

Aumet Oy has in recent years developed a valve controlled 2-stroke combustion engine, working with hydrogen as fuel. It has a very rapid high pressure gas exchange (tested with test engine) at 120-130 deg. ABDC, after the exhaust period between 30deg. BBDC-120 deg. ABDC has occurred. The intake air is at full load compressed with a turbocharger to 2.5 bar, then intercooled and then compressed to 10 bar with a piston compressor, then intercooled and led to the working cylinder, making strong turbulence there, where it mixes with the remaining 10% combustion gases. After the gas exchange the pressure in cylinder is about 10 bar and temperature about 400K. After the gas exchange about 30% water of the cylinder gas mass is injected to the cylinder between 125-140 deg. ABDC, in order to prevent the ignition of the at 135-150 deg. ABDC injected hydrogen. As the temperature in the work cylinder is low at this point and the pressure is quite high, the injected water droplets do not evaporate, but they lower the compression temperature, like oil droplets in the oil droplet cooled screw compressor. The water droplets stay liquid until the ignition has occurred with spark at 15 deg. ATDC. As the water particles do not evaporate before the combustion has already rise the temperature in the cylinder, they act as neutral particles and they don't have any effect to the ignition of the mixture. After the evaporation of the water particles, they increase the volume of the working gas at about 30%. The injected water is condensed from exhaust gases The combustion duration is about 20 deg., max. pressure 240 bar, max. temperature 1750K. BTE 60% at full load. Cr =32:1, lambda = 1,1, BMEP =47.5 bar.

Diesel - RK: &In-cylinder Parameters

