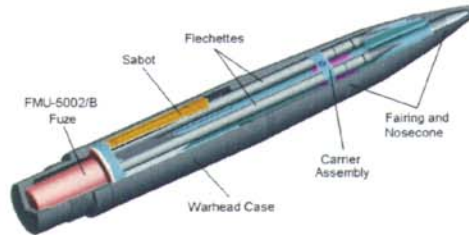




FLECHETTE ANTI-TANK WARHEAD

The WDU-5002/B Flechette Anti-Tank (FAT) warhead, for use with 2.75 inch (70mm) rockets is designed to defeat NATO-Standard Heavy Triple armour at angles of obliquity up to 40 degrees. The warhead contains five tungsten alloy flechettes which are expelled at rocket motor burnout to provide five times the hit probability of a unitary penetrator warhead.



The FAT warhead weighs 10.8 lb (4.9 kg) and is 21.0 in (53.3 cm) long. The warhead has an impact extruded aluminum case that is threaded for attachment to the rocket motor. A molded plastic fairing and phenolic nose cone enclose the payload and provide a low drag aerodynamic shape.

The payload consists of a carrier assembly containing five flechettes. Five sabots are inserted between the flechettes and the outer case. The FMU-5002/B fuze expels the payload at motor burnout.



The FAT warhead has been fully qualified and is in the inventory of the Canadian Forces

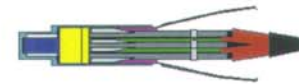
FLECHETTE DESCRIPTION



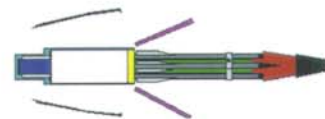
Each flechette weighs 1.5 lb (0.7 kg), has an overall length of 13.7 in (34.8 cm), a diameter of 0.50 in (1.27 cm), and a length-to-diameter ratio of 24:1. The stainless steel fin assembly and phenolic nose cone are bonded onto the high density tungsten alloy rod.

FLECHETTE SEPARATION

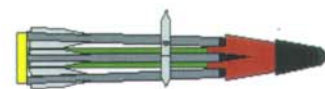
Fuze arming occurs under sustained acceleration during rocket burn. At motor burnout the fuze ignites a 4.9 g black powder charge. The pressure generated acts on the base of the carrier assembly and forces forward. The forward motion causes the fairing to split open and separate from the warhead. When the carrier assembly is completely expelled from the case, the rocket spin causes the five flechettes to pivot outward from the tail, break the retaining band, and separate from the carrier. Each flechette stabilizes and continues to fly toward the target.



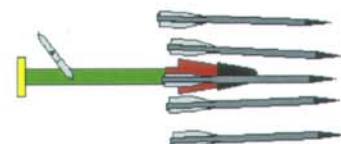
Fuze functions expelling carrier; fairing breaks open



Sabots separate from carrier as carrier exits the case



Flechette tails pivot breaking retaining band



Flechettes separate from carrier; carrier and band drop back

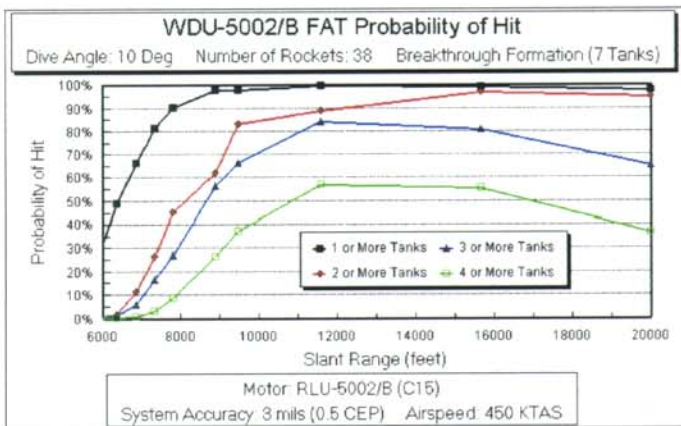
WARHEAD PERFORMANCE

The FAT warhead is designed to be fired from high speed platforms to deliver maximum penetration as depicted in the Velocity vs. Slant Range graph. A dashed line shows the predicted velocity vs. Range of the rocket and the flechettes not separated. This illustrates the advantage of expelling the flechettes at maximum burnout velocity. The flechettes lose much less velocity than a unitary warhead coupled with a burned-out rocket motor. The green line shows predicted penetration of monolithic Rolled Homogeneous Armour (RHA) as a function of slant range.

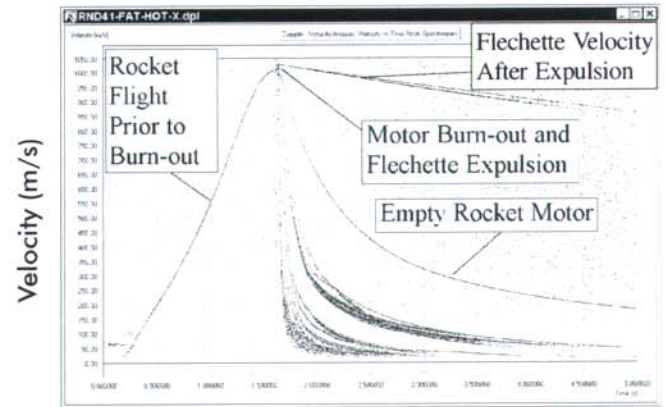
The Flechette Performance graph shows flechette velocities attained during ground launch testing of the FAT warhead. These results verify flechette separation and flight characteristics. Note that the flechettes maintained very high velocity for an extended time (upper lines on the chart).

OPERATIONAL USE

The FAT warhead can be employed as an area weapon against medium to heavy armour. A typical hit probability for a columnar formation of tanks is shown below.

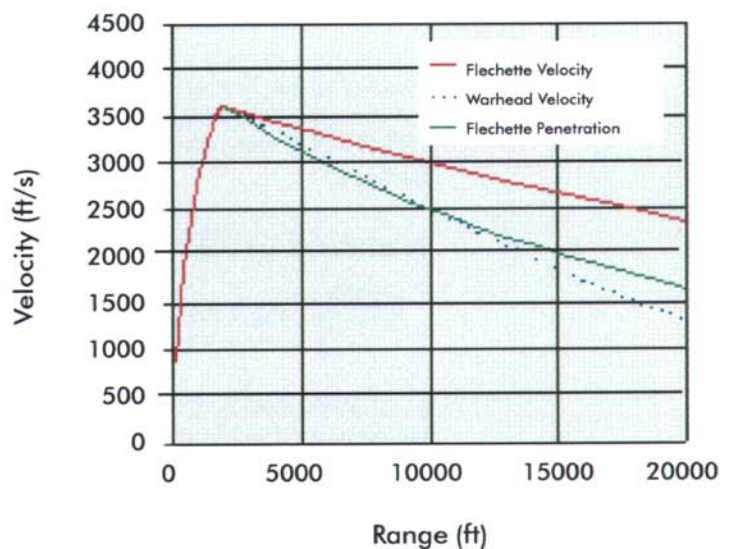


Velocity vs. Slant Range



Flechette Performance (actual results during ground launch)

FAT Warhead Velocity and Penetration vs. Range 10 Deg Dive, 450 knots, C15 Rocket Motor



For Information, contact David T. O'Connor
BRISTOL AEROSPACE LIMITED

660 Berry Street P.O. Box 874 Winnipeg Manitoba Canada R3C 2S4 Phone (204) 775-8331 Fax (204) 775-7494

Printed in Canada
 August 2002