



TERPENE & AROMATICS DIVISION  
**JACKSONVILLE, FLORIDA**

EPA Est. No. 9886-FL-1

**UNIPINE<sup>®</sup> S**

For manufacturing disinfectants

Net Contents 55 Gals. EPA Reg. No. 9886-7

Active Ingredient 100% Pine Oil

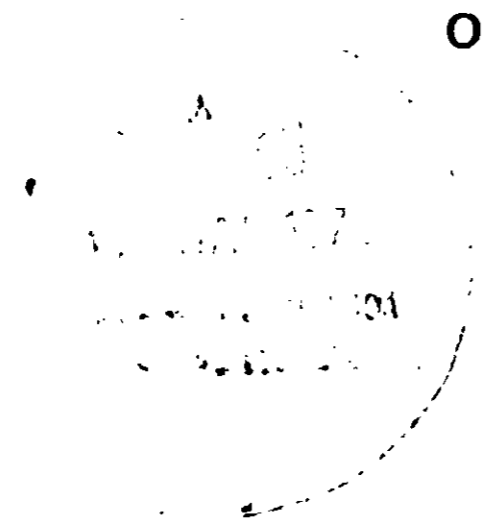
**WARNING:** Keep Out of Reach of Children. Harmful if swallowed. May cause eye damage. Causes skin irritation. Do not get in eyes or on skin. Avoid contamination of food.

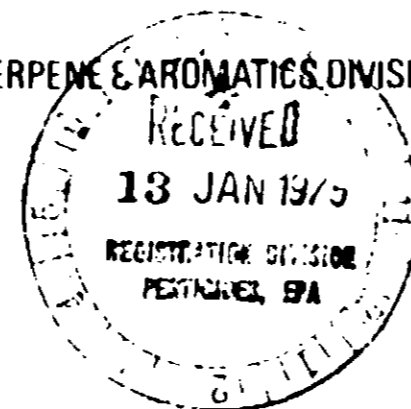
**FIRST AID:** In case of contact with eyes or skin, wash immediately with water. For eyes, get medical attention. If swallowed, do not induce vomiting. Vomiting may be harmful. Consult physician immediately.

Rinse empty drum thoroughly with soapy water before discarding or returning to drum reconditioner.

See Technical Service Bulletin TS-134 for use information

THERE ARE NO WARRANTIES, EXPRESSED OR IMPLIED, BY CONTRACT STATUTE, OR COMMON LAW OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OTHERWISE, EXCEPT THAT THE PRODUCT SHALL BE OF UNION CAMP CORPORATION'S STANDARD QUALITY AND SHALL CONFORM TO THE DESCRIPTION AS STATED ON THIS LABEL





## UNIPINE PRODUCTS IN DISINFECTANTS

Introduction

UNIPINE products are high quality pine oils widely used in household and industrial disinfectants. In addition to proven bacterial effectiveness, they provide a pleasant fragrance and excellent solvency properties. Other attributes such as freedom from staining and the ability to prepare disinfectants of sparkling clarity add to the value of UNIPINE products to the formulator.

This bulletin describes the use of UNIPINE products in disinfectants having a concentration of terpene alcohols greater than 50%. Representative disinfectants for each UNIPINE product are shown in Table III.

Emulsifiers

The alkali metal soaps of UNITOL products are low cost emulsifiers which enhance the uniformity of disinfectant compounds. This type of disinfectant is usually made from pine oil and emulsifying agents modified in some cases with alcohol or glycol couplers and supplementary bactericides. Although most anionic and nonionic surfactants are suitable emulsifiers, anionics such as alkali metal soaps are preferred. The typical properties of a UNITOL fatty acid are given in Table I.

Disinfectant Properties

The A. O. A. C. Phenol Coefficient Method which appears in the "Official Methods of Analysis" (1955), has been used to measure the effectiveness of the disinfectant formulations. The Phenol Coefficient Values shown here were determined by an independent testing laboratory using SALMON-ELLA TYPHOSA organisms. The values given are subject to the influence of many variables and usually fall within approximately 15% reproducibility range.

Pine Oil Properties

Of the various components present in commercial pine oil, the terpene alcohols are primarily responsible for its germicidal power. Premium pine oil disinfectants therefore contain a high quantity of terpene alcohols. The UNIPINE products presented here meet the quantitative requirements of one of the pine oil types (I, II or III) described in Federal Specification LLL-P-400A. The physical properties of the UNIPINE products are given in Table II.

Technical Service Bulletin TS-134

Various germicidal fortifiers may be used to increase the phenol coefficient and, in some cases, activity against gram-positive organisms which are resistant to pine oil disinfectants. Santophen No. 1(1) is a typical example. The phenol coefficient value is used to express germicidal activity in terms of killing power toward a test organism compared to that of phenol under identical conditions. Complete specifications for pine oil disinfectants appear in Commercial Standards CS69-38 of the U. S. Department of Commerce as amended April 8, 1955.

Preparation Procedure

The following is a suggested procedure for preparation of typical disinfectants made with UNIPINE products.

1. Cold blend UNIPINE product, UNITOL and isopropanol together as the oil phase.
2. With continuous agitation, add the caustic soda dissolved in the water.
3. Continue agitation until the batch clears.

(1) Product of Monsanto Company

Shown in Table III are several 80% pine oil disinfectant formulations. Also shown are two pine odor or pine-type disinfectants (Formulas JPO-54-39C and JPO-54-04D). Various germicidal fortifiers may be employed in these formulations to increase the phenol coefficient.



**Technical Service Bulletin TS-134**

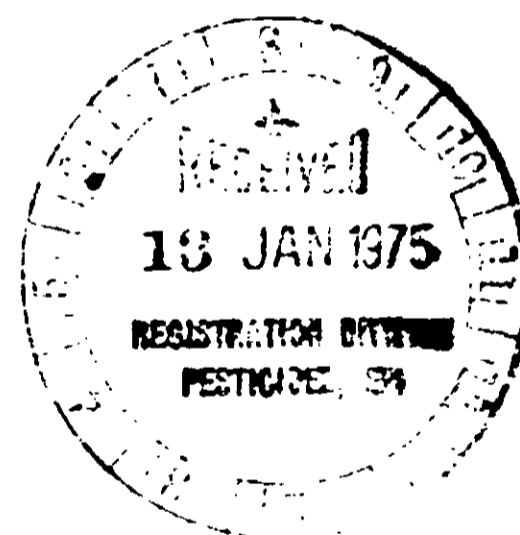
**PRECAUTIONARY STATEMENT**

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**FIRST AID: In case of contact with eyes or skin, wash immediately with water. For eyes, get medical attention. If swallowed – DO NOT INDUCE VOMITING. Vomiting may be harmful. CONSULT PHYSICIAN IMMEDIATELY.**

**TABLE I**  
**Typical Properties of**  
**UNITOL FATTY**  
**ACIDS**

	<b>UNITOL LFA</b>
Total Fatty Acids, %	94.7
Rosin Acids, %	3.5
Unsaponifiables, %	1.8
Gardner Color, ASTM D-1544	4+
Acid Number	194.0
Saponification Number	196.0
Specific Gravity Secs, 25° C	0.905



**TABLE II**  
**Typical Properties of**  
**UNIPINE products**

<b>UNIPINE</b>	<b>% Terpene Alcohols</b>	<b>% Other Terpene Hydrocarbons</b>	<b>Specific Gravity 15.6/15.6° C</b>	<b>% Moisture</b>	<b>Terpene Ethers</b>
85	87.8	11.9	0.932	0.3	Trace
75	74.5	25.2	0.923	0.3	Trace
S-70	70.0	23.0	0.930	0.5	6.5
8510	86.7	12.0	0.932	0.3	1.0
NCL	88.0	9.1	0.936	0.5	2.4
8050	87.0	9.5	0.936	0.5	3.0
S	80.0	12.0	0.945	0.5	7.5
80	80.0	19.5	0.925	0.5	Trace

TABLE III

FORMULATION NUMBER	JPO- 54-39 B	JPO- 54-39 C	JPO- 54-04 D	JPO- 54-04 E	JPO- 54-04 F	JPO- 54-04 G	JPO- 54-04 H	JPO- 54-04 I
UNIPINE 85	80							
UNIPINE 75		80						
UNIPINE S-70			80					
UNIPINE 8510				80				
UNIPINE NCL					80			
UNIPINE 8050						80		
UNIPINE S							80	
UNIPINE 80								80
UNITOL LFA	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4
Isopropyl Alcohol	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7
Sodium Hydroxide	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
Water	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6
Phenol Coefficient	3.9	2.8	3.4	5.3	5.0	5.3	6.0	5.0

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