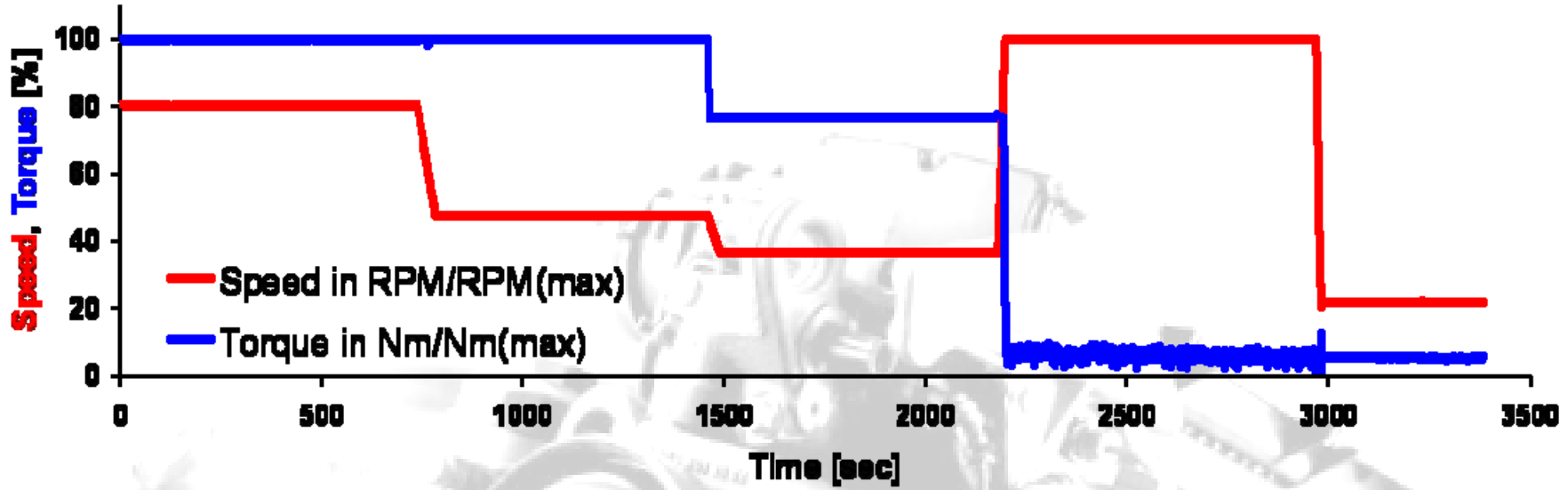
- Severe Test Program

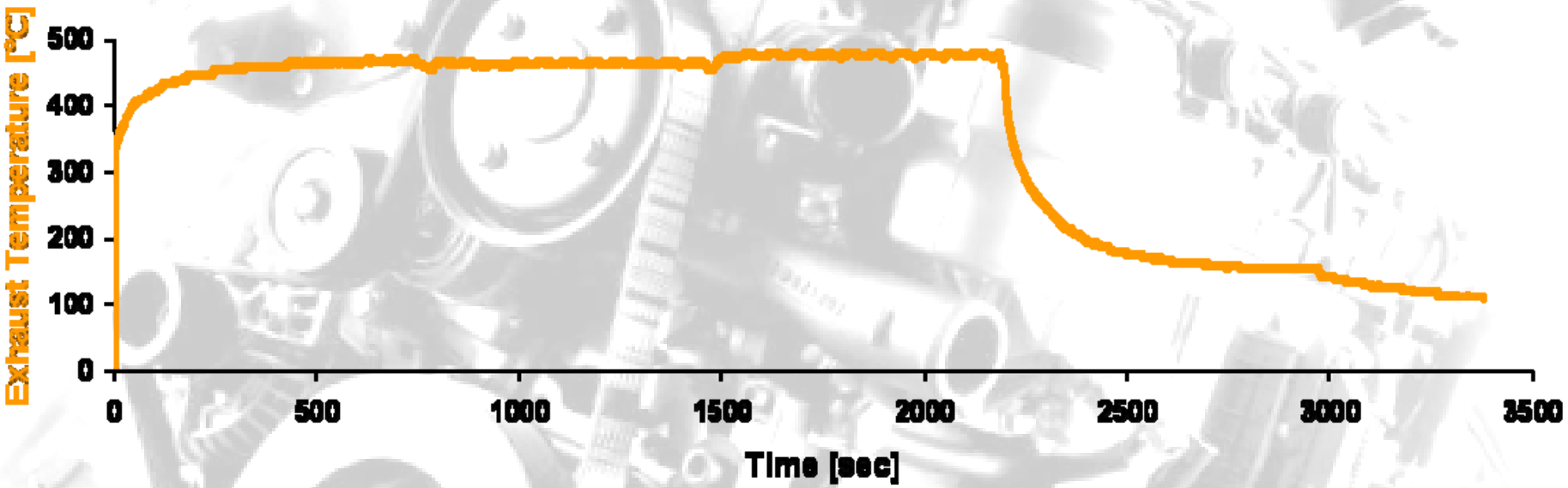
915 000km (569 kMiles)

3 Years Heavy Duty Field Test Program

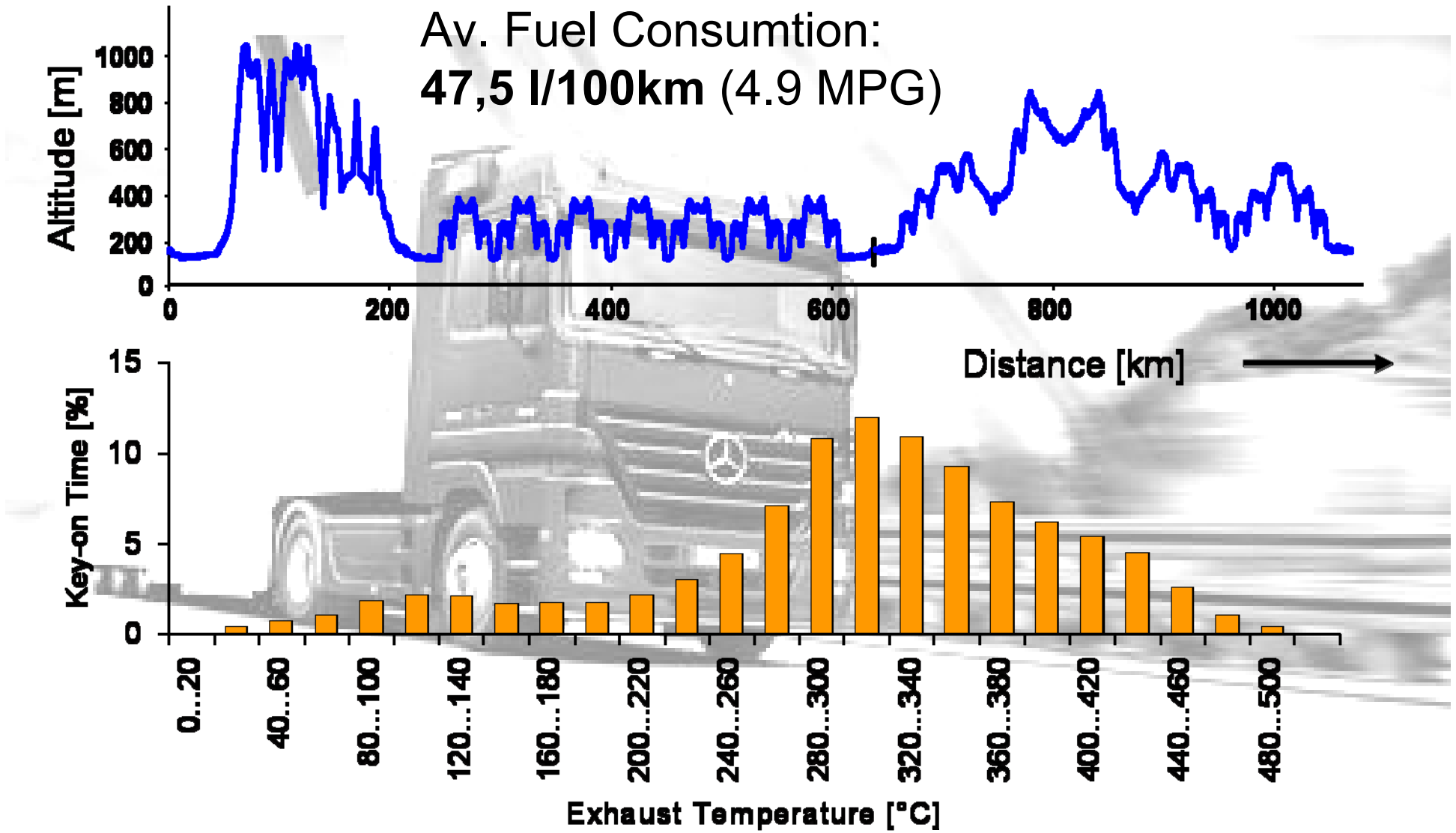
- On-Highway Test

3000h DAIMLER BlueTec® Medium Duty Application Durability Test – Test Bench Aging Conditions



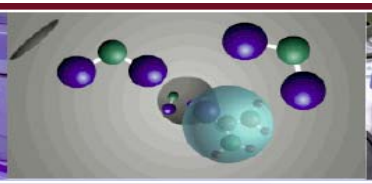


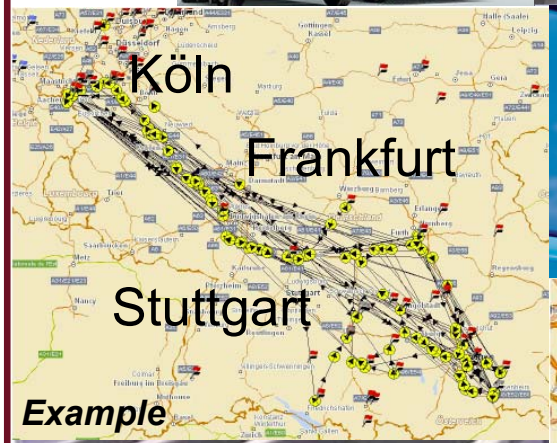
3 Years Mercedes-Benz BlueTec® HD Durability Test
Severe Test Program: 750 000 km (466 kMiles)

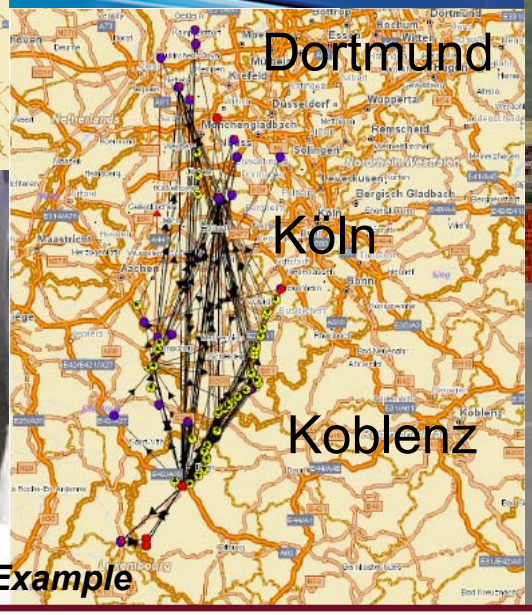


3 Years Mercedes-Benz BlueTec® - HD Field Test Program
On-Highway Test: 915 000 km (569 kMiles)

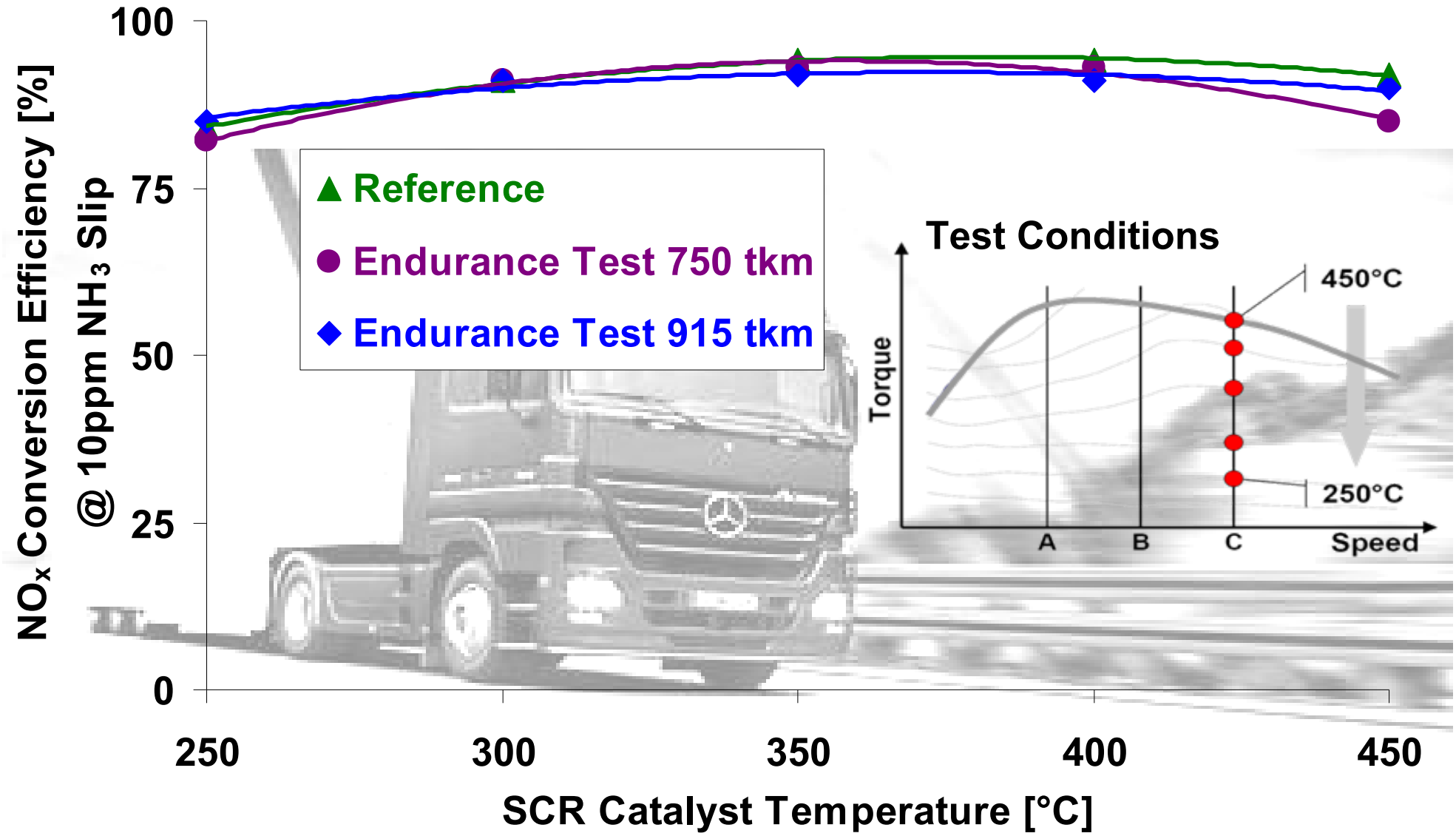


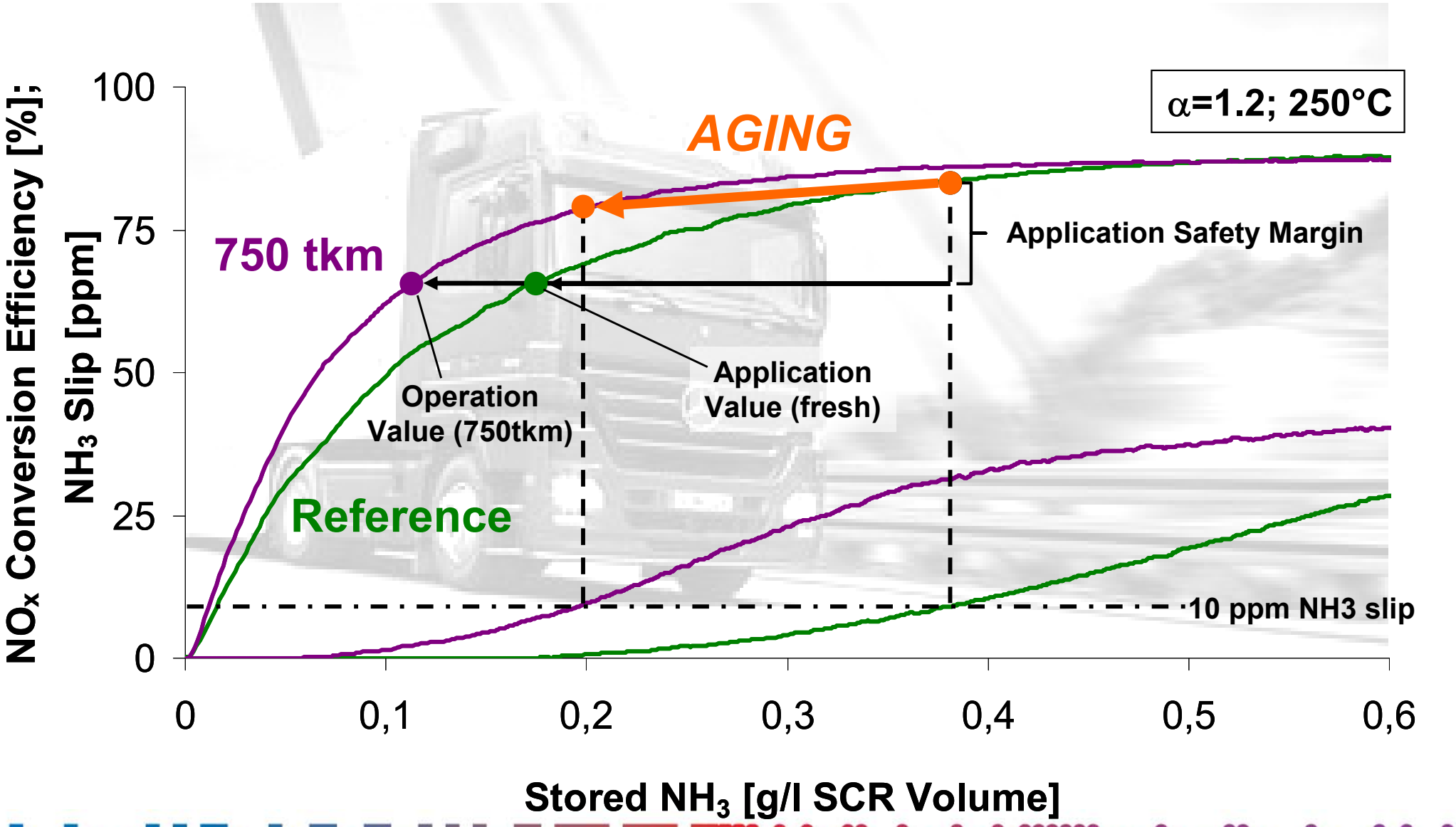





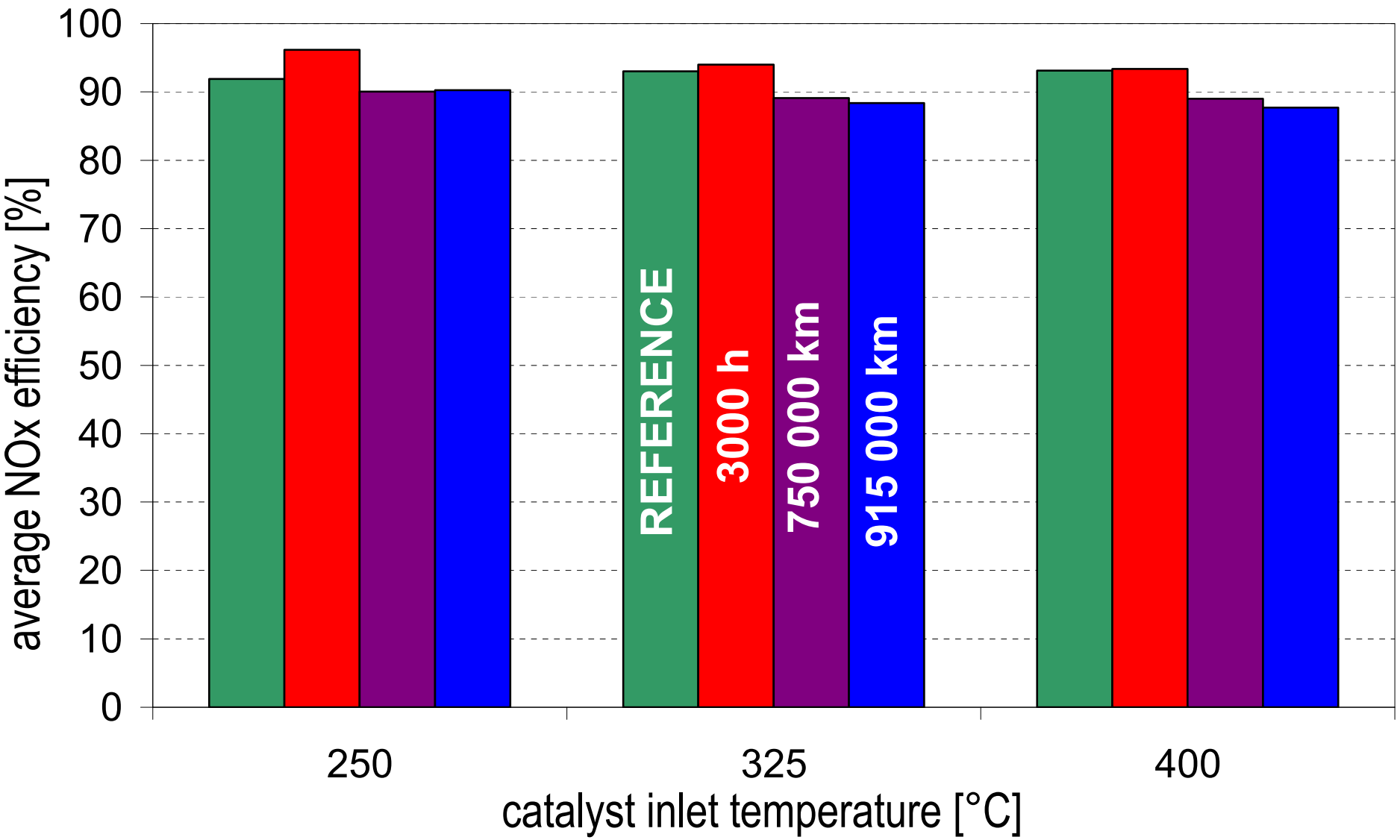

3 Years Mercedes-Benz BlueTec® HD Durability Test
NOx Conversion Activities – Heavy Duty On-Highway



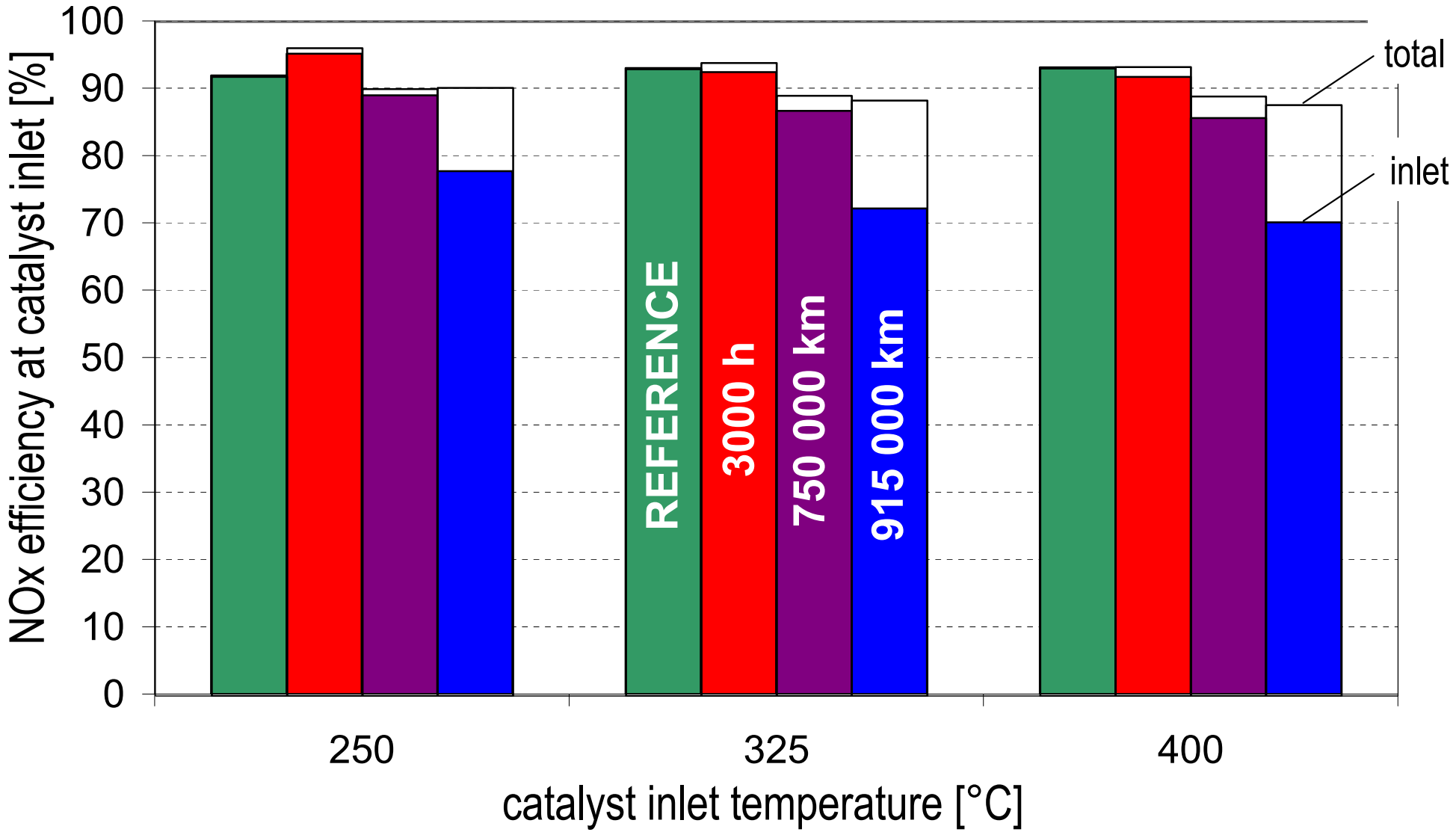
Impact on transient NOx conversion performance after 750 000 km (466 kMiles)



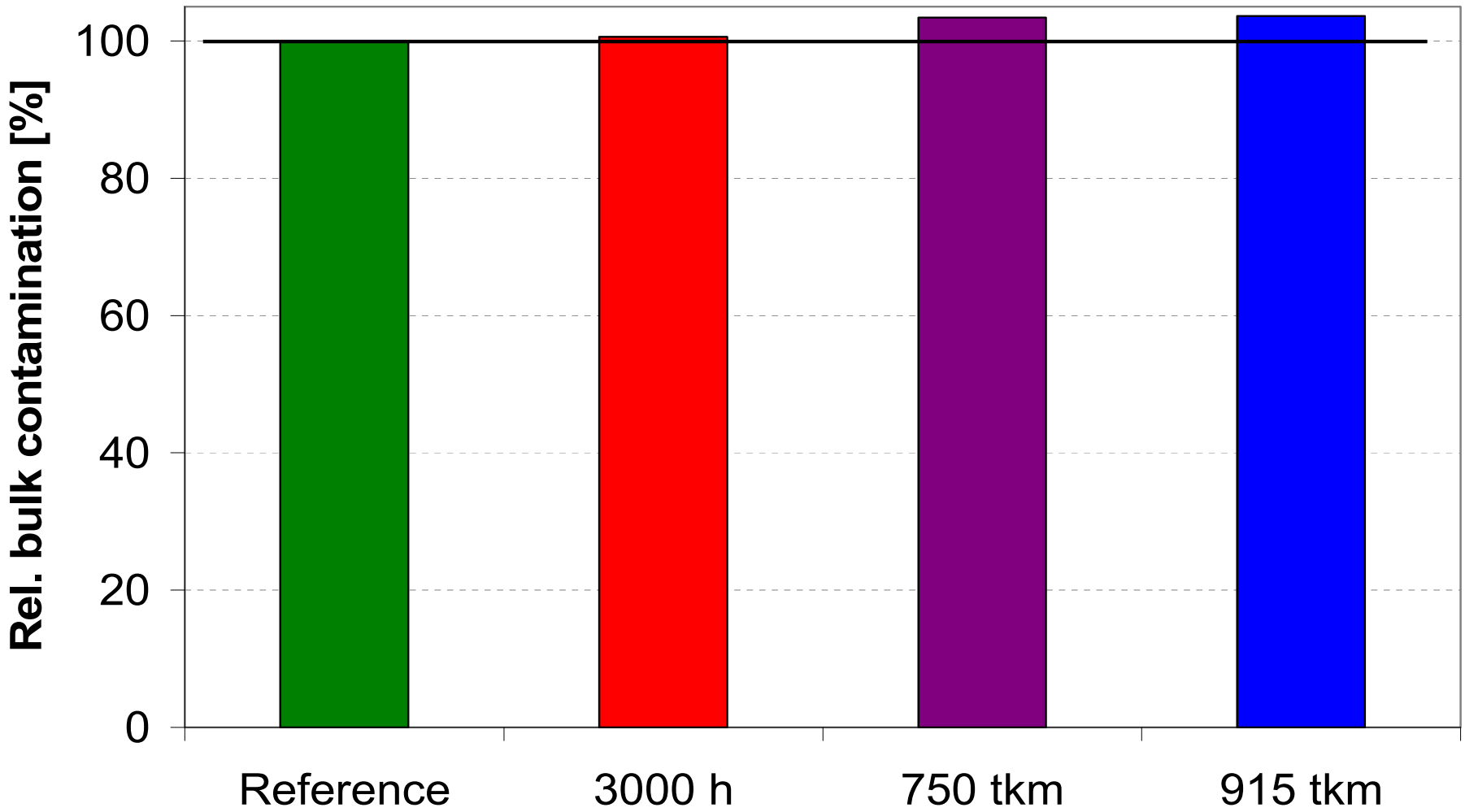
NOx conversion after long term tests for total catalyst - lab scale conditions



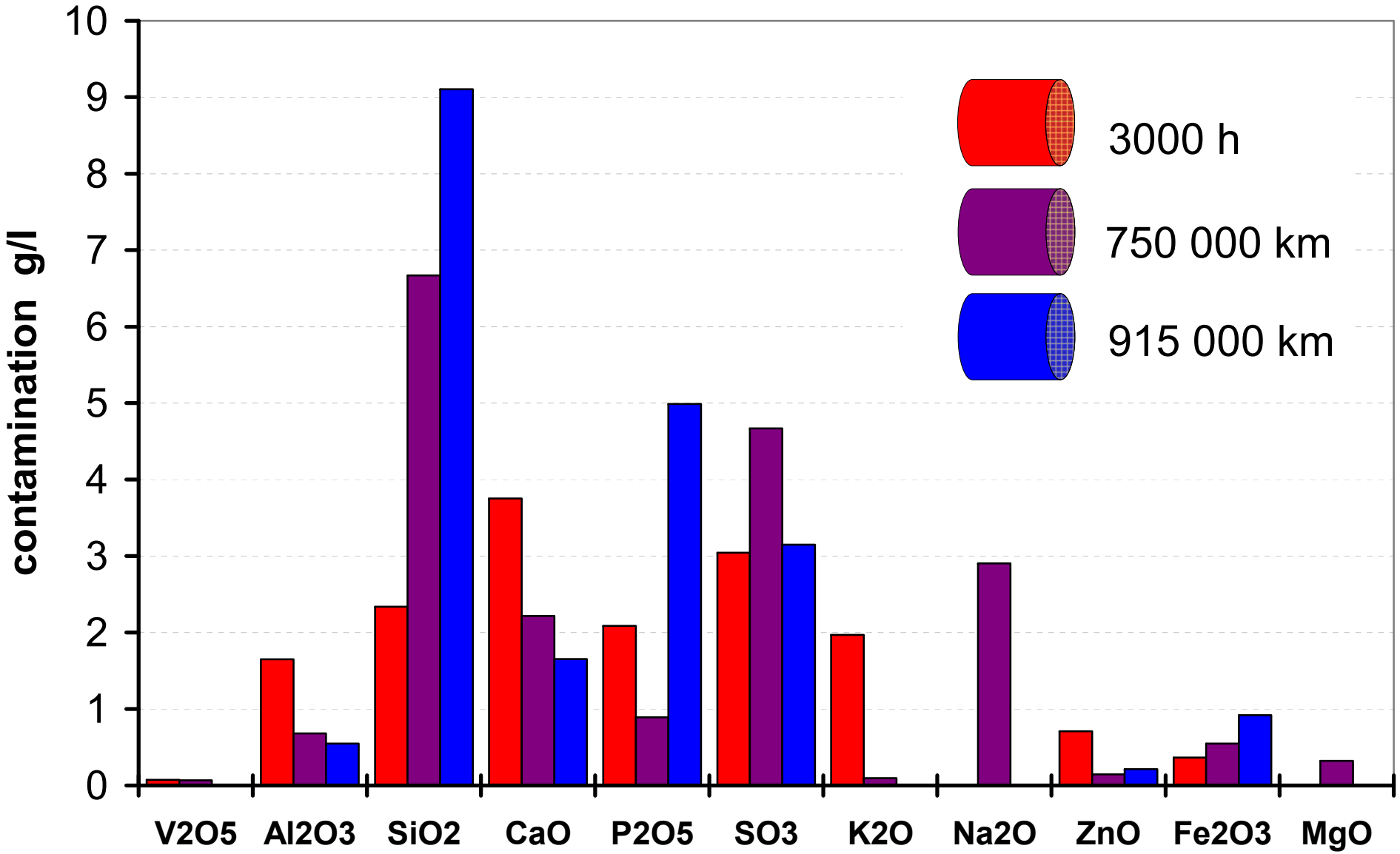
NOx conversion after long term tests for catalyst inlet - lab scale conditions



Poisoning of bulk catalyst by XRF



Catalyst Contamination after endurance tests



Summary and Conclusions

- 3 long term test programs were performed at Daimler while conditions were tracked, thus tendencies of aging impacts could be figured out
- High robustness and extensive long-term stability of Argillon SCR catalysts are demonstrated under typical truck operation conditions
- Improved catalyst performance was determined after 3000 h test bench aging
- Highest catalyst contamination in inlet zone detected but thermal activation may partly compensate for poisoning effect
- NOx efficiency decrease correlates mainly to P und Si poisoning

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Thank you