NGK RUTHENIUM HX™

NGK Spark Plugs is introducing the latest technology in high ignitability spark plugs to the automotive aftermarket: NGK RUTHENIUM HX ™. Today's efficient engine designs create more power while using less fuel and shortens the life of traditional Iridium and Platinum spark plugs. In response, NGK's patented Ruthenium technology is used for maximum durability and performance in newer engines where more efficiency is demanded.

The NGK Difference

Patented OEM Ruthenium Technology
Addresses the advanced technology of today's modern engines by offering an Aftermarket replacement to the OE special-tip plug designs

Ruthenium HX
covers over 93% of 2005-2018 high ignitability vehicles on the road today

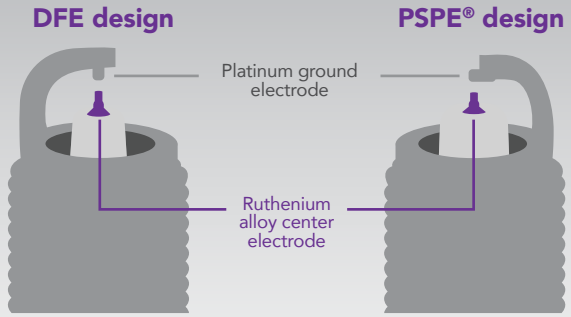
Ruthenium Alloy
Increases durability that provides the longest service life for turbo or direct injection engines

How does NGK RUTHENIUM HX™ compare to other spark plugs?

Ruthenium HX utilizes the two most advanced high ignitability spark plug tip designs offered today:

Double Fine Electrode (DFE):
maximizes ignitability while reducing emissions for low heat engines. This NGK-patented design is recommended for non-turbo applications.

Projected Square Platinum Electrode (PSPE®):
provides the best ignitability and service life for high heat engines. This NGK-patented design is recommended for turbo and supercharged engines.



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Tech Support: (877) 473-6767 ext. 2

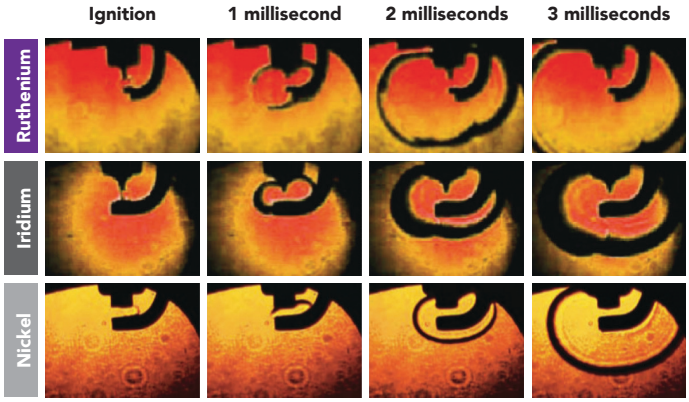
THE IGNITION SPECIALIST™

DURABILITY *Illustration B*

NGK's patented Ruthenium technology is available in our most advanced OEM designs to provide the most optimal durability at high temperatures in various driving conditions.

HIGH IGNITABILITY *Illustration C*

NGK RUTHENIUM HX™ provides more complete fuel burn than other precious metal spark plugs. The results are quicker throttle response, smoother idle and better cold starts.



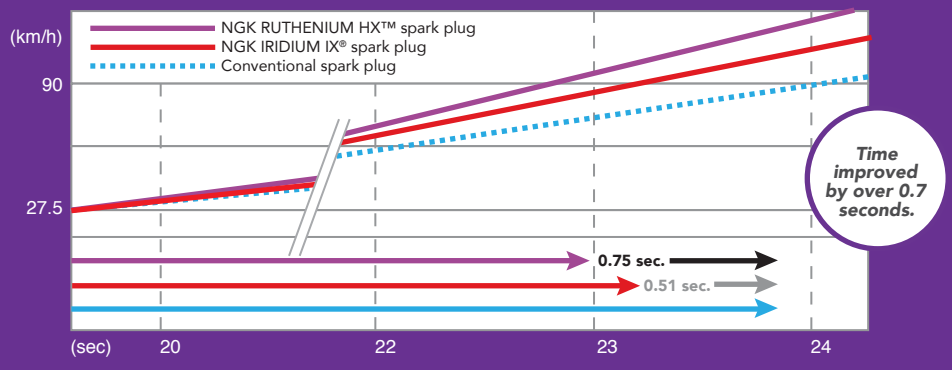
Note: Based on flame kernel growth tests comparing a NGK RUTHENIUM HX™ PSPE® design with Iridium and Nickel J-gap designs.

TESTING & MANUFACTURING

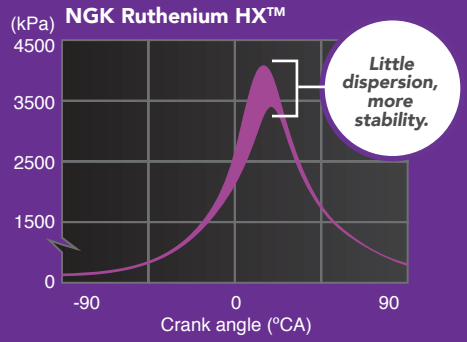
All NGK spark plugs must pass extensive testing procedures and quality checks to ensure fit and performance.

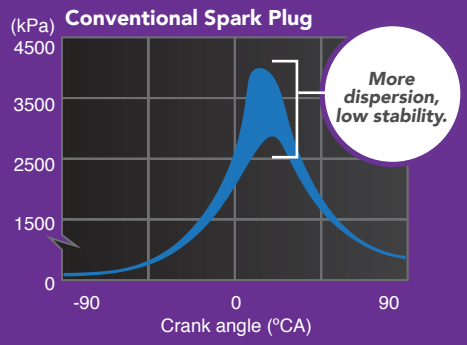
- **Combustion pressure testing to maintain stable performance** *(Diagram 1)*
- **Acceleration testing for improved acceleration performance** *(Diagram 2)*
- **Mechanical vibration testing**
- **Thermal shock testing to -40°F**
- **Tightest resistor manufacturing process in the industry**
- **Manufacturing in our ISO 11565 certified manufacturing facility**
- **Gap measurement with laser precision throughout production process**
- **Center electrodes are accurately positioned with 360° welding process**

ACCELERATION TEST *Diagram 2*



COMBUSTION PRESSURE TEST *Diagram 1*





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SS-0318-SPHX1

RUTHENIUM HX™ CROSS & CONSOLIDATE

Part Number	Stock No.	NGK OE Laser Part #	Stock No.	NGK Ruthenium HX™	Stock No.
BOSCH					
FR7DII35V	9680	DIFR6D13	94167	FR6AHX-S	94279
FR7KII35T	96304	DILKAR7B11	1406	LKAR7AHX-S	92274
FR7NII352U	96309	DILFR6J11	92491	LFR6AHX-S	94122
FR7NII35U	9615	DILFR5A11	93759	LFR5AHX	96355
FR8NII35T	96300	DILFR5A11	93759	LFR5AHX	96355
FR8NII35U	9622	DILFR5A-11D	98376	LFR6AHX-S	94122
HR8MII33V	96302	ILTR5K13	90607	LTR5AHX	90220
HR8MII33X	96301	ILTR5B11	3474	LTR5AHX	90220
VR6NII352U	96310	DILKAR7H11GS	96964	LKAR7AHX-S	92274
VR6NII35T	9683	DILKAR7B11	1406	LKAR7AHX-S	92274
VR6NII35U	9693	DILKAR7B11	1406	LKAR7AHX-S	92274
VR7TII35U	9695	DF6H-11A	94702	LKAR7AHX-S	92274
VR8NII35U	9620	DILKAR6A11	9029	LKAR6AHX	97292
YR7SII3520X	96305	DILZKR7B11GS	95710	LKR7AHX-S	96358
YR8NII35U	96323	DILKR7A11	93135	LKR7AHX-S	96358
DENSO					
DK20PR-D13	3476	DIFR6D13	94167	FR6AHX-S	94279
DXE22HCR11S	3500	DILZKR7A11DS	90074	LKR7AHX-S	96358
DXE22HQR-D11S	3492	DILKAR7G11GS	91578	LKAR7AHX-S	92274
DXU22HCR-D11S	3483	DILZKR7B11GS	95710	LKR7AHX-S	96358
FK16HQR11	3458	DILFR5A-11D	98376	LFR5AHX	96355
FK16HR11	3450	DILFR5A11	93759	LFR5AHX	96355
FK16HR-A8	3484	DILFR5A11	93759	LFR5AHX	96355
FK16R11	3440	DILFR5A11	93759	LFR5AHX	96355
FK20HBR11	3473	DFH6B-11A	6858	LFR6AHX-S	94122
FK20HBR8	3491	DFH6B-11A	6858	LFR6AHX-S	94122
FK20HR11	3426	DILFR6D11	6176	LFR6AHX-S	94122
FXE20HE11	3436	DILKAR6A11	9029	LKAR6AHX	97292
FXE20HE11C	3490	DF6H-11A	94702	LKAR6AHX	97292
FXE20HR11	3439	DILKAR6A11	9029	LKAR6AHX	97292
FXE22HR11	3442	DILKAR7B11	1406	LKAR7AHX-S	92274
FXE24HR11	3457	DF8H-11B	90174	LKAR8BHX	91784