

Nevada Thermal Spray Technologies (NTST)
NTST contact: Dominic Varacalle, 702-449-2154
NTST website: www.nevadathermalspray.com

NTST Zirconium Nitride (ZrN) Coatings

General Information:

NTST has recently developed the unique capability to fabricate zirconium nitride (i.e., ZrN) coatings. ZrN is extremely difficult to fabricate as a coating due to its tendency to sublime at high temperature (i.e., 2,980°C). It is an inorganic compound used in a variety of ways due to its properties. The compound is normally obtained through the physical vapor deposition (PVD) process which yields micron thick films, but now NTST has developed a thermal spray process that can produce coatings up to 20 mils thick.

ZrN is a hard ceramic material, which is similar to titanium nitride. Due to its properties, it is employed in many refractory applications where a high wear and corrosive environment is inherent. It is commonly used for coating industrial drill bits, automotive and aerospace components, medical devices, crucibles, and high temperature liners. Tools coated with zirconium nitride are suitable for non-ferrous metal applications such as machining of aluminum alloys, copper alloys such as brass, and titanium. It has been used as a liner for fuel tanks for rockets and aircrafts.

Figure 1 illustrates typical NTST ZrN coatings. As illustrated, experimental studies have produced coatings as thick as 20 mils. Material characterization is currently being conducted on this coating.

Figure 1.

