

# 1,2,4-Butanetriol (BT): Synthesis and Manufacture at Holston Army Ammunition Plant

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1,2,4-Butanetriol (BT) is the precursor to BTTN, an essential energetic plasticizer in certain propellant formulations, which is utilized in such key weapon systems as TOW, HELLFIRE, and JAVELIN. BTTN is used as a replacement for nitroglycerin in propellants due to its reduced sensitivity to stimuli and other attributes. Ongoing concerns regarding a stable manufacturing source of BT have resulted in BAE Systems Ordnance Systems developing a credible, scalable synthesis method for manufacturing the ingredient at Holston Army Ammunition Plant (HSAAP). The BT synthesis will be performed using the existing infrastructure in the Agile Manufacturing Plant at HSAAP to provide a stable, flexible production source for BT which can readily adjust to variable requirements in support of Defense applications in the future.

This paper will provide an overview of the synthetic development efforts and the proposed large-scale manufacture of BT at HSAAP. Data will be presented to summarize product attributes of BT and its successful conversion to BTTN to meet required specification parameters. Additionally, this paper will review alternate methods available for the synthesis of BT.