USN 16-INCH PROJECTILE VARIANTS

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Designation	Type	BuOrd Drawing No.	Drawing Date	Weight (lbs.)	Length (in)	Length (Calibers)	Filler	Source Notes	Notes
Drill Projectile	Drill			2,240	64.00	4.00	Inert	None	Training round for the Colorado class
Drill Projectile	Drill			2,700	72.00	4.50	Inert	None	Training round for the North Carolina, South Dakota and Iowa classes
MK 1	Target	45867	24-Sep-1913	2,100	56.54	3.53	Inert	Requisition drawing	Target version of MK 2
MK 1	Target	55337	16-Jun-1917	2,100	56.54	3.53	Inert	The Tredegar Company drawing	
MK 1 Mod 1 [1]	Target	63427	18-Jun-1918	2,100	56.54	3.53	Inert	The Tredegar Company drawing	
MK 2 [2]	Armor-Piercing	50400	29-Nov-1915	2,100	56.54	3.53	50 lbs. Explosive D	Requisition drawing	Presumably for Colorado class but unsure
MK 2 Mod 1	Armor-Piercing	50926		2,100	56.82	3.55	50 lbs. Explosive D	Information from OP-4 page 122 (1923 edition)	
MK 2 Mod 2	Armor-Piercing	58839	26-Apr-1919	2,100	56.54	3.53	50 lbs. Explosive D	Crucible Steel Company drawing	
MK 2 Mod 3	Armor-Piercing	59438		2,100	56.79	3.55	50 lbs. Explosive D	Information from OP-4 page 122 (1923 edition)	
MK 2 Mod 4	Armor-Piercing	59489		2,100	56.54	3.53	50 lbs. Explosive D	Information from OP-4 page 122 (1923 edition)	
MK 2 Mod 5	Armor-Piercing	88001		2,100	56.54	3.53	50 lbs. Explosive D	Information from OP-4 page 122 (1923 edition)	
MK 2 Mod 6	Armor-Piercing	72101		2,100	57.70	3.61	50 lbs. Explosive D	Information from OP-4 page 122 (1923 edition)	
MK 2 Mod 7	Armor-Piercing	72719		2,100	56.54	3.53	50 lbs. Explosive D	Information from OP-4 page 122 (1923 edition)	
MK 3 [2 3]	Armor-Piercing	72285	7-Jan-1921	2,100	56.54	3.53	50 lbs. Explosive D	Requisition drawing	Standard round for Colorado class prewar. With a different fuze was the Army AP Mark 2 Mod 2.
MK 3 Mod 1	Armor-Piercing	73792		2,100	56.79	3.55	50 lbs. Explosive D	Information from OP-4 page 122 (1923 edition)	
MK 3 Mod 2	Armor-Piercing	73793		2,100	56.54	3.53	50 lbs. Explosive D	Information from OP-4 page 122 (1923 edition)	
MK 3 Mod 3	Armor-Piercing	73794		2,100	57.17	3.57	50 lbs. Explosive D	Information from OP-4 page 122 (1923 edition)	
MK 3 Mod 4	Armor-Piercing	88002		2,100	56.54	3.53	50 lbs. Explosive D	Information from OP-4 page 122 (1923 edition)	
MK 3 Mod 5	Armor-Piercing	98114	20-Sep-1921	2,100	56.34	3.52	50 lbs. Explosive D	The Hadfield Penfield Steel Company drawing	
MK 4	Target	72276	2-Mar-1921	2,100	56.54	3.53	Inert	Requisition drawing	Target version of MK 3
MK 4 Mod 1	Target	74549	18-Jun-1918	2,100	56.54	3.53	Inert	The Tredegar Company drawing	
MK 5	AP with Dye Load	227537	6-Dec-1938	2,240	64.00	4.00	33.6 lbs. Explosive D	Requisition drawing	Heavier round developed for Colorado class. With a different fuze was the Army AP MK 12.
MK 5 Mod 1	AP with Dye Load	264177	27-Jan-1939	2,240	64.00	4.00	33.6 lbs. Explosive D	Crucible Steel Company drawing	
MK 5 Mod 2 [4]	AP with Dye Load			2,240	64.00	4.00	34.0 lbs. Explosive D	Information from OP 1664 page 63 (1947 edition)	
MK 5 Mod 3 [4]	AP with Dye Load			2,240	64.00	4.00	34.0 lbs. Explosive D	Information from OP 1664 page 63 (1947 edition)	
MK 5 Mod 4 [4]	AP with Dye Load			2,240	64.00	4.00	34.0 lbs. Explosive D	Information from OP 1664 page 63 (1947 edition)	
MK 5 Mod 5 [4]	AP with Dye Load			2,240	64.00	4.00	34.0 lbs. Explosive D	Information from OP 1664 page 63 (1947 edition)	
MK 5 Mod 6	AP with Dye Load			2,240	64.00	4.00	34.0 lbs. Explosive D	Information from OP 1664 page 63 (1947 edition)	Mod 6 was a modified MK 12 (Army use) with a special base-plug adaptor
MK 6	Target	227562	14-Jan-1939	2,240	64.00	4.00	Inert	Requisition drawing	Target version of AP MK 5 without dye
MK 6 Mod 1 [3]	Target			2,240	64.00	4.00	Inert	Information from OP 1664 page 65 (1947 edition)	
MK 6 Mod 2	Target	561712	14-Mar-1945	2,240	64.00	4.00	Inert	The Tredegar Company drawing	
MK 7	Target with Dye Load	199146	8-Feb-1943	2,240	64.00	4.00	Inert	Requisition drawing	Target version of AP MK 5 with dye
MK 8	AP with Dye Load	267894	26-Jun-1939	2,700	72.00	4.50	40.9 lbs. Explosive D	Requisition drawing	Standard AP Round for the fast battleships of the North Carolina, South Dakota and Iowa classes
MK 8 Mod 1	AP with Dye Load	267764	21-Aug-1939	2,700	72.00	4.50	40.9 lbs. Explosive D	Crucible Steel Company drawing	
MK 8 Mod 2	AP with Dye Load	267651	2-Oct-1939	2,700	72.00	4.50	40.9 lbs. Explosive D	Bethlehem Steel Company drawing	
MK 8 Mod 3	AP with Dye Load	272668	29-Dec-1939	2,700	72.00	4.50	40.9 lbs. Explosive D	Midvale Steel Company drawing	
MK 8 Mod 4 [4]	AP with Dye Load			2,700	72.00	4.50	40.9 lbs. Explosive D	Information from OP 1664 page 63 (1947 edition)	
MK 8 Mod 5	AP with Dye Load	300715	14-Nov-1941	2,700	72.00	4.50	40.9 lbs. Explosive D	Bethlehem Steel Company drawing	
MK 8 Mod 6	AP with Dye Load	422536	1-Jan-1944	2,700	72.00	4.50	40.9 lbs. Explosive D	Bethlehem Steel Company drawing	Mod 6 had such better armor penetration that all earlier Mods were withdrawn from service
MK 8 Mod 7	AP with Dye Load	562197	3-Jul-1945	2,700	72.00	4.50	40.9 lbs. Explosive D	Crucible Steel Company drawing	
MK 8 Mod 8	AP with Dye Load	562919	21-Dec-1945	2,700	72.00	4.50	40.9 lbs. Explosive D	Midvale Steel Company drawing	Compared to earlier Mods, the Mod 8 had a heavier cap, blunter nose and harder body from improved heat treating techniques
MK 9	Target	204207	15-Sep-1937	2,700	72.00	4.50	Inert	Requisition drawing	Target version of MK 8 without dye
MK 9 Mod 1	Target	273160	24-Jan-1940	2,700	72.00	4.50	Inert	The Tredegar Company drawing	
MK 9 Mod 2	Target	327920	11-Jan-1942	2,700	72.00	4.50	Inert	The Tredegar Company drawing	
MK 10	Target with Dye Load	267823	8-Feb-1943	2,700	72.00	4.50	Inert	Requisition drawing	Target version of MK 8 with dye
MK 11								No records found for this variant	
MK 12 Mod	Armor-Piercing	32792_	3-Mar-1942	2,240	64.00	4.00	33.6 lbs. Explosive D	Bethlehem Steel Company drawing. Navy projectile made for Army use (from Steve Skelley). Drawing number and Mod number not fully legible.	Made for Army use. Possibly incorrectly labeled MK 5.
MK 13	HC			1,900	64.00	4.00	153.6 lbs. Explosive D	No records found for this variant	Standard HC round for all 16" battleships
MK 13 Mod 1	HC	329793	21-Sep-1942	1,900	64.00	4.00	153.6 lbs. Explosive D	Bethlehem Steel Company drawing	Mod 1 was originally designated as EX-1
MK 13 Mod 2	HC	394294	27-Aug-1943	1,900	64.00	4.00	153.6 lbs. Explosive D	Bethlehem Steel Company drawing	
MK 13 Mod 3	HC	423082	11-Feb-1944	1,900	64.00	4.00	153.6 lbs. Explosive D	Crucible Steel Company drawing	
MK 13 Mod 4	HC	438189	4-Jul-1944	1,900	64.00	4.00	153.6 lbs. Explosive D	United Engineering & Foundry Co. drawing	
MK 13 Mod 5	HC	438245	25-Jul-1944	1,900	64.00	4.00	153.6 lbs. Explosive D	Blaw Knox Co. drawing	
MK 13 Mod 6	HC	439885	10-Nov-1944	1,900	64.00	4.00	153.6 lbs. Explosive D	Joshua Hendy Iron Works drawing	
MK 14	HC	440559	16-May-1945	1,900	64.00	4.00	153.6 lbs. Explosive D	Requisition drawing	MK 13 manufactured at least by the Naval Surface Warfare Center at Crane, Indiana, may also have been made by other contractors
MK 15	Target	561949	9-Nov-1945	1,900	64.00	4.00	Inert	Requisition drawing	Target Version of MK 13
MK 16	Target	562199	9-Nov-1945	2,240	64.00	4.00	Inert	Requisition drawing	Target Version of MK 5
MK 17	Target	562200	9-Nov-1945	2,700	72.00	4.50	Inert	Requisition drawing	MK 9 with two piece windscreen
MK 18	Target with Dye Load	563250	17-Mar-1947	2,700	72.00	4.50	Inert	Requisition drawing	Target with dye load made from MK 8 Mods 1-5
MK 18 Mod 1	Target with Dye Load	563699	29-May-1947	2,700	72.00	4.50	Inert	Requisition drawing	
MK 19	ICM		abt. 1967	1,880	63.60	3.98	400 GP, M43A1 submunitions	Sources as documented on NavWeaps [5]	Modified MK 13 cargo projectile with Army M565 Mechanical Time Fuze
N/A [6]	HE		abt. 1967	602	52.43	4.77	101.7 lbs. + 0.3 lbs. TNT	Sources as documented on NavWeaps	U.S. Army 280mm HE with Sabot and Obdurator
Drill Projectile	Drill		15-Oct-1956	1,900	64.00	4.00	Inert	Sources as documented on NavWeaps	Training round for Nuclear MK 23
MK 23 [7]	Nuclear		15-Oct-1956	1,900	64.00	4.00	W23 Warhead (15-20kt)	Sources as documented on NavWeaps	MK 13 modified with nuclear warhead
MK 24 [8]	Target		15-Oct-1956	1,900	64.00	4.00	Inert	Sources as documented on NavWeaps	Target version of MK 23
MK 139 [9]	AP with Dye Load		abt. 1981	2,700	72.00	4.50	40.9 lbs. Explosive D	See MK 8	MK 8 Mods 6-8 redesignated in the 1980s
MK 140	HC		abt. 1981	1,900	64.00	4.00	153.6 lbs. Explosive D	See MK 13	MK 13/14 redesignated in the 1980s
MK 141	Target		abt. 1981	1,900	64.00	4.00	Inert	See MK 15	Target version of MK 140
MK 142								No records found for this variant	As an educated guess, "MK 142" may have been reserved for redesignating Target MKs 9, 10, 17 and 18
MK 143	HE-CVT		abt. 1984	1,900	64.00	4.00	153.6 lbs. Explosive D	See MK 13	MK 13 using Army M732 Controlled Variable Time nose Fuze
MK 143 Mod 1	HE-CVT		abt. 1984	1,900	64.00	4.00	153.6 lbs. Explosive D	See MK 13	
MK 144	ICM		abt. 1984	1,880	63.60	3.98	400 GP, M43A1 submunitions	Sources as documented on NavWeaps	Reconditioned or newly converted MK 19 using Army M724 Electronic Time Fuze
MK 145	HE-ET/PT		abt. 1986	1,900	64.00	4.00	153.6 lbs. Explosive D	See MK 13	MK 13 with Mark 423 Point Detonating nose fuze and Mark 48 Mod 4 base fuze. Some of these shells were modified to have an ASW function, details unknown.
MK 145 Mod 1	HE-ET/PT		abt. 1986	1,900	64.00	4.00	153.6 lbs. Explosive D	See MK 13	
MK 145 Mod 2	HE-ET/PT		abt. 1986	1,900	64.00	4.00	153.6 lbs. Explosive D	See MK 13	
MK 145 Mod 3	HE-ET/PT		abt. 1986	1,900	64.00	4.00	153.6 lbs. Explosive D	See MK 13	
MK 146	ICM		abt. 1988	1,900	64.00	4.00	666 M42, M46, and M77 submunitions	Sources as documented on NavWeaps	Improved cargo projectile using Army M724 Electronic Time Fuze
MK 146 Mod 1	ICM		abt. 1988	1,900	64.00	4.00	666 M42, M46, and M77 submunitions	Sources as documented on NavWeaps	Unknown modification of MK 146 Mod 0
MK 146 Mod 2	ICM		abt. 1988	1,900	64.00	4.00	666 M42, M46, and M77 submunitions	Sources as documented on NavWeaps	Differed from Mod 1 by having a threaded base plug to simplify renovation
MK 147(?)	HC		abt. 1986	2,240	72.00	4.50	~207.2 lbs. Composition A-3	Sources as documented on NavWeaps	Experimental 4.5 Caliber HC known as "2,240-lb. Extended Range Projectile"
MK 148	HE-ER		abt. 1988	1,300 [10]	72.00	4.50	300 M46 submunitions	Sources as documented on NavWeaps	Experimental 13.65" sub-caliber cargo round w/sabot

Abbreviations
AP = Armor Piercing
HC = High Capacity
HE = High Explosive
HE-ER = High Explosive, Extended Range
HE-ET/PT = High Explosive with Electronic Time and Point Detonating Fuzes
ICM = Improved Conventional Munition
CVT = Controlled Variable Time Fuze

Notes:
1) Many Mod Numbers were assigned to indicate a contractor (manufacturer) other than the Naval Gun Factory; they do not necessarily represent a design change.
2) The Requisition drawings for the MK 2 and MK 3 did not include the AP Cap and windshield. Contractors were responsibe for the design of these as long as they met the requirements of the Requisition drawing.
3) In the mid-1920s, the USN increased the compression (density) used for packing Explosive D bursters into shell bodies. This change raised the burster weight of all Mark 3 Mods to 57.5 lbs. and together with other changes raised their overall shell weight to 2,110 lbs. Information from OP 1664 page 63 (1947 edition) and "Powder and Propellants (2nd Edition)" by Rodney Carlisle pages 74-75.
4) These Mod numbers are known to indicate contractor builds, but which ones is unknown at the present time.
5) Primary and Secondary Sources as shown at http://www.navweaps.com/Weapons/WNUS_16-50_mk7.php#Sources.
6) Conversion of left-over U.S. Army 280mm HE rounds originally made for the "Atomic Annie" M65 cannon. These projectiles were given a sabot and oburator so as to fit in a 16" barrel. Results with test shots were promising, but the sudden deactivation of USS New Jersey (BB-62) in 1969 halted the project.
7) The MK 23 designation is in the Nuclear Weapon designation series, not the USN 16" designation series.
8) The MK 24 designation is unique and seems to be an effort to keep this Target designation together with the MK 23 Nuclear Project, as this designation is not in either the Nuclear Weapon designation series nor in the Naval 16" Projectile designation series.
9) The MK 139 - 148 series were either redesignated 1940s shells or new and modified designs developed during the 1980s.
10) Weight with Sabot. Fly-away weight about 1,000 lbs.

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