

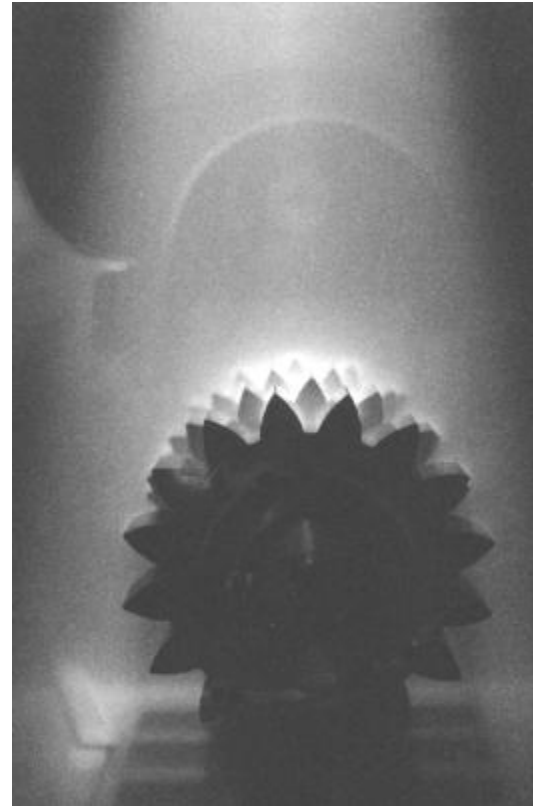
Ion Implantation

The ion implantation process has been developed to modify the surface properties of materials by using a combination of chemical and physical effects.

The material to be treated is bombarded by an intense beam of high energy ions (usually nitrogen) which penetrate the surface, resulting in the build up of a subsurface zone of highly doped and compressively stressed structure.

The doping nitrogen ions form very finely dispersed nitrides and there is consequently a substantial increase in surface hardness and wear resistance. The compressive stresses induced strongly resist crack propagation which further improves the durability of the treated surface.

Because the process does not rely on diffusion for the doping of nitrogen into the surface, (all the energy being supplied by the very high kinetic energy of the ion beam) there is no need to heat the workpiece and the process is carried out near room temperature. This means that very many materials which are not suitable for other surface enhancement techniques, such as PVD coating, can be successfully treated by Ion Implantation.



Applications

Plastic Moulding Tools and Injection Screws

Paper Slitting Tools

Precision Press Tools

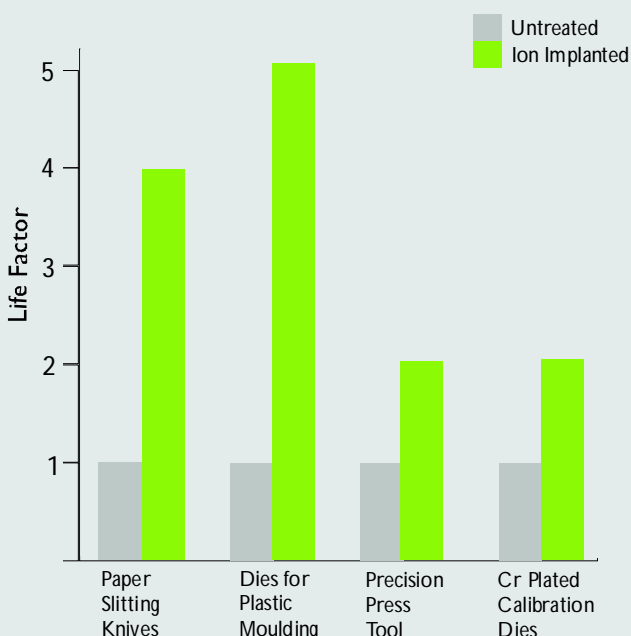
Biomedical Implants

The principal applications for nitrogen ion implantation are in the improvements of surfaces subject to medium abrasive wear. The life of plastic moulding cores, cavities, nozzles and gate pads used for glass and mineral filled materials can be improved.

Implantation into hard chromium plating can substantially enhance the life of tools such as calibration dies and precision press tools.

Typically materials, whose composition, surface finish or extreme value make them unsuitable for high temperature treatments, can be cost effectively enhanced by the II process.

Examples of Life Improvements with Nitrogen Ion Implantation



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