DENSO

Twin Tip (TT) Spark Plugs

Premium OE technology
brought to the aftermarket

10th Anniversary TT SPARK PLUG 2019

Driven by Quality

Twin Tip (TT) Spark Plugs

The DENSO difference

DENSO has been setting the standard for spark plug technology since 1959. We develop all of our ranges in-house, and manufacture them in our own QS 9000 and ISO 9000 certified factories worldwide – with ‘zero-defects’ as standard. We also provide this outstanding OE quality to the aftermarket.

The patented DENSO TT Spark Plugs are manufactured using Super Ignition Plug (SIP) technology. They deliver superb reliability, lower emissions and excellent fuel economy, and offer a highly consolidated range with a limited number of part numbers.

Features & Benefits

Benefit from world class technology featured in every DENSO Twin Tip Spark Plug, bringing advanced technology to the aftermarket covering a vast majority of the top selling EU car park with its consolidated ranges.

Nickel TT | High efficiency, lower costs

DENSO's world-first patented Nickel TT Spark Plugs feature a nickel centre and 'twin' 1.5 mm diameter protruding ground electrode – achieving superb ignition efficiency without expensive precious metals.

These Nickel TT plugs are the first spark plugs with thin electrodes made without use of precious metals. They have a nickel centre and ground electrodes with a diameter of 1.5 mm, which is smaller than nickel plugs. Thanks to this feature, DENSO Nickel TT Spark Plugs demonstrate higher spark power and provide more effective ignition of air-fuel mixture.

In terms of ignition parameters, Nickel TT plugs are equal to platinum plugs and allow a reduction in fuel consumption. This is achieved through complete combustion of mixture in the cylinder while engine performance is improved.

Nickel TT

- **Fuel Efficiency**
  Excellent ignitability ensures better combustion that can ignite leaner mixtures, resulting in less misfiring than a standard plug.
- **Reduced Emissions**
  Improved ignitability leads to less combustion fluctuation, resulting in less fuel consumption and significantly reduced CO, CO_2 and HC emissions.
- **Highly Consolidated Range**
  The complete NiTT range is highly consolidated and caters for the vast majority of the top selling EU car parc.
- **Born for Cold Starts**
  A lower voltage is required to start the engine, ensuring a quicker, stronger start even in extreme cold weather conditions.

LPG and CNG converted cars

The ultimate spark plug to use in an LPG engine is the Iridium TT which meets all standard requirements. In the lower cost segment, Nickel TT is the perfect alternative for LPG engines in the place of nickel, the original fitment for petrol engines.

Igniting the air/fuel mixture for both liquid petroleum gas (LPG) and compressed natural gas (CNG) is even more difficult than with engines fuelled by petrol/gasoline. The increased difficulty is because LPG and CNG are injected as a gas whereas petrol/gasoline is injected in a liquid form. Gasses require a higher ionization voltage to create the spark than liquids. The gas also occupies more space than a liquid, so there is less space for fresh air inside the combustion chamber; this reduces the amount of air/fuel molecules around the electrodes. As a result, there is a higher chance of misfire. The higher voltage requirement to ignite LPG/CNG places a higher load on the

Iridium TT

- **Vastly Increased Endurance**
  Lifetime of 120,000 km.
- **Improved Ignitability**
  Stronger spark delivers better ignition performance.
- **Improved Output**
  Low voltage requirement and high ignitability improves combustion.
- **Reduced Emissions**
  Improved ignitability leads to less combustion fluctuation, resulting in less fuel consumption and significantly reduced CO, CO_2 and HC emissions.
- **Technologically Advanced**
  Delivers all-round optimum vehicle performance to a much wider range of OE vehicles at an affordable price.
- **Consolidated Range**
  The complete Iridium TT spark plug range is highly consolidated and caters for the majority of the top selling EU car parc.

ignition coil and on the spark plug. Therefore, in many cases, a spark plug with a smaller gap is chosen to reduce the voltage requirement, but the smaller gap then reduces ignition performance. An alternative method of reducing the loads on the coils and spark plugs is to use spark plugs with fine electrodes such as the DENSO range of iridium spark plugs that require lower voltages and therefore allow larger gaps to be retained.

In some applications, such as turbocharged engines, the gap may need to be reduced to 0.8 mm. LPG and CNG burn at a higher temperature than petrol/gasoline, which results in larger changes in electrode temperature during the different engine cycles. These larger temperature fluctuations reduce the service life of a spark plug by around 20-30%; upgrading the spark plugs to long life iridium spark plugs will improve the life of the spark plug thus reducing overall costs.

Iridium TT | Pioneering performance

Introducing the Iridium TT Spark Plug - featuring, at 0.4 mm, the world's smallest diameter centre electrode and a 0.7 mm ground electrode. This aftermarket range makes advanced OE-quality technology available to a wider range of vehicles at an affordable cost. It offers 3 times the lifetime of a nickel plug and delivers better fuel economy and all-round optimum vehicle performance.

Nickel plugs feature two flat surfaces, which block the ability of the ignition spark to grow. But DENSO's Iridium TT's two needle-thin electrodes (with the center electrode 0.2 mm smaller than the nearest rival) act as thinner 'fingers', allowing the spark to expand 360 degrees in all 3 dimensions.

This improves the ability of the air-fuel mix to ignite and, in turn, allows the spark to expand quicker and better, optimising both fuel economy and performance.

DENSO's cutting-edge technology has created a unique iridium rhodium alloy with the highest iridium ratio in the market for the center electrode as well as a bespoke platinum alloy for the ground electrode, allowing for the extended lifespan of the plug.

DENSO Twin Tip Spark Plugs

It's what's inside that counts

With the launch of Nickel TT in 2009, DENSO's innovative, TT Spark Plug technology is the outcome of years of research and development work at DENSO Japan's engineering centre, aimed at meeting the joint challenges of environmental protection and technical performance.

The TT range offers:

> Improved fuel efficiency
> Low carbon dioxide (CO_2) and hydrocarbon (HC) vehicle emissions
> Better acceleration and output
> Consolidated ranges to cover the vast majority of EU car parc
> Advanced OE-quality technology available to a wider range of vehicles at an affordable cost

DENSO Europe B.V.
Hogeweyselaan 165
1382 JL Weesp
The Netherlands

www.denso-am.eu
www.denso-am.co.uk

DETT18UK20MM
Printed in Belgium