Process	Advantages	Disadvantages
Salt bath nitriding	• Rapid heating and processing • Ease of obtaining good nitrided layers on low carbon and low alloy steels in repeatable production	• No in-process control • Processes limited to those steels, which can be heated to higher temperatures, without losing core hardness. • Short processes only • Requires thorough washing to remove salt residues which may cause corrosion • Health hazard and waste disposal problems
Ion nitriding	• Simple, mechanical masking of surfaces to be free of nitriding • Ease of surface activation through cathodic sputtering • Low temperature processes possible • Short saturation cycles	Problems with temperature measurement and uniformity Ease of overheating if not closely monitored Results sensitive to part geometry and arrangement in furnace retort Requires highly skilled and experienced operator
Conventional gas nitriding	• Low temperature in comparison with carburizing • Simple control techniques	• Controlling parameter: (ammonia dissociation rate) inadequate for control of layer properties • In many cases process produces a brittle white layer which requires removal • Masking requires copper plating or painting with protective paste • Stainless steels require special activation techniques
Controlled gas nitriding	• Ease of operation • Controlling parameter: (nitriding potential) has direct correlation with nitrogen concentration and properties • Predictable white layer thickness and phase composition • Excellent uniformity of layer, regardless of part geometry • No finish grinding required	• Masking requires copper plating or painting with protective paste • Stainless steels require special activation techniques