

The effects of chemical additives on the ultra violet output of MTV

Ultraviolet (UV) pyrotechnics are a specialized field with potential future defence applications to combat new threats. UV pyrotechnics involves the use of materials that emit ultraviolet light when ignited, creating unique and visually striking effects.

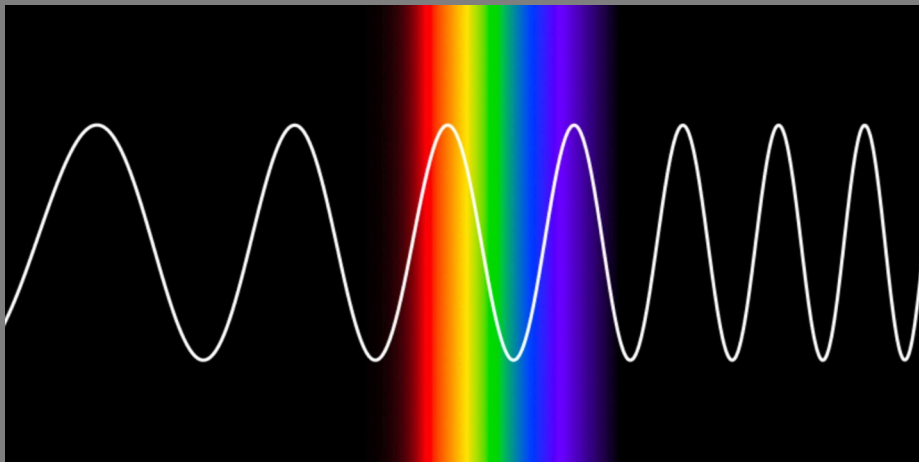
The reason for this research stems from the current threat environment that military vehicles find themselves in. Current threat systems use Infra-Red (IR) detection however, a potential future threat could arrive from the use of UV spectral imaging to identify targets were by the weapon system is using the UV signature of the target rather than the IR signature currently used.



The aim of this project is to develop a greater understanding of the UV output of Magnesium Teflon Viton (MTV) and what affect different chemical substitutions may have on this output with the ultimate goal of increasing the UV and Visible output.



- OBJECTIVES:
- Objective 1: Investigate possible alternative compounds*
 - Objective 2: Identify current UV properties of MTV*
 - Objective 3: Investigate compatibility issues*
 - Objective 4: Produce simulation of compositions*



Sodium Nitrate was the only material to show an increase over standard MTV producing a far greater blackbody curve and pushing the overall output further into the UV part of the spectrum.

This warrants further investigation and a move from modelling to small scale hazard testing and burn pot tests.

Magnalium to increase the burn temperature & rate of combustion.

Lithium Tetrafluoro aluminate to increase the visible and UV through emission lines while still maintaining the fluorine .

Sodium Nitrate for its previous use in MK45 parachute flares and its shown UV emissions in these.

Materials for composition A	Ratio by weight
Magnalium	5
Teflon	4.5
Viton A	0.5
Materials for composition B	
Magnesium	5
Lithium Tetrafluoroaluminate	4.5
Viton A	0.5
Materials for composition C	
Magnesium	5
Sodium Nitrate	4.5
Viton A	0.5
Materials for composition D	
Magnesium	5
Teflon	4.5
Viton A	0.5

