

## MATERIALS

Proper material choice for the application is crucial to the valve performance and reliability. The extreme change of temperature to a valve in the combustion chamber area (in excess of 1600° F) and in the intake manifold area (up to -25° F), can cause "thermal fatigue". The material's ability to resist these drastic thermal variations is crucial to the valve life. This is why **Ferrea** is constantly testing and evaluating new materials and processes to provide the highest level of "fatigue resistance" in the industry. Here is the growing list of materials that we use in the production of our valves:

X3	Steel Alloy (Chromium/Silicon)	Intake Valves
Y6	Steel Alloy (Chromium/Silicon)	Heavy Duty Intake Valves
EV8	Stainless Steel (Chromium/Nickel)	Racing Intake & Exhaust Valves
EV8-Z18	Stainless Steel (Chromium/Nickel) + Tungsten	Racing Intake & Exhaust Valves
EV4-N12	Stainless Steel Hi-Temp	Turbo Intake & Exhaust Valves
VV54/EV16	Stainless Steel Hi-Temp	Racing Exhaust Valves
VV54/Nb/W	(Nickel Base + Niobium + Tungsten)	Racing Exhaust Valves
VV50	Stainless Steel Hi-Temp	Racing Exhaust Valves
IN-751	Inconel Alloy 1.800 °F	Turbo Intake & Exhaust Valves
NICKELVAC N80A	Super Alloy (Nickel Base) 1.850 °F	Racing Exhaust Valves
NIMONIC 90	Super Alloy (Nickel Base) 2.000 °F	Turbo Exhaust Valves
NICKELVAC 600	Super Alloy (Nickel/Chromium) 2.200 °F	Racing Exhaust Valves
NICKELVAC 800	Super Alloy (Nickel/Chromium) 2.400 °F	Racing Exhaust Valves (Funny Car/Top Fuel)
NIMONIC 263	Super Alloy (Nickel Base) 2600 °F	Turbo & Nitro Exhaust Valves
WASPALLOY	Super Alloy (Nickel Base) 2700 °F	Turbo & Nitro Exhaust Valves
ASTELLOY 75	Super Alloy (Nickel Base)	Turbo Exhaust Valves
PYROMET	Super Alloy (Nickel Base)	Turbo Exhaust Valves
STELLITE	(Chromium/Tungstem)	Seat & Tips Applications

## SUPER FLO vs. FLO

This illustration shows our **Super-Flo** valves (often referred to as under-cut and/or neck down), that actually reduces the stem diameter in the port area. This increases flow over "straight" stem diameter (**Flo** valves) considerably without adverse effect on reliability.

To properly establish the amount of reduction in the stem, several factors have to be considered, such as: original stem diameter, valve head thickness and diameter, valve material, engine application, etc. There is also extensive test conducted to reach the more efficient combination.

