

# Combustion SI

## PLANNING GROUP 2

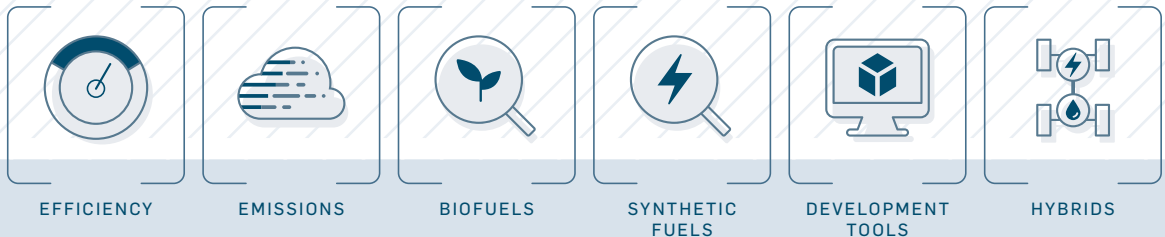
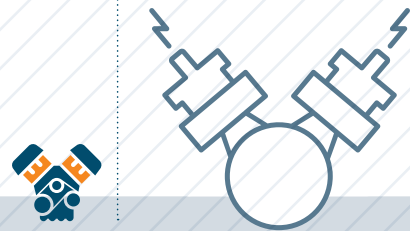
### COORDINATOR

Dr. Bodo Durst,  
BMW GROUP (until 30.04.2020)

### PROJECT MANAGEMENT

Ralf Thee, FVV

ENGINES COMBUSTION SI



### RESEARCH PRIORITIES

Planning group 2, ›Combustion SI‹, is dedicated to the following topics:  
Efficiency of the engine | Hybridisation | Alternative fuels | Artificial intelligence  
in development, big data and digitalisation

And tackles the following lines of research/ focuses:  
Combustion modelling/simulation | Combustion processes and fuel  
preparation | Water injection | Wall heat transfer | Knocking and pre-ignition |  
Particle formation in the combustion chamber | Downsizing concepts

### PUBLICATIONS

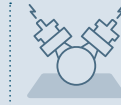
- **MTZ worldwide 06/2019:** Combustion Development for Gas Engines with Extreme BMEPs above 30 bar
- **MTZ worldwide 04/2019:** Investigation of the Mixture Formation in Gasoline Engines with Small Bore Diameter
- **MTZ worldwide 02/2019:** Scale-resolving Simulations for Combustion Process Development
- **FVV proceedings:** R587 | 2019 Spring Conference, R590 | 2019 Autumn Conference and R593 | 2020 Spring Conference

PG2  
DATABASE



THEMIS

PG 2 | RESEARCH PROJECTS



NO	TITLE // FUNDING ORGANISATION // DURATION	PROJECT COORDINATOR
<b>Planned projects</b>		
M0120	Oil Input into Combustion II	Dr. Eike Stitterich, Hengst
M0220	DI Hydrogen Combustion Process	Michael Günther, IAV
M0820	High-efficiency H <sub>2</sub> SI Engine with Direct Injection	Dr. David Lejsek, Robert Bosch
M1319	Oxyfuel Combustion Process for Stationary Gas Engines	Marc Sens, IAV
M1520	SACI Combustion System with Active Pre-Chamber	Dr. André Casal Kulzer, Porsche
M1719	Modelling of Turbulence III	Dr. David Lejsek, Robert Bosch
M1916	Cause-and-Effect Chain Simulation	Dr. Dirk Linse, BMW
M2718	Heuristic Search and Deep Learning for 1D Simulations	Dr. Aras Mirfendreski, TOYOTA GAZOO Racing Europe
M2719	Alternative Ignition Concept for High-pressure Gas Combustion	Dr. Michael Willmann, Woodward L'Orange
M3218	Characteristic Fuel Numbers Biofuels III	Dr. Ulrich Kramer, Ford
<b>Ongoing projects</b>		
1260	Thermodynamics Top Land Volume // BMWi/AiF, FVV-EM // 01-01-2017 to 31-12-2020	Oliver Dingel, IAV
1281	Pilot Injection Gas Engine // BMWi/AiF // 01-08-2017 to 31-07-2020	Dr. Martin Schenk, BMW
1307	ICE2025+: Ultimate System Efficiency // FVV-EM // 01-03-2018 to 31-10-2020	Arndt Döhler, Opel Dr. André Casal Kulzer, Porsche
1311	Gas Pulsation and Turbochargers Interaction // BMWi/AiF // 01-01-2018 to 31-12-2020	Marc Sens, IAV
1313	Engine Knock Model // BMWi/AiF // 01-01-2018 to 30-11-2020	Dr. André Casal Kulzer, Porsche
1328	Initial Pre-ignition // CORNET, FVV-EM // 01-05-2018 to 31-12-2020	Albert Breuer, Ford
1336	Post-Oxidation // CORNET, FVV-EM, BMWi/AiF // 01-10-2018 to 30-09-2020	Christine Burkhardt, EnginOS Yoshihiro Imaoka, Nissan
1343	Spray Modelling for DI Gasoline Engines // FVV-EM // 01-01-2019 to 31-12-2021	Yoshihito Yasukawa, Hitachi
1348	Fuel Composition for CO <sub>2</sub> Reduction // FVV-EM // 01-03-2019 to 28-02-2022	Dr. Yoshihiro Okada, Toyota Terutoshi Tomoda, Toyota
1349	Influencing Wall Heat Losses in SI Engines // BMWi/AiF, FVV-EM // 01-01-2019 to 30-09-2021	Dr. Thorsten Unger, Porsche
1357	Homogenisation Model SI Engines II // BMWi/AiF // 01-07-2019 to 31-03-2022	Marc Sens, IAV



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1367	Water Injection in SI Engines II // FVV-EM // 01-10-2019 to 31-03-2022	Dr. André Casal Kulzer, Porsche
1370	Fast Knocking Prediction for Gasoline Engines // FVV-EM // 01-10-2019 to 30-09-2021	Dr. Michael Fischer, Tenneco
1374	Fuel Influence on Particulate Characteristics // BMWi/AiF // 01-09-2019 to 31-08-2021	Dr. Wolfgang Samenfink, Robert Bosch
1387	Benchmark Platform for Scale Resolving Simulations // BMWi/AiF // 01-01-2020 to 30-06-2022	Kathrin Giefer, Ford
1395	Experimentally Validated LES Models for Wall Heat Transfer in Otto Engines // CORNET, FVV-EM // 01-01-2020 to 31-03-2021	Gabriel Dilmac, Porsche
<b>Completed projects</b>		
1202	CNG-DI-Engine at $\lambda=1$ -Operation with Highload-EGR // FVV-EM // 01-10-2015 to 31-10-2019	Dr. Helmut Ruhland, Ford
1213	Methane Fuels II: Combustion Modelling // FVV-EM // 01-04-2016 to 31-12-2019	Dr. Martin Schenk, BMW Dr. Frank Altenschmidt, Daimler Truck
1222	Evaporation of Biofuels // BMWi/AiF // 01-02-2016 to 31-01-2019	Jerome Munier, Porsche
1233	Modelling of Turbulence II // BMWi/AiF // 01-07-2016 to 31-07-2019	Dr. David Lejsek, Robert Bosch
1256	Water Injection in SI Engines // FVV-EM // 01-04-2017 to 30-11-2019	Dr. André Casal Kulzer, Porsche
1257	Homogenisation Model SI Engine // BMWi/AiF // 01-01-2017 to 31-10-2019	Oliver Dingel, IAV
1263	Near Drop Neighbourhood // BMWi/AiF // 01-02-2017 to 31-10-2019	Jerome Munier, Porsche
1282	Soot Formation at DI Gasoline Engines // FVV-EM, BMWi/AiF // 01-08-2017 to 30-11-2019	Prof. Dr. Peter Prenzinger, AVL List
1283	Oil Input into Combustion // BMWi/AiF, FVV-EM // 01-08-2017 to 31-01-2020	Dr. Eike Stitterich, Hengst
1286	Wall Heat Transfer in Otto Engines // FVV-EM, CORNET // 01-09-2017 to 31-08-2019	Gabriel Dilmac, Porsche
1317	Spray Diagnostics of Gasoline E-Fuels // FVV-EM // 01-08-2018 to 31-03-2020	Dr. Eberhard Kull, Vitesco