



Non-stoichiometric Titanium Nitride thin films (Patent no. 282370)

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Titanium nitride films are extremely important in a wide variety of applications due to its different characteristics such as



extreme hardness, abrasion resistance, high melting temperature, high corrosion resistance and electrical conductivity. The present application deals with a process for the manufacture of transparent, large band gap, high refractive index and high temperature stable non-stoichiometric titanium nitride thin films. The present invention also includes within its scope the use of titanium nitride in optical and optoelectronic devices. These films exhibit different colours such as blue, magenta, brown and golden yellow, which makes them very attractive for decorative applications including artificial jewellery, watches etc. The reflectance of these films in the visible region of the spectrum can be tuned to values close to zero, which can be extremely useful as anti-reflecting coatings. The large band gap of 3.7 to 4.5 eV is expected to make these materials applicable in thin film LEDs used for solid-state lighting. The films can be deposited on a large variety of surfaces (such as glass, quartz, silicon, stainless steel, magnesium oxide and sapphire) that are used in the microelectronic, optical, optoelectronic industries. The films are stable up to 600°C. This permits the use of these coatings in space applications also. The extreme hardness and biocompatibility of these coatings allows medical applications possible. The University is in the process of transferring technology based on this patent to M/s Advanced Process Technology, Ltd., Pune for commercialization. *Read more* (<https://herald.uohyd.ac.in/united-states-and-european-patents-for-prof-k-a-padmanabhan-and-prof-m-ghanashyam-krishna-of-uoh/>)