dV/dT Filters

dV/dt filters provide a slower voltage rise rate on the motor terminal phase-to-phase voltage, which is particularly important when using shorter motor cables. The higher the level of inductance, the higher the voltage peaks, which can cause flashover, a condition that results in premature breakdown of the winding insulation of the connected motor.
Even in applications where motor cable length is substantial, dV/dt filters reduce the peak voltage, prolonging the life of the motor. They accomplish this by cutting off frequencies above the switching frequency. With small inductance and capacitance, dV/dt filters are a more cost-conscious solution than (but not a substitute for) sine wave filters.

- Greater motor longevity through lower dV/dt stress
- Reduced transmission of electromagnetic interference to surrounding cables and equipment

The PWM waveform is comprised of a series of square wave pulses. At the beginning of each voltage pulse, the output voltage rises very rapidly from zero (0) to the normal pulse height. The output waveform has high frequency characteristics that are associated with this very rapid voltage rise time. Spikes of high peak voltage at the motor terminals result from the combined high frequency characteristics of the PWM waveform, the motor windings and the cable that connects the motor to the drive. High voltage spikes cause dielectric stress that can lead to insulation failure. The peak voltage at the motor terminals is related to the rise time and switching frequency of the PWM waveform, the length and characteristic impedance of the motor cable, the surge impedance of the motor and other factors.