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6 APRIL 1981**

**TECHNICAL MANUAL
DATA SHEETS
FOR
GUNS, HOWITZERS, AND MORTARS
INTEROPERABLE AMMUNITION**

HEADQUARTERS, DEPARTMENT OF THE ARMY

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 DEPARTMENT OF THE ARMY
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DATA SHEETS FOR
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 INTEROPERABLE AMMUNITION

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in the back of this manual direct to Commander, US Army Armament, Munitions and Chemical Command, ATTN: AMSMC-MAY-T (D), Dover, New Jersey 07801-5001. A reply will be furnished directly to you.

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CHAPTER 1

INTRODUCTION

1-1. GENERAL

As a result of recent agreements between the United States (US) and a number of its NATO allies, it is intended to establish the interoperability of many weapon systems and ammunition of the various countries. The goal is to enable the safe and effective firing of major types of ammunition of the same size from the same compatible size and type weapon of the NATO armies. Interoperability criteria are now required for many weapons and ammunition items in current development. Determinations are now being made to establish which ammunition is compatible with which weapons. As these are completed, ammunition items will be authorized for use in US weapons by changes to the applicable ammunition and weapons manuals. NATO nations will provide similar authorization in their manuals. Only authorized NATO ammunition will be used. Those items covered in this technical manual have been authorized. If a munitions item has not been authorized, it is because (1) it has not yet been determined to be safe to fire from a US weapon system or (2) it has been determined that the munitions item cannot be safely fired from the US weapon system.

NOTE

The interchange of munitions with NATO nations is for combined training exercise, i.e., US Army troops and NATO nation troops. At the conclusion of any training exercise, munitions drawn from NATO nation troops and not consumed (fired) are to be returned to troops of the NATO nation from whom they were obtained.

1-2. PURPOSE

This manual is a reference handbook published as an aid in planning, training, familiarization and identification of interoperable artillery ammunition.

1-3. SCOPE

a. For each item of material, there are illustrations and descriptions, together with characteristics and related data. Included in the related data are weights, dimensions, performance data, packing, shipping and storage data, type classification, and logistics control codes (LCC).

b. Information concerning supply, operation, and maintenance of the items will be found in the publications referenced for these items. A complete listing of these publications is maintained in DA PAM 310-1 index.

c. Numerical values, such as weights, dimensions, candlepower, etc., are nominal values, except when specified as maximum or minimum. Actual items may vary slightly from these values. Allowable limits can be obtained from the drawings indicated in the data sheets.

1-4. METRIC CONVERSION CHART

For approximate conversions to/from metric measures, see figure 1-1.

1-5. KEY TO COMMON ABBREVIATIONS AND SYMBOLS

AP -----	Armor piercing
APC -----	Armor piercing capped
APDS -----	Armor piercing, discarding sabot
APERS -----	Antipersonnel

AT	Antitank
BD	Base detonating
BE	Base ejection
CS	A tactical riot control agent
DS	Discarding sabot
GB	Nonpersistent toxic (casualty) nerve gas
H	Mustard gas
HD	Distilled mustard gas
HE	High explosive
HT	Mixture of HD&T
HEAT	High explosive antitank
HEAT-T-MP	High explosive antitank with tracer, multipurpose
HEDP	High explosive dual purpose
HEI	High explosive incendiary
HEP	High explosive plastic
HERA	High explosive rocket assisted
HVAP	Hypervelocity, armor piercing
HVTP	Hypervelocity, target practice

ILLUM	Illuminating
MOD	Modified
MK	Mark
MP	Multipurpose
MT	Mechanical time
MTSQ	Mechanical time and superquick
MV	Muzzle velocity
PD	Point detonating
PIBD	Point initiating, base detonating
PROX	Proximity
PWP	Plasticized white phosphorous
RAP	Rocket assisted projectile
SD	Self destroying
SQ	Superquick
T	Time fuze or for training only
-T	With tracer
TP	Target practice
TSQ	Time superquick
VX	Persistent toxic (casualty) nerve gas
WP	White phosphorous

METRIC CONVERSION CHART

Approximate Conversions to Metric Measures					
Symbol	When You Know	Multiply by	To Find	Symbol	
LENGTH					
in	inches	2.5	centimeters	cm	
ft	feet	30	centimeters	cm	
yd	yards	0.9	meters	m	
mi	miles	1.6	kilometers	km	
AREA					
in ²	square inches	6.5	square centimeters	cm ²	
ft ²	square feet	0.09	square meters	m ²	
yd ²	square yards	0.8	square meters	m ²	
mi ²	square miles	2.6	square kilometers	km ²	
	acres	0.4	hectares	ha	
WEIGHT					
oz	ounces	28	grams	g	
lb	pounds	0.45	kilograms	kg	
	short tons (2000 lb)	0.9	tonnes	t	
VOLUME					
tsp	teaspoons	5	milliliters	ml	
Tbsp	tablespoons	15	milliliters	ml	
fl oz	fluid ounces	30	milliliters	ml	
c	cups	0.24	liters	l	
pt	pints	0.47	liters	l	
qt	quarts	0.95	liters	l	
gal	gallons	3.8	liters	l	
ft ³	cubic feet	0.03	cubic meters	m ³	
yd ³	cubic yards	0.76	cubic meters	m ³	
TEMPERATURE					
Symbol	When You Know	Subtract	Multiply by	To Find	Symbol
°F	Fahrenheit	32	65	Celsius	°C

Approximate Conversions from Metric Measures					
Symbol	When You Know	Multiply by	To Find	Symbol	
LENGTH					
mm	millimeters	0.04	inches	in	
cm	centimeters	0.4	inches	in	
m	meters	3.3	feet	ft	
m	meters	1.1	yards	yd	
km	kilometers	0.6	miles	mi	
AREA					
cm ²	square centimeters	0.16	square inches	in ²	
m ²	square meters	1.2	square yards	yd ²	
km ²	square kilometers	0.4	square miles	mi ²	
ha	hectares (10,000 m ²)	2.5	acres		
WEIGHT					
g	grams	0.035	ounces	oz	
kg	kilograms	2.2	pounds	lb	
t	tonnes (1000 kg)	1.1	short tons		
VOLUME					
ml	milliliters	0.03	fluid ounces	fl oz	
l	liters	2.1	pints	pt	
l	liters	1.06	quarts	qt	
l	liters	0.26	gallons	gal	
m ³	cubic meters	35	cubic feet	ft ³	
m ³	cubic meters	1.3	cubic yards	yd ³	
TEMPERATURE					
Symbol	When You Know	Multiply by	Add	To Find	Symbol
°C	Celsius	1.8	32	Fahrenheit	°F

AR 101380-A

Figure 1-1. Metric conversion chart.

1-6. QUANTITY-DISTANCE CLASSES AND STORAGE COMPATIBILITY GROUPS

Quantity-Distance (QD) classes and Storage Compatibility groups (SCG) listed in this manual are changed. For conversion to new system see Table 1-1 below.

Table 1-1. Quantity-Distance Classes and Storage Compatibility Groups

Quantity-distance hazard class ¹		Storage compatibility group ^{1 3}
Old	New ²	Typical - New
8	6.1	
7	1.1	D
6	1.2(18)	E
5	1.2(12)	
4	1.2(08)	F
3	1.2(04)	G
2	1.3	C
1	1.4	S

NOTES:

¹New QD and SCG's are compatible with classes used by NATO nations.

²Numbers in parentheses are minimum distances x 100 feet to protect against specific fragment hazards and vary with items and types of ammunition. (Refer to TM 9-1300-206).

³There is no simple conversion from old SCG's to new system. The SCG groups listed in this column are typical for the majority of items in the corresponding listed QD class, but do not apply to every individual item in the class. For SCG of individual items, refer to TM 9-1300-206.

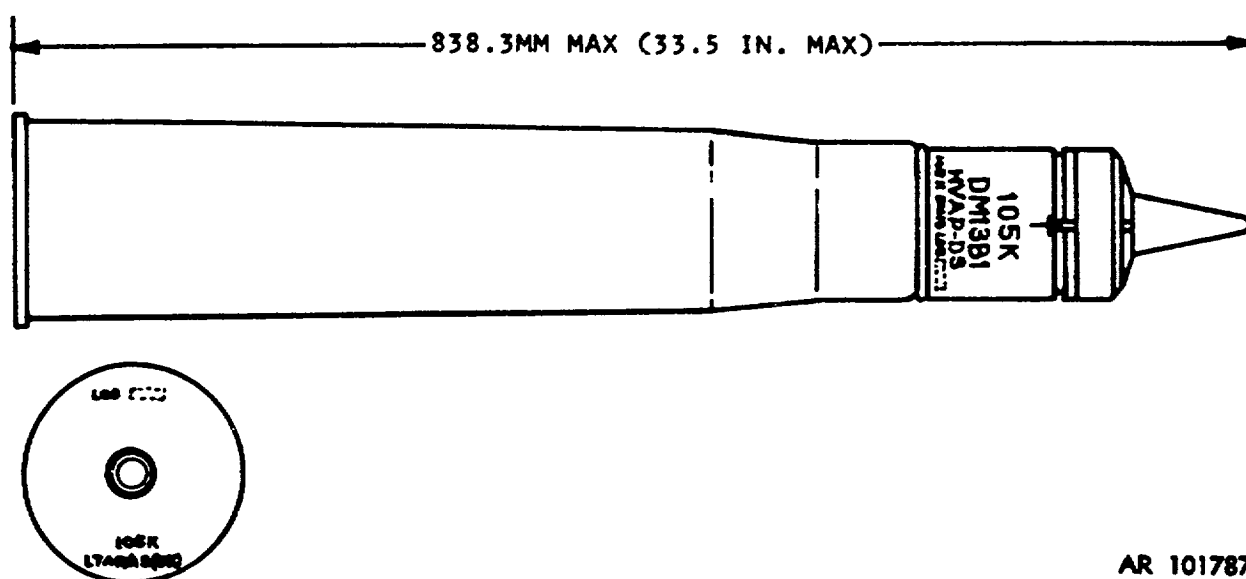
CHAPTER 2

AMMUNITION

FOR

GUNS

CARTRIDGE, 105 MILLIMETER: DM13B1, HVAP-DS (GE)



AR 101787

Use:

This cartridge is a hypervelocity armor-piercing type with discarding sabot, intended for use in 105 mm guns against armored targets.

Description:

The projectile consists of a sheathed tungsten carbide core with tracer and a sabot. The core, which is the armor-piercing element, is carried within the sheath with the sabot assembled on the exterior surface. A plastic band is positioned on the outside diameter of the

sabot at the forward end. A fiber rotating band and a rubber obturator are assembled on the outside diameter near the base of the sabot. The igniter tube of the electric primer extends almost the entire length of the propellant loosely packed in the cartridge case.

Functioning:

The electrically initiated primer ignites the propelling charge. Gases produced by the burning propellant propel the projectile from the gun and ignites the tracer which burns for a minimum of 2.5 seconds. Setback, centrifugal, and air pressure forces cause the

sabot to discard upon leaving the gun tube. The sheathed core is spin stabilized and penetrates the target solely by kinetic energy.

Tabulated Data:

Complete round:

Type ----- HVAP-DS (GE)
Weight ----- 18.55 kg (40.6 lb)
Length----- 838.3mm (33.5 in.)
Cannon used with----- 105mm M68 (US)
105mm L7A1 (GE)

Projectile:

Body material ----- Tungsten carbide core
Color----- Black with white markings

Components:

Cartridge case ----- RW-244 (UK)
Propelling charge----- NQ/M.044 (UK)
Primer ----- L1A4(UK)
Tracer ----- No. 33, MK1 (UK)

Temperature Limits:

Firing:

Upper limit----- +52°C (+125°F)

Storage:

Upper limit----- +63°C (+145°F)

Packing----- 1 round per metal container, 12 containers per pallet

Pallet:

Weight ----- 488.2 kg (1074.0 lb)
Dimensions ----- 1200 x 1000 x 910 mm
(48 x 40 x 36.4 in.)
Cube----- 1.09m³ (38.15 ft³)

Shipping and Storage Data:

Storage class/SCG ----- (08) 1.2C
DOT shipping class----- B
DOT designation----- AMMUNITION FOR CANNON WITH SOLID PROJECTILES
DODAC----- Not available

Limitations:

Not available

References:

Not available