# 0251 DBD Ignitor

*Arc-resistant barrier discharge ignition for high-pressure hydrogen, ammonia and lean-burn engines*

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## THE OPPORTUNITY

Hydrogen, ammonia and ultra-lean combustion require reliable ignition across demanding pressure and temperature conditions. Existing barrier discharge igniters can arc through porous ceramic at elevated pressure, damaging the insulator and interrupting useful streamer discharge.

## 1 TECHNOLOGY

A barrier discharge igniter with additional insulation between the central and ground electrodes. Silicon dioxide, corundum or related material fills ceramic interstices or forms a barrier layer, closing air paths that can trigger arc breakdown at elevated pressure.

## 2 APPLICATIONS

- Hydrogen and natural-gas lean-burn engines
- Ammonia and hydrogen-assisted ammonia engines
- Advanced ignition systems for transport and power generation

## 3 KEY BENEFITS

- Suppresses arc formation at elevated pressure
- Preserves distributed streamer discharge
- Supports non-thermal plasma ignition of difficult fuels

## EVIDENCE & DEVELOPMENT STATUS

- Stage: working prototype and UK patent application filed.
- Initial prototype produced visible streamers from 20 kV; unmodified designs arced as chamber pressure increased.
- Insulated test prototypes operated without initiation of arcing at pressures above 600 kPa; energy measurements were taken at 5 bar gauge.
- Next milestone: establish fuel mixing and evaluate hydrogen-assisted ammonia ignition with the novel ignition system.

## IP & OWNERSHIP

- IP position: UK patent application

## PARTNERSHIP SOUGHT

- Engine and ignition-system validation
- Collaborative hydrogen / ammonia testing
- Licensing and scale-up partner

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