



**OPOC**

**OPPOSED PISTON OPPOSED CYLINDERS**

**HYDROGEN COMBUSTION ENGINE**

## **OPOC | The ideal hydrogen engine for vehicles**

A new type of engine has been developed by Prof. Dr. Peter Hofbauer named as **Opposed Piston Opposed Cylinder** Engine - or short OPOC. It is a 2-stroke internal combustion engine, but with a very innovative concept that makes it possible to build very light and very energy efficient engines. To use hydrogen as fuel for the OPOC solves an old emission problem of 2-stroke engines in addition to many other advantages that makes the OPOC „the better combustion engine“.

### **1. Hydrogen as a fuel > Pollutant-free and CO2-free exhaust gas**

Conventional gasoline and diesel engines require complex catalytic systems for exhaust gas purification of toxic pollutants, which are as expensive as the engine itself. This exhaust gas cleaning increases fuel consumption and thus CO2 emissions.

### **Hydrogen as a fuel solves the emissions problem once and for all.**

The exhaust gas of the hydrogen engine contains only water vapor, residual oxygen, and non-toxic nitrogen. The possible pollutant gas nitrogen oxide can be avoided by water injection. No expensive exhaust gas purification system is needed. The exhaust gas of the hydrogen combustion engine is absolutely clean.

### **2 With noxious gas and CO2-free exhaust > light and cheap two-stroke engine possible again**

Pollutant gas- and CO2-free hydrogen combustion opens the possibility of reintroducing the high-performance, lightweight and inexpensive two-stroke engine. The two-stroke engine is no longer

installed in cars, buses, and trucks mainly because of its exhaust gases from gasoline or diesel combustion. By eliminating the gas exchange cycles, the two-stroke engine can produce almost twice as much power as a four-stroke engine.

### **3. Two-stroke engine power unit > superior hydrogen two-stroke engine = OPOC**

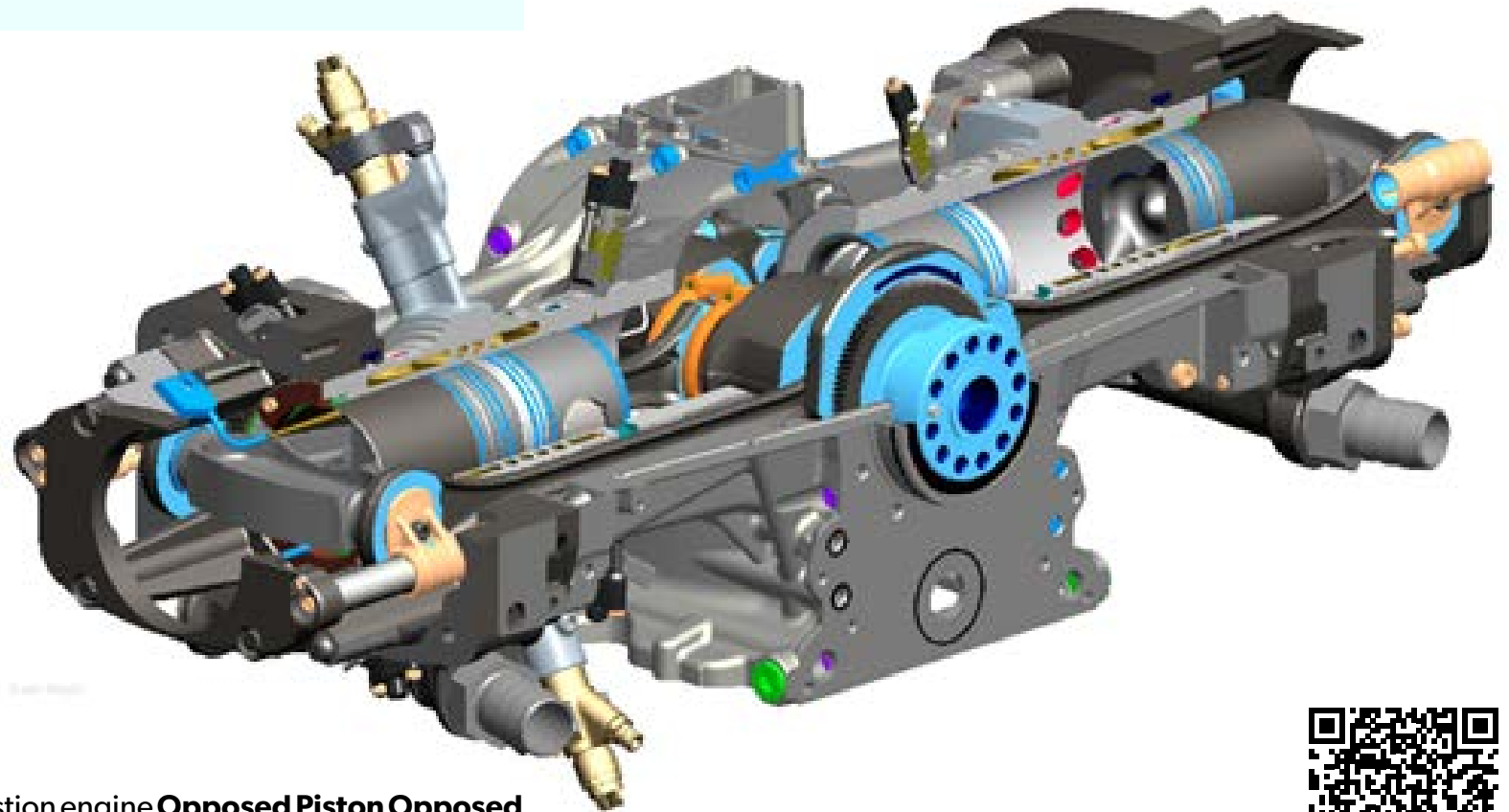
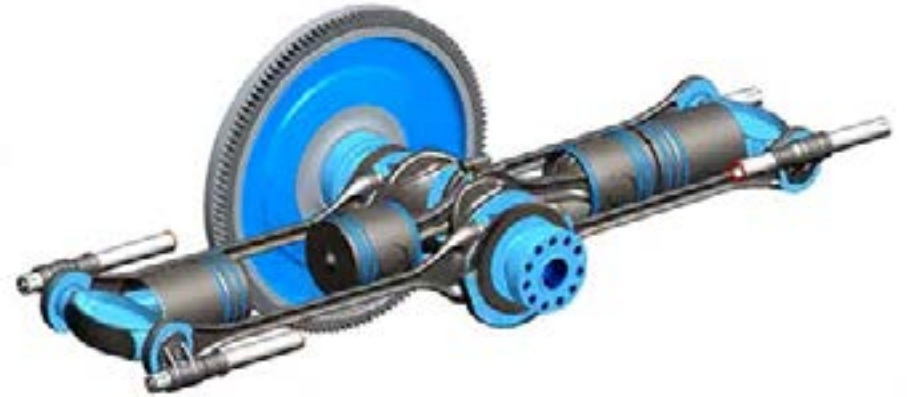
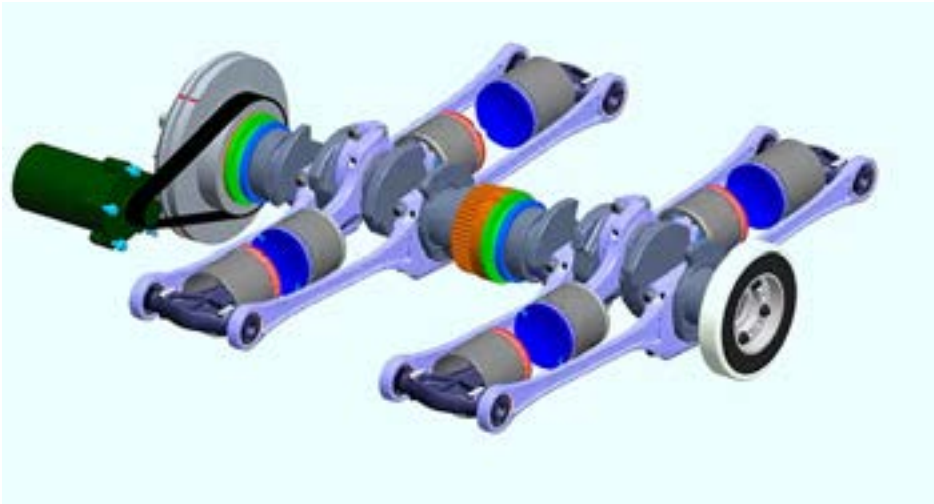
Hydrogen combustion is extremely fast with a huge increase in pressure in the cylinder. This results in loud engine noises and increased wear. Robust engines are therefore necessary. Conventional in-line and V-engines are not designed for this. But there is a technical solution that corresponds optimally to the hydrogen two-stroke engine: the OPOC (Opposed Piston Opposed Cylinder) engine.

In the OPOC engine, opposed pistons drive a central crankshaft which synchronizes them in the opposing cylinders. The two outer pistons move in opposite directions to the two inner pistons, so that the inertial forces are balanced. This results in vibration-free running. The two-cylinder OPOC module is therefore quiet and has very low friction despite the harsh hydrogen combustion. Due to the combination of low friction, low weight and two coupled modules, the hydrogen OPOC engine has the potential to halve the hydrogen consumption of the vehicle compared to conventional engines.

### **The hydrogen OPOC engine is far superior to the fuel cell drive in terms of weight, manufacturing costs and economy.**

**We see the OPOC engine due to its excellent suitability as a hydrogen engine as a completely emission-free, better alternative to electromobility**

## OPOC | The ideal hydrogen engine for vehicles



The 2-stroke internal combustion engine **Opposed Piston Opposed Cylinder** - or short OPOC, a very innovative concept that makes it possible to build very light and very energy efficient.

[See engine in motion:](#)

