

HYENGINE *SOLUTIONS*



Where Clean meets Performance



Endurance pays.

3 Years of research and development is paying off. HyEngine Solutions nv has successfully manufactured a hydrogen powered Internal Combustion Engine (ICE) using the unique and patented technology of HyEngine nv.

The internal combustion engine will maintain its key-role in the hydrogen technology palette available today and in the future. The ICE-technology has been in use for over 200 years and is still being further enhanced. However, it is being challenged by new emission norms, regulations and the issue around the still increasing usage of non-renewable and exhaustive fuels.

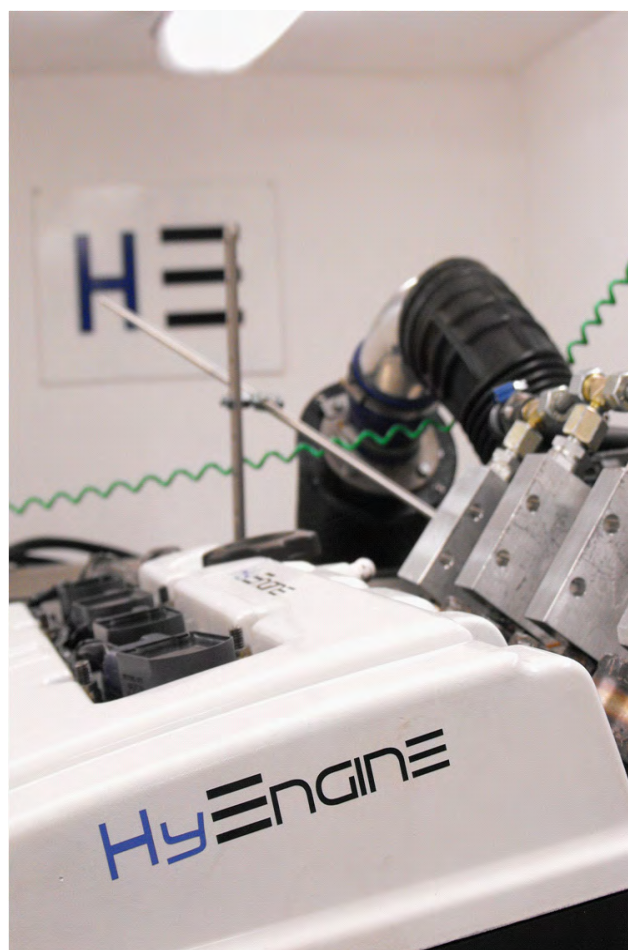
And that is exactly where HyEngine Solutions comes in. With our vast experience in Internal Combustion Engines combined with hydrogen technology we lead the path to zero-emission.

The HyEngines

For HyEngine Solutions, engines are nothing new. Why not? Because HyEngine evolved from a company specialized in Engine Management and Internal Combustion Engine optimisation.

Because the ICE does not hold any secrets for HyEngine, our team of engineers is doing everything that is necessary to provide you with the perfect applications, ready to face the future.

The result is a range of zero-emission applications whose engine performances are not likely to be matched.



200 Years of development, 13 years of experience and 3 years of innovation.

The patented technology used has been tested and approved by several universities across Europe. As a 'proof of concept', we implemented our Hy-engine into a Honda Civic EG. We have chosen this relatively old car to prove that old polluting, technology can become clean and stay efficient as well.

The Honda Civic is now the 'living proof' of our technology. By burning the separately mixed air and hydrogen, we actually make water. This means that the Civic now only exhausts steam and water on the road.

Nothing less, nothing more.





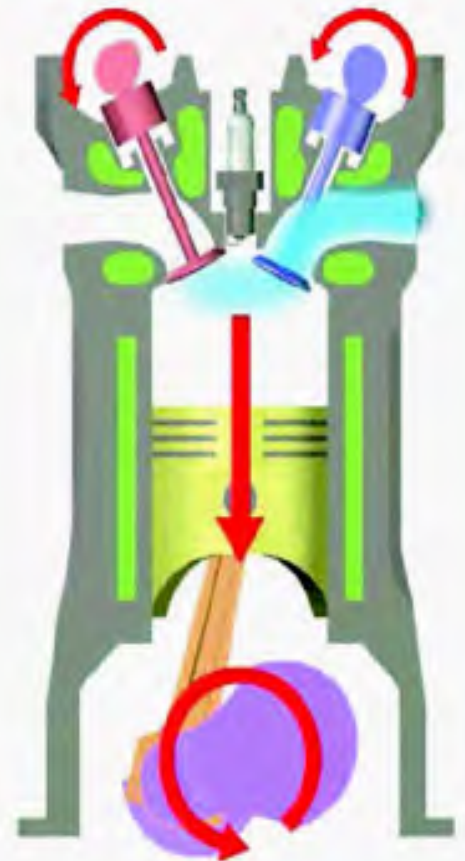
Why ICE and not Fuel Cell?

- 200 years of reliability
- Proven technology
- Easy to implement on new and existing engines
- Sustainable
- Performance
- Low maintenance
- Lower cost

What makes our technology unique is the patented design of the cylinder head. Due to a bright valve timing, hydrogen and air cannot be mixed outside the cylinder head. By doing so we fully exclude backfire.

Furthermore, we have minimal to no performance losses. We maintain the original power, and in some applications even surpass it.

***“...make water...Performance...
Nothing less, nothing more...”***



Vision

HyEngine believes in a society and future with sustainable energy. Hydrogen can be produced in various sustainable ways. It is the smallest, lightest and most common element in the universe. HyEngine believes in this source of energy for large-scale use. Besides these views, we are convinced that the internal combustion engine will continue to play an important part in many industries. The development of these engines still offers many perspectives and continues to demand a lot of attention.

HyEngine combines the energy of the future with a technology that holds great prospects, a view it shares with the European Commission. In her research on hydrogen as an energy source, the European Commission states indeed: “The use of hydrogen in combustion engines could be a significant leap towards the introduction of hydrogen.”

The combination of hydrogen and internal combustion engines meets the demand of a gradually changing society. Companies, governments and consumers are taking a growing interest in the environment and our surroundings. HyEngine joins in with these groups in an innovative and customer-oriented way, now and in the future.

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1,345 mm

Future

Hydrogen is an energy carrier and is expected to offer very sustainable, powerful and clean energy in combination with Internal Combustion Engines. A lot of countries such as Germany, Iceland, ... are already implementing a hydrogen infrastructure.

The amount of hydrogen in road transportation is, despite the developments over the past decade, still quite small. However the first commercially available hydrogen cars and busses are already available.

But there is still a lot of work to be done to integrate a fully H₂-based system. Storage possibilities, infrastructure, production, ... all have to be further developed. Several projects are being elaborated with the support of the European Commission.

Safety

Hydrogen has been used worldwide in the petrochemical industries for several decades. It has never led to severe safety risks. Even for cars, hydrogen is completely safe. Nowadays, hydrogen is mostly stored in composite tanks. However, options such as storage in cartridges is being researched as we speak.

We at HyEngine take Safety as priority number one. This is reflected in our R&D policy





Our hydrogen is currently stored inside a cylinder tank (type V074H350X8) made by Dynetek, Germany.

Our engine is completely zero emission. There are absolutely no harmful components released when burning hydrogen.



Hydrogen is the most abundant element in the entire universe. And also a perfect way to store energy. Therefore, all governments agree hydrogen will take a prominent position in the energies of the future.

How we came up with the idea is quite simple. We just thought the whole concept all over and realized that a small but bright modification of the valve timing was the only thing necessary.





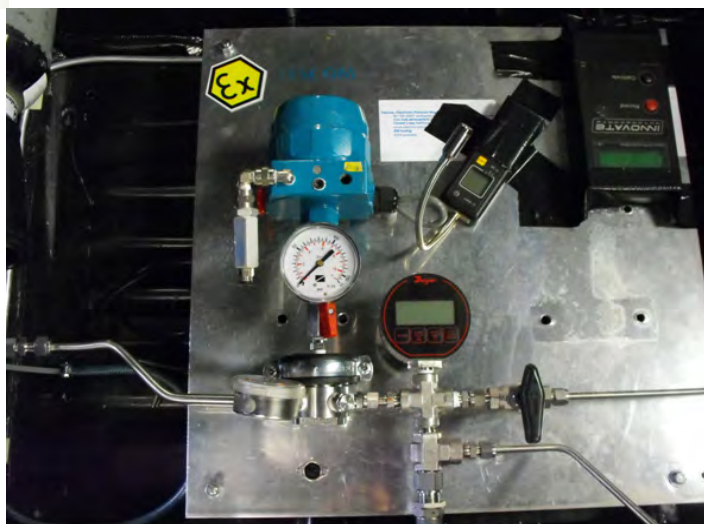
This flange optimizes the separation between air and hydrogen before entering the combustion chamber.

Because we only burn hydrogen mixed with air, the only thing we exhaust is plain water.



Our whole operating system is not so different from the conventional engine. The part we modify is the cylinder head and the infrastructure to get the hydrogen from tank to engine.

Our custom made pressure regulator is able to reduce the 300 bar pressure from our tank to just 3 bar, needed for our injection rail.



What we offer

We can implement our unique technology in all sorts of applications. Most Internal Combustion Engine can be easily converted to a highly efficient, zero emission engine with no backfire problems or performance loss.



Engines on Hydrogen

Our technology allows conversion of nearly all internal combustion engines. This means we can convert all IC engines as found in lawnmowers, karts, trucks, indoor-transportation, boats, cars, railing, industrial applications, helicopters, busses, generators, non-jet aviation, ...

Easy & carbon-free Power

Our Businesses

We are already involved in the automotive, boat, forklift, bus, indoor-transportation and kart business.

However, our team is always open for new challenges. We are eager to get involved in all motorized industries. For we believe in a solution with an absolute minimal impact on the environment.



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