INTELLIGENCE REPORT

ON

JAPANESE CHEMICAL WARFARE

Volume V

Part G

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EQUIPMENT AND MATERIEL

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E.) PYROTECHNICS AND CHEMICAL ORDNANCE

This section covers small munitions not included under other seperate headings. The specific items include smoke candles and generators, tear gas candles and sticks, ground and aircraft flares and a miscellany of incendiary items. Some of the items are out of the Chemical Warefare field, however are related to many of the Chemical Warfare Service developments and are included for this reason.

The Japanese apparently devoted a considerable effort in this field as shown by the vast number of items resulting from the work. Once again a lack of standardization is noted.

In handling these items caution must be exercised despite the relative small explosive charges contained. Being pyrotechnics these items are fire hazards.

1.) CANDLES, CONTAINERS AND STICKS

Do to a lack of a defenite terminology consistent with the Japanese system of naming, most of the smoke munitions have been termed candles if the means of ignition was with a scratcher block. The small candles have been included in the table heading Japanese Smoke Candle. Photographs are included to illustrate each of these items. Larger type candles are reported separately.

Most of the small candles are used for signalling purposes. A variety of colors including red, green, blue, yellow, black and white are included. The color values are for the most, inferior to U.S. colored smokes. These candles are contained in very thin sheet metal cylinders, have lid over the scratcher block igniters secured by adhesive tape. This method of ignition appears faulty as the igniters are susceptible to moisture. Performance test shows many of the candles to be duds.

The markings on these items very considerably. In most cases labels give the nomenclature, directions for use and date and name of manufacture. In some cases color of smoke was indicated by color of candle body, in others by the band about the body of the candle.

There are a few tear gas munitions included in this section designated by a variety of names. In this field these are almost as many types of ignition and differences of design as there are items.

In a few cases the Japanese were striving for dual effect. Munitions designated "Special Smoke", contain vomiting gas as well as harmless smoke agent.

In the few cases where type number is given in the nomenclature, the last one or two digits of the empire year is used. For example 1939 is type 99, 1942 is type 2. Mark numbers are some times used however it is not known what they represent. Model and modification numbers are often used. These indicate variations of a basic design, model being the more drastic change.

General Description: The candles listed in the following table have characteristics that are common to all. The containers are made of practically the same thickness sheet metal. All candles are equipped with the match-scratcher igniter. The scratcher blocks are found in the top of each candle which is covered with a lid that is secured by a piece of adhesive tape. The igniters have a delay of 2-5 seconds.

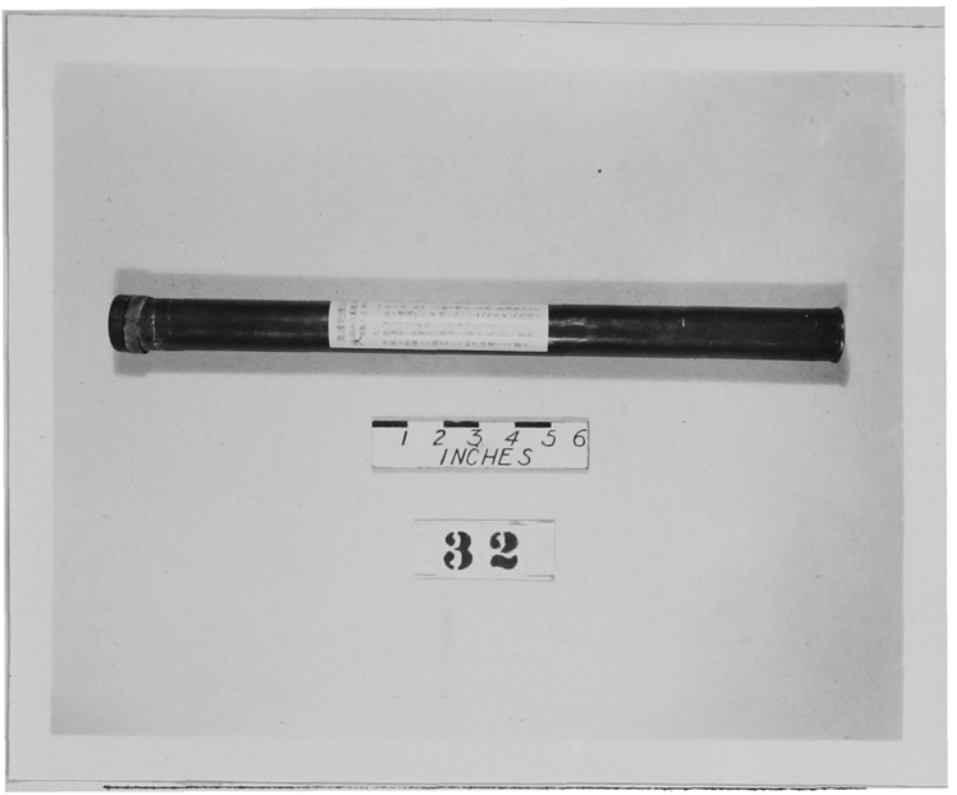
An actual test of the burning time and the effiency of the candles was conducted on those that were available

Following the table there are photographs of the different candles.

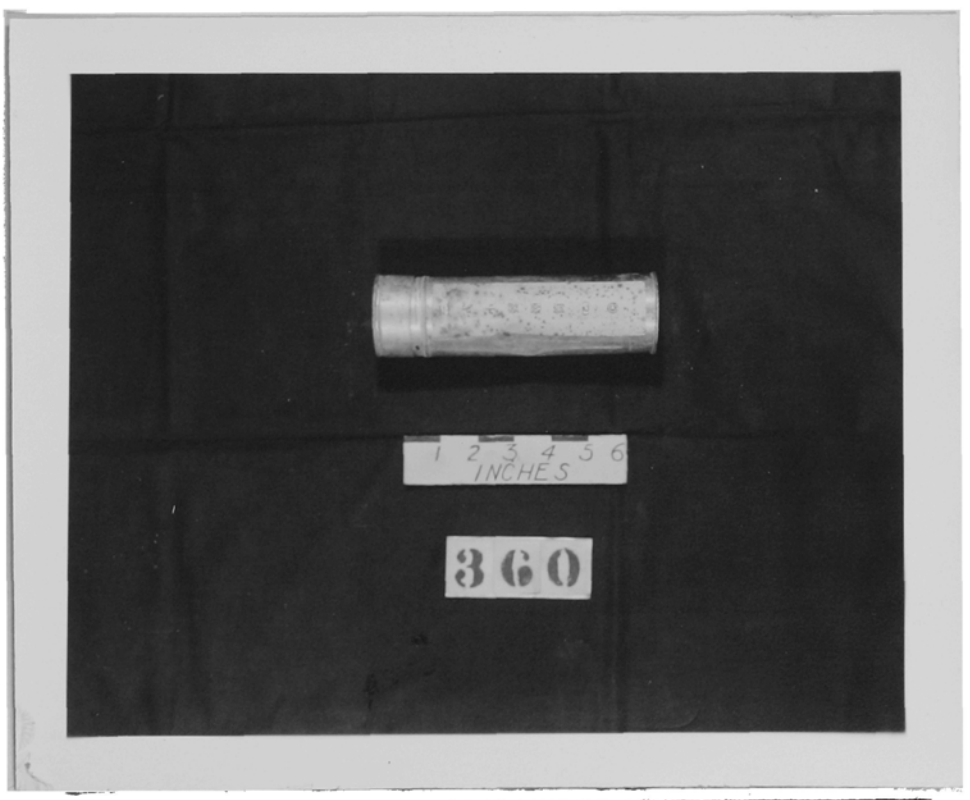
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CANDLES, SMOKE, JAPANESE

ITEM NO.	NOMENCLATURE	LENGTH INCHES	DIAMETER INCHES	WEIGHT POUNDS	COLOR & MARKINGS	REMARKS
32	Candle, Smoke, Type 97, Light	20	1.5	2.19	Blue with white label	Burns 16 min., in spurts, disperses rapidly, very poor screening smoke.
360	Candle, Smoke, Type 3B, Small	7 3/8	1.5	1.70	Unpainted Metal, White label	Burns 3 min, white very thick smoke, Good for screening purposes.
361	Candle, Smoke, MK 2, White	7 1/8	1.5	0.47	Blue, White label	Burns 3 min., White Smoke.
536R	Candle, Smoke, Type 1, Model 1, White	10	2 1/8	3.19	White, Yellow labels	Burns 1 min., White, Fuse hole only port.
536B	Candle, Smoke, Type 1, Model 1, Yellow	10	2 1/8	3.08	Yellow, Yellow labels	Burns 4.5 min., Yellow, Fuse hole only port.
536C	Candle, Smoke, Type 1, Model 1, Red	10	2 1/8	1.08	Red, Yellow labels	Burns 1.5 min., Bright red, turns pink Fuse hole only port.
536D	Candle, Smoke, Type 1, Model 1, Blue	10	2 1/8	1.78	Green, Yellow labels	Only one tested was a dud.
595	Candle, Smoke, Rev. 3, White	2 3/4	2 1/8	0.74	Brass, White label	Burning time unknown.
612A	Candle, Smoke, Large, Model , Green	7 1/8	2 1/8	0.35	Blue, White label, Green Band	Burns 1 min., Blue smoke, 4 ports.
612B	Candle, Smoke, Large, Model, Red	7 1/8	2 1/8	0.39	Blue, White label, Red Band	Burns 1 min., Red Smoke, 4 ports.
612C	Candle, Smoke, Large Model, Yellow	7 1/8	2 1/8	0.39	Blue, White label, Yellow Band	Burns 1 min., Canary Yellow smoke 4 ports.
617	Candle, Smoke, Self-Projecting	8	2 1/8	2.95	Olive Drab, Gray Stripe, White labels.	Burning time unknown.
619	Candle, Smoke, 1 Kg Rev. 5	2 3/4	2 1/8	0.55	Brass, White label	Burning time unknown.
624A	Candle, Smoke, Red	4 3/4	2 1/8	0.48	Red, White label	Burns 2 min., Brilliant Red, 8side ports.
624B	Candle, Smoke, Blue	4 3/4	2 1/8	0.54	Blue, White label	Burns 1/2 min., Bright Blue, 3 side ports.
624C	Candle, Smoke, Blue (1932)	4 5/8	2 1/8	0.48	Blue, White label	One candle tested, was a dud.
625	Candle, Smoke, Black	5	1.5	0.43	Unpainted, covered with White & Green checked paper	Burning time unknown.
631	Candle, Smoke, Experimental, Signal, White	10	2 1/8	2.81	White, Yellow labels	Burning time unknown.

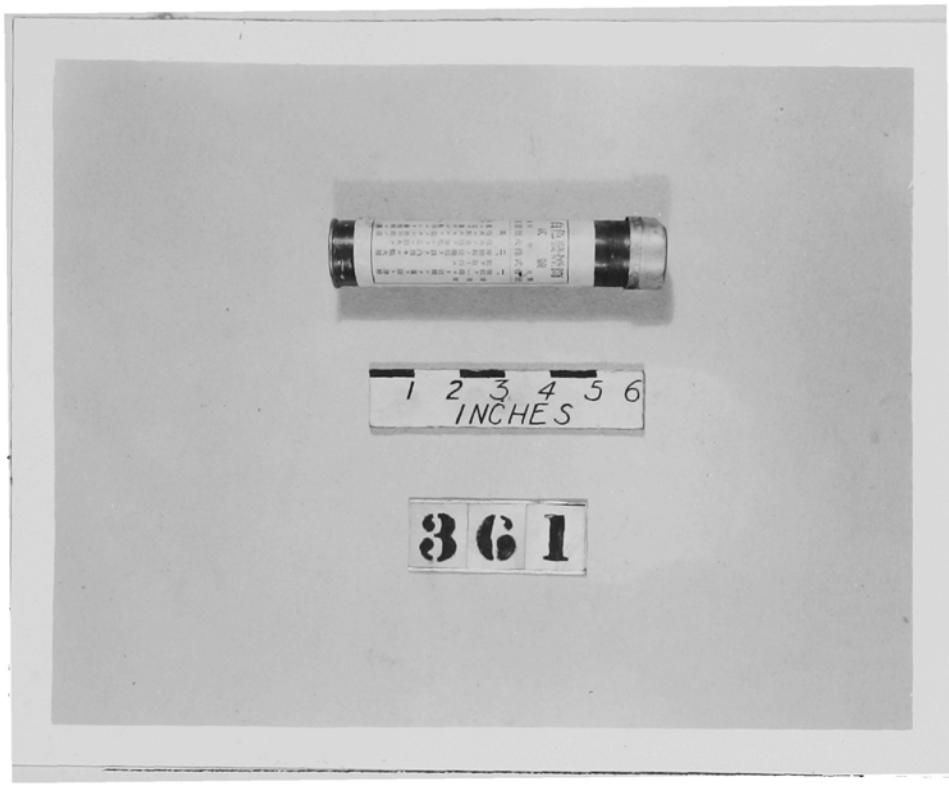


32-CANDLE, SMOKE, TYPE 97, LIGHT

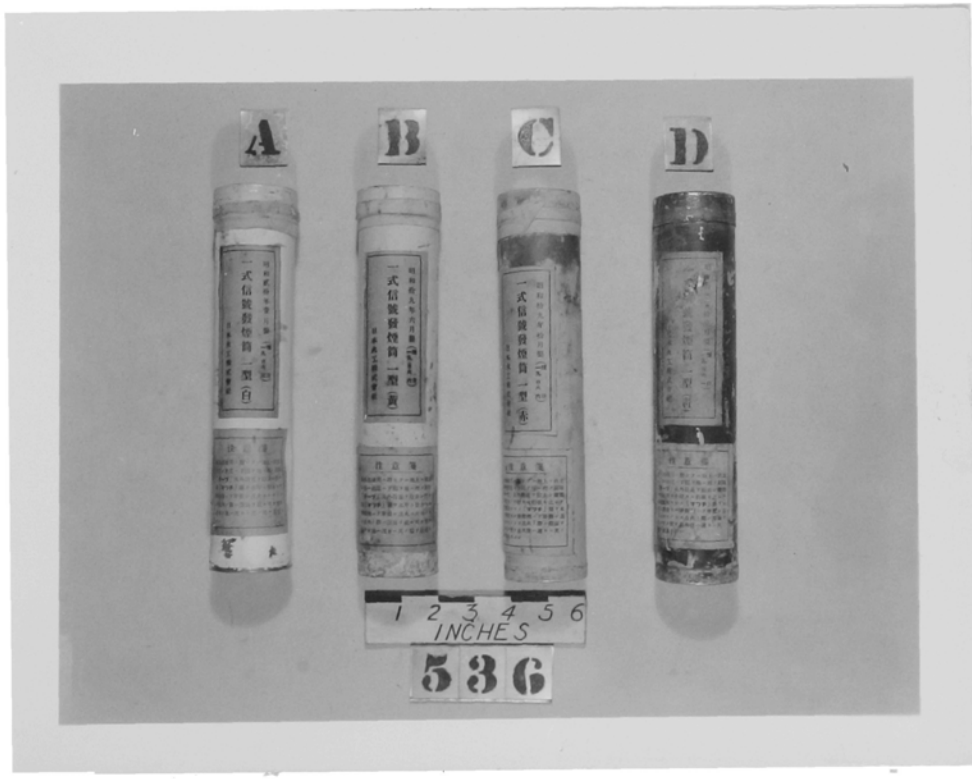


360-CANDLE, SMOKE, TYPE 3B, SMALL

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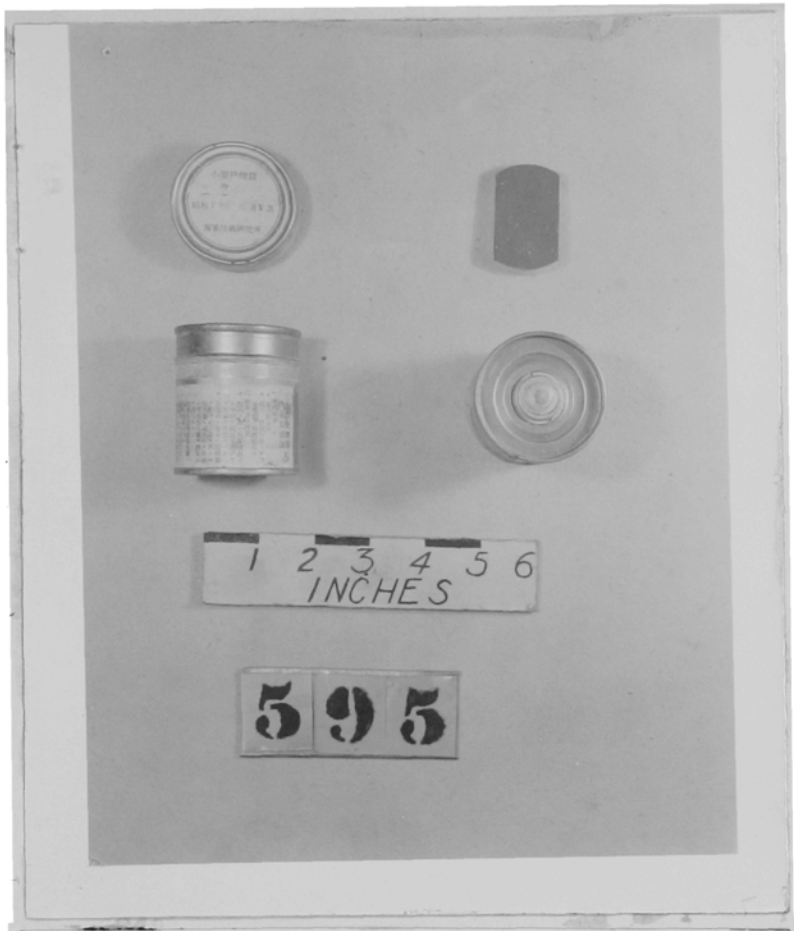


361-CANDLE, SMOKE, Mk2, WHITE



536A, 536B, 536C, 536D, Candle, Smoke, Type 1, Model 1
White Yellow Red Blue

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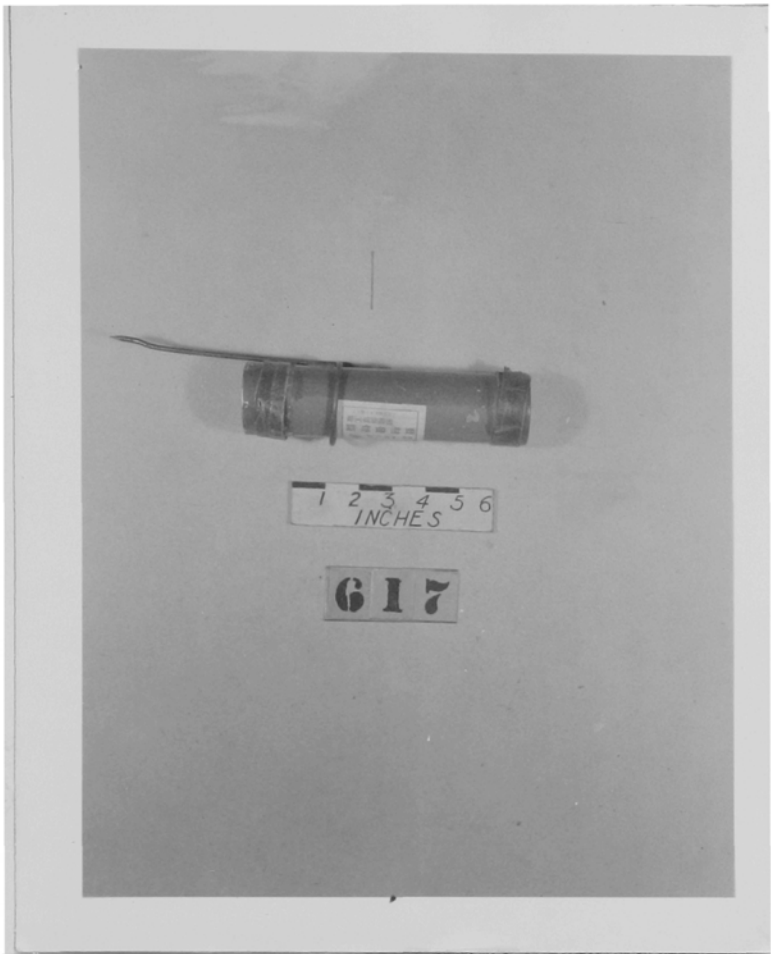
595-CANDLE, SMOKE, Rev.3, WHITE



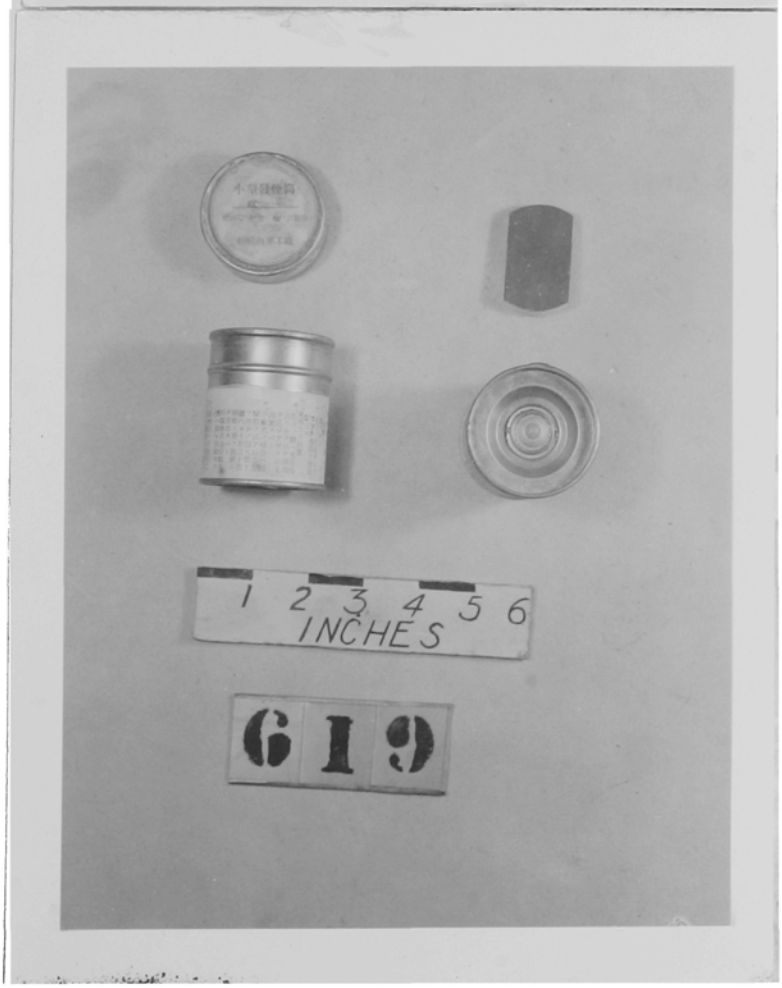
CANDLE, SMOKE, LARGE MODEL

612A -- Green (left)
612B -- Red (center)
612C -- Yellow (right)

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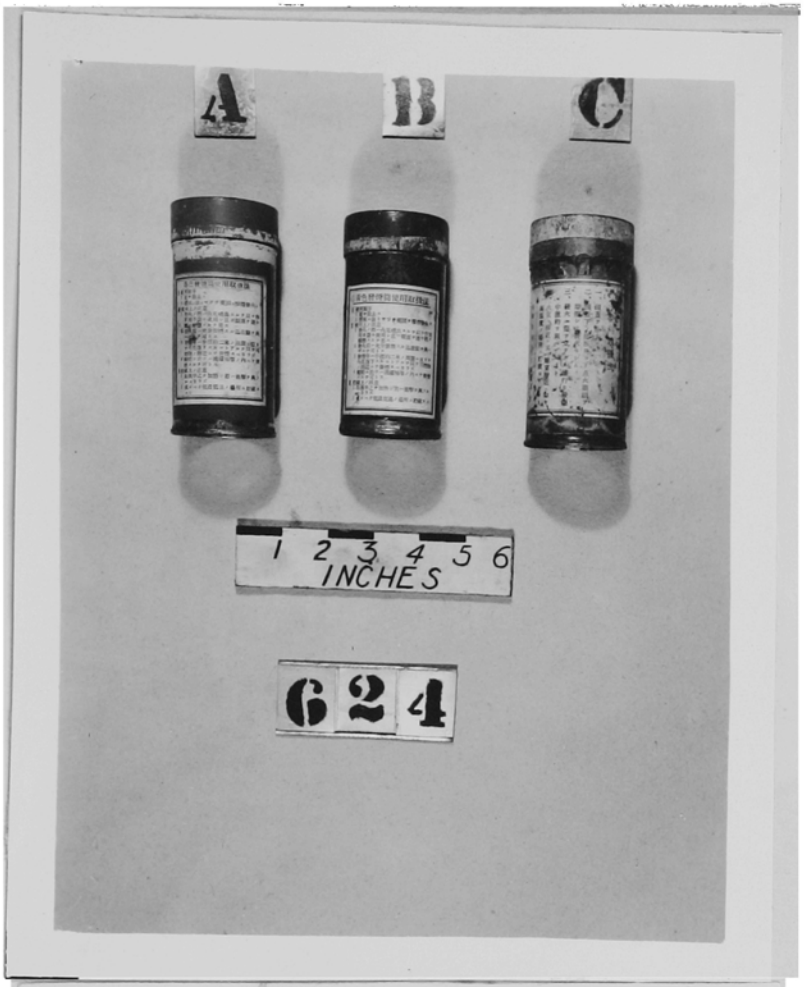


617-CANDLE, SMOKE, SELF-PROJECTING



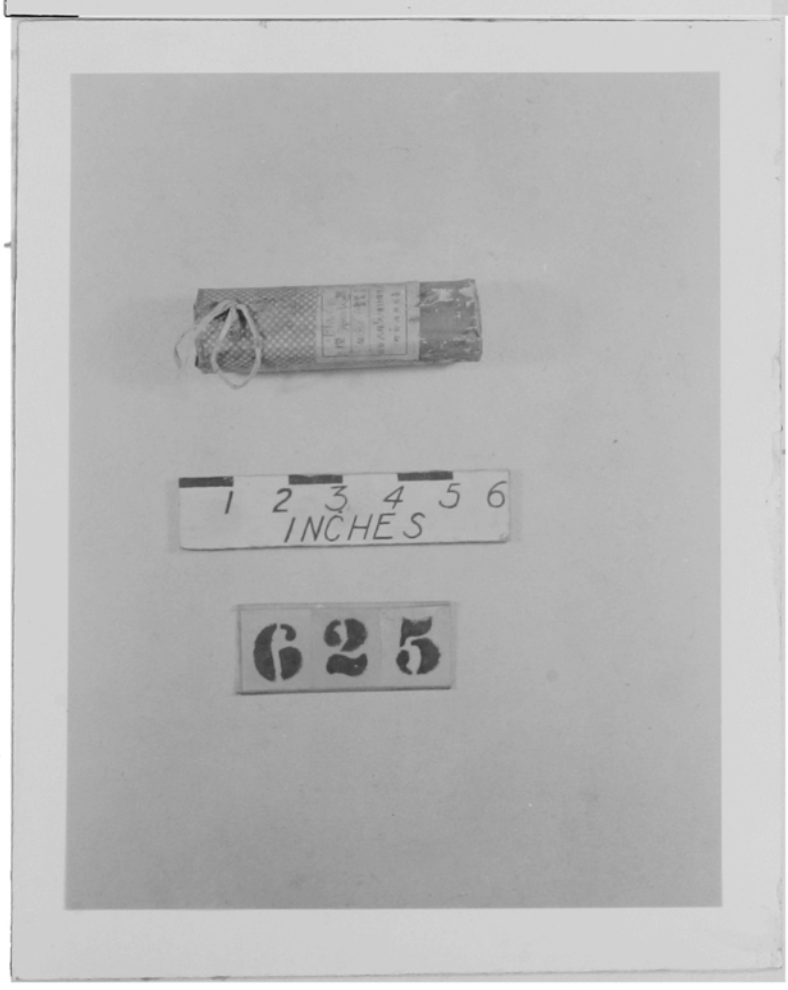
619-CANDLE, SMOKE, 1 Kg, Rev. 5

[redacted]



CANDLE, SMOKE,

624A - Red (left)
624B - Blue (center)
624C - Blue(1932)(right,



625-CANDLE, SMOKE, BLACK

[redacted]



631-CANDLE, SMOKE, EXPERIMENTAL, SIGNAL, WHITE

17C-CANDLE, SMOKE, TYPE 94, LARGE

General:

Color:	Olive drab
Markings:	White label.
Dimensions:	18½" high, 6½" diameter.
Weight:	42½ lbs.

Description: This candle is cylindrically shaped. There is a metal band 1 in. wide around the top to which is attached a carrying handle. The candle has a match head igniter which is protected by a screw cap that contains the scratcher block.

Remarks: An actual test was made on this candle. When the candle was ignited it burned slowly for approximately 1 minute but for the next 3 minutes it burned furiously and gave off very thick smoke. The total burning time was 4 minutes, 15 seconds.

This candle is undoubtedly the same as either 17A or 17B, however nomenclature did not specify "A" or "B".



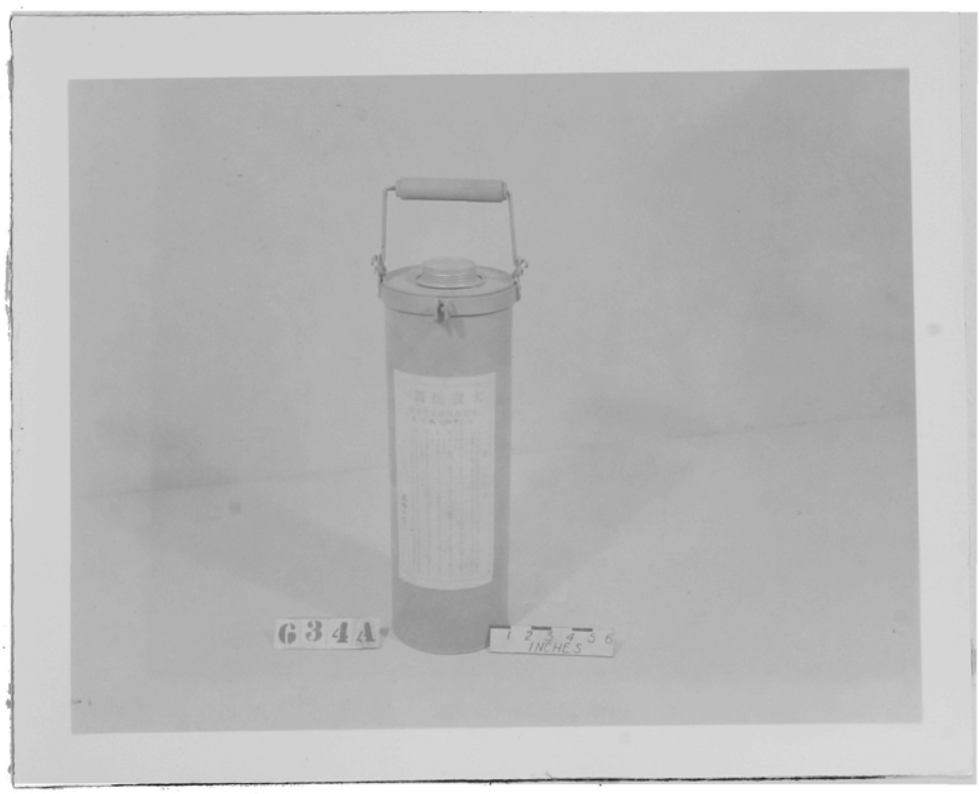
634A-CANDLE, SMOKE, LARGE A

General:

Color:	Gray with white labels.
Markings:	Japanese characters giving nomenclature and directions for use.
Dimensions:	18" long, 6" diameter
Weight:	45 lbs.

Description: The smoke candle container is made of thin sheet metal. A metal screw cap of 2½" in diameter covers the match head and encloses a scratch block. The candle is equipped with a wooden handle which is secured to a heavy metal band around the top.

Remarks; The external characteristics of this candle are identical in every respect to the candle, smoke, type 94, large A, but the label does not have the words "Type 94" printed on it. An analysis of the filling of this candle is necessary before classifying it as identical to the Type 94 which is filled with a Berger type smoke mix.



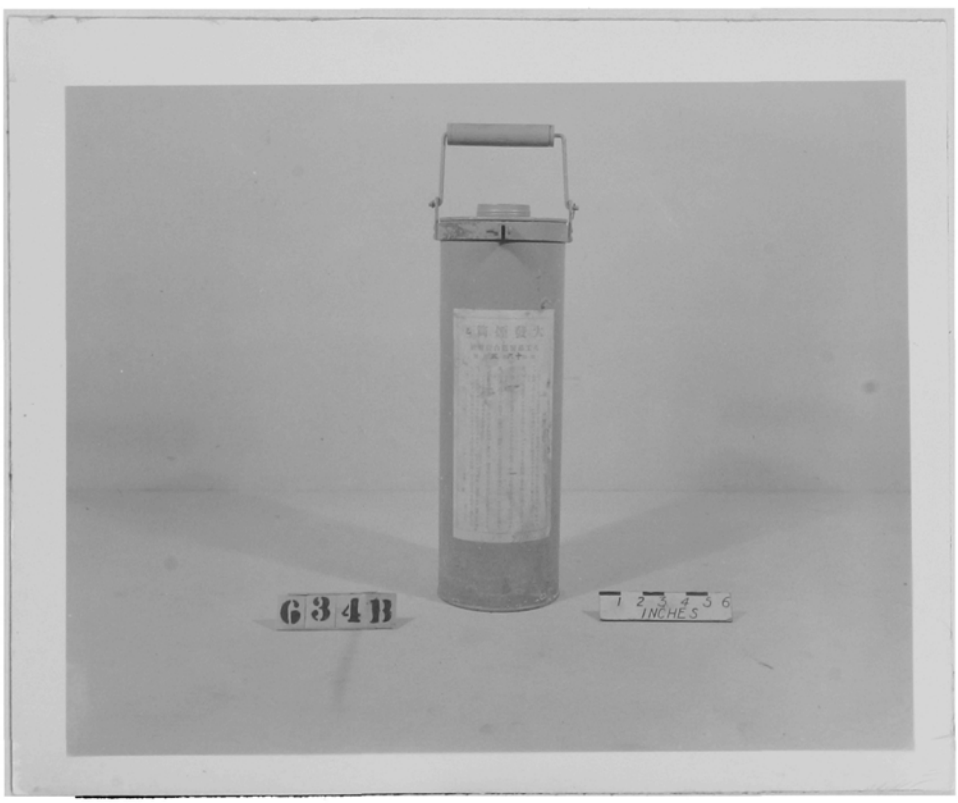
634B-CANDLE, SMOKE, LARGE B

General:

Color:	Gray with white labels.
Markings:	Japanese characters giving nomenclature and directions for use.
Dimensions:	18" long, 6" diameter
Weight:	36 lbs.

Description: The container is made of thin sheet metal. A screw on cap of 2½" in diameter covers the match head and encloses a scratcher block. The container is equipped with a carrying handle which is secured by a heavy metal band.

Remarks: The external characteristics of this candle are identical to the Candle, Smoke, Type 94, Large B, but the label does not have the words "Type 94" printed on it. An examination of the smoke mixture should be made before considering this candle to be the same as the HC mixture filled Type 94.



407-CONTAINER, SMOKE, "A", MK I

General:

Color:	Black
Dimensions:	21 in. high, 12 in. diameter
Weight:	141 lbs.

Description: The container is made of sheet iron and is cylindrically shaped. The bottom is slightly concave and is welded inside the cylinder so that it does not touch the ground when in the upright position. The upper end is set in about 2½ inches and is welded to the cylindrical wall. There is one filling hole in the head of the container. Two 3/8 in. rod handles are located diametrically opposite each other at the top of the cylinder.

Remarks: The capacity of this container is approximately 10 gallons. The container is filled with a liquid the composition of which is unknown as no attempt was made to analyze the contents. It is believed to be one of the common smoke agents, HC or FM.



657--GENERATOR, SMOKE, FLOATING "A"

General:

Color:	Blue gray
Markings:	White label
Components:	Neck, 1st. section, 2nd section.
Dimensions:	31 in. high, 11.6 in diameter
Weight:	37½ lbs.

Description:

Neck: The neck is 6 in. high and 5 in. in diameter and is welded to the center of the top of the first section. The top of the neck is closed except for a hole in the center that is closed by a 1½ in. threaded plug.

First section: The first section is 15 in. high and 11.6 in. in diameter. The top is welded to the cylinder wall. The body is equipped with an out turned flange that is bolted to the flange of the second section. Two rod handles, triangle in shape, are attached opposite each other near the top of the first section.

Second section: The second section is 10 in. high and 11.6 in. in diameter. The bottom is welded to the cylinder wall.

Remarks: The first section was apparently empty. Filling for this item is not known.



660-SMOKE BALL

General:

Color:	Buff
Markings:	On the larger protuberance white paper strip have been glued to form a conventionalized pattern resembling a maltese cross.
Components:	A spherical body and two hemispherical protuberances attached in opposition.
Dimensions;	Diameter of sphere 9", Diameter of smaller dome 4½", Diameter of larger dome 5".
Weight:	4,400 gms. or 9.7 lbs.

Description: The bomb is made of cardboard or paper-mache' covered with glued strips of buff paper. The hemispheres are attached to the main body by glued strips of paper. Two rip wires attached to pull rings facilitate in tearing the paper which joins the two cardboard hemispheres to the main body. A flat paper fuze is attached to the ball and connects with the two ends.

Remarks: This smoke ball has been briefly described in "Handbook of Japanese Explosive Ordnance," OPNAV 30-3M, dtd 15 August 1945, pp 247-248. This reference gives the following descriptive information. "This is a large round cardboard container with a dome top covering a paper-wrapped black powder fuze and a dome containing a black powder charge in a celluloid cup. It is filled with 80 smoke pellets packaged around a black powder charge in a silk bag." It is reported to be an aerial burst and "believed to be lauched from metal tubes."



660-Smoke Ball

22-CANDLE, SMOKE, HAND CARRIED

General:

Color:	Unpainted metal with asbestos covering.
Components:	Outer container, Inner container, pull type igniting fuse.
Dimensions:	22" long, 1½" wide, 1½" thick, tapering to 1¼".
Weight:	3 lbs.

Description: The outer Container: The outer container is made of galvanized sheet steel 0.016 inches thick. The tapered end of the container is closed by a rectangular wooden block and is secured by nails driven through the container walls. The square end of the container is closed by a piece of galvanized sheet metal soldered in place. A hole of 3/4" diameter is in the end of the plate which is an outlet for the fuse of the inner container. A steel rod stud soldered to the outside of the container prevents the slipping of the asbestos covering.

The outside of the container is wrapped with sheet asbestos 1/16" thick which is held in place by 0.032 in. diameter wire wrapped spirally. The fuse end of the container has a tight fitting removable cap.

Inner Container: The inner container is of cylindrical shape, 19-3/4 inches long and an inside diameter of 1-1/16 inches, and has a weight of 1½ lbs. A brass cylinder 1-3/4" long is filled with igniter mixture. The open end of this cylinder is covered with a black powder quick match composition. A gray powdered smoke mixture, very tightly packed, filled the remainder of the inner tube.

Pull Type Igniting Fuse: A pull cord coated with red phosphorus type scratch mixture and a priming charge constitutes the fuse. In the assembled unit, the pull cord is coiled and held in place by a tin plate cover fitting over the outer tube. A pull on the cord draws the attached igniter through the priming charge in the fuse which upon ignition starts the burning of the quick match that covers the head of the brass cylinder. This in turn ignites the smoke mixture.

Remarks: Even though the candle is covered by a sheet of asbestos, it cannot be held in hand due to the heat from the smoke mixture.

Reference: This candle was completely reported in C.M.T.R. No. 12, dtd 14 August 1945, by the Laboratory Section, 98th Chemical Service Company.



22-CANDLE, SMOKE, HAND CARRIED

627-CANDLE, SMOKE, MESSAGE TUBE

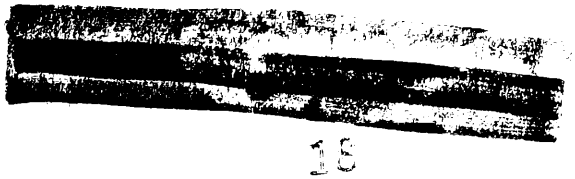
General:

Color: Brass finished metal with white labels.
Components: Message tube, smoke candle.
Weight: 1 lb.

Description: Message tube: The message tube is 10½" long, 1½" in diameter and has a screw on cap. The tube is made of metal 0.05mm thick. It is attached to the smoke candle by two metal bands 3/8" wide and 1/16" thick. In the bottom of the message tube, there is a filling of sand and gravel which is separated from the remainder of the tube by a card board disc held in place by a wax coating. The sand and gravel add weight to the bottom end, causing the lighted end of the candle to remain up. The sand and gravel fills 3 inches of the tube leaving 7½ inches for the message.

Smoke Candle: The smoke candle is 9-3/8" long, 1-3/8" in diameter. The fuse end of the candle has a small hole through which extends the pull cord. The coil of pull cord is protected by a cardboard disc which is secured by a strip of adhesive tape. The cardboard and tape are painted with aluminum paint. The pull cord is used to ignite the primer which in turn starts the burning of the smoke mixture. According to the translation, the smoke is white and has a burning time of approximately 10 minutes.

Remarks: Apparently the message tube smoke candle was designed for airplane to ground communication.







627-CANDLE, SMOKE, MESSAGE TUBE

629A-CANDLE, SMOKE, SMALL MODEL 2 SPECIAL

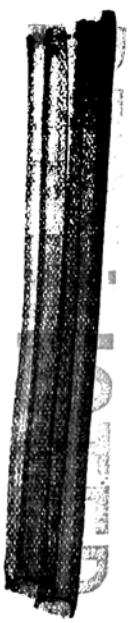
General:

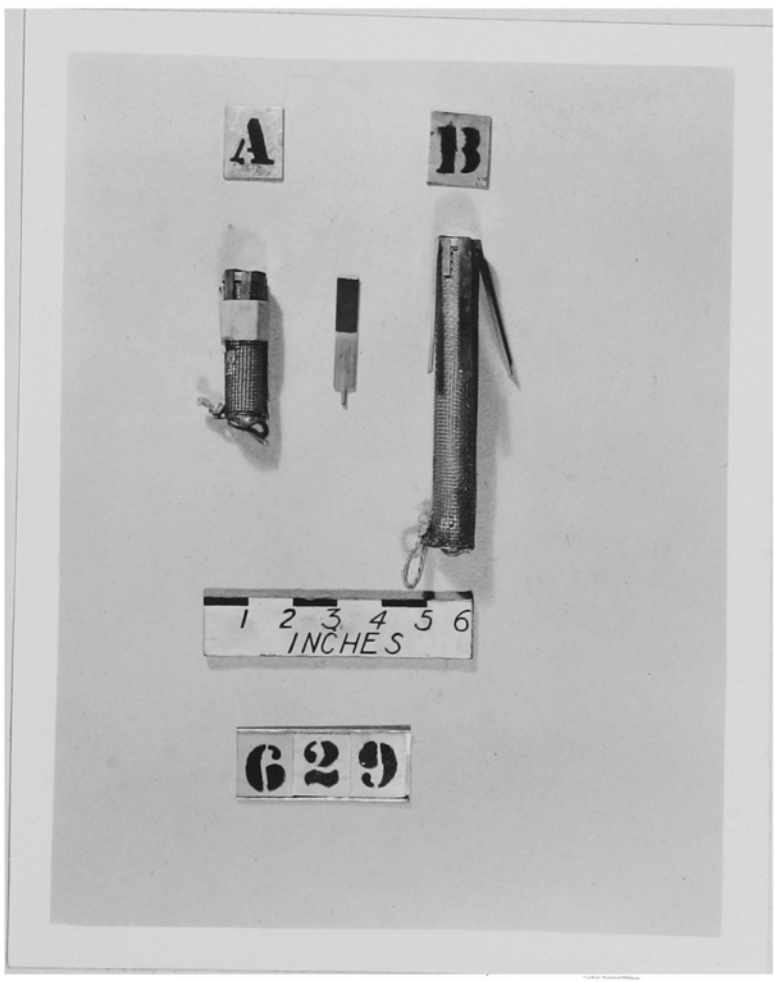
Color:	Unpainted metal
Components:	Candle, Candle support
Dimensions:	2-3/4" Long, ½" Diameter
Weight:	58 grams (0.13 lbs.)

Description: Candle: The candle is made of a thin magnesium alloy which burns with the inside mixture. It is ignited by rubbing abrasive over matchhead.

Candle Support: Four thin sheet metal strips are riveted together to form legs to support the candle. The upper part is made of 20 mesh screen wire shaped to fit the candle.

Remarks: The burning time is 1½ minutes. It gives off a thin, white smoke. Due to a faulty match igniter, other means of ignition were employed.





629B-CANDLE, SMOKE, LARGE MODEL 2, SPECIAL

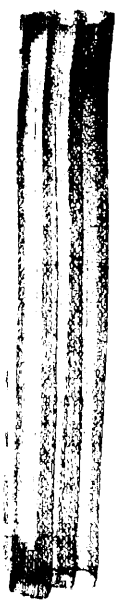
General:

Color:	Unpainted metal.
Components:	Candle, Candle support.
Dimensions:	6½" long, ½" Diameter.
Weight:	140 grams (.30 lbs)

Description: Candle: The candle is made of magnesium alloy which burns with the mixture inside. It is ignited by rubbing abrasive over matchhead.

Candle support: The support is made of thin metal. Four metal strips are riveted together to form legs for the support. The upper part is made of 20 mesh screen wire, shaped to fit the candle.

Remarks: When ignited, the candle gives off a white smoke, but not very dense. The burning time is 9 minutes. Other means of ignition were employed due to faulty abrasive scratcher.



27A-SMOKE CANDLE, 10 Kg. NAVAL, IGNITION CHARGES

Ref: EA - CMTR 83

General:

Color:	Yellow lacquered metal can.
Markings:	Japanese characters and Arabic numerals on top of can.
Contents:	Ten ignition charges and ten striker blocks.
Dimensions:	6-1/8" long, 4½" wide, 1-7/8" high.
Weight:	1.87 lbs.

Description: Each ignition charge consists of a drawn aluminum tube, a lead cap, a matchhead in a ¼" diameter hole in the lead cap, an intermediate starter mix consisting of potassium chlorat (41%), aluminum (29%), iron oxide (24.5%), inert matter (sand) 5% and oily matter (ether extractions) 0.5%.

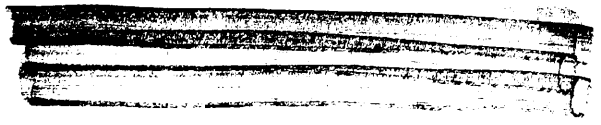
The matchhead mix is forced through the ¼" hole in the cap from the inside while the intermediate starter mix is tamped into the recess of the lead cap, surrounding the matchhead mix. The open end of the cap is sealed with rice paper. After the starter mix is loaded into the aluminum tube, the lead cap is used to close the tube.

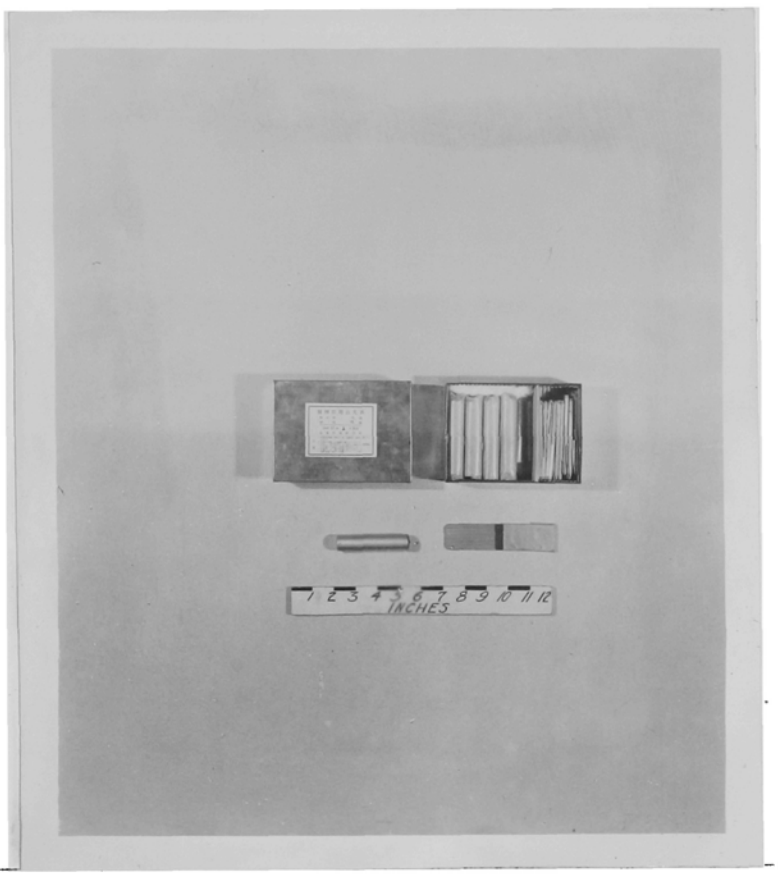
The matchhead is composed of large amounts of potassium chlorate and antimony trisulfide and smaller amounts of aluminum, potassium chromate and powdered glass, with shellac as a binder.

The striker block is a flat wood stick coated on one end with a scratcher composition of red phosphorous, sand and binder.

The ten ignition charges and ten striker blocks are separated into two compartments in the container can.

Remarks: These ignition charges are used with both the 10 kg. and 30 kg. Naval Smoke Candles.





27A-SMOKE GRENADE, 40 MM., NAVAL, WHITE; CHARGE

RESTRICTED

656-CONTAINER, TEAR GAS, MODEL 1

General:

Color:	Battleship Grey.
Markings:	Two rectangular white paper labels glued to the side in superposition. The smaller (upper) label is identifying. The other label gives directions for use.
Components:	A large cylindrical metal canister, metal cover, ignition well, two heavy wire handles attached to the canister, two smaller wire handles attached to the lid.
Dimensions:	Diameter: 10 inches, Length 13½ inches.
Weight:	30 lbs.

Description: The inside of the lid cover is coated with a heavily waxed paper. The top of the can is slightly recessed and is bolted in place with four small bolts and is sealed around the edge with a resin. The top is lacquered and covered with paper. The lid cover protects the top and is sealed to the can with an adhesive strip. A well opening in the center of the top is fitted with a threaded coupling. A plastic screw plug with plastic diaphragm insert effectively seals the well opening. The well is formed by a thin walled lacquered metal tube. The well extends into the charge about 9 inches.

Remarks: According to instructions this container may be fired with a special ignitor tube which fastens into the well.



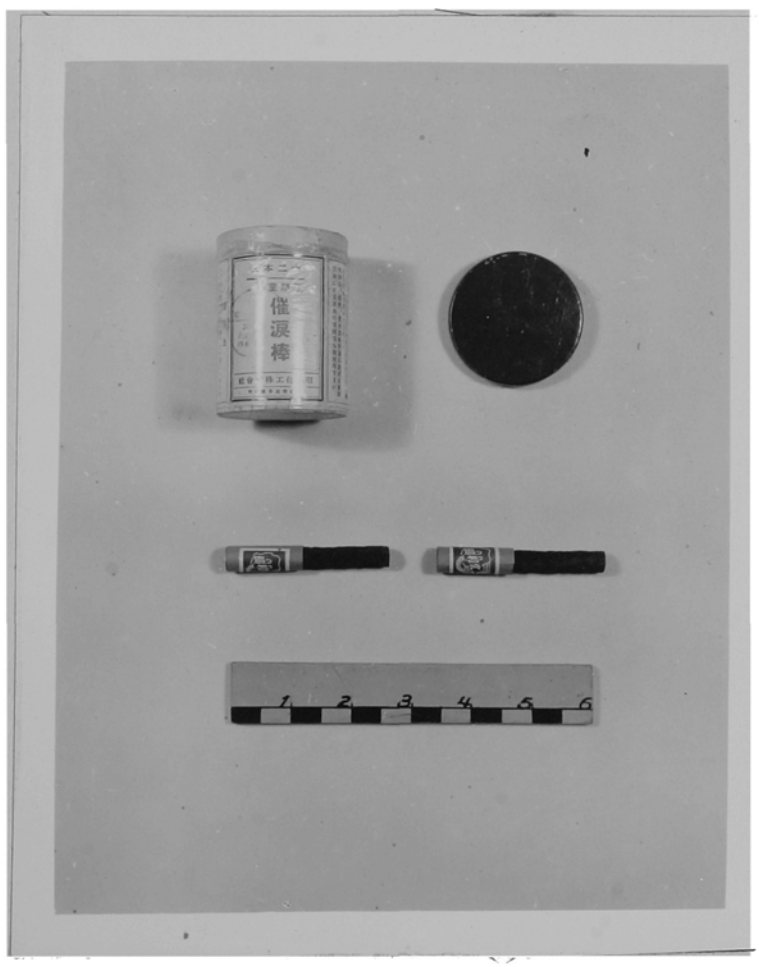
615-STICKS, TEAR GAS, CIVILIAN, TRAINING

General:

Color:	White with green lid.
Markings:	Japanese characters printed on container.
Contents:	Fourteen tear gas sticks (Wood pulp impregnated with CN crystals.
Dimensions:	2-7/8" long, 2-5/32" diameter.
Weight:	.12 lbs.

Description: The sticks are contained in a cardboard box with a metal lid. The whole is wrapped in cellophane to protect it from moisture. The sticks are in two parts, the burning mixture and a paper collar. The impregnate stick is approximately two inches long and three eighths of an inch in diameter. The overall length of the stick with the collar is approximately 2-3/4".

Function: According to the instructions on the label the stick is held in the hand by the paper collar and lighted with a match. If a flame appears on the stick it should be blown out. The sticks are used in rooms or gas chambers to instruct civilians. One stick is considered sufficient for a room about 9 ft. square. A stronger concentration results when the sticks are placed in a bed of coal. The instructions state that one stick will burn for about eight minutes and that, if kept in the sealed container the sticks will maintain strength for two years. These sticks were tested out side in a strong wind, and each burned for 50 seconds.



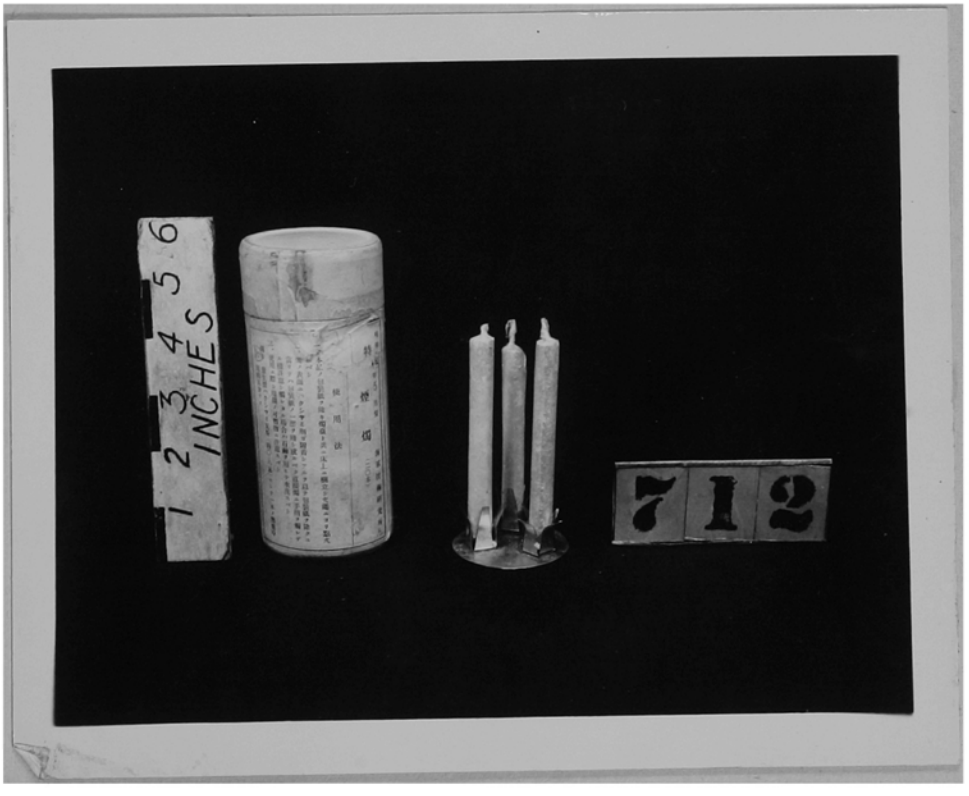
712-CANDLE, SPECIAL SMOKE, VOMITING GAS IMPREGNATED

General:

Color-	Buff.
Markings-	A large white paper label gives the nomenclature of the item and instructions for use
Components-	A cardboard container enclosing twenty waxed paper wrapped candles and a three candle holder.
Dimensions-	2½ inches in diameter, 5½ inches in length
Weight-	5 Ozs.

Description: These candles are 3-3/4 inches x ½ inch in diameter. They are composed of glued sawdust and are coated on the outside with a white crystaline substance which was tentatively identified as diphenylcyanoarsine. Each stick is wrapp d in waxed paper and, according to the instuctions given in the label, this wrapper should be removed when the candle is used. It is also noted in the instructions that the candles should not be handled directly or if handled the hands should be washed with soap and water. The candle holder which is included in the package is a thin metal disc to which three four pronged holders have been riveted.

Remarks: The candles burn very slowly and not always continuously. On burning they emit a choking gas but only a very slight white smoke.



[redacted]

519A-CANDLE FOR BOMB DISPOSAL WORK, RED

General:
Color: Red
Markings: Label on side or bottom
Dimensions: 8.75 in. long, 5.2 in. diameter.
Weight: 9.87 lbs.

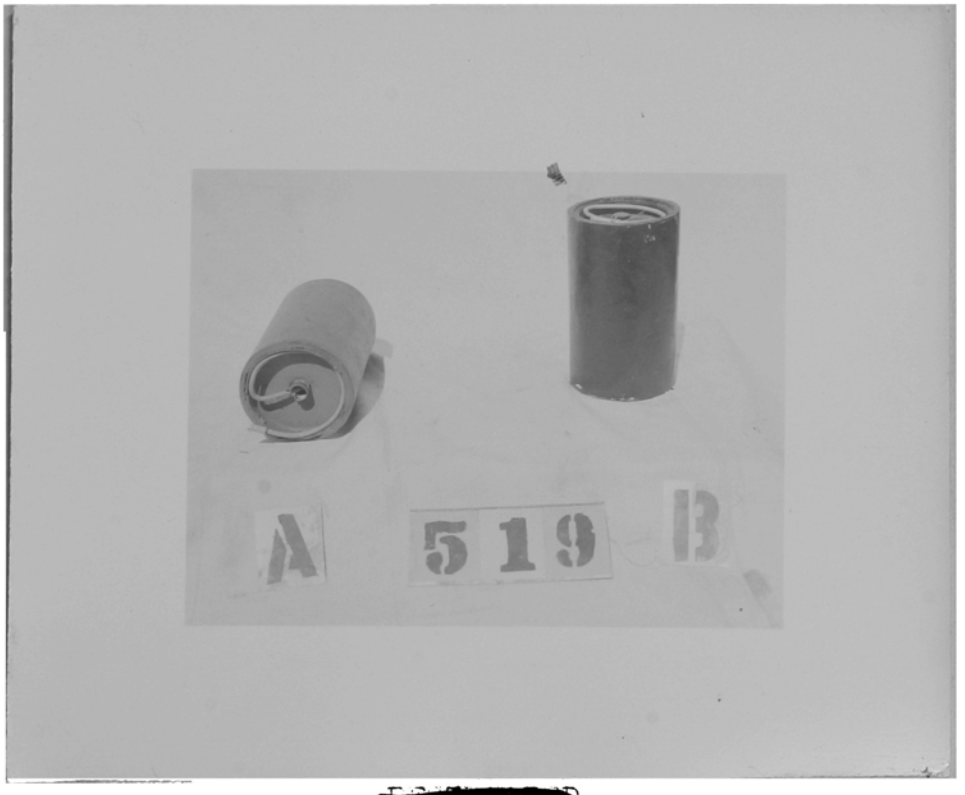
Description: The container is a wood cylinder with a paper cove and inside the wooden cylinder there is a cardboard liner. The ends of the cylinder are closed with cardboard discs.

A tiny fuze approximately 14 in. long is attached inside the end of a cardboard tube that runs through the cente of the candle.

Remarks: The filling of this candle is unknown and the method of using it is unkno n.

The following is the translation of the label- "How To Use:The same way as in disposing of a dud or a time bomb. Kawagoe Plant, Tokyo First Army Munition Arsenal, Decembe 1944."

Photograph for this item shows item 519B as well.



519B-CANDLE FOR BOMB DISPOSAL WORK, BLACK

General:

Color:	Black
Dimensions:	8.75 in. long, 5.2 in. diameter.
Weight:	9.9 lbs.

Remarks: From all outward appearances this candle is identical with Candle For Bomb Disposal Work, Red, except for the color of the candle.

Photograph for 519A shows this item marked B.

2.) FLARES

Items included in this section are signal devices occurring in two categories according to method of launching. One group is released from the ground, the other from aircraft. Exception to these are floating flares which are dropped from aircraft or projected from a vessel. Ground flares are usually of the self projecting type with provisions for mounting the flare tube in the ground for firing. These are ignited by fuze or scratcher block. Aircraft flares are either hand launched or self-projecting Hand launched type are usually pull wire ignited.

The self projecting flares are of two types, those containing parachutes, those without.

The floating flares are equipped with delay fuzes to permit the flare to return to the water surface before igniting, following impact on water surface.

The nomenclature is given on all, the flares. The color given off by the flare is referred to in the nomenclature and is frequen tly indicated by the color of the cap at one of the flares.

Type number, when used, is by the empire age system, type 90 is 1930, type 93, is 1933, type 6, is 1940, etc.

611-FLARE, WING, TYPE 90

General:

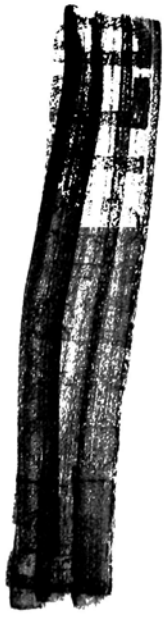
Color: Brown
Markings: Nomenclature in white Japanese characters.
Contents: Burning mixture.
Dimensions: 7-13/16" long, 2" diameter

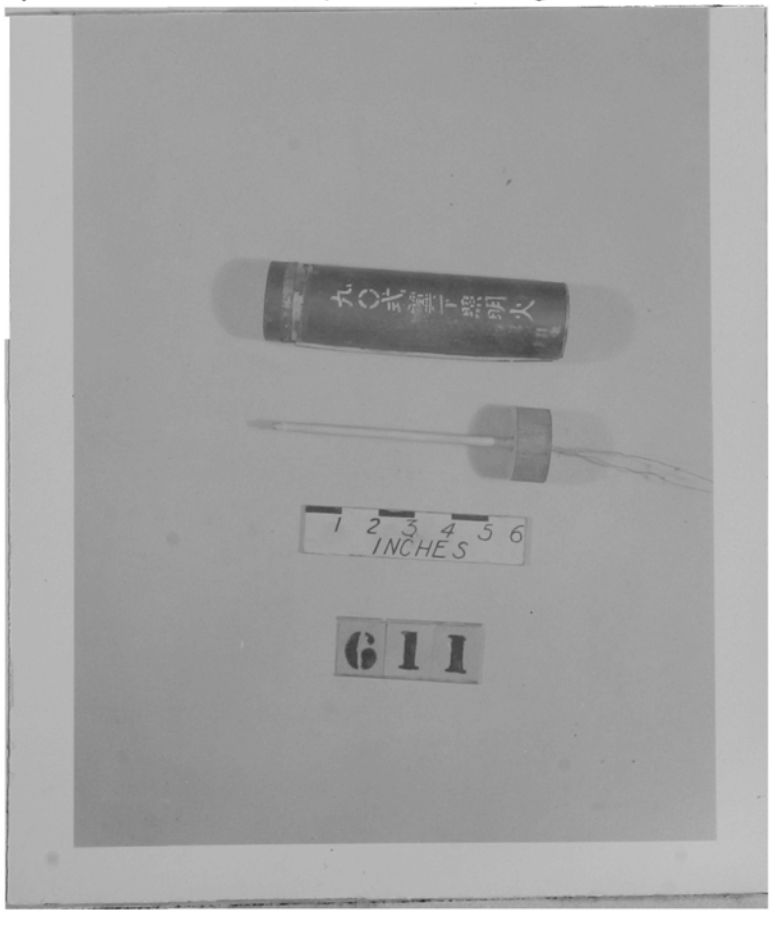
Description: This cylindrical flare can be partially disassembled. A wooden plug which fits into one end of the flare tube is removable. A cardboard covered burster approximately 6 in. long, $\frac{1}{2}$ in. in diameter, is attached to the bottom of this wooden plug. Two small insulated wires enter the top of the wooden plug and connect with the burster. Judging from the yellow color of part of the burster filling the cardboard covering, picric acid is undoubtedly a component of the burster mix.

A burster well, cardboard walled and of large enough diameter to receive the burster, is in the middle of the flare tube.

This flare is fired electrically from the using of a plane. It burns with a bright white flame for approximately one minute. Presumably this flare is used for night landings.

Remarks: Some of the information in this report was taken from following reference: "Handbook of Japanese Explosive Ordnance", OPNAV 30 - 3M, dtd 15 August 1945, page 250.





630A-FLARE, PARACHUTE, TYPE 90, MODEL 1, WHITE

General:

Color:	Blue with yellow lid
Markings:	Japanese characters on white label giving nomenclature and directions for use.
Components:	Flare block, parachute in a cardboard cylinder.
Dimensions:	10" long, 2¼" diameter.
Weight:	2.5 lbs.

Description: The flare and a cotton parachute are contained in a split, hinged cardboard cylinder which has an end slip over cap. When the cap is removed, the cylinder opens releasing its contents. The flare is ignited by a pull on an igniter wire when the flare is released. This flare is ordinarily hand dropped from a plane. It is used for signalling purpose.

It had been previously reported*that this flare burns for 2 minutes and 40 seconds with an intense red flame.

Performance: Tests on flare examined showed it burned for 3 minutes with an intense, red flame. Tests were made in a strong wind.

Remarks: *Reference: "Handbook of Japanese Explosive Ordnanc OPNAV 30-3M, 15 Aug 1945, page 250. Photograph shows flares 630A, 630B, and 630C, respectively.

[redacted]



630A-FLARE, PARACHUTE, TYPE 90, MODEL 1, WHITE

630A 630B 630C

630B-FLARE, PARACHUTE, TYPE 90, MODEL, RED

General:

Color:	Blue with red lid.
Markings:	Japanese characters on white label giving nomenclature and directions for use.
Components:	Flare block, parachute in a cardboard, cylinde
Dimensions:	10" long, 2¼" diameter.
Weight:	2.5 lbs.

Description: This flare is the same as 630A except for compositio of burning mixture. It is used for signalling purposes, dropped from an airplane. Photograph for 630A shows this flare in center

Performance: Actual test on flare examined gave a 3 minute burning time with a bright red flame.

630C-FLARE, PARACHUTE, TYPE 90, MODEL, GREEN

General:

Color:	Blue with green lid.
Markings:	White labels
Components:	Flare block, parachute, cardboard cylinder.
Dimensions:	10" long, 2¼" diameter.
Weight:	2.5 lbs.

Description: This flare is the same as 630A and 630B except for burning mixture which gives a green color. It is used as a signal dropped from an airplane. Photograph for 630A shows this flare on right.

Performance: Actual test on flare examined gave a burning time of approximately 3 minutes. Color burning was green.

537A-FLARE, PARACHUTE, TYPE O WHITE-RED STAR

General:

Color:	The upper two thirds of the outer casing is painted white, and the remainder, red. A black cross completely encircles the casing in the red painted section and extend along its length to the red white border.
Markings:	Japanese characters on yellow labels giving nomenclature, mfr., mfg., date and instructi
Contents:	Brass pull fuze, silk parachute, parachute supported flare charge and eight star pellet
Dimensions:	Overall length 11½", Max. Diameter 2-1/32".
Weight:	1.5 lbs.

Description: The fuse is housed in a metal capped tube on top of the main casing. The cap is attached with a metal tear off strip. The igniter plug of the fuze projects into the interior of the casing, where a doughnut shaped wooden block with a recess at the bottom fits tightly around it. A cylindrical cardboard container 5-11/16" long, and 1-3/4" in diameter is fitted into the outer metal casing against the wooden block in the top. This container, occupying all the space inside the metal casing except that taken up by the parachute in the base, holds the parachute supported flare charge and the "expelled pellet" cartridge. It is attached to the parachute by a thin wire cable. Starting with the section nearest the fuze, the container is made up of the following elements:

a) The black powder initiator.

b) The flare charge, a cylindrical dark grey pressed block, 1-9/16" high and 1-11/16" in diameter.

c) The star pellet cartridge, a smaller cylindrical cardboard container inside the parachute flare casing. The top and bottom surfaces are covered by felt spacers, cardboard disks, and finally wooden spacer disks. A four path, paper covered ignition train leads from the base of the parachute flare charge along the outside of the cartridge to the bottom, where it enters the cartridge through a cotton silk lacquered tube in the wooden spacer disk. Inside the cartridge are eight cardboard covered pellet segments. Four segments form a cylinder with a square center opening which is filled with the pellet cartridge burster charge. A wooden spacer ring separate the upper pellet layer of four segments from the lower layer. The space between layers is also filled by the burster charge. In this space, the black powder initiator and quick match, found on the end of all eight of the pellets, face each other.

d) The star pellet cartridge expelling charge directly under the cartridge. It consists of two circular piece of plain silk sewn together to form a ring-pocket which is fille with an expelling charge..

e) A cardboard spacer disk and a wooden block, which form the top of the parachute flare casing. This remainin section of the outer casing is taken up by the parachute which is attached to the wooden block (e) by a small wire cable. It is dropped by hand from an airplane.

Analyses of Charges:(In order of firing).

a) A Percussion Primer:Consisting of a small cup containing stibnite (black antimony trisulfide) Potassium Nitrate, and an organic binder. The whole mixture was covered with a thin aluminum foil.

b) A Quick Match: A wick impregnated with black powder which was found qualitatively to contain potassium nitrate ion, and sulfur.

c) A Black Powder Train: Of black powder with the following composition:

Moisture -	1.3%
Sulfur -	3.8
Potassium Nitrate -	72.5
Carbon -	12.2
(by difference)	
Ash -	0.2
Total	100.0%

d) A Black Powder Charge: Of the following composition.

Moisture -	1.0%
Sulfur -	10.0%
Potassium Nitrate -	74.5%
Carbon (by difference)-	13.5%
Ash -	1.0%
	100.0%

2) Flare Block, Parachute Supported: Of the following composition.

Binder(Paraffin, .P. 45°C) -	2.3%
Barium Nitrate -	67.2%
Aluminum -	22.8%
Magnesium -	4.8%
Iron -	0.4%
Sand or Silica -	1.1%
Wood meal or mascerated paper-	1.4%
	100.0%

3) Black Powder Ring: (Wt. 0.8 gms) Of black powder with the following composition.

Moisture -	0.7%
Potassium Nitrate -	74.1%
Sulfur -	9.4%
Carbon (BY Difference)	15.7%
Ash-	0.1%
	100.0%

4) Star Cartridge Burster Charge: Of black powder with the following composition.

Moisture -	0.3%
Potassium Nitrate -	74.5%
Sulfur -	9.3%
Carbon (By difference) -	15.8%
Ash -	0.1%
	100.0%

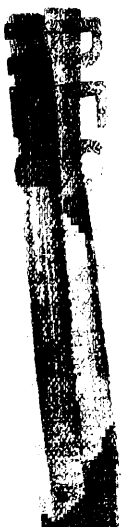
5) Star flare Pellets: Each pellet has a short wick, impregnated with black powder, inserted into one end which is coated with black powder. The upper third of the pellet (into which the wick was inserted) was of a grey black material containing shiny metallic particles while the lower section was a cream colored solid with dark metallic particles dispersed in it. The two sections are analysed seperately.

A) Upper portion of Star Flare Pellet.

Binder (Paraffin, M.P. 50°C.)	4.4%
Sulfur -	15.4%
Antimony Trisulfide -	9.6%
Barium Nitrate -	20.1%
Calcium Nitrate -	20.0%
Potassium Nitrate -	10.5%
Iron --	0.3%
Aluminum -	15.4%
Wood Fibers -	2.9%
	98.6%

B) Lower Portion of Star Flare Pellet.

Paraffin Binder -	8.1%
Magnesium (metallic)	20.5%
Calcium Carbonate -	14.1%
Calcium Hydroxide -	17.8%
Calcium Peroxide -	25.2%
Sodium Chloride -	10.7%
Iron Oxide -	1.1%
Silica and Mascerated paper -	1.3%
	98.8%

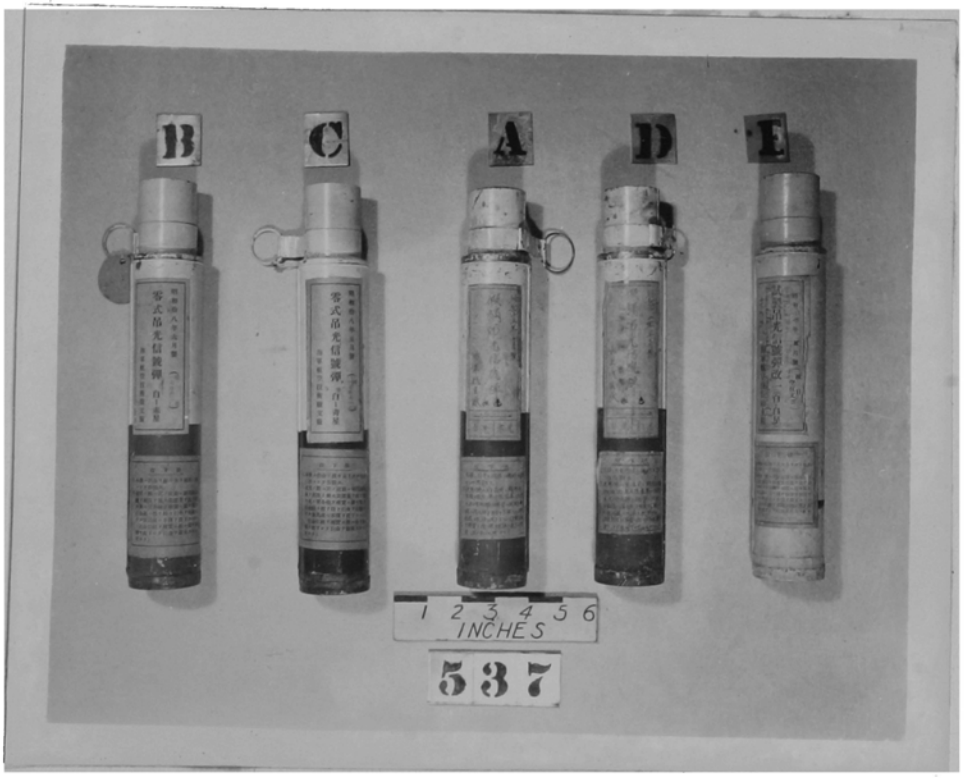


Function: This flare is hand thrown from a plane. After removin the safty pin the cord which is held in the hand when the flare is thrown pulls out the striker release. Immediately the strike moves forward, under spring pressure, striking the primer cap. The flash ignites the delay train of the fuse (The instructions say the delay is 3 seconds) which in turn sets off the ignition charge forcing out the parachute flare casing. The parachute opens and the flare charge burns, giving off a white light.

After the flare charge is burned out, contact is made with the ignition train thereby igniting the star cartridge expelling charge. This has a double effect upon the remaining part of the flare. It forces the star cartridge container from the cardboard parachute flare casing and also ignites the star cartridge burster charge which fills out the space between the right pellets. The pellets are ignited by the quick-matches and scatter, burning with a red light.

Remarks: Reference: From a report by the 43rd Chemical Laboratory Company, 16 November 1944, C.M.T.R. No. 70 in "Chemical Warfare Service Technical Notes for Laboratories" November 1944, Number 5. In the reference report the manufacturing date of the flare described is given as October 1942 and the manufacturer is given as the Naval Air Technical Branch Depot. The translation of the markings on the flare more recently examined gives a manufacturing date of May 1943 and the manufacturer as the Navy Aviation Arsenal. The reference model also had affixed to the pull ring of the metal tear off strip.

A cardboard disk marked "2475", There is similar disk attached to the later flare marked "2665". The meaning of this number probably refers to the lot or packing numbers.



537B-FLARE, PARACHUTE, SIGNAL, MODIFICATION 1, WHITE-WHITE STAR, TRIAL MED.

General:

Color:	White Black cross extending one third the length from the bottom, and completely encircling the casing.
Markings:	Japanese characters on yellow labels giving nomenclature, mfr., mfg., date and instructions.
Contents:	Brass pull fuze, silk parachute, parachute supported flare charge and eight star pellets
Dimensions:	Overall length 11⅛", Max. Diameter 2-1/32".
Weight:	1.7 lbs.

Description: The only differences between this flare and Flare, Parachute, Type O, White-Red star, is in the overall weight and the composition of the flare block and star flare pellets.

ANALYSIS OF FLARE CHARGES:

1. Flare block, Parachute supported is of the following composition.

% Kolatile at 70°C -	1.4%
Organic Binder -	1.4%
Sulfur -	7.5%
Barium Nitrate -	50.6%
Potassium Nitrate -	6.9%
Antimony Trisulfide -	10.8%
Aluminum -	9.7%
Magnesium -	10.3%
	98.6%



2. Star Flare Pellets: Differing from those of the Type O, White-Red Star in that they are of one homogeneous mixture. Of the following mixture:

Binder (paraffin, M.P. 50°C.) -	2.6%
Sulfur -	0.5%
Barium Nitrate -	67.4%
Sodium Nitrate -	1.0%
Potassium Nitrate -	2.6%
Antimony Trisulfide -	0.6%
Aluminum -	12.4%
Magnesium -	11.5%
Silica or Sand -	0.5%
Iron and Carbon -	traces
	99.1%

Remarks: Reference: From a report by the 43rd Chemical Laboratory Company, 16 November 1944, C.M.T.R. No. 70 in "Chemical Warfare Service Technical Notes" for Laboratories, November 1944, Number 5.

DECLASSIFIED

The translations of the labels on the flare more recently examined make no mention of type number; the type number is replaced with the words "Trial Manufactured". The words "Trial Manufactured" presumably mean that the flare is a test productic model, pending approval of its use in field effectiveness before a type number is assigned.

537C-FLARE, PARACHUTE, TYPE O, WHITE-BLUE STAR

General:

Color:	The upper two thirds of the outer casing is painted white, and the remainder, green. A black cross completely encircles the casing in the green painted section and extends along its length to the green white border.
Markings:	Japanese characters on yellow labels giving nomenclature, mfg., date and instructions.
Dimensions:	Overall length 11½", Max. Diameter 2-1/32".
Weight:	1.9 lbs.

Description: The only difference between this flare and Flare, Parachute, Type O, White-Red Star is in the overall weight and the composition of the flare block and star pellets. This flare functions in the same manner as 537A and 537B.

Remarks: The manufacturing date given on this flare is June 1943. It was made at the Navy Aviation Arsenal. No date on the chemical composition of the flare block or star pellets is available.

537D-FLARE, PARACHUTE, SIGNAL, WHITE-RED, PROVISIONAL

General:

Color:	The upper half of the flare is white, the remainder red.
Markings:	Japanese characters on yellow labels giving the nomenclature, mfr., mfg., date, and instructions.
Contents:	Brass pull fuze, silk parachute and a parachute supported flare charge.
Dimensions:	Overall length 11½", Max. Diameter 2-1/32".
Weight:	1.9 lbs.

Description: This flare differs from the Flare, Parachute, Signal, White-White Star, Trial Mfd., Item 537A, and Flare Parachute, Type O, White-Red Star Item 537B in that it has no star pellets. The space usually taken up by the pellets is occupied by a portion of the large parachute supported flare block. This flare block is 5-2/5" long. The upper 2 inches (the end nearest the fuze) is of a silver grey material being similar in appearance to the parachute supported flare block of the items 537B and 537A. The lower 3-2/5" is of a cream-color with dark metallic particles dispersed in it, being similar in appearence to the lower two thirds of a flare pellet from the "Type O" (537A) flare. The flare is fired in the same manner as the "Type O". The flare block is expelled from the tube and ignited by the ignition charge in the base of the fuze. The parachute opens and floats the burning flare to earth. The flare block burns with a white flame, initially which later turns to red. It is dropped by hand from an airplane.

Remarks: The flare inspected was manufactured in October 1937 by the Navy Aviation Arsenal. It has a provisional or temporary designation which probably means that it was an experimental design at that time, not in production and without an official type or model number. No data was obtained on the chemical composition of the flare block.

Performance: During a strong wind the flare burned with a bright flame for a period of two minutes.

RESTRICTED

RESTRICTED

537E-FLARE, PARACHUTE, SIGNAL, WHITE-BLUE, PROVISIONAL

General:

Color:	The upper two thirds of the casing is white, the remainder green.
Markings:	Japanese characters on yellow labels give nomenclature manufacture, mfg., date, and operating instructions.
Contents:	A brass pull fuze a silk parachute, and a parachute supported flare block.
Dimensions:	Overall length 11½", Max. Diameter 2-1/32".
Weight:	1.8 lbs.

Description: The physical appearance and function of this flare are identical to Flare, Parachute, Signal, White Red, Provisional Item 537D. The one piece flare block is composed of two separate mixtures that burn white and blue, in that order.

Remarks: This flare was an experimental model at the time the one examined was made. It is not known whether or not it was accepted as a standard flare or abandoned at a later date.

Performance: During a strong wind the flare burned with a bright flame for a period of two minutes.

RESTRICTED

RESTRICTED

616-FLARE, PARACHUTE, TYPE 100, SELF-PROJECTING

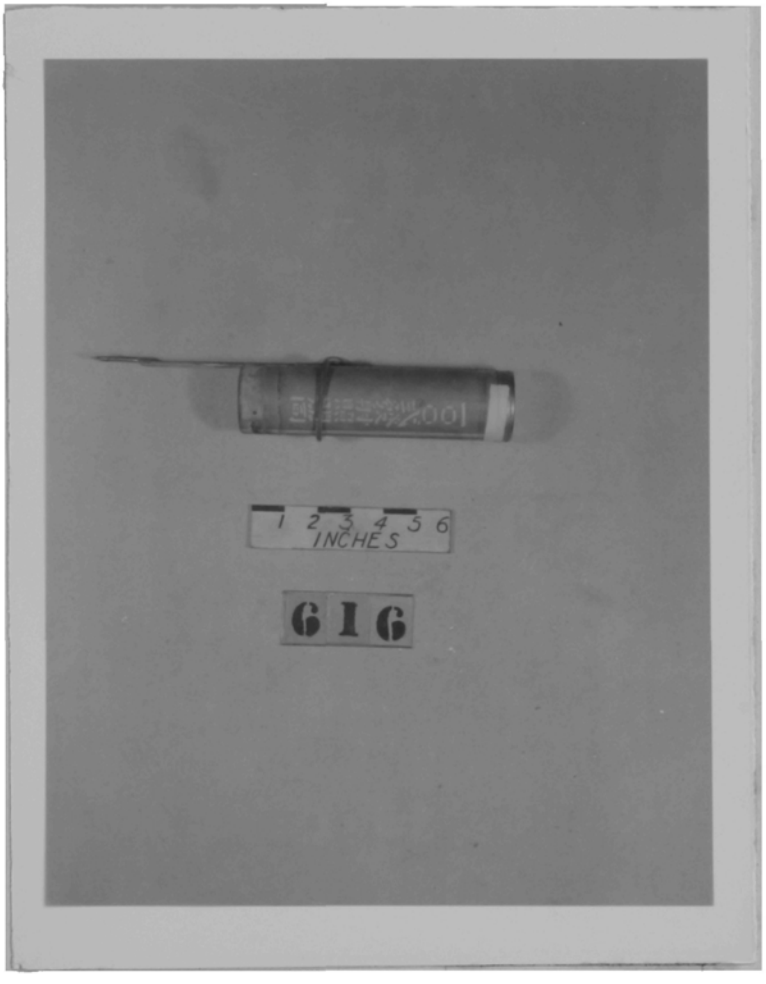
General:

Color:	Gray
Markings:	Japanese characters stenciled in white giving nomenclature, a narrow white line running the length of the tube.
Contents:	A flare canister propelling charge, a scratcher block, and a flare canister containing a flare block propelling charge, a flare block, a paper parachute and a silk auxilary chute.
Dimensions:	8.05" long, 2.05" diameter.
Weight:	1.8 lbs.

Description: A rod encircles the candle and extends along its length to form a spike which is inserted into the ground to support the candle when it is fired. Beginning at the bottom of the tube (the end on which the tube rests when it is fired) the contents are as follows: The black powder propelling charge and the flare canister. Beginning at the bottom of the flare canister (the end next to the propelling charge) the contents are as follows: The black powder flare block propelling charge, the flare block, a cotton cord attached to the flare block, and the silk auxiliary and paper parachutes attached to the cotton cord.

Function: To operate the bottom cover is taken off exposing the matchhead in its recess at the base. Then the spiked rod is inserted into the ground. The top cover is taken off and the flare is fired by rubbing the circular scratches block, found inside the bottom cover, against the matchhead in the base. This action sets off a short delay train which ignites the propelling charge thus projecting the flare canister out of the tube. The explosion of the propelling charge sets off a delay train in the base of the flare canister which in turn sets off the flare block propelling charge expelling the flare block and parachutes from the canister. The flare block is ignited as the flare canister is blown open.

Remarks: This flare is probably used for signaling or illuminating purposes at night. The chemical composition of the flare block is not known nor was a performance test made.



616-FLARE, PARACHUTE, TYPE 100, SELF-PROJECTING

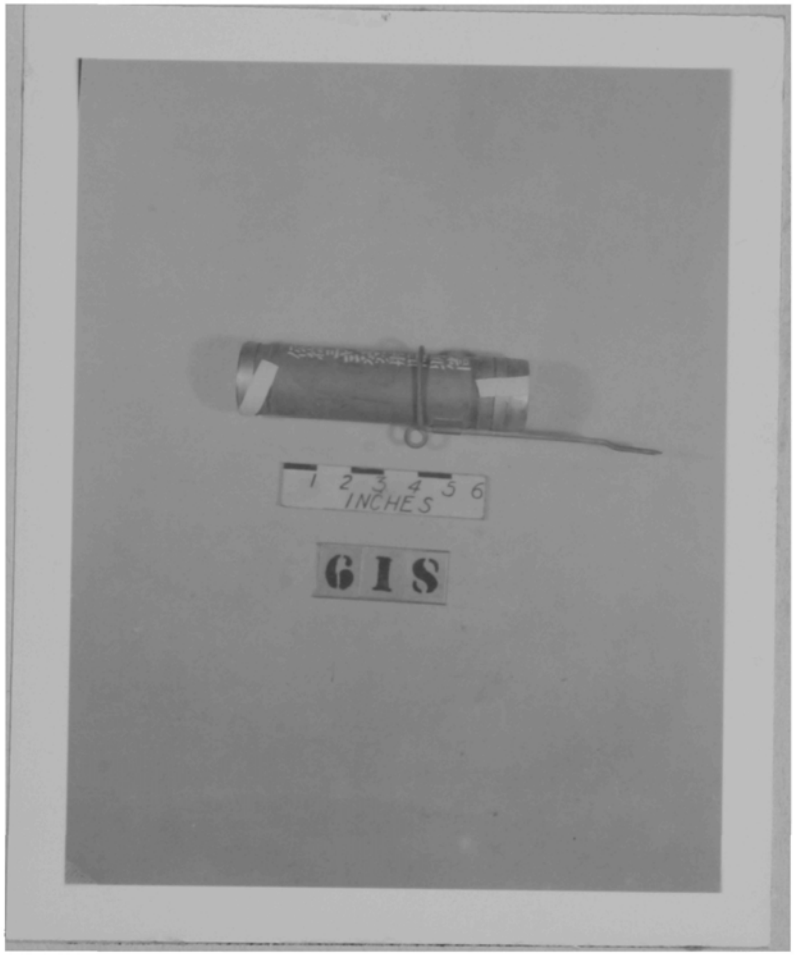
618-FLARE TUBE, TYPE 3, SELF-PROJECTING, PROVISIONAL

General:

Color:	Grey
Markings:	Japanese characters stenciled in white on the body of the flare giving nomenclature, a narrow white line running the length of the tube.
Contents:	A flare canister propelling charge, a scratcher block and a flare canister containing a flare block propelling charge, a paper parachute and a silk auxilary chute.
Dimensions:	8.05" long, 2.05" diameter.
Weight:	1.7 lbs.

Description: This flare tube is identical to 616-Flare, Parachute, Type 100, Self-Projecting, except in the nomenclature given on the body in Japanese and a slightly lower weight. The weight difference was found to be in the outer shell of the flare, it was .1 lb lighter in this model.

Remarks: Assuming that Type 3 represents a 1943 developement it is probable that a slight design change was made in the type 100 (616). The word "provisional" in the translated nomenclature indicates a test model designation probably similar to an E or T designation by our system. Composition of flare block is not known, nor was a performance test made on the flare.



618-FLARE TUBE, TYPE 3, SELF-PROJECTING, PROVISIONAL

622-FLARE, TYPE 93, 40M.

General:

Color:	Brass metal
Markings:	Nomenclature given in Japanese characters on white label.
Components:	A primary propelling charge, one flare projectile.
Dimensions:	7.4 inches long, 1-3/4 inches diameter.
Weight:	.58 lbs.

Description: The flare body consists of a metal tube closed at one end by a cardboard disc and at the other end by a metal cap. Both are fastened by a wax seal.

If the metal cap is removed, it is found that the body tube has been cut to produce four sharp prongs. These prongs serve to hold the flare tube in the ground, providing a base, when the flare is fired.

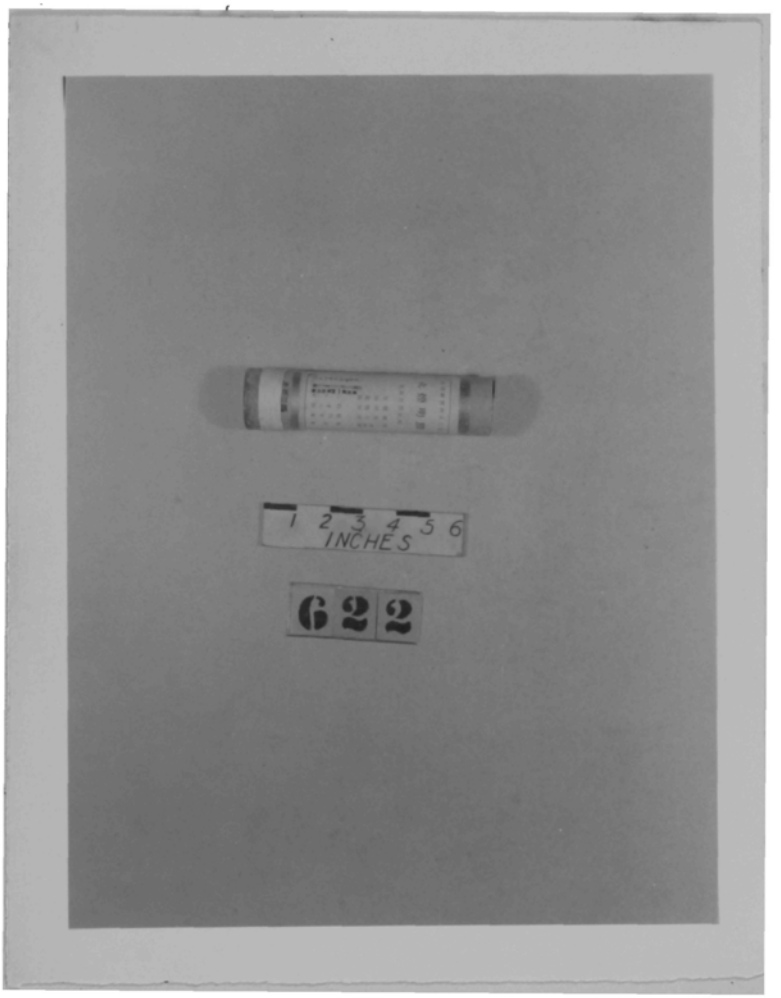
Inside the base of the flare tube there is a wooden disc. A powder train fuse with a friction igniter is attached to this disc. The fuse can be unfolded to extend about 1½ inches from the flare itself. This facilitates ease of ignition, also the flare can be firmly emplaced without fouling the fuse.

A primary propelling charge in the flare tube projects the flare projectile in the air upon ignition of the fuse. This propelling charge seems to be black powder.

The flare projectile consists of four components a secondary propelling charge, a parachute, a flare block and a fuse. This fuse is set off when the flare projectile is projecte from the emplaced tube. The secondary propelling charge is ignited by this fuse while the flare is in flight and it throws out the flare block attached to the parachute. The parachute opens and suspends the burning flare block as it slowly drops toward the ground.

Remarks: The flare block composition is not known, although it is obviously composed of a burning mix and either a dye or bright burning compound.

[redacted]



622-FLARE, TYPE 93, 4cm

[redacted]

623-A FLARE, SIGNAL, TYPE 93, 4cm, WHITE PARACHUTE STAR

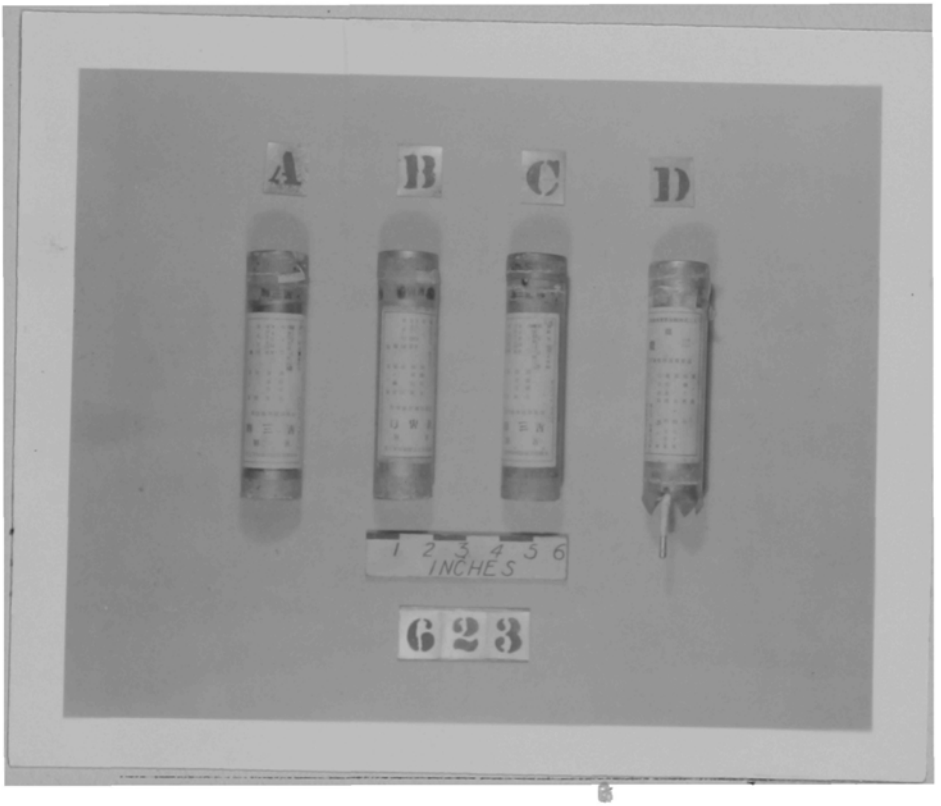
General:

Color:	Brass finish
Markings:	Nomenclature given in Japanese characters on white label.
Contents:	A propelling charge and one flare projectile containing a parachute, a flare block and a propelling charge.
Dimensions:	7½" long, 1-3/4" diameter.
Weight:	.55 lbs.

Description: All physical components dimensions operation, and functions of this flare are identical with the "Flare, type 93, 4cm"(622). Only the color of the burning flare differs.

Photograph shows items 623A, 623B, 623C, and 623D in that order.

[redacted]



623-A FLARE, SIGNAL, TYPE 93, 4cm, WHITE PARACHUTE STAR

[redacted]

623B-FLARE, SIGNAL, TYPE 93, 4cm GREEN, TRIPLE STAR

General:

Color:	Brass finish
Markings:	Nomenclature given in Japanese characters on white label.
Contents:	A propelling charge and a flare projectile, containing three flare pellets and a propelling charge.
Dimensions:	7½" long, 1-3/4" diameter.
Weight:	.59 lbs.

Description: The only difference between this flare and the "Flare Signal, Type 93, 4cm, White-White Star" (623A) is that it has no parachute and burns with a different color. The space usually occupied by the parachute is taken up by the star pellets. When the flare projectile explodes the pellets are ejected and ignited.

Remarks: Due to the nature of the flare the star pellets no doubt burn for a short duration making a prearranged point of firing necessary for signaling purposes.

Photograph for 623A-Flare, Signal, Type 93, 4cm, White-Parachute Star shows this item second from left position.

[redacted]

623C-FLARE, SIGNAL, TYPE 93, 4cm, WHITE-TRIPLE STAR

General:

Color:	Brass finish
Markings:	Nomenclature given in Japanese characters on white label.
Contents:	A propelling charge and a flare projectile containing three flare pellets and a propelling charge.
Dimensions:	7½" long, 1-3/4" diameter.
Weight:	.58 lbs.

Description: Physical components, dimensions, operation, and function of this flare, are identical with the "Type 93, 4cm, Green, Triple Star"(623B). Only the color of the burning flare differs.

Remarks: Photograph for 623A-Flare, Signal, Type 93, 4cm, White-Parachute Star shows this item third from left position.

623D-FLARE, SIGNAL, TYPE 93, 4cm, BLACK DRAGON

General:

Color:	Brass finish
Markings:	Nomenclature given in Japanese characters on white label.
Contents:	A propelling charge and one flare projectile containing a parachute, a flare block and a propelling charge.
Dimensions:	7½" long, 1-3/4" diameter.
Weight:	.56 lbs.

Description: All physical components, dimensions, operations, and functions of this flare are identical with the "Flare Signal Type 93, 4cm, White Star"(623A). They differ only in color of burning mix.

Remarks: Photograph for 623A-Flare, Signal, Type 93, 4cm, White Parachute Star shows this item on right.

628-FLARE, SIGNAL, GROUND, GREEN

General:

Color:	Blue green body with green band around the top.
Markings:	Japanese characters which give the nomenclature.
Dimensions:	3-5/8" long, 1-7/8" diameter
Weight:	215 grams (7½ oz.)

Description: The outer container is open at both ends and is made of heavy cardboard which is covered with wax paper. The open ends are rolled inward and closed by cardboard discs secured by wax. These discs cover a thin sheet of metal foil on each end. On the end which has the pull-wire attached, there are two small flash holes in the cardboard disc. On the nose end, there are one large and 3 small vent holes.

The copper pull-wire, on the base of the tube, leads into a copper igniter tube which is moulded in the flare charge. This tube extends to the upper surface of the charge. The lower end is closed except for flash holes and a hole for the pull-wire and contains a small "floating" inner tube which is filled with a friction compound through which a rough scratch is drawn by the pull wire. The upper portion of the igniter tube is filled with black powder which extends to the upper surface of the flare charge, which is coated with an ignition layer.

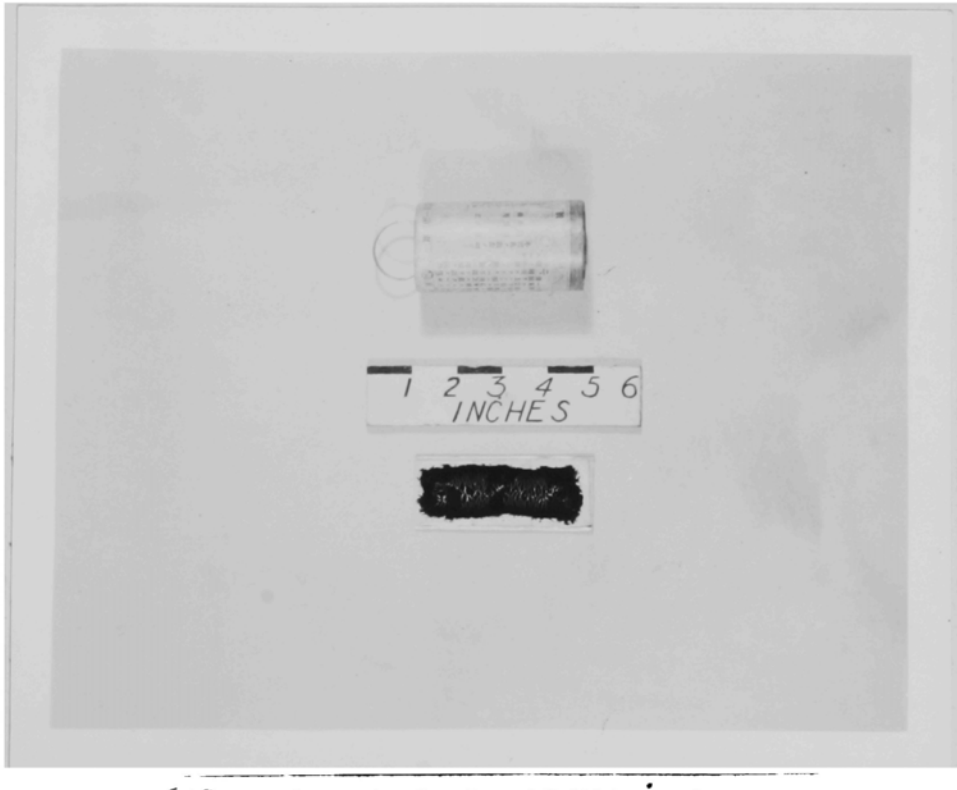
The flare charge is a circular block of material covered with a sheet of brown paper.

Remarks: Apparently the purpose of this flare is for ground to air craft signalling.

This flare is also made in two other colors red and white which can be identified by the number of small vent holes in the nose end of the flare. The white has 4 small holes, the red 8 small holes, the green, as described above, has 3 small holes.

Reference: Functional characteristics were described in C.M.T.R. No. 103, dtd 1 October 1945 by the 43rd Laboratory Company.

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628-FLARE, SIGNAL, GROUND, GREEN

[redacted]

3. INCENDIARY ITEMS

In this section are a number of small incendiary munitions which were probably intended for use in the same manner as the standardized U.S. thermite grenade.

Also included are a group of incendiary bomb fillers these are designed for the filling of the various inserts that are used on the different models and modifications of the 50-100 Kg incendiary bombs.

Most of the loose incendiary materials are composed of Mg particles, an oxdizing agent usually a nitrate, iron oxide, sometimes aluminum particles, held together by a gum rubber binder.

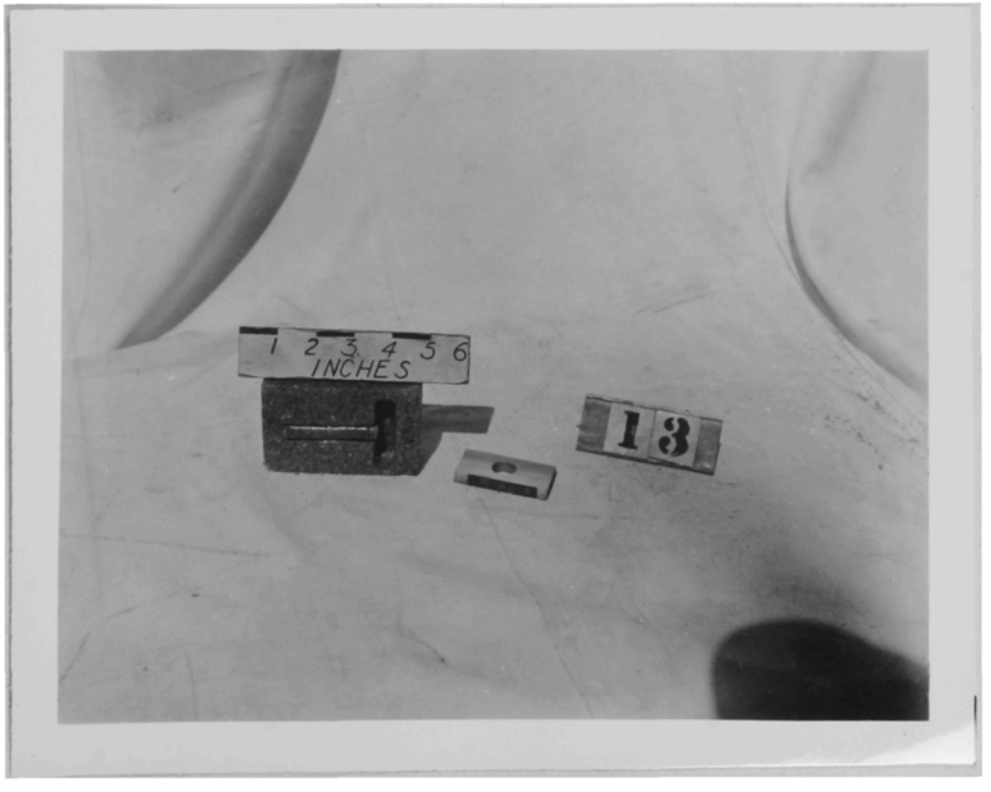
13-INCENDIARY BLOCK

General:

Color:	Mottled olive green tinseled block in a white paper wrapper.
Components:	Block, igniter tube, striker.
Dimensions:	4¼" x 1½" x 2-3/4".
Weight:	14 ozs.

Description: This block is a composite matte formed of a curdled waxy residue and magesium, aluminum and iron metal shavings. The residue was found to contain celluloid, carbon, camphor and glue. Barium Nitrate also was present. The block is rectangular in shape and has a "T" slot pressed into it. An igniter tube of celluloid which contains potassium chlorate, carbon and magnesiu metal is inserted in the long leg of the "T". Two types of paper-wrapped wooden strikers were found to be glued to these incendiary blocks; one, a rectangular striker and the other a disc striker.

Remarks: Upon test firing this block was found to burn abou 2½ minutes. It emitted a black sooty flame and a few white hot sparks. The intensity of burning was no more than would be required to start fires in ordinary combustible materials.



[redacted]

577-CANDLE INCENDIARY, MK 1A, SMALL

General:

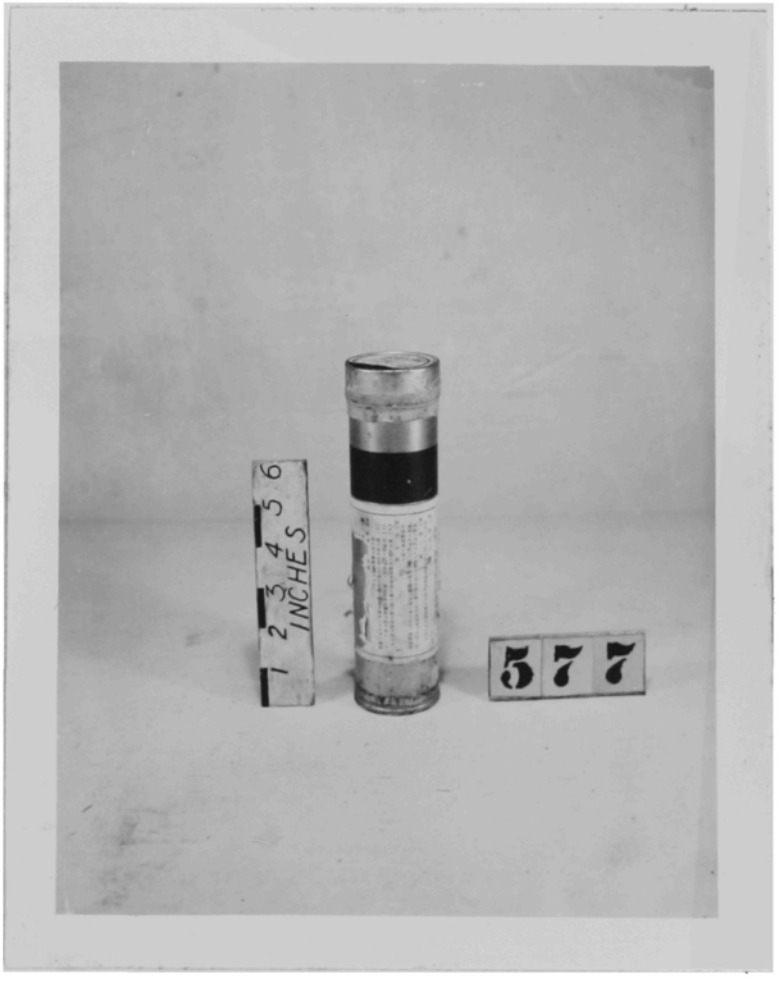
Color:	Brass finished metal, one purple band, and white labels.
Dimensions:	Length 8.5 inches, Diameter 2 1/8 inches.
Weight:	2.04 lbs.

Description: The lid is secured by adhesive tape. The matchhead fuse is protected by a piece of waxed paper which can be removed by pulling a small cord that is attached to the paper. A wooden disc fits over the paper which gives further protection. The opposite side of the disc is used for a scratcher for igniting the candle.

According to the translation of the label, this incendiary candle is used for training men in the methods of extinguishing fires caused from thermite incendiary bombs. It is supposed to burn about 30 seconds and have a dispersing radius of about 5 1/2 yards. The directions given for extinguishing the fire are to use sand or a wet straw mat.

Remarks: This candle was manufactured by the Sugami Naval Arsenal, July 1943.

Performance: The matchhead igniter was a dud and other means of igniting was used. The candle burned for 30 seconds.



393C-FILLER, INCENDIARY

General:
Color: Mottled grey
Components: Short rod shaped incendiary slugs.
Dimensions: Diameter of slugs-½ inch
Length-Approximately 1 inch average.

Description: This is a gum rubber bound incendiary mix which has been molded into the form of rods. These rods have been broken up into short slugs some of which were found to be still joined together in groups of two or more.

Remarks: These slugs burn easily with an intense white heat and emit a few very hot sparks. Analysis showed this filler to be comprised of magnesium powder, gum rubber, barium nitrate and oxide of iron. This incendiary is a bomb filler.



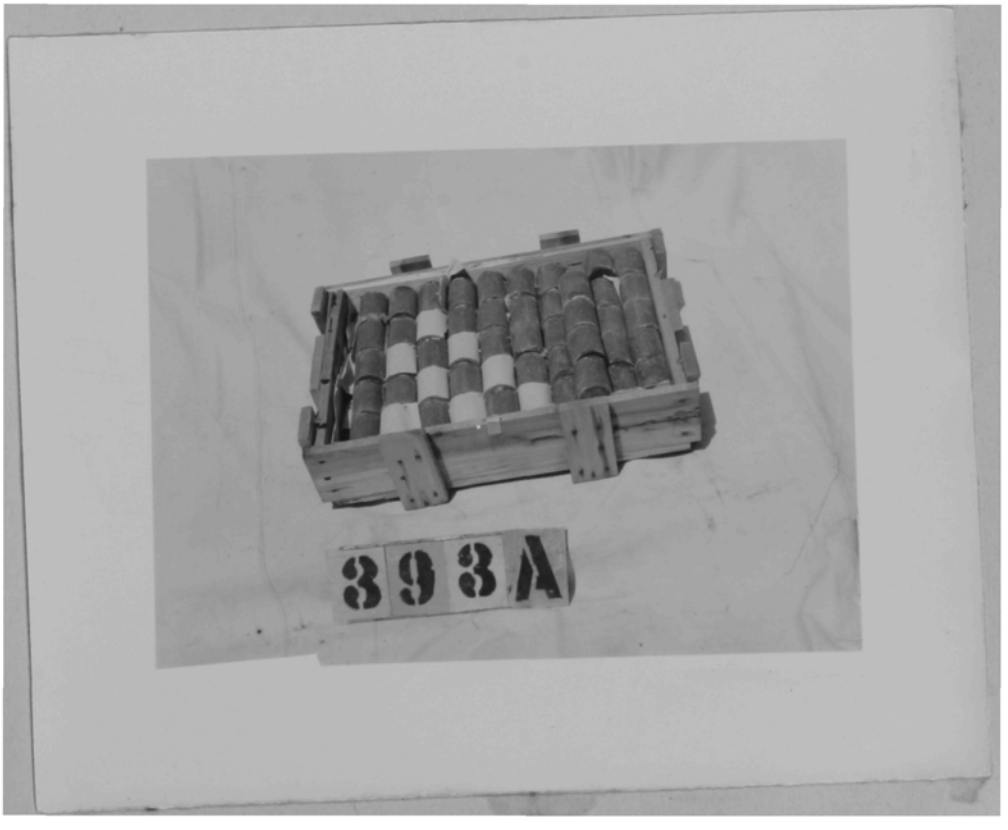
393A-PELLET, INCENDIARY

General:

Color: Gray, capped on one end with black
Components: Incendiary cylindrical pellets
Dimensions: 1½" in diameter, 2" long.

Description: These pellets are formed of a gum rubber bound incendiary mix capped with a black gum rubber high temperature starter. The cap is thin and is underlaid with metal fillings (probably magnesium). The cap was found to contain, besides rubber, potassium nitrate and carbon. The pellet itself was composed of barium nitrate, rubber, aluminum and magnesium filings iron filings, and iron oxide.

Remarks: Although the pellet did not burn readily at low temperature ignition, the starter burned very readily and initiated the burning of the pellet. Once started, the pellet burned at a very white heat and emitted considerable sparks. These pellet are designed for incendiary bomb filling.



393B-SHEET, INCENDIARY

General:

Color:	Tinseled Grey
Components:	Sheet
Dimensions:	19" x 14" x ¼" (roughly)
Weight:	7 lbs. a sheet (roughly)

Description: This sheet is composed of an incendiary mix bound together by vulcanized rubber (probably reclaimed). The mix was found to include magnesium and aluminum metals (probably alloy filings), sodium sulphide, barium nitrate and iron in the metallic and oxide forms. The sheet is brittle and easily broken up. When heated it has a tendency to crumble.

Remarks: The ignition of this sheet is difficult, but, once burning the sheet burns white hot and emits hot sparks.



[redacted]

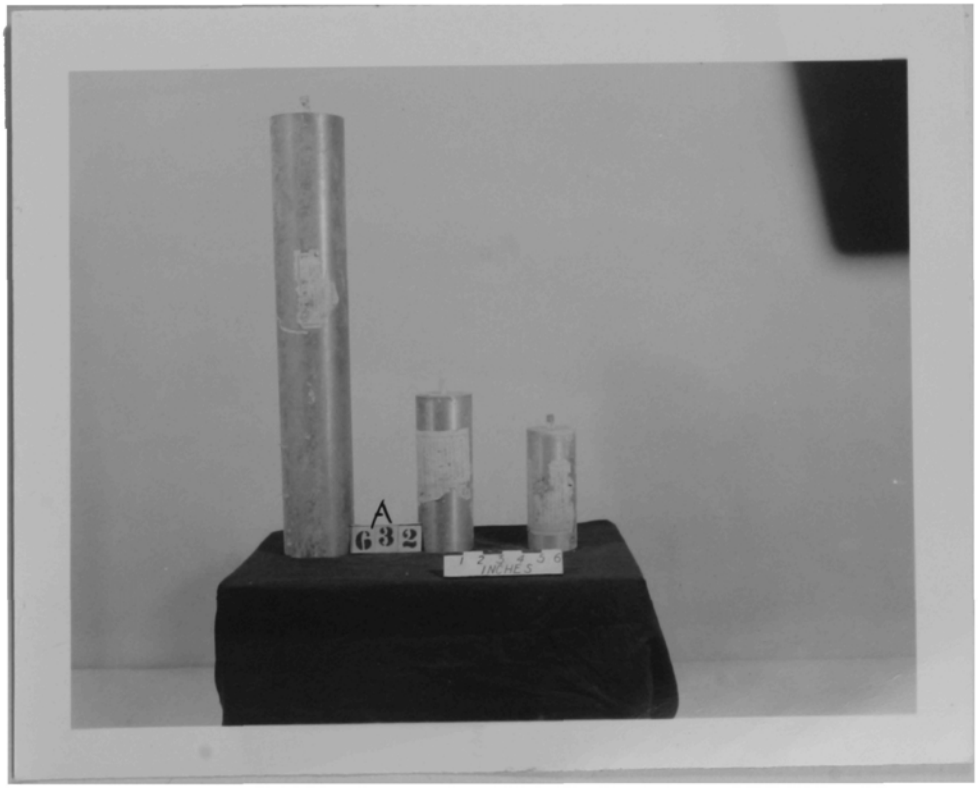
632A INCENDIARY TUBE, 1 Kg, ELECTRON

General:

Color:	Unpainted metal with a white label.
Markings:	Japanese characters giving nomenclature and directions for use.
Dimensions:	6.7" long, 2.75" diameter
Weight:	2.58 lbs.

Description: The cylindrical container is made of a magnesium alloy 0.2" thick, threaded inside on each end. The ends are of the same material and are approximately 0.4" thick and are screwed into each end of the cylinder. The upper end has a 0.5" hole drilled in the center through which extends a heavy paper tube that contains the starting mixture. There are two holes, 0.3" in depth, drilled in each end $\frac{1}{2}$" from the outside of the container. These holes are diametrically opposite of the center of the end plates. By using a two-pronged wrench in these holes, the ends can be screwed tight or taken out.

Remarks: According to the label, a matchhead igniter must be inserted in the end of the paper tube. The matchhead igniter is supposed to be in paper attached but in this particular one, it was missing. The directions on the label also stated that this incendiary was to be used in an open field at least 20 meters from any inflammable. A temperature of approximately 2700 degrees centigrade is reached during the burning. Since the label only gives directions for using in an open area, this incendiary is probably only used in training.



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632B-INCENDIARY TUBE, ELECTRON 2 Kg.

General:

Color:	Unpainted metal with white labels.
Markings:	Japanese characters giving nomenclature and directions for use.
Dimensions:	5-5/8" long, 3-3/8" diameter.
Weight:	4.53 lbs. (2 kg) (approx)

Remarks: This incendiary tube is a larger model of Incendiary Tube, Electron, 1 Kg, differing only in size.

Photograph for 632A-Incendiary, Electron, 1 Kg. shows this unit in center.

632C-INCENDIARY TUBE, ELECTRON 10 Kg

General:

Color:	Unpainted metal with white labels.
Markings:	Japanese characters giving nomenclature and directions for use.
Dimensions:	23-5/8" long, 3-7/8" diameter.
Weight:	22 lbs. (10 Kg) (Approx)

Remarks: This incendiary tube is a larger model of Incendiary Tube, Electron, 1 Kg. The only apparent difference is in the size.

Photograph for 632A-Incendiary Tube, Electron, 1 Kg. shows this unit on left.

[redacted]

404-INCENDIARY TUBE A (SPECIAL), TYPE III

General:

Color:	Canary yellow cylinder
Markings:	None on outside of cylinder
Contnets:	Five incendiary pieces, one scratching plate
Dimensions:	10" long - 2-3/4" diameter
Weight:	3.3 lbs.

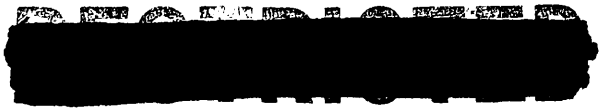
Description: The cylindrical container is made of cardboard and contains five segments of thermite. One or all may be used at one time, but only one scratching plate is provided in each container.

The incendiary piece is used primarily for combustibles. The five segments together are made of 250 gm. of thermite mixed with rubber. Rubber serves dual purposes as a binder and as an adherent which causes the incendiary to stick to the combustibles. The thermite has a matchhead on top for use in setting it off. A thin layer of paraffin between the top of the thermite and the container cover serves to keep out moisture.

A scratching plate is provided for igniting the matchhead. The plate is a thin piece of wood 1.95" x 1.56" with scratching powder found on both surfaces.

Instructions inside the top cover state that the burning time of the incendiary segment is from 20 to 30 seconds, and that the entire tube may be thrown after it is ignited.

Remarks: Chemical tests on thermite indicate it is of usual composition.





404-I.C.NDIARY TUBE A (SPECIAL), TYPE III

[redacted]

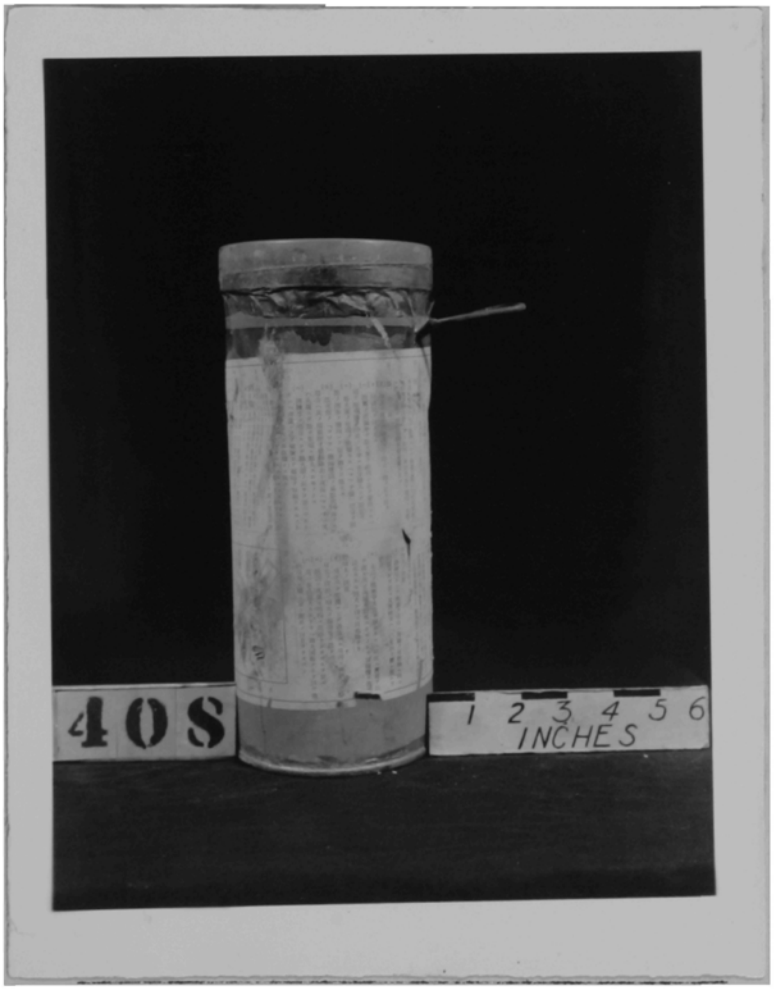
408- INCENDIARY TUBE A, MARK 1, THERMITE

General:

Color:	Grey-Green with one purple band at the top.
Markings:	Glued to the side a large white label giving descriptive instructions. A circular label of identification glued to the top of the lid.
Components:	A cylindrical metal canister, metal cover, wire handle, Match.
Dimensions:	4.5 inches Diameter, Length 10.75 inches.
Weight:	12.5 lbs.

Description: The lid is sealed to the canister with waterproofed paper. Under the lid is a shallow metal well sealed over with a waxed paper cover. In the center of this well is a black match with a small fluted recess for fuse insertion. Two small metal clamps soldered to the well are for the attaching of a special firing line described by the large label.

Remarks: Primarily designed for use in bomb disposal work.



409-INCENDIARY TUBE A, MK 2, LARGE

General:

Color:	Grey with one purple band at the top.
Markings:	Glued to the side a large white label giving descriptive instructions and also a very small nomenclature label.
Dimensions:	5.5 inches Diameter, 11inches Length.
Weight:	22 lbs.

Description: Same as for 408.

Remarks: Same as for 408. Similar to Mk 1, Incendiary Cylinder "A" Large, described in "Handbook of Japanese Explosive Ordnance", O.N.I. 30-3M, P. 249.



538-INCENDIARY LIQUID

General:

Color:	Battleship grey.
Markings:	Blue inspection stamp on top only.
Components:	Thin walled metal canister with 3/8" well traversing it longitudinally containing a liquid filling.
Dimensions:	2" Diameter, 5½" Long.
Weight:	⅛ lb.

Description: The metal canister is cylindrical in shape and is soldered at the seam. The top and bottom are both slightly recessed. The well, formed of a thin walled metal tube extends thru the canister from top to bottom, but is soldered over at the bottom. There is a metal strip soldered to the top near the well opening. This strip is possibly intended to hold the fuse or lead wires of a firing device.

Remarks: Movement of liquid filling is very definite when container is shaken. The composition of the filling has not been determined.



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