DEPARTMENT OF THE ARMY TECHNICAL BULLETIN

IDENTIFICATION AND DETECTION OF US GOVERNMENT-OWNED PETROLEUM PRODUCTS

Headquarters, Department of the Army, Washington, D.C.

15 November 1974

1. **Purpose**. *a.* This bulletin provides information and instruction, designates responsibilities and prescribes procedures for treating military-owned)petroleum products with covert identification agents, and detecting the presence of these agents in fuels suspected of being stolen or illegally diverted from Army supply activities. The use of procedures (described in this bulletin also will permit criminal investigators to trace a treated fuel to the specific storage activity from which it was stolen or illegally diverted.

b. Equipment and supplies required to apply and detect covert identification agents in military fuels are available through military supply channels and are identified herein for requisitioning purposes.

2. **Scope**. *a.* These instructions are applicable to all military criminal investigating activities and to commands, units, installations, and activities responsible for receipt, storage, and issue of petroleum products.

b. The use of identification agents in military petroleum products is restricted to ground products, i.e., motor gasolines, diesel fuels, kerosenes, and heating fuels. Identification agents will not be introduced(into these products by the manufacturer at time of procurement or by the Army at the time products are initially received into oversea ocean terminals of Army petroleum distribution systems.

3. **Recommended Changes.** Users of this bulletin are encouraged to submit recommended changes and comments to improve the publication. Comments should be keyed to specific page, paragraph and line of the text in which the change is recommended.
Reasons should be included for each recommended change and comment to insure understanding and complete evaluation. Comments should be prepared using DA Form 2028 (Recommended Changes to Publications and Blank Forms) and forwarded direct to Commander, US Army Materiel Command, ATTN: AMCSU-L, Alexandria, Virginia 22333.

4. **Responsibilities**. *a.* The US Army Criminal Investigation Command (USACIDC) is responsible for the overall administration and control of applying covert identification agents to petroleum fuels.

b. The USACIDC will submit a list of regional and field activities authorized to use covert agents and agent identification extractant to the US Army General Materiel and Parts Center (USAGMPC).

c. USACIDC regional and field activities are responsible for designating the storage locations where identification agents will be applied and the type and

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quantity of fuels to be identified. These activities also will be responsible to take samples of suspect fuels and to perform detecting tests. USACIDC personnel must closely coordinate the application and detection of military fuels with commanders of the Army petroleum storage and distribution activities. Identification agents required to mark military fuels will be requisitioned, on an as needed basis, by the concerned USACIDC activity and when received will be provided to commanders of Army petroleum storage and distribution activities for storage and application.

d. USACIDC activities will forward requisitions by mail for items listed in table 1 to the US Army General Materiel and Parts Center, ATTN: STSGP-IM, New Cumberland Army Depot, New Cumberland, PA 17070.

e. Commanders of Army petroleum storage and distribution facilities, when requested and provided identification agents by USACIDC activities, will provide secure storage for and apply the agents to fuels under their cognizance in accordance with instructions furnished by USACIDC.

f: The USAGMPC is responsible for the following:

(1) Receive, route, process and monitor all requisitions received from USACIDC regional and field activities for the table 1 covert agents and for the agent identification extractant.

(2) Act as a focal point for supply and technical problems related to identification and extractant agents.

(3) Insure that only authorized USACIDC regional and field activities requisition covert agents and the agent identification extractant.

5. **Application of Covert Identification Agents.** *a.* Six identification agents are available for blending into ground products, none of which produces a noticeable color change after addition to the fuel. The identification agents are listed in table 1.

Table 1

Item	NSN		U/I	RIC	Cost
1	6820-00-487-9982	Agent Identification (Blue)	Gal	A35	Est $15.00
2	6820-00-487-9983	Agent Identification (Red)	Gal	A35	Est 15.00
3	6820-00-487-9985	Agent Identification (Yellow)	Gal	A35	Est 15.00
4	6820-00-488-0005	Agent Identification (Green)	Gal	A35	Est 15.00
5	6820-00-488-0034	Agent Identification (Orange)	Gal	A35	Est 15.00
6	6820-00-488-0037	Agent Identification (Purple)	Gal	A35	Est 15.00
7	6820-00-488-0040	Agent Identification Extractant	Gal	A35	Est 15.00

b. The identification agents are in a benzene solution. The required amount of agent to be used in treating various quantities of ground products is shown in table 2.

Table 2

Volume of fuel to be treated	Volume of identification agent required
Gallons	**Milliliters**
5	1
55	10
500	100
1,200	240
5,000	1,000
10,000	2,000
100,000	20,000 or 5 gallons

c. Identification agents are miscible with ground products and when blended in fuels in ratios listed in table 2 have no adverse effect on the product, storage, filtration, and dispensing equipment or the fuel consuming equipment in which the treated fuel is intended for use. To obtain a thoroughly mixed product, identification agents should be poured or introduced into the container, tank truck, rail car, or barge during filling operations. Measurement and application of identification agents to treat specified quantities of fuel may be accomplished with standard equipment authorized petroleum operating and laboratory units assigned or attached to the Army Petroleum Storage and Distribution System in oversea areas. In certain instances, the criminal investigator may desire to add identification agent to an already filled container of unmarked fuel. On these occasions, the identification agent may be poured direct into the filled container. The normal movement of the container during transport and handling will cause sufficient blending to produce a positive test result. However, complete mixing

may not occur and the concentration may vary and be less than optimum.

6. **Sampling and Detection of Covert Identified Fuels.** a. Sampling Equipment. Items listed in Table 3 provide a means to take samples of covert identified fuels.

b. Sampling Procedure.

(1) The 1-quart oil sampler (item 1, table 3) is used to remove fuels to be tested from large bulk storage containers, tank trucks, rail cars, and barges. The sampler is a weighted metal round 3/4 inch diameter beaker with a stoppered opening at the top and lowering rope. The lowering rope is attached through the stopper so that with a quick jerk the sampler can be opened at any point beneath the surface of the product. To take a sample, place the cork in the 3% inch opening and lower sampler to the bottom of the tank. While sample is setting on the bottom of the tank, jerk the rope to remove stopper and raise sampler at a uniform rate of speed such that the sampler is about 3/4 full when withdrawn from the fuel.

(2) The pressure and circulating bulb (item 2, table 3) and the plastic tubing (item 3, table 3) are used to take samples from small containers, such as 5-gallon cans, 55-gallon drums, fuel tanks of automotive vehicles and from other containers which cannot accept the 1-quart oil sampler. The bulb has a capacity of approximately 85 milliliters and is equipped with a check valve at each end.

(a) Separate lengths of plastic tubing are cut and affixed to the valve stems. The tubing on the suction side of the bulb should be of sufficient length to extend below the surface of the fuel to be withdrawn.

The tubing on the discharge side should be of sufficient length to transfer the fuel sample into a graduated cylinder.

(b) Lower the suction tubing into the container from which a fuel sample is to be taken. The suction tubing should extend below the fuel surface.

Fully squeeze bulb and allow product to be drawn into bulb chamber. Squeeze bulb to transfer sample to graduated cylinder.

(3) The bung wrench (item 4, table 3) is used to open varied type and size closures of 55-gallon steel drums.

(4) Representative samples are prerequisites for detection tests and positive identification that sampled fuel was stolen or illegally diverted from military supply channels. All sampling equipment must be clean. Since covert identification agents have a residual characteristic, sampling equipment should be thoroughly rinsed with unmarked fuel before used to take samples of fuels from other containers.

Table 3

Item	NSN	Nomenclature	U/I	RIC	Cost
1	6695-00-359-9944	Sampler Oil, 1-qt. Cap	Ea	S9G	$66.00
2	6640-00-494-3726	Bulb, Pressure and Circulating	Ea	S9M	$ 1.20
3	4720-00-410-9505	Tubing, Tygon Plastic 3/8 inch ID 10 ft Length	Length	S9C	$ 1.00
4	5120-00-410-4389	Wrench, Bung	Ea	*	$ 6.10
5	6640-00-889-7089	Cylinder, Graduated Plastic O10MI	Ea	S9M	$ 1.90
6	6640-00-075-5817	Bottle, Screw Top Plastic 402	Ea	S9M	

*** Forward requisitions for this item to the applicable General Service Agency Support Center.**

c. Detection Equipment. Item 7, Table 1 and items 5 and 6, Table 3 are required to determine presence of covert identification in samples of petroleum fuels.

d. Detection Procedure.

(1) After a sample of the fuel to be tested is obtained, transfer 100-milliliters of the fuel from the oil sampler or pressure and circulating bulb into the 100milliliter graduated plastic cylinder (item 5, table 3).

(2) Pour the 100-milliliters of fuel from the graduated cylinder into a 4-ounce plastic bottle (item 2, table 4). The bottle will be filled to about one inch of the top.

(3) Pour 10-milliliters of the extractant agent (item 7, table 1) into the graduated cylinder previously used to 100 measure milliliters of the sampled fuel. The graduated cylinder should be thoroughly rinsed with unmarked fuel and dried before receiving the extractant agent. For ease of handling, the extractant agent may be transferred from the 1-gallon container into a 4-ounce bottle which the investigator can use at the place of test.

(4) Add the 10-milliliters of extractant agent to the 4-ounce plastic bottle containing the fuel to be tested. Place top on the bottle and tighten.

(5) Shake the bottle and its contents for 10 to 15 seconds.

(6) If a covert identification agent is present in the fuel sample being tested, the color of the identification agent used (blue, red, yellow, orange, green, or purple) will appear in the lower layer of the bottle. If the lower layer is colorless, the fuel sample being tested does not contain one of the covert identification agents. Test results of fuel samples in which identification agents have been added are illustrated in figure 1.

(7) Because identification agents have a residual characteristic, all test equipment should be thoroughly cleaned after each test when test revealed positive presence of an identification agent. To insure that equipment does not contain residual identification agents, a determination using unmarked fuel should be made prior to conducting tests.

7. **Safety of Handling.** *a.* Covert identification agents are provided in a solution of benzene. As such, these solutions are flammable. The identification agents may cause irritation or allergic skin sensitization of some individuals and contact should be avoided. If accidentally spilled on the skin or clothing, wash off promptly with soap and water. Avoid contact with the eyes. Do not take internally. Inhalation of benzene vapors is injurious and also should be avoided.

b. Identification agents, because of the benzene solvent, may have a detrimental effect on collapsible storage tanks when introduced in large and concentrated quantities and may cause a softening of the elastromer material. When treating fuels in collapsible containers, identification agents should be added slowly and at time fuel is being pumped or filled into the container. When identification agents are added in this manner, the resultant concentration will have no adverse effect on the collapsible container.

c. The extractant agent is not flammable but should be handled with normal precautions associated in handling most chemicals, otherwise, the same handling precautions should be followed with the extractant agent as stated above for the covert identification agent.

8. **Security**. *a.* This bulletin and information contained herein should be controlled inasmuch as identification agents in petroleum products may be chemically neutralized or compromised by insertion of other colored dyes. Only those individuals directly involved in the treatment and detection of covert marked fuels and instructions therefor, should be given access to this bulletin and the identification and extractant agents listed in Table 1.

b. The identification and extractant agents should be stored in an enclosed locked area for sensitive items, affording maximum security reasonably available for such material and accessable to a minimum of personnel.

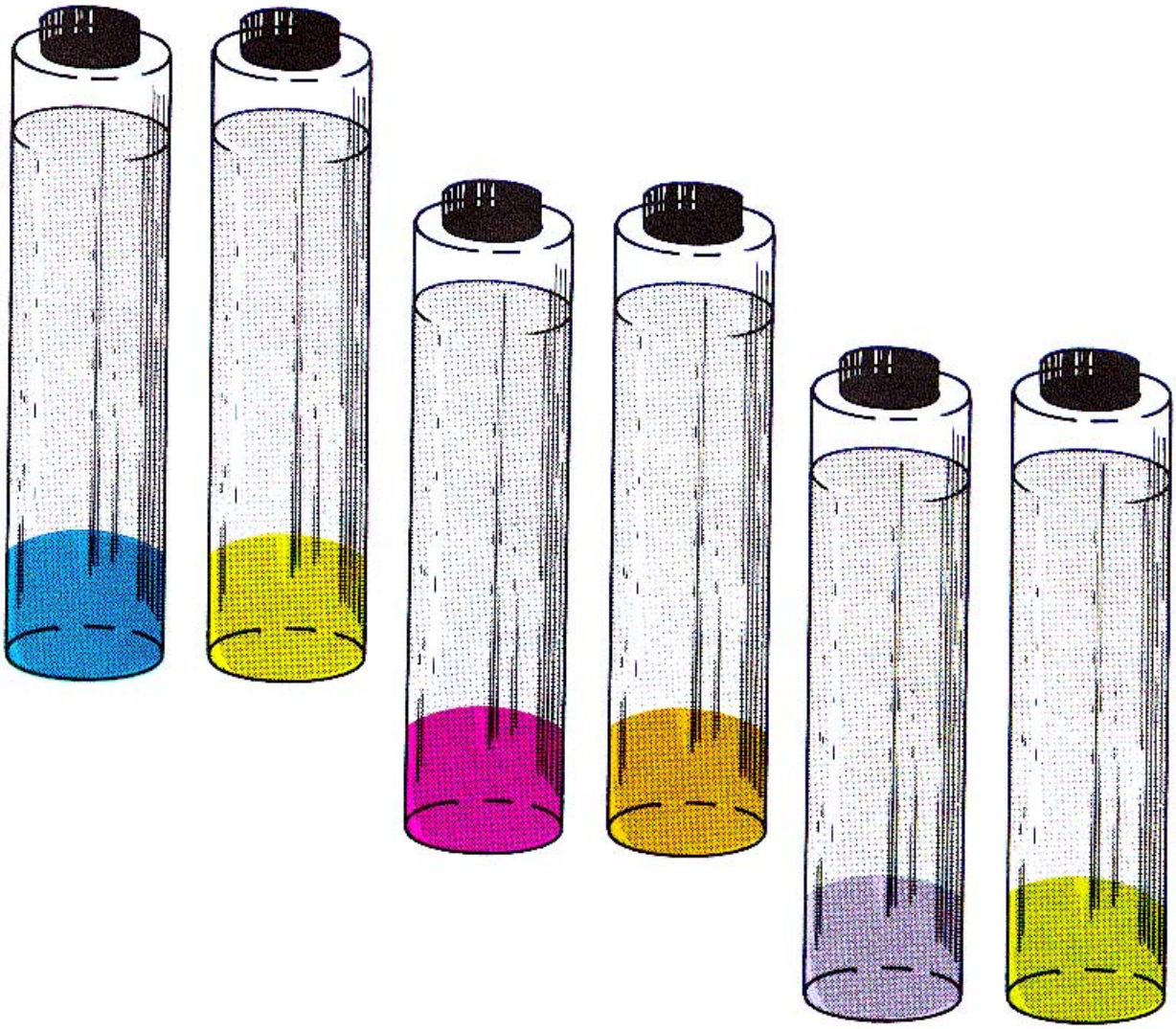

Figure 1. Test results of kerosene samples treated with identification agents.

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ARNG and USAR: None.

For explanation of abbreviations used, see AR 310-50.

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The Metric System and Equivalents

Linear Measure

1 centimeter = 10 millimeters = .39 inch
1 decimeter = 10 centimeters = 3.94 inches
1 meter = 10 decimeters = 39.37 inches
1 dekameter = 10 meters = 32.8 feet
1 hectometer = 10 dekameters = 328.08 feet
1 kilometer = 10 hectometers = 3,280.8 feet

Weights

1 centigram = 10 milligrams = .15 grain
1 decigram = 10 centigrams = 1.54 grains
1 gram = 10 decigram = .035 ounce
1 decagram = 10 grams = .35 ounce
1 hectogram = 10 decagrams = 3.52 ounces
1 kilogram = 10 hectograms = 2.2 pounds
1 quintal = 100 kilograms = 220.46 pounds
1 metric ton = 10 quintals = 1.1 short tons

Liquid Measure

1 centiliter = 10 milliters = .34 fl. ounce
1 deciliter = 10 centiliters = 3.38 fl. ounces
1 liter = 10 deciliters = 33.81 fl. ounces
1 dekaliter = 10 liters = 2.64 gallons
1 hectoliter = 10 dekaliters = 26.42 gallons
1 kiloliter = 10 hectoliters = 264.18 gallons

Square Measure

1 sq. centimeter = 100 sq. millimeters = .155 sq. inch
1 sq. decimeter = 100 sq. centimeters = 15.5 sq. inches
1 sq. meter (centare) = 100 sq. decimeters = 10.76 sq. feet
1 sq. dekameter (are) = 100 sq. meters = 1,076.4 sq. feet
1 sq. hectometer (hectare) = 100 sq. dekameters = 2.47 acres
1 sq. kilometer = 100 sq. hectometers = .386 sq. mile

Cubic Measure

1 cu. centimeter = 1000 cu. millimeters = .06 cu. inch
1 cu. decimeter = 1000 cu. centimeters = 61.02 cu. inches
1 cu. meter = 1000 cu. decimeters = 35.31 cu. feet

Approximate Conversion Factors

To change	*To*	*Multiply by*	*To change*	*To*	*Multiply by*
inches	centimeters	2.540	ounce-inches	Newton-meters	.007062
feet	meters	.305	centimeters	inches	.394
yards	meters	.914	meters	feet	3.280
miles	kilometers	1.609	meters	yards	1.094
square inches	square centimeters	6.451	kilometers	miles	.621
square feet	square meters	.093	square centimeters	square inches	.155
square yards	square meters	.836	square meters	square feet	10.764
square miles	square kilometers	2.590	square meters	square yards	1.196
acres	square hectometers	.405	square kilometers	square miles	.386
cubic feet	cubic meters	.028	square hectometers	acres	2.471
cubic yards	cubic meters	.765	cubic meters	cubic feet	35.315
fluid ounces	milliliters	29,573	cubic meters	cubic yards	1.308
pints	liters	.473	milliliters	fluid ounces	.034
quarts	liters	.946	liters	pints	2.113
gallons	liters	3.785	liters	quarts	1.057
ounces	grams	28.349	liters	gallons	.264
pounds	kilograms	.454	grams	ounces	.035
short tons	metric tons	.907	kilograms	pounds	2.205
pound-feet	Newton-meters	1.356	metric tons	short tons	1.102
pound-inches	Newton-meters	.11296			

Temperature (Exact)

°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C

PIN: 015294-000