



Particle Reduced, Efficient Gasoline Engines

EUROPEAN COMMISSION
Horizon 2020 | GV-2-2016 | Technologies for low emission light duty
powertrains
GA # 723954

Deliverable No.	PaREGEEn D2.1	
Deliverable Title	Improved GPF Substrate Design	
Deliverable Date	2017-07-31	
Deliverable Type	REPORT	
Dissemination level	Confidential – member only (CO)	
Written By	Jeremy Gidney (JM)	2017-12-15
Checked by	Jason Cleeton (JM)	
Approved by	Norman Freisinger (JM) Simon Edwards (RIC) - Coordinator	2018-01-14 2018-01-02
Status	Final	2018-15-02

Publishable Summary

The initial objective of this Work Package 2 (WP2) is to improve the design of gasoline particulate filters (GPF) to address sub 23nm emissions. Using a current vehicle technology and test bench equipment, improved filters will be devised. As part of this process the substrate material, characteristics and geometry will be considered alongside the catalyst coating properties. In parallel with the filter development, there will be an interactive collaboration with WP's 3 and 4 to determine the aftertreatment system for the respective demonstrator vehicles. This is particularly the case for WP4, where a lean NOx system is required and the engine exhaust temperature and composition characteristics will be critical for its design. Ultimately, for both applications, the particulate filter improvements will be integrated into the final exhaust systems supplied.

Deliverable 2.1, 'Improved GPF Substrate Design', is concerned with the first step in developing GPF technologies to suit the applications in Work Packages 3 and 4. The closing step is Deliverable 2.2, 'Develop GPF with Excellent sub 23nm Particle Filtration' relates directly to the submission of technologies to WP's 3 and 4.

In this document the method of screening filters is discussed alongside initial results. A combination of test bed engine and chassis dynamometer vehicle testing will be used. As there is no regulated method for measuring sub 23nm particles, the equipment and approach used in this programme is explained. The correlation of the test vehicle with the baseline measurements reported for WP5 is also incorporated.

At this stage, a range of filters on standard substrates but with different coating technologies has been tested. In this deliverable initial bed engine results are reviewed and the preparation of the test vehicle and associated drive cycles discussed. The objective is excellent filtration accompanied with a low exhaust backpressure. A conjecture as to optimal GPF substrate technologies to be supplied by the project partner NGK is included.

Appendix A – Acknowledgement

The author(s) would like to thank the partners in the project for their valuable comments on previous drafts and for performing the review.

Project partners:

#	Partner	Partner Full Name
1	RIC	RICARDO UK LIMITED
2	DAI	DAIMLER AG
3	JLR	JAGUAR LAND ROVER LIMITED
4	BOSCH	ROBERT BOSCH GMBH
5	FEV	FEV EUROPE GMBH
6	JM	JOHNSON MATTHEY PLC
7	HON	HONEYWELL, SPOL. S.R.O
8	JRC	JOINT RESEARCH CENTRE – EUROPEAN COMMISSION
9	UNR	UNIRESEARCH BV
10	IDIADA	IDIADA AUTOMOTIVE TECHNOLOGY SA
11	SIEMENS	SIEMENS INDUSTRY SOFTWARE SAS
12	LOGE	LUND COMBUSTION ENGINEERING LOGE AB
13	ETH	EIDGENOESSISCHE TECHNISCHE HOCHSCHULE ZUERICH
14	UDE	UNIVERSITAET DUISBURG-ESSEN
15	RWTH	RWTH AACHEN UNIVERSITY
16	UFI	UFI FILTERS SPA

This project has received funding from the European Union’s Horizon2020 Programme for research, technological development and demonstration under Grant Agreement no. **723954**.



This project has received funding from the European Union’s Horizon2020 research and innovation programme under Grant Agreement no. 723954.