

waive the requirements for retaining invoices if the quantity sold to any person during a calendar month does not exceed 25 gallons, and if a waiver will not hinder the effective administration of this part and will not pose a jeopardy to the revenue.

(Approved by the Office of Management and Budget under control number 1513-0061)

[T.D. ATF-199, 50 FR 9162, Mar. 6, 1985, as amended by T.D. TTB-140, 81 FR 59456, Aug. 30, 2016]

§ 20.266 Time for making entries in records.

Any person who conducts an operation which is required to be recorded under this part, shall enter that operation in the records on the same day on which the operation occurred. However, the daily posting of records may be deferred to conform to the permittee's normal accounting cycle if (a) supporting or supplemental records are prepared at the time of the operation, and these supporting or supplemental records are to be used to post the daily record, and (b) the deferral of posting does not pose a jeopardy to the revenue.

§ 20.267 Filing and retaining records.

Any person who is required to maintain records of operations under this part shall file and retain records and copies of reports in the following manner:

(a) Keep on file for a period of not less than 3 years after the date of the report covering the operation, in such a way as to allow inspection by TTB officers, all those records of operations, all supporting or supplemental records, and copies of all reports as required by this part. However, the appropriate TTB officer may require that the records and copies of reports be kept for an additional period, not to exceed 3 years.

(b) File all records and copies of reports at the premises where the operations are conducted.

(c) Make the files of records and copies of reports available to TTB officers

during regular business hours for examination.

[T.D. ATF-199, 50 FR 9162, Mar. 6, 1985, as amended by T.D. ATF-435, 66 FR 5475, Jan. 19, 2001]

§ 20.268 Photographic copies of records.

(a) *General.* Permittees may record, copy, or reproduce required records. Any process may be used which accurately reproduces the original record, and which forms a durable medium for reproducing and preserving the original record.

(b) *Copies of records treated as original records.* Whenever records are reproduced under this section, the reproduced records will be preserved in conveniently accessible files, and provisions will be made for examining, viewing, and using the reproduced records the same as if they were the original record, and they will be treated and considered for all purposes as though they were the original record. All provisions of law and regulations applicable to the original are applicable to the reproduced record. As used in this section, "original record" means the record required by this part to be maintained or preserved by the permittee, even though it may be an executed duplicate or other copy of the document.

(Sec. 201, Pub. L. 85-859, 72 Stat. 1395, as amended (26 U.S.C. 5555))

PART 21—FORMULAS FOR DENATURED ALCOHOL AND RUM

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AUTHORITY: 5 U.S.C. 552(a); 26 U.S.C. 5242, 7805.

SOURCE: T.D. ATF-133, 48 FR 24673, June 2, 1983, unless otherwise noted.

EDITORIAL NOTES: Nomenclature changes to part 21 appear by T.D. ATF-435, 66 FR 5475, Jan. 19, 2001.

Nomenclature changes to part 21 appear by 81 T.D. TTB-140, 81 FR Aug. 30, 2016.

Subpart A—General Provisions

§ 21.1 Scope of regulations.

The regulations in this part relate to the formulation of completely denatured alcohol, specially denatured alcohol, and specially denatured rum; to the specifications for denaturants; and to the uses of denatured spirits.

§ 21.2 Forms prescribed.

(a) *General.* The appropriate TTB officer is authorized to prescribe all forms required by this part. All of the information called for in each form shall be furnished as indicated by the headings on the form and the instructions on or pertaining to the form. In addition, information called for in each form shall be furnished as required by this part. The form will be filed in accordance with the instructions for the form.

(b) Forms prescribed by this part are available for printing through the TTB Web site (<https://www.ttb.gov>) or by mailing a request to the Alcohol and Tobacco Tax and Trade Bureau, National Revenue Center, 550 Main Street, Room 8970, Cincinnati, OH 45202.

[T.D. ATF-133, 48 FR 24673, June 2, 1983, as amended by T.D. ATF-249, 52 FR 5961, Feb. 27, 1987; T.D. 372, 61 FR 20724, May 8, 1996; T.D. ATF-435, 66 FR 5475, Jan. 19, 2001; T.D. TTB-44, 71 FR 16934, Apr. 4, 2006; T.D. TTB-196, 89 FR 87940, Nov. 6, 2024]

§ 21.3 Stocks of discontinued formulas.

Denaturers, or specially denatured spirits dealers or users, having on hand stocks of denaturants or formulas of specially denatured spirits no longer authorized by this part may—

(a) Continue to supply or use those stocks in accordance with existing permits until the stocks are exhausted;

(b) Use up those stocks in any manufacturing process approved by the appropriate TTB officer, pursuant to an

application filed with such officer on TTB Form 5150.19, Formula for Articles made with Specially Denatured Alcohol and Rum;

(c) On approval of an application, filed with the appropriate TTB officer and approved by such officer, destroy those stocks under whatever supervision the appropriate TTB officer requires; or

(d) Otherwise dispose of those stocks in a manner satisfactory to the appropriate TTB officer, pursuant to approval of an application.

[T.D. ATF-133, 48 FR 24673, June 2, 1983, as amended by T.D. ATF-435, 66 FR 5475, Jan. 19, 2001; T.D. TTB-196, 89 FR 87940, Nov. 6, 2024]

§ 21.4 Related regulations.

The procedural and substantive requirements relative to the production of denatured alcohol and specially denatured rum are prescribed in part 19 of this chapter, and those relative to the distribution and use of denatured alcohol and specially denatured rum are prescribed in part 20 of this chapter.

[T.D. ATF-133, 48 FR 24673, June 2, 1983, as amended by T.D. ATF-199, 50 FR 9183 Mar. 6, 1985]

§ 21.5 Denatured spirits for export.

Spirits may be denatured in accordance with formulas prescribed by the government of a foreign country to which the denatured spirits will be exported. However, the denaturer must first apply for and obtain written permission from the appropriate TTB officer. The application shall be submitted to the appropriate TTB officer and shall contain the following information:

(a) A complete list of ingredients for the spirits to be denatured.

(b) The exact amount of each ingredient to be used in denaturing the spirits.

(c) A copy (accompanied by an English translation as necessary) of the law or regulations of the foreign country to which the denatured spirits will be exported, specifying the denatured spirits formulation prescribed by that country.

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§ 21.6 Incorporations by reference.

(a) “The United States Pharmacopoeia (Twentieth Revision, Official from July, 1980) and the National Formulary (Fifteenth Edition, Official from July 1, 1980)” published together as “The USP and NF Compendia,” are incorporated by reference in this part. This incorporation by reference was approved by the Director of the Federal Register. The publication is available from the United States Pharmacopoeia Convention, Inc., 12601 Twinbrook Parkway, Rockville, Maryland 20852, or may be inspected at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202-741-6030, or go to: <https://www.archives.gov/federal-register/cfr/ibr-locations.html>.

(b) Material from Parts 23, 25, and 29 of the 1980 Annual Book of ASTM Standards is incorporated by reference in this part. This incorporation by reference was approved by the Director of the Federal Register. These publications are available from the American Society for Testing and Materials, 1916 Race Street, Philadelphia, Pennsylvania 19103, or may be inspected at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202-741-6030, or go to: <https://www.archives.gov/federal-register/cfr/ibr-locations.html>.

(c) Material from the “Official Methods of Analysis of the Association of Official Analytical Chemists (13th Edition 1980)” (AOAC) is incorporated by reference in this part. This incorporation by reference was approved by the Director of the Federal Register. This publication is available from the Association of Official Analytical Chemists, 11 North 19th Street, Suite 210, Arlington, Virginia 22209, or may be inspected at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202-741-6030, or go

to: <https://www.archives.gov/federal-register/cfr/ibr-locations.html>.

[T.D. ATF-133, 48 FR 24673, June 2, 1983, as amended at 69 FR 18803, Apr. 9, 2004; T.D. TTB-196, 89 FR 87940, Nov. 6, 2024]

(Pub. L. 89-554, 80 Stat. 383 as amended (5 U.S.C. 552(a)))

§ 21.7 Delegations of the Administrator.

The regulatory authorities of the Administrator contained in this part are delegated to appropriate TTB officers. These TTB officers are specified in the current version of TTB Order 1135.21, Delegation of the Administrator’s Authorities in 27 CFR Part 21, Formulas for Denatured Alcohol and Rum. You may obtain a copy of this order by accessing the TTB Web site (<https://www.ttb.gov>) or by mailing a request to the Alcohol and Tobacco Tax and Trade Bureau, National Revenue Center, 550 Main Street, Room 8970, Cincinnati, OH 45202.

[T.D. TTB-44, 71 FR 16936, Apr. 4, 2006; T.D. TTB-140, 81 FR 59460, Aug. 30, 2016; T.D. TTB-196, 89 FR 87940, Nov. 6, 2024]

Subpart B—Definitions

§ 21.11 Meaning of terms.

When used in this part and in forms prescribed under this part, unless the context otherwise requires, terms have the meanings given in this section. Words in the plural form include the singular, and vice versa, and words indicating the masculine gender include the feminine. The terms “includes” and “including” do not exclude things not mentioned which are in the same general class.

Administrator. The Administrator, Alcohol and Tobacco Tax and Trade Bureau, Department of the Treasury, Washington, DC.

Alcohol. The spirits known as ethyl alcohol, ethanol, or spirits of wine, from whatever source or by whatever process produced. The term does not include such spirits as whisky, brandy, rum, gin, or vodka.

Appropriate TTB officer. An officer or employee of the Alcohol and Tobacco Tax and Trade Bureau (TTB) authorized to perform any functions relating to the administration or enforcement

of this part by the current version of TTB Order 1135.21, Delegation of the Administrator's Authorities in 27 CFR Part 21, Formulas For Denatured Alcohol and Rum.

CFR. The Code of Federal Regulations.

C.D.A. Completely denatured alcohol.

Completely denatured alcohol. The spirits known as alcohol, as defined in this section, denatured pursuant to completely denatured alcohol formulas prescribed in subpart C of this part.

Denaturant. A material authorized by this part to be added to spirits in order to make those spirits unfit for beverage or internal human medicinal use.

Denatured spirits. Alcohol or rum to which denaturants have been added as provided in this part.

Essential oil. Any of the volatile odoriferous natural oils found in plants, which impart to such plants odor, and often other characteristic properties; also, imitations of such natural oils, as well as aromatic substances, and synthetic oils, which possess the denaturing characteristics of such natural oils.

Gallon. The liquid measure equivalent to the volume of 231 cubic inches.

Manufacturer or user. A person who holds a permit, issued under part 20 of this chapter, to withdraw and use specially denatured alcohol or specially denatured rum, or to recover completely or specially denatured alcohol, or specially denatured rum, or articles manufactured with denatured spirits, or a distilled spirits plant proprietor qualified under part 19 of this chapter as a processor.

N.F. The National Formulary. The latest edition is intended unless otherwise specified. The designations "U.S.P." and "N.F." are considered interchangeable when preparations are transferred from one publication to the other. (For incorporation by reference, see §21.6(a).)

Proof. The ethyl alcohol content of a liquid at 60 degrees Fahrenheit, stated as twice the percent of ethyl alcohol by volume.

Rum. Any spirits produced from sugar cane products and distilled at less than 190 proof in such manner that the spirits possess the taste, aroma, and characteristics generally attributed to rum.

S.D.A. Specially denatured alcohol.

Specially denatured alcohol. Those spirits known as alcohol, as defined in this section, denatured pursuant to the specially denatured alcohol formulas authorized under subpart D of this part.

Specially denatured rum. Those spirits known as rum, as defined in this section, denatured pursuant to the specially denatured rum formula authorized under subpart D of this part.

Spirits or distilled spirits. Alcohol or rum as defined in this part.

U.S.C. The United States Code.

U.S.P. The United States Pharmacopoeia. The latest edition is intended unless otherwise specified. The designations "U.S.P." and "N.F." are considered interchangeable when preparations are transferred from one publication to the other. (For incorporation by reference, see §21.6(a).)

[T.D. ATF-133, 48 FR 24673, June 2, 1983, as amended by T.D. ATF-199, 50 FR 9183, Mar. 6, 1985; T.D. ATF-435, 66 FR 5475, Jan. 19, 2001; T.D. TTB-44, 71 FR 16936, Apr. 4, 2006; T.D.TTB-140 81 FR 59460, Aug. 30, 2016]

Subpart C—Completely Denatured Alcohol Formulas

§21.21 General.

(a) Alcohol shall be completely denatured only in accordance with formulas prescribed in this subpart (or in accordance with §21.5).

(b) Denaturers may be authorized to add a small quantity of an odorant, rust inhibitor, or dye to completely denatured alcohol. Any such addition shall be made only on approval by the appropriate TTB officer. Request for such approval shall be submitted to the appropriate TTB officer.

(c) Odorants or perfume materials may be added to denaturants authorized for completely denatured alcohol in amounts not greater than 1 part to 250, by weight. However, such addition shall not decrease the denaturing value nor change the chemical or physical constants beyond the limits of the specifications for these denaturants as prescribed in subpart E, except as to odor. Proprietors of distilled spirits plants using denaturants to which such odorants or perfume materials have been added shall inform the appropriate TTB officer, in writing, of the

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names and properties of the odorants or perfume materials so used.

(d) TTB will apply an analytical tolerance of ± 5 percent and use standard rounding rules in determining whether completely denatured alcohol complies with the formula prescribed in this subpart (or in accordance with § 21.5).

[T.D. ATF-133, 48 FR 24673, June 2, 1983, as amended by T.D. TTB-140, 81 FR 59460, Aug. 30, 2016]

§ 21.22 Formula No. 18.

To every 100 gallons of ethyl alcohol of not less than 160 proof add:

2.50 gallons of either methyl isobutyl ketone, mixed isomers of nitropropane, or methyl *n*-butyl ketone;

0.125 gallon of pyronate or a similar compound;

0.50 gallon acetaldol (beta-hydroxybutyraldehyde); and

1.00 gallon of either kerosene, deodorized kerosene, gasoline, unleaded gasoline, rubber hydrocarbon solvent, or heptane.

§ 21.23 Formula No. 19.

To every 100 gallons of ethyl alcohol of not less than 160 proof add:

4.0 gallons of either methyl isobutyl ketone, mixed isomers of nitropropane, or methyl *n*-butyl ketone; and

1.0 gallon of either kerosene, deodorized kerosene, gasoline, unleaded gasoline, rubber hydrocarbon solvent, or heptane.

§ 21.24 Formula No. 20.

(a) *Formula.* To every 100 gallons of ethyl alcohol of not less than 195 proof add:

A total of 2.0 gallons of either unleaded gasoline, rubber hydrocarbon solvent, kerosene, deodorized kerosene, alkylate, ethyl tertiary butyl ether, high octane denaturant blend, methyl tertiary butyl ether, naphtha, natural gasoline, raffinate, or any combination of these; or
A total of 5.0 gallons of toluene.

(b) *Authorized use.* Restricted to fuel use, comparable to specially denatured alcohol “Use Code No.” 611, 612, 613, 620, and 630.

[T.D. ATF-133, 48 FR 24673, June 2, 1983, as amended by T.D. TTB-140, 81 FR 59460, Aug. 30, 2016]

§ 21.25 Formula No. 35.

Formula. To every 100 gallons of alcohol of not less than 185 proof add:

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29.75 gallons of ethyl acetate having an ester content of 100 percent by weight or the equivalent thereof not to exceed 35 gallons of ethyl acetate with an ester content of not less than 85 percent by weight.

[T.D. TTB-140, 81 FR 59461, Aug. 30, 2016]

§ 21.26 Formula No. 12–A.

Formula. To every 100 gallons of alcohol of not less than 185 proof add:

Five gallons of toluene or 5 gallons of heptane.

[T.D. TTB-140, 81 FR 59461, Aug. 31, 2016]

Subpart D—Specially Denatured Spirits Formulas and Authorized Uses

§ 21.31 General.

(a) *Formulas for specially denatured spirits.* Alcohol and rum shall be specially denatured only in accordance with formulas prescribed in this subpart (or in accordance with § 21.5).

(b) *Proof of spirits for denaturation.* Alcohol of not less than 185 proof shall be used in the manufacture of all formulas of specially denatured alcohol, unless otherwise specifically stated or unless otherwise authorized by the appropriate TTB officer. Rum for denaturation shall be of not less than 150 proof and may be denatured only in accordance with Formula No. 4.

(c) *Use of Denatured Spirits.* Users and manufacturers holding approved Forms 5150.19 (formerly 1479–A) covering use in processes or manufacture of products no longer authorized for a particular formula may continue that use. Pursuant to written application and subject to the provisions of 26 U.S.C. Chapter 51, part 20 of this chapter, and this part, the appropriate TTB officer, may authorize the use of any formula of specially denatured alcohol or specially denatured rum for uses not specifically authorized in this part. The code number before each item under “authorized uses” shall be used in reporting the use of specially denatured alcohol or specially denatured rum.

(d) *Analytical tolerance.* TTB will apply an analytical tolerance of $\pm 5\%$ and use standard rounding rules in determining whether specially denatured

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spirits complies with the formula prescribed in this subpart (or in accordance with § 21.5).

[T.D. ATF-133, 48 FR 24673, June 2, 1983, as amended by T.D. ATF-199, 50 FR 9183, Mar. 6, 1985; T.D. TTB-140, 81 FR 59461, Aug. 30, 2016]

§ 21.32 Formula No. 1.

(a) *Formula.* To every 100 gallons of alcohol add:

Four gallons of methyl alcohol and either $\frac{1}{4}$ avoirdupois ounce of denatonium benzoate, N.F.; 1 gallon of methyl isobutyl ketone; 1 gallon of mixed isomers of nitropropane; or 1 gallon of methyl *n*-butyl ketone.

(b) *Authorized uses.* (1) As a solvent:

- 011. Cellulose coatings.
- 012. Synthetic resin coatings.
- 013. Shellac coatings.
- 014. Other natural resin coatings.
- 016. Other coatings.
- 021. Cellulose plastics.
- 022. Non-cellulose plastics, including resins.
- 031. Photographic film and emulsions.
- 032. Transparent sheeting.
- 033. Explosives.
- 034. Cellulose intermediates and industrial collodions.
- 035. Soldering flux.
- 036. Adhesives and binders.
- 041. Proprietary solvents.
- 042. Solvents and thinners (other than proprietary solvents or special industrial solvents).
- 043. Solvents, special (restricted sale).
- 051. Polishes.
- 052. Inks (not including meat branding inks).
- 053. Stains (wood, etc.).
- 141. Shampoos.
- 142. Soap and bath preparations.
- 311. Cellulose compounds (dehydration).
- 312. Sodium hydrosulfite (dehydration).
- 315. Other dehydration products.
- 320. Petroleum products.
- 331. Processing pectin.
- 332. Processing other food products.
- 341. Processing crude drugs.
- 342. Processing glandular products, vitamins, hormones, and yeasts.
- 343. Processing antibiotics and vaccines.
- 344. Processing medicinal chemicals (including alkaloids).
- 345. Processing blood and blood products.
- 349. Miscellaneous drug processing (including manufacture of pills).
- 351. Processing dyes and intermediates.
- 352. Processing perfume materials and fixatives.
- 353. Processing photographic chemicals.
- 354. Processing rosin.
- 355. Processing rubber (latex).
- 358. Processing other chemicals.

- 359. Processing miscellaneous products.
- 410. Disinfectants, insecticides, fungicides, and other biocides.
- 420. Embalming fluids and related products.
- 430. Sterilizing and preserving solutions.
- 440. Industrial detergents and soaps.
- 450. Cleaning solutions (including household detergents).
- 481. Photoengraving and rotogravure dyes and solutions.
- 482. Other dye solutions.
- 485. Miscellaneous solutions (including duplicating fluids).

(2) As a raw material:

- 521. Ethyl acetate.
- 522. Ethyl chloride.
- 523. Other ethyl esters.
- 530. Ethylamines.
- 540. Dyes and intermediates.
- 551. Acetaldehyde.
- 552. Other aldehydes.
- 561. Ethyl ether.
- 562. Other ethers.
- 571. Ethylene dibromide.
- 572. Ethylene gas.
- 573. Xanthates.
- 574. Fulminate of mercury and other detonators.
- 575. Drugs and medicinal chemicals.
- 579. Other chemicals.

(3) As a fuel:

- 611. Automobile and supplementary fuels.
- 612. Airplane and supplementary fuels.
- 613. Rocket and jet fuels.
- 620. Proprietary heating fuels.
- 630. Other fuel uses.

(4) As a fluid:

- 710. Scientific instruments.
- 720. Brake fluids.
- 730. Cutting oil.
- 740. Refrigerating uses.
- 750. Other fluid uses.
- 760. Proprietary anti-freeze.

(5) Miscellaneous uses:

- 812. Product development and pilot plant uses (own use only).
- 900. Specialized uses (unclassified).

[T.D. ATF-133, 48 FR 24673, June 2, 1983, as amended by T.D. ATF-199, 50 FR 9183, Mar. 6, 1985; T.D. ATF-442, 66 FR 12854, Mar. 1, 2001]

§ 21.33 Formula No. 2-B.

(a) *Formula.* To every 100 gallons of alcohol add:

One-half gallon of rubber hydrocarbon solvent, $\frac{1}{2}$ gallon of toluene, $\frac{1}{2}$ gallon of heptane, $\frac{1}{2}$ gallon of hexane (mixed isomers), or $\frac{1}{2}$ gallon of *n*-hexane.

(b) *Authorized uses.* (1) As a solvent:

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- 021. Cellulose plastics.
- 022. Non-cellulose plastics, including resins.
- 031. Photographic film and emulsions.
- 032. Transparent sheeting.
- 033. Explosives.
- 311. Cellulose compounds (dehydration).
- 312. Sodium hydrosulfite (dehydration).
- 315. Other dehydration products.
- 320. Petroleum products.
- 331. Processing pectin.
- 332. Processing other food products.
- 341. Processing crude drugs.
- 342. Processing glandular products, vitamins, hormones, and yeasts.
- 343. Processing antibiotics and vaccines.
- 344. Processing medicinal chemicals (including alkaloids).
- 349. Miscellaneous drug processing (including manufacture of pills).
- 351. Processing dyes and intermediates.
- 352. Processing perfume materials and fixatives.
- 353. Processing photographic chemicals.
- 358. Processing other chemicals.
- 359. Processing miscellaneous products.

(2) As a raw material:

- 521. Ethyl acetate.
- 522. Ethyl chloride.
- 523. Other ethyl esters.
- 524. Sodium ethylate, anhydrous.
- 530. Ethylamines.
- 540. Dyes and intermediates.
- 551. Acetaldehyde.
- 552. Other aldehydes.
- 561. Ethyl ether.
- 562. Other ethers.
- 571. Ethylene dibromide.
- 572. Ethylene gas.
- 573. Xanthates.
- 575. Drugs and medicinal chemicals.
- 576. Organo-silicone products.
- 579. Other chemicals.

(3) Miscellaneous uses:

- 812. Product development and pilot plant uses (own use only).

(c) *Conditions governing use.* This formula shall be used in a closed and continuous system unless otherwise authorized by the appropriate TTB officer.

[T.D. ATF-133, 48 FR 24673, June 2, 1983, as amended by T.D. ATF-442, 66 FR 12854, Mar. 1, 2001; T.D. TTB-140 81 FR 59461, Aug. 30, 2016]

§ 21.34 [Reserved]

§ 21.35 Formula No. 3-A.

(a) *Formula.* To every 100 gallons of alcohol add:

Five gallons of cyclohexane or methyl alcohol.

(b) *Authorized uses.* (1) As a solvent:

- 011. Cellulose coatings.
- 012. Synthetic resin coatings.
- 016. Other coatings.
- 021. Cellulose plastics.
- 022. Non-cellulose plastics, including resins.
- 031. Photographic film and emulsions.
- 032. Transparent sheeting.
- 033. Explosives.
- 034. Cellulose intermediates and industrial collodions.
- 035. Soldering flux.
- 036. Adhesives and binders.
- 041. Proprietary solvents.
- 043. Solvents, special (restricted sale).
- 051. Polishes.
- 052. Inks (including meat branding inks).
- 053. Stains (wood, etc.).
- 141. Shampoos.
- 142. Soap and bath preparations.
- 311. Cellulose compounds (dehydration).
- 312. Sodium hydrosulfite (dehydration).
- 315. Other dehydration products.
- 320. Petroleum products.
- 331. Processing pectin.
- 332. Processing other food products.
- 341. Processing crude drugs.
- 342. Processing glandular products, vitamins, hormones, and yeasts.
- 343. Processing antibiotics and vaccines.
- 344. Processing medicinal chemicals (including alkaloids).
- 345. Processing blood and blood products.
- 349. Miscellaneous drug processing (including manufacture of pills).
- 351. Processing dyes and intermediates.
- 352. Processing perfume materials and fixatives.
- 353. Processing photographic chemicals.
- 354. Processing rosin.
- 355. Processing rubber (latex).
- 358. Processing other chemicals.
- 359. Processing miscellaneous products.
- 410. Disinfectants, insecticides, fungicides, and other biocides.
- 420. Embalming fluids and related products.
- 430. Sterilizing and preserving solutions.
- 440. Industrial detergents and soaps.
- 450. Cleaning solutions (including household detergents).
- 470. Theater sprays, incense, and room deodorants.
- 481. Photoengraving and rotogravure dyes and solutions.
- 482. Other dye solutions.
- 485. Miscellaneous solutions (including duplicating fluids).

(2) As a raw material:

- 530. Ethylamines.
- 540. Dyes and intermediates.
- 575. Drugs and medicinal chemicals.
- 576. Organo-silicone products.
- 579. Other chemicals.
- 590. Synthetic resins.

(3) As a fuel:

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- 611. Automobile and supplementary fuels.
- 612. Airplane and supplementary fuels.
- 613. Rocket and jet fuels.
- 620. Proprietary heating fuels.
- 630. Other fuel uses.

(4) As a fluid:

- 710. Scientific instruments.
- 720. Brake fluids.
- 730. Cutting oils.
- 740. Refrigerating uses.
- 750. Other fluid uses.

(5) Miscellaneous uses:

- 810. General laboratory and experimental use (own use only).
- 811. Laboratory reagents for sale.
- 812. Product development and pilot plant uses (own use only).
- 900. Specialized uses (unclassified).

[T.D. ATF-133, 48 FR 24673, June 2, 1983, as amended by T.D. ATF-199, 50 FR 9183, Mar. 6, 1985; T.D. TTB-140, 81 FR 59461, Aug. 30, 2016]

§ 21.36 [Reserved]

§ 21.37 Formula No. 3-C.

(a) *Formula.* To every 100 gallons of alcohol add:

Five gallons of isopropyl alcohol.

(b) *Authorized uses.* (1) As a solvent:

- 011. Cellulose coatings.
- 012. Synthetic resin coatings.
- 016. Other coatings.
- 021. Cellulose plastics.
- 022. Non-cellulose plastics, including resins.
- 031. Photographic film and emulsions.
- 032. Transparent sheeting.
- 033. Explosives.
- 034. Cellulose intermediates and industrial collodions.
- 035. Soldering flux.
- 036. Adhesives and binders.
- 043. Solvents, special (restricted sale).
- 051. Polishes.
- 052. Inks (including meat branding inks).
- 053. Stains (wood, etc.).
- 141. Shampoos.
- 142. Soaps and bath preparations.
- 311. Cellulose compounds (dehydration).
- 312. Sodium hydrosulfite (dehydration).
- 315. Other dehydration products.
- 320. Petroleum products.
- 331. Processing pectin.
- 332. Processing other food products.
- 341. Processing crude drugs.
- 342. Processing glandular products, vitamins, hormones, and yeasts.
- 343. Processing antibiotics and vaccines.
- 344. Processing medicinal chemicals (including alkaloids).
- 345. Processing blood and blood products.
- 349. Miscellaneous drug processing (including manufacture of pills).

- 351. Processing dyes and intermediates.
- 352. Processing perfume materials and fixatives.
- 353. Processing photographic chemicals.
- 354. Processing rosin.
- 355. Processing rubber (latex).
- 358. Processing other chemicals.
- 359. Processing miscellaneous products.
- 410. Disinfectants, insecticides, fungicides, and other biocides.
- 420. Embalming fluids and related products.
- 430. Sterilizing and preserving solutions.
- 440. Industrial detergents and soaps.
- 450. Cleaning solutions (including household detergents).
- 470. Theater sprays, incense, and room deodorants.
- 481. Photoengraving and rotogravure dyes and solutions.
- 482. Other dye solutions.
- 485. Miscellaneous solutions (including duplicating fluids).

(2) As a raw material:

- 530. Ethylamines.
- 540. Dyes and intermediates.
- 575. Drugs and medicinal chemicals.
- 576. Organo-silicone products.
- 579. Other chemicals.
- 590. Synthetic resins.

(3) As a fuel:

- 611. Automobile and supplementary fuels.
- 612. Airplane and supplementary fuels.
- 613. Rocket and jet fuels.
- 620. Proprietary heating fuels.
- 630. Other fuel uses.

(4) As a fluid:

- 710. Scientific instruments.
- 720. Brake fluids.
- 730. Cutting oils.
- 740. Refrigerating uses.
- 750. Other fluid uses.

(5) Miscellaneous uses:

- 810. General laboratory and experimental use (own use only).
- 811. Laboratory reagents for sale.
- 812. Product development and pilot plant uses (own use only).
- 900. Specialized uses (unclassified).

(c) *Conditions governing use.* This formula shall not be used in manufacturing Reagent alcohol general-use formula under § 20.117 of this chapter.

[T.D. ATF-133, 48 FR 24673, June 2, 1983, as amended by T.D. ATF-199, 50 FR 9183, Mar. 6, 1985]

§ 21.38 Formula No. 4.

(a) *Formula.* To every 100 gallons of alcohol, or to every 100 gallons of rum of not less than 150 proof, add:

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One gallon of the following solution: Five gallons of an aqueous solution containing 40 percent nicotine; 3.6 avoirdupois ounces of methylene blue, U.S.P.; and water sufficient to make 100 gallons.

(b) *Authorized uses.* (1) As a solvent:

460. Tobacco sprays and flavors.

(2) Miscellaneous uses:

812. Product development and pilot plant uses (own use only).

§§ 21.39–21.40 [Reserved]

§ 21.41 Formula No. 13–A.

(a) *Formula.* To every 100 gallons of alcohol add:

Ten gallons of ethyl ether.

(b) *Authorized uses.* (1) As a solvent:

015. Candy glazes.

021. Cellulose plastics.

022. Non-cellulose plastics, including resins.

031. Photographic film and emulsions.

032. Transparent sheeting.

034. Cellulose intermediates and industrial collodions.

052. Inks (not including meat branding inks).

241. Collodion, U.S.P.

331. Processing pectin.

332. Processing other food products.

342. Processing glandular products, vitamins, hormones, and yeasts.

343. Processing antibiotics and vaccines.

344. Processing medicinal chemicals (including alkaloids).

345. Processing blood and blood products.

349. Miscellaneous drug processing (including manufacture of pills).

352. Processing perfume materials and fixatives.

353. Processing photographic chemicals.

358. Processing other chemicals.

359. Processing miscellaneous products.

430. Sterilizing and preserving solutions.

481. Photoengraving and rotogravure solutions and dyes.

485. Miscellaneous solutions.

(2) As a raw material:

523. Miscellaneous ethyl esters.

561. Ethyl ether.

562. Other ethers.

575. Drugs and medicinal chemicals.

579. Other chemicals.

(3) Miscellaneous uses:

812. Product development and pilot plant uses (own use only).

[T.D. ATF-133, 48 FR 24673, June 2, 1983, as amended by T.D. TTB-140, 81 FR 59461, Aug. 30, 2016]

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§ 21.42 [Reserved]

§ 21.43 Formula No. 18.

(a) *Formula.* To every 100 gallons of alcohol of not less than 160 proof add:

One hundred gallons of vinegar of not less than 90-grain strength or 150 gallons of vinegar of not less than 60-grain strength.

(b) *Authorized uses.* (1) As a raw material:

511. Vinegar.

(2) Miscellaneous uses:

812. Product development and pilot plant uses (own use only).

§ 21.44 Formula No. 19.

(a) *Formula.* To every 100 gallons of alcohol add:

One hundred gallons of ethyl ether.

(b) *Authorized uses.* (1) As a solvent:

031. Photographic film and emulsions.

034. Cellulose intermediates and industrial collodions.

241. Collodion, U.S.P.

(2) Miscellaneous uses:

812. Product development and pilot plant uses (own use only).

§§ 21.45–21.46 [Reserved]

§ 21.47 Formula No. 23–A.

(a) *Formula.* To every 100 gallons of alcohol add:

Eight gallons of acetone, U.S.P.

(b) *Authorized uses.* (1) As a solvent:

011. Cellulose coatings.

012. Synthetic resin coatings.

013. Shellac coatings.

014. Other natural resin coatings.

015. Candy glazes.

016. Other coatings.

032. Transparent sheeting.

034. Cellulose intermediates and industrial collodions.

035. Soldering flux.

036. Adhesives and binders.

042. Solvents and thinners (other than proprietary solvents or special industrial solvents).

052. Inks (including meat branding inks).

053. Stains (wood, etc.).

111. Hair and scalp preparations.

112. Bay rum.

113. Lotions and creams (hand, face, and body).

114. Body deodorants and deodorant creams.

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- 141. Shampoos.
- 142. Soaps and bath preparations.
- 210. External pharmaceuticals, not U.S.P. or N.F.
- 244. Antiseptic solutions, U.S.P. or N.F.
- 249. Miscellaneous external pharmaceuticals, U.S.P. or N.F.
- 331. Processing pectin.
- 332. Processing other food products.
- 341. Processing crude drugs.
- 342. Processing glandular products, vitamins, hormones, and yeasts.
- 343. Processing antibiotics and vaccines.
- 344. Processing medicinal chemicals (including alkaloids).
- 345. Processing blood and blood products.
- 349. Miscellaneous drug processing (including manufacture of pills).
- 358. Processing other chemicals.
- 359. Processing miscellaneous products.
- 410. Disinfectants, insecticides, fungicides, and other biocides.
- 420. Embalming fluids and related products.
- 430. Sterilizing and preserving solutions.
- 440. Industrial detergents and soaps.
- 450. Cleaning solutions (including household detergents).
- 482. Miscellaneous dye solutions.
- 485. Miscellaneous solutions.

(2) As a fluid:

- 740. Refrigerating uses.
- 750. Miscellaneous fluid uses.

(3) Miscellaneous uses:

- 812. Product development and pilot plant uses (own use only).

§ 21.48 [Reserved]

§ 21.49 Formula No. 23-H.

(a) *Formula.* To every 100 gallons of alcohol add:

Eight gallons of acetone, U.S.P., and 1.5 gallons of methyl isobutyl ketone.

(b) *Authorized uses.* (1) As a solvent:

- 111. Hair and scalp preparations.
- 113. Lotions and creams (hand, face, and body).
- 210. External pharmaceuticals, not U.S.P. or N.F.
- 220. Rubbing alcohols.
- 410. Disinfectants, insecticides, fungicides, and other biocides.
- 450. Cleaning solutions (including household detergents).

(2) Miscellaneous uses:

- 812. Product development and pilot plant uses (own use only).

[T.D. ATF-133, 48 FR 24673, June 2, 1983, as amended by T.D. TTB-140, 81 FR 59461, Aug. 30, 2016]

§ 21.50 Formula No. 25.

(a) *Formula.* To every 100 gallons of alcohol add:

Twenty pounds of iodine, U.S.P., and 15 pounds of either potassium iodide, U.S.P., or sodium iodide, U.S.P.

(b) *Authorized uses.* (1) As a solvent:

- 230. Tinctures of iodine.
- 249. Miscellaneous external pharmaceuticals, U.S.P. or N.F.

(2) Miscellaneous uses:

- 812. Product development and pilot plant uses (own use only).

§ 21.51 Formula No. 25-A.

(a) *Formula.* To every 100 gallons of alcohol add:

A solution composed of 20 pounds of iodine, U.S.P.; 15 pounds of either potassium iodide, U.S.P., or sodium iodide, U.S.P.; and 15 pounds of water.

(b) *Authorized uses.* (1) As a solvent:

- 230. Tinctures of iodine.
- 249. Miscellaneous external pharmaceuticals, U.S.P. or N.F.

(2) Miscellaneous uses:

- 812. Product development and pilot plant uses (own use only).

§§ 21.52-21.54 [Reserved]

§ 21.55 Formula No. 28-A.

(a) *Formula.* To every 100 gallons of alcohol add:

One gallon or any combination totaling 1 gallon of either gasoline, unleaded gasoline, heptane, or rubber hydrocarbon solvent.

(b) *Authorized uses.* (1) As a fuel:

- 611. Automobile and supplementary fuels.
- 612. Airplane and supplementary fuels.
- 613. Rocket and jet fuels.
- 620. Proprietary heating fuels.
- 630. Other fuel uses.

(2) Miscellaneous uses:

- 812. Product development and pilot plant uses (own use only).

§ 21.56 Formula No. 29.

(a) *Formula.* To every 100 gallons of alcohol add:

One gallon of 100 percent acetaldehyde or 5 gallons of an alcohol solution of acetaldehyde containing not less than 20 percent

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acetaldehyde, or 1 gallon of ethyl acetate having an ester content of 100 percent, or, where approved by the appropriate TTB officer, as to material and quantity, not less than 6.8 pounds if solid, or 1 gallon if liquid, of any chemical. When material other than acetaldehyde or ethyl acetate is proposed to be used, the user shall submit an application for such use to the appropriate TTB officer. The application shall include specifications, assay methods, and an 8-ounce sample of the substitute material for analysis.

(b) *Authorized uses.* (1) As a raw material:

- 511. Vinegar.
- 512. Acetic acid.
- 521. Ethyl acetate.
- 522. Ethyl chloride.
- 523. Other ethyl esters.
- 530. Ethylamines.
- 540. Dyes and intermediates.
- 551. Acetaldehyde.
- 552. Other aldehydes.
- 561. Ethyl ether.
- 562. Other ethers.
- 571. Ethylene dibromide.
- 572. Ethylene gas.
- 573. Xanthates.
- 575. Drugs and medicinal chemicals.
- 579. Other chemicals.
- 580. Synthetic rubber.
- 590. Synthetic resins.

(2) Miscellaneous uses:

- 812. Product development and pilot plant uses (own use only).

(c) *Conditions governing use.* This formula is restricted to processes in which the alcohol loses its identity by being converted into other chemicals.

§ 21.57 Formula No. 30.

(a) *Formula.* To every 100 gallons of alcohol add:

Ten gallons of methyl alcohol.

(b) *Authorized uses.* (1) As a solvent:

- 011. Cellulose coatings.
- 012. Synthetic resin coatings.
- 021. Cellulose plastics.
- 022. Non-cellulose plastics, including resins.
- 031. Photographic film and emulsions.
- 035. Soldering flux.
- 036. Adhesives and binders.
- 042. Solvents and thinners (other than proprietary solvents or special industrial solvents).
- 051. Polishes.
- 052. Inks (not including meat branding inks).
- 053. Stains.
- 142. Soap and bath preparations.

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- 331. Processing pectin.
- 332. Processing other food products.
- 341. Processing crude drugs.
- 342. Processing glandular products, vitamins, hormones, and yeasts.
- 343. Processing antibiotics and vaccines.
- 344. Processing medicinal chemicals (including alkaloids).
- 345. Processing blood and blood products.
- 349. Miscellaneous drug processing (including manufacture of pills).
- 352. Processing perfume materials and fixatives.
- 353. Processing photographic chemicals.
- 358. Processing other chemicals.
- 359. Processing miscellaneous products.
- 410. Disinfectants, insecticides, fungicides, and other biocides.
- 430. Sterilizing and preserving solutions.
- 440. Industrial detergents and soaps.
- 450. Cleaning solutions (including household detergents).
- 481. Photoengraving and rotogravure solutions and dyes.
- 482. Other dye solutions.
- 485. Miscellaneous solutions (including duplicating fluids).

(2) As a raw material:

- 575. Drugs and medicinal chemicals.
- 576. Organo-silicone products.
- 579. Other chemicals.
- 590. Synthetic resins.

(3) As a fluid in:

- 740. Refrigerating uses.
- 750. Other fluid uses:

(4) Miscellaneous uses:

- 810. General laboratory and experimental use (own use only).
- 811. Laboratory reagents for sale.
- 812. Product development and pilot plant uses (own use only).

§ 21.58 Formula No. 31–A.

(a) *Formula.* To every 100 gallons of alcohol add:

One hundred pounds of glycerin (glycerol), U.S.P., and 20 pounds of hard soap, N.F. XI.

(b) *Authorized uses.* (1) As a solvent:

- 113. Lotions and creams (hands, face, and body).
- 131. Tooth paste and tooth powder.
- 141. Shampoos.

(2) Miscellaneous uses:

- 812. Product development and pilot plant uses (own use only).

§ 21.59 Formula No. 32.

(a) *Formula.* To every 100 gallons of alcohol add:

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Five gallons of ethyl ether.

(b) *Authorized uses.* (1) As a solvent:

- 031. Photographic film and emulsions.
- 034. Cellulose intermediates and industrial collodions.
- 052. Inks (not including meat branding inks).
- 241. Collodion, U.S.P.
- 311. Ethyl cellulose compounds (dehydration).
- 332. Processing miscellaneous food products.
- 342. Processing glandular products, vitamins, hormones, and yeasts.
- 343. Processing antibiotics and vaccines.
- 344. Processing medicinal chemicals (including alkaloids).
- 430. Sterilizing and preserving solutions.
- 481. Photoengraving and rotogravure solutions and dyes.
- 485. Miscellaneous solutions.

(2) As a raw material:

- 522. Ethyl chloride.
- 523. Other ethyl esters.
- 561. Ethyl ether.
- 562. Other ethers.
- 571. Ethylene dibromide.
- 572. Ethylene gas.
- 575. Drugs and medicinal chemicals.
- 579. Other chemicals.
- 580. Synthetic rubber.

(3) Miscellaneous uses:

- 812. Product development and pilot plant uses (own use only).

[T.D. ATF-133, 48 FR 24673, June 2, 1983, as amended by T.D. TTB-140, 81 FR 59461, Aug. 30, 2016]

§§ 21.60–21.61 [Reserved]

§ 21.62 Formula No. 35–A.

(a) *Formula.* To every 100 gallons of alcohol add:

4.25 gallons of ethyl acetate having an ester content of 100 percent by weight or the equivalent thereof not to exceed 5 gallons of ethyl acetate with an ester content of not less than 85 percent by weight.

(b) *Authorized uses.* (1) As a solvent:

- 015. Candy glazes.
- 052. Inks.
- 331. Processing pectin.
- 332. Processing other food products.
- 342. Processing glandular products, vitamins, hormones, and yeasts.
- 343. Processing antibiotics and vaccines.
- 344. Processing medicinal chemicals (including alkaloids).
- 349. Miscellaneous drug processing (including manufacture of pills).

- 358. Processing miscellaneous chemicals.
- 359. Processing miscellaneous products.
- 485. Miscellaneous solutions.

(2) As a raw material:

- 511. Vinegar.
- 512. Acetic acid.
- 521. Ethyl acetate.
- 523. Other ethyl esters.
- 590. Synthetic resins.
- 910. Animal feed supplements.

(3) Miscellaneous uses:

- 812. Product development and pilot plant uses (own use only).

[T.D. ATF-133, 48 FR 24673, June 2, 1983, as amended by T.D. TTB-140, 81 FR 59461, Aug. 30, 2016]

§ 21.63 Formula No. 36.

(a) *Formula.* To every 100 gallons of alcohol add:

Three gallons of ammonia, aqueous, 27 to 30 percent by weight; 3 gallons of strong ammonia solution, N.F.: 17.5 pounds of caustic soda, liquid grade, containing 50 percent sodium hydroxide by weight; 8.75 pounds of potassium hydroxide, on an anhydrous basis or 12.0 pounds of caustic soda, liquid grade, containing 73 percent sodium hydroxide by weight.

(b) *Authorized uses.* (1) As a solvent:

- 141. Shampoos.
- 142. Soap and bath preparations.
- 210. External pharmaceuticals, not U.S.P. or N.F.
- 450. Cleaning solutions (including household detergents).

(2) As a raw material:

- 530. Ethylamines.
- 540. Dyes and intermediates.
- 579. Other chemicals.

(3) Miscellaneous uses:

- 812. Product development and pilot plant uses (own use only).

[T.D. ATF-133, 48 FR 24673, June 2, 1983, as amended by T.D. TTB-140, 81 FR 59461, Aug. 30, 2016]

§ 21.64 Formula No. 37.

(a) *Formula.* To every 100 gallons of alcohol add:

Forty-five fluid ounces of eucalyptol, N.F. XII, 30 avoirdupois ounces of thymol, N.F., and 20 avoirdupois ounces of menthol, U.S.P.

(b) *Authorized uses.* (1) As a solvent:

- 111. Hair and scalp preparations.

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- 112. Bay rum.
- 113. Lotions and creams (hand, face, and body).
- 131. Dentifrices.
- 132. Mouth washes.
- 210. External pharmaceuticals, not U.S.P. or N.F.
- 244. Antiseptic solutions, U.S.P. or N.F.
- 410. Disinfectants, insecticides, fungicides, and other biocides.
- 430. Sterilizing and preserving solutions.
- 470. Theater sprays, incense, and room deodorants.

(2) Miscellaneous uses:

- 812. Product development and pilot plant uses (own use only).

[T.D. ATF-133, 48 FR 24673, June 2, 1983, as amended by T.D. TTB-140, 81 FR 59461, Aug. 30, 2016]

§ 21.65 Formula No. 38-B.

(a) *Formula*. To every 100 gallons of alcohol add:

Ten pounds of any one, or a total of 10 pounds of two or more, of the oils and substances listed below:

Alpha terpineol
Anethole, N.F.
Anise oil, N.F.
Bay oil (myrcia oil), N.F. XI.
Benzaldehyde, N.F.
Bergamot oil, N.F. XI.
Bitter almond oil, N.F. X.
Camphor, U.S.P.
Cedar leaf oil, U.S.P. XIII.
Chlorothymol, N.F. XII.
Cinnamic aldehyde, N.F. IX.
Cinnamon oil, N.F.
Citronella oil, natural.
Clove oil, N.F.
Coal tar, U.S.P.
Cornmint oil.
Distilled lime oil.
Eucalyptol, N.F. XII.
Eucalyptus oil, N.F.
Eugenol, U.S.P.
Guaiacol, N.F. X.
L(-)-Carvone.
Lavender oil, N.F.
Lemon oil.
Menthol, U.S.P.
Methyl salicylate, N.F.
Mustard oil, volatile (allyl isothiocyanate), U.S.P. XII.
Peppermint oil, N.F.
Peppermint oil, terpeneless.
Phenol, U.S.P.
Phenyl salicylate (salol), N.F. XI.
Pine oil, N.F. XII.
Pine needle oil, dwarf, N.F.
Rosemary oil, N.F. XII.
Safrole.
Sassafras oil, N.F. XI.

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Spearmint oil, N.F.
Spearmint oil, terpeneless.
Spike lavender oil, natural.
Storax, U.S.P.
Thyme oil, N.F. XII.
Thymol, N.F.
Tolu balsam, U.S.P.
Turpentine oil, N.F. XI.

If it is shown that none of the above single denaturants or combinations can be used in the manufacture of a particular product, the user may submit an application to the appropriate TTB officer, requesting permission to use another essential oil or substance having denaturing properties satisfactory to the appropriate TTB officer. In such a case the user shall furnish the appropriate TTB officer, with specifications, assay methods, the name and address of the manufacturer, and an 8-ounce sample of the denaturant for analysis.

(b) *Authorized uses*. (1) As a solvent:

- 111. Hair and scalp preparations.
- 112. Bay rum.
- 113. Lotions and creams (hand, face, and body).
- 114. Deodorants (body).
- 121. Perfumes and perfume tinctures.
- 122. Toilet waters and colognes.
- 131. Dentifrices.
- 132. Mouth washes.
- 141. Shampoos.
- 142. Soap and bath preparations.
- 210. External pharmaceuticals, not U.S.P. or N.F.
- 243. Liniments, U.S.P. or N.F.
- 244. Antiseptic solutions, U.S.P. or N.F.
- 249. Miscellaneous external pharmaceuticals, U.S.P. or N.F.
- 349. Miscellaneous drug processing (including manufacture of pills).
- 410. Disinfectants, insecticides, fungicides, and other biocides.
- 430. Sterilizing and preserving solutions.
- 470. Theater sprays, incense, and room deodorants.

(2) Miscellaneous uses:

- 812. Product development and pilot plant uses (own use only).

[T.D. ATF-133, 48 FR 24673, June 2, 1983, as amended by T.D. ATF-442, 66 FR 12854, Mar. 1, 2001; T.D. TTB-140, 81 FR 59461, Aug. 30, 2016]

§ 21.66 [Reserved]

§ 21.67 Formula No. 38-D.

(a) *Formula*. To every 100 gallons of alcohol add:

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Two and one-half pounds of menthol, U.S.P., and 2.5 gallons of formaldehyde solution, U.S.P.

(b) *Authorized uses.* (1) As a solvent:

- 131. Dentifrices.
- 132. Mouth washes.

(2) Miscellaneous uses:

- 812. Product development and pilot plant uses (own use only).

§21.68 Formula No. 38-F.

(a) *Formula.* To every 100 gallons of alcohol add:

(1) Six pounds of either boric acid, N.F., Polysorbate 80, N.F., or Poloxamer 407, N.F.; $1\frac{1}{3}$ pounds of thymol, N.F.; $1\frac{1}{3}$ pounds of chlorothymol, N.F. XII; and $1\frac{1}{3}$ pounds of menthol, U.S.P.; or

(2) A total of at least 3 pounds of any two or more denaturing materials listed under Formula No. 38-B, plus sufficient boric acid, N.F., Polysorbate 80, N.F., or Poloxamer 407, N.F. to total 10 pounds of denaturant; or

(3) Seven pounds of zinc chloride, U.S.P., 2.6 fluid ounces of hydrochloric acid, N.F., and a total of 3 pounds of any two or more of the denaturing materials listed under Formula No. 38-B.

(b) *Authorized uses.* (1) As a solvent:

- 132. Mouth washes.
- 210. External pharmaceuticals, not U.S.P. or N.F.
- 244. Antiseptic solutions, U.S.P. or N.F.

(2) Miscellaneous uses:

- 812. Product development and pilot plant uses (own use only).

[T.D. ATF-133, 48 FR 24673, June 2, 1983, as amended by T.D. TTB-140, 81 FR 59461, Aug. 30, 2016]

§§21.69-21.70 [Reserved]

§21.71 Formula No. 39-B.

(a) *Formula.* To every 100 gallons of alcohol add:

Two and one-half gallons of diethyl phthalate and $\frac{1}{8}$ gallon of *tert*-butyl alcohol.

(b) *Authorized uses.* (1) As a solvent:

- 111. Hair and scalp preparations.
- 112. Bay rum.
- 113. Lotions and creams (hand, face, and body).
- 114. Deodorants (body).
- 121. Perfumes and perfume tinctures.
- 122. Toilet waters and colognes.

- 141. Shampoos.
- 142. Soap and bath preparations.
- 210. External pharmaceuticals, not U.S.P. or N.F.

- 410. Disinfectants, insecticides, fungicides, and other biocides.
- 450. Cleaning solutions (including household detergents).
- 470. Theater sprays, incense, and room deodorants.

(2) Miscellaneous uses:

- 812. Product development and pilot plant uses (own use only).

§21.72 Formula No. 39-C.

(a) *Formula.* To every 100 gallons of alcohol add:

One gallon of diethyl phthalate.

(b) *Authorized uses.* (1) As a solvent:

- 111. Hair and scalp preparations.
- 113. Lotions and creams (hand, face, and body).
- 114. Deodorants (body).
- 121. Perfumes and perfume tinctures.
- 122. Toilet waters and colognes.
- 142. Soaps and bath preparations.
- 470. Theater sprays, incense, and room deodorants.

(2) Miscellaneous uses:

- 812. Product development and pilot plant uses (own use only).

§21.73 Formula No. 39-D.

(a) *Formula.* To every 100 gallons of alcohol add:

One gallon of bay oil (myrcia oil), N.F. XI, and either 50 avoirdupois ounces of quinine sulfate, U.S.P., 50 avoirdupois ounces of sodium salicylate, U.S.P.

(b) *Authorized uses.* (1) As a solvent:

- 111. Hair and scalp preparations.
- 112. Bay rum.

(2) Miscellaneous uses:

- 812. Product development and pilot plant uses (own use only).

§21.74 Formula No. 40.

(a) *Formula.* To every 100 gallons of alcohol add $\frac{1}{8}$ gallon of *tert*-butyl alcohol, and:

One and one-half avoirdupois ounces of either (1) brucine alkaloid, (2) brucine sulfate, N.F. IX, (3) quassin, or (4) any combination of two or of three of those denaturants.

(b) *Authorized uses.* (1) As a solvent:

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- 111. Hair and scalp preparations.
- 112. Bay rum.
- 113. Lotions and creams (hand, face, and body).
- 114. Deodorants (body).
- 121. Perfumes and perfume tinctures.
- 122. Toilet waters and colognes.
- 141. Shampoos.
- 142. Soaps and bath preparations.
- 210. External pharmaceuticals, not U.S.P. or N.F.
- 410. Disinfectants, insecticides, fungicides, and other biocides.
- 450. Cleaning solutions (including household detergents).
- 470. Theater sprays, incense, and room deodorants.

(2) Miscellaneous uses:

- 812. Product development and pilot plant uses (own use only).

§ 21.75 Formula No. 40-A.

(a) *Formula*. To every 100 gallons of alcohol add:

One pound of sucrose octaacetate and $\frac{1}{8}$ gallon of *tert*-butyl alcohol.

(b) *Authorized uses*. (1) As a solvent:

- 111. Hair and scalp preparations.
- 112. Bay rum.
- 113. Lotions and creams (hand, face, and body).
- 114. Deodorants (body).
- 121. Perfumes and perfume tinctures.
- 122. Toilet waters and colognes.
- 141. Shampoos.
- 142. Soaps and bath preparations.
- 210. External pharmaceuticals, not U.S.P. or N.F.
- 410. Disinfectants, insecticides, fungicides, and other biocides.
- 450. Cleaning solutions (including household detergents).
- 470. Theater sprays, incense, and room deodorants.

(2) Miscellaneous uses:

- 812. Product development and pilot plant uses (own use only).

§ 21.76 Formula No. 40-B.

(a) *Formula*. To every 100 gallons of alcohol add:

One-sixteenth avoirdupois ounce of denatonium benzoate, N.F., and $\frac{1}{8}$ gallon of *tert*-butyl alcohol.

(b) *Authorized uses*. (1) As a solvent:

- 052. Inks.
- 111. Hair and scalp preparations.
- 112. Bay rum.
- 113. Lotions and creams (hand, face, and body).

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- 114. Deodorants (body).
- 121. Perfumes and perfume tinctures.
- 122. Toilet waters and colognes.
- 141. Shampoos.
- 142. Soaps and bath preparations.
- 210. External pharmaceuticals, not U.S.P. or N.F.
- 410. Disinfectants, insecticides, fungicides, and other biocides.
- 450. Cleaning solutions (including household detergents).
- 470. Theater sprays, incense, and room deodorants.
- 485. Miscellaneous solutions.

(2) Miscellaneous uses:

- 812. Product development and pilot plant uses (own use only).

[T.D. ATF-133, 48 FR 24673, June 2, 1983, as amended by T.D. ATF-442, 66 FR 12854, Mar. 1, 2001; T.D. TTB-140, 81 FR 59461, Aug. 30, 2016]

§ 21.77 Formula No. 40-C.

(a) *Formula*. To every 100 gallons of alcohol add:

Three gallons of *tert*-butyl alcohol.

(b) *Authorized uses*. (1) As a solvent:

- 111. Hair and scalp preparations.
- 112. Bay rum.
- 113. Lotions and creams (hand, face, and body).
- 114. Deodorants (body).
- 121. Perfumes and perfume tinctures.
- 122. Toilet waters and colognes.
- 141. Shampoos.
- 142. Soaps and bath preparations.
- 210. External pharmaceuticals, not U.S.P. or N.F.
- 410. Disinfectants, insecticides, fungicides, and other biocides.
- 450. Cleaning solutions (including household detergents).
- 470. Theater sprays, incense, and room deodorants.
- 485. Miscellaneous solutions.

(2) Miscellaneous uses.

- 812. Product development and pilot plant uses (own use only).

(c) *Conditions governing use*. This formula shall be used only in the manufacture of products which will be packaged in pressurized containers in which the liquid contents are in intimate contact with the propellant and from which the contents are not easily removable in liquid form.

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§ 21.78 [Reserved]

§ 21.79 Formula No. 44.

(a) *Formula.* To every 100 gallons of alcohol add:

Ten gallons of *n*-butyl alcohol

(b) *Authorized uses.* (1) As a solvent:

430. Sterilizing and preserving solutions.

(2) Miscellaneous uses:

812. Product development and pilot plant uses (own use only).

§ 21.80 Formula No. 45.

(a) *Formula.* To every 100 gallons of alcohol add:

Three hundred pounds of refined white or orange shellac.

(b) *Authorized uses.* (1) As a solvent:

015. Candy glazes.

(2) Miscellaneous uses:

812. Product development and pilot plant uses (own use only).

§ 21.81 [Reserved]

Subpart E—Specifications for Denaturants

§ 21.91 General.

Denaturants prescribed in this part shall comply with the specifications set forth in this subpart. However, in order to meet requirements of national defense or for other valid reasons, the appropriate TTB officer may, pursuant to written application filed by the denaturer, authorize variations from such specifications or authorize the use of substitute denaturants if such variation or substitution will not jeopardize the revenue. Each such application shall identify the applicant by name, address, and permit number; state the number of each formula of specially denatured alcohol involved; explain why the use of the substitute denaturant, or the variation from specifications, as the case may be, is necessary; and include, as applicable, either the identity of the approved denaturant for which substitution is desired and the identity of the substitute denaturant (including the name of the manufacturer) or the identity of the prescribed specifications and the proposed

variation from those specifications. The application shall be accompanied by an 8-ounce sample of the proposed denaturing material for analysis. The authorization of a substitute denaturant may be published in a TTB Ruling.

[T.D. ATF-133, 48 FR 24673, June 2, 1983, as amended by T.D. ATF-442, 66 FR 12854, Mar. 1, 2001; T.D. TTB-140, 81 FR 59461, Aug. 30, 2016]

§ 21.92 Denaturants listed as U.S.P. or N.F.

Denaturing materials and products listed in this part as “U.S.P.” or “N.F.” shall meet the specifications set forth in the current United States Pharmacopoeia or National Formulary, or the latest volume of these publications in which the denaturants appeared as official preparations.

§ 21.93 Acetaldehyde.

(a) *Aldehyde content (as acetaldehyde).* Not less than 95.0 percent by weight.

(b) *Color.* Colorless.

(c) *Odor.* Characteristic pungent, fruity odor.

(d) *Specific gravity at 15.56 °/15.56 °C.* Not less than 0.7800.

§ 21.94 Acetaldol.

(a) *Purity.* Not less than 90 percent by weight acetaldol as determined by the following method:

Dissolve 15 grams of the acetaldol in distilled water and dilute to 1 liter in a volumetric flask. Transfer 5 mL of this solution to a 250 mL glass-stoppered flask containing 25 mL distilled water. Add 25 mL of a freshly prepared 1 percent sodium bisulfite solution. Prepare a blank omitting the acetaldol solution. Place the flasks in a dark place away from excessive heat or cold and allow to stand six hours. Remove flasks and titrate free bisulfite with 0.1 N iodine solution using starch indicator.

Percent acetaldol by weight = $(\text{mL blank} - \text{mL test}) \times 200 \times 0.44 / \text{weight of sample}$

Titration in excess of 100 percent may be obtained if the sample contains appreciable amounts of acetaldehyde.

(b) *Specific gravity at 20 °C.* 1.098 to 1.105.

§ 21.94-T Alkylate.

(a) *API gravity at 60 °F.* 70.4.

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(b) *Reid vapor pressure (PSI)*. 5.60 maximum.

(c) *Distillation (°F)*:

(i) *I.B.P.* 109.0.

(ii) *10 percent*. 186.6.

(iii) *50 percent*. 221.1.

(iv) *90 percent*. 271.8.

(v) *End point distillation*. 375.7.

[T.D. TTB-140, 81 FR 59461, Aug. 30, 2016]

§ 21.95 Alpha terpineol.

(a) Boiling point at 752mm 218.8–219.4 °C.

(b) Density at 15° 0.9386.

(c) Refractive index at 20° 1.4831.

[T.D. ATF-442, 66 FR 12854, Mar. 1, 2001]

§ 21.96 Ammonia, aqueous.

(a) *Alkalinity*. Strongly alkaline to litmus.

(b) *Ammonia content*. 27 to 30 percent by weight. Accurately weigh a glass-stoppered flask containing 25 mL of water, add about 2 mL of the sample, stopper, and weigh again. Add methyl red indicator, and titrate with 1 N sulfuric acid. Each mL of 1 N sulfuric acid is equivalent to 17.03 mg of NH₃.

(c) *Color*. Colorless liquid.

(d) *Non-volatile residue*. 2 mg maximum. Dilute a portion of the sample with 1½ times its volume of distilled water. Evaporate 10 mL of this product to dryness in a tared platinum or porcelain dish. Dry residue at 105 °C. for 1 hour, cool and weigh.

(e) *Odor*. Characteristic (exceedingly pungent).

(f) *Specific gravity at 20 °/4 °C*. 0.8920 to 0.9010.

[T.D. ATF-133, 48 FR 24673, June 2, 1983. Re-designated by T.D. ATF-442, 66 FR 12854, Mar. 1, 2001]

§§ 21.97–21.98 [Reserved]

§ 21.99 Brucine alkaloid.

(a) *Identification test*. Add a few drops of concentrated nitric acid to about 10 mg of brucine alkaloid. A vivid red color is produced. Dilute the red solution with a few drops of water and add a few drops of freshly made dilute stannous chloride solution. A reddish purple (violet) color is produced.

(b) *Melting point*. 178 °±1 °C. Dry the alkaloid in an oven for one hour at 100 °C., increase the temperature to 110°

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and dry to a constant weight before taking melting point.

NOTE. Brucine alkaloid tetrahydrate melts at 105 °C. while the anhydrous form melts at 178 °C.

(c) *Strychnine test*. Brucine alkaloid shall be free of strychnine when tested by the method listed under Brucine Sulfate, N.F. IX.

NOTE. If the brucine contains as much as 0.05 percent strychnine, a clear distinctive violet color, characteristic of strychnine, will be obtained.

(d) *Sulfate test*. No white precipitate is formed that is not dissolved by hydrochloric acid when several drops of a 1 N barium chloride solution are added to 10 mL of a solution of the alkaloid.

[T.D. ATF-133, 48 FR 24673, June 2, 1983. Re-designated by T.D. ATF-442, 66 FR 12854, Mar. 1, 2001]

§ 21.100 n-Butyl alcohol.

(a) *Acidity (as acetic acid)*. 0.03 percent by weight maximum.

(b) *Color*. Colorless.

(c) *Dryness at 20 °C*. Miscible without turbidity with 10 volumes of 60° Bé. gasoline.

(d) *Odor*. Characteristic odor.

(e) *Specific gravity at 20 °/20 °C*. 0.810 to 0.815.

[T.D. ATF-133, 48 FR 24673, June 2, 1983. Re-designated by T.D. ATF-442, 66 FR 12854, Mar. 1, 2001]

§ 21.101 tert-Butyl alcohol.

(a) *Acidity (as acetic acid)*. 0.003 percent by weight maximum.

(b) *Color*. Colorless.

(c) *Distillation range*. When 100 mL of tertiary butyl alcohol are distilled, none should distill below 78 °C. and none above 85 °C. More than 95 percent should distill between 81 °–83 °C.

(d) *Dryness at 20 °C*. Miscible without turbidity with 19 volumes of 60° Bé. gasoline.

(e) *Freezing point (first needle)*. Above 20 °C.

(f) *Identification test*. Place five drops of a solution containing approximately 0.1 percent tertiary butyl alcohol in ethyl alcohol in a test tube. Add 2 mL of Denige's reagent (dissolve 5 grams of

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red mercuric oxide in 20 mL of concentrated sulfuric acid; add this solution to 80 mL of distilled water, and filter when cool). Heat the mixture just to the boiling point and remove from the flame. A yellow precipitate forms within a few seconds.

(g) *Nonvolatile matter*. Less than 0.005 percent by weight.

(h) *Odor*. Characteristic odor.

(i) *Residual odor after evaporation*. None.

(j) *Specific gravity at 25 °/25 °C*. 0.780 to 0.786.

[T.D. ATF-133, 48 FR 24673, June 2, 1983. Redesignated by T.D. ATF-442, 66 FR 12854, Mar. 1, 2001]

§ 21.102 Caustic soda, liquid.

(a) The liquid caustic soda may consist of either 50 percent or 73 percent by weight sodium hydroxide in aqueous solution. The amount of caustic soda used shall be such that each 100 gallons of alcohol will contain not less than 8.76 pounds of sodium hydroxide, anhydrous basis.

(b) *Color*. A 2 percent solution of the sodium hydroxide in water shall be water-white.

(c) *Assay*. The sodium hydroxide content of the caustic soda solution shall be determined by the following procedure:

Accurately weigh 2 grams of liquid caustic soda into a 100 mL volumetric flask, dissolve, and dilute to the mark with distilled water at room temperature. Transfer a 25 mL aliquot of the solution to a titration flask, add 10 mL of 1 percent barium chloride solution, 0.2 mL of 1 percent phenolphthalein indicator, and 50 mL of distilled water. Titrate with 0.25 N hydrochloric acid to the disappearance of the pink color. Not less than 25 mL of the hydrochloric acid shall be required to neutralize the sample of diluted 50 percent caustic soda, and not less than 36.5 mL of the hydrochloric acid shall be required to neutralize the sample of diluted 73 percent caustic soda.

One mL of 0.25 N hydrochloric acid equals 0.01 gram of sodium hydroxide (anhydrous).

[T.D. ATF-133, 48 FR 24673, June 2, 1983. Redesignated by T.D. ATF-442, 66 FR 12854, Mar. 1, 2001]

§§ 21.103–21.104 [Reserved]

§ 21.105 Citronella oil, natural.

(a) *Java type*:

(1) *Alcohol content (as Geraniol)*. Not less than 85 percent by weight.

(2) *Aldehyde content (as Citronellal)*. Not less than 30 percent by weight.

(3) *Refractive index at 20 °C*. 1.4660 to 1.4745.

(4) *Specific gravity at 25 °/25 °C*. 0.875 to 0.893.

(5) *Odor*. Characteristic odor.

(b) *Ceylon type*:

(1) *Alcohol content (as Geraniol)*. Not less than 55 percent by weight.

(2) *Aldehyde content (as Citronellal)*. Not less than 7 percent by weight.

(3) *Refractive index at 20 °C*. 1.4790 to 1.4850.

(4) *Specific gravity at 25 °/25 °C*. 0.891 to 0.904.

(5) *Odor*. Characteristic odor.

[T.D. ATF-133, 48 FR 24673, June 2, 1983. Redesignated by T.D. ATF-442, 66 FR 12854, Mar. 1, 2001]

§ 21.105–T1 Cornmint oil (*Mentha arvensis* and *Mentha canadensis*).

(a) *Specific gravity at 25 °C*. 0.895 to 0.905.

(b) *Refractive index at 20 °C*. 1.4580 to 1.4590.

(c) *Optical rotation at 20 °C*. –18° to –36°.

(d) *Alcohol content (as menthol)*. 65 percent minimum.

(e) *Ketone content (as menthone)*. 5 percent minimum.

[T.D. TTB-140, 81 FR 59462, Aug. 30, 2016]

§ 21.105–T2 Cyclohexane.

(a) *Specific gravity at 20 °C*. 0.75 to 0.80.

(b) *Odor*. Characteristic odor.

[T.D. TTB-140, 81 FR 59462, Aug. 30, 2016]

§ 21.106 Diethyl phthalate.

(a) *Refractive index at 25 °C*. 1.497 to 1.502.

(b) *Color*. Colorless.

(c) *Odor*. Practically odorless.

(d) *Solubility*. Soluble in 20 parts of 60 percent alcohol.

(e) *Specific gravity at 25 °/25 °C*. 1.115 to 1.118.

(f) *Ester content (as diethyl phthalate)*. Not less than 99 percent by weight.

NOTE. The sample taken for ester determination should be approximately 0.8 gram. The number of mL of 0.5 N potassium hydroxide used in saponification multiplied by

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0.05555 indicates the number of grams of ester in the sample taken for assay.

[T.D. ATF-133, 48 FR 24673, June 2, 1983. Redesignated by T.D. ATF-442, 66 FR 12854, Mar. 1, 2001]

§ 21.106-T Distilled lime oil (*Citrus aurantifolia*).

- (a) *Specific gravity at 25 °C.* 0.850 to 0.870.
- (b) *Refractive index at 20 °C.* 1.4740 to 1.4780.
- (c) *Optical rotation at 20 °C.* +30° to +50°.
- (d) *Aldehyde content (as citral).* 0.5 to 3.0 percent.
- (e) *Terpene content (as limonene).* 45 percent minimum.

[T.D. TTB-140, 81 FR 59462, Aug. 30, 2016]

§ 21.107 Ethyl acetate.

- (a) *85 percent ester:*
 - (1) *Acidity (as acetic acid).* Not more than 0.015 percent by weight.
 - (2) *Color.* Colorless.
 - (3) *Odor.* Characteristic odor.
 - (4) *Ester content.* Not less than 85 percent by weight.
 - (5) *Specific gravity at 20 °/20 °C.* Not less than 0.882.
 - (6) *Distillation range.* (For applicable ASTM method, see 1980 Annual Book of ASTM Standards, Part 29, page 70, Standard No. D 302-58 (1975); for incorporation by reference, see § 21.6(b).) When 100 mL of ethyl acetate are distilled by this method, none shall distill below 70 °C., not more than 10 mL shall distill below 72 °C., and none above 80 °C.
- (b) *100 percent ester:*
 - (1) *Acidity (as acetic acid).* Not more than 0.010 percent by weight.
 - (2) *Color.* Colorless.
 - (3) *Odor.* Characteristic odor.
 - (4) *Ester content.* Not less than 99 percent by weight.
 - (5) *Specific gravity at 20 °/20 °C.* Not less than 0.899.
 - (6) *Distillation range.* (For applicable ASTM method, see 1980 Annual Book of ASTM Standards, Part 29, page 433, Standard No. D 3127-77; for incorporation by reference, see § 21.6(b).) When 100 mL of ethyl acetate are distilled by this method, not more than 2 mL shall

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distill below 75 °C., and none above 80 °C. (760 mm).

[T.D. ATF-133, 48 FR 24673, June 2, 1983. Redesignated by T.D. ATF-442, 66 FR 12854, Mar. 1, 2001]

§ 21.108 Ethyl ether.

- (a) *Odor.* Characteristic odor.
- (b) *Specific gravity at 15.56 °/15.56 °C.* Not more than 0.728.

[T.D. ATF-133, 48 FR 24673, June 2, 1983. Redesignated by T.D. ATF-442, 66 FR 12854, Mar. 1, 2001]

§ 21.108-T Ethyl tertiary butyl ether.

- (a) *Purity.* ≥95.0 percent.
- (b) *Color.* Colorless to light yellow.
- (c) *Odor.* Terpene-like.
- (d) *Specific gravity at 20 °C.* 0.70 to 0.80.
- (e) *Boiling point (°C).* 73.

[T.D. TTB-140, 81 FR 59462, Aug. 30, 2016]

§ 21.109 Gasoline.

- (a) *Distillation range.* When 100 mL of gasoline are distilled, none shall distill below 90 °F. Not more than 5 mL shall be collected below 140 °F., and not less than 50 mL shall distill below 230 °F.
- (b) *Odor.* Characteristic odor.

[T.D. ATF-133, 48 FR 24673, June 2, 1983. Redesignated by T.D. ATF-442, 66 FR 12854, Mar. 1, 2001]

§ 21.110 Gasoline, unleaded.

Conforms to specifications as established by the American Society for Testing and Materials (ASTM) in the 1980 Annual Book of ASTM Standards, Part 23, page 229, Standard No. D 439-79. Any of the “seasonal and geographical” volatility classes for unleaded gasoline are considered suitable as a denaturant. (For incorporation by reference, see § 21.6(b).)

[T.D. ATF-133, 48 FR 24673, June 2, 1983. Redesignated by T.D. ATF-442, 66 FR 12854, Mar. 1, 2001]

§ 21.111 [Reserved]

§ 21.112 Heptane.

- (a) *Distillation range.* No distillate should come over below 200 °F. and none above 211 °F.

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(b) *Odor*. Characteristic odor.

[T.D. ATF-133, 48 FR 24673, June 2, 1983. Re-designated by T.D. ATF-442, 66 FR 12854, Mar. 1, 2001]

§21.112-T1 Hexane (mixed isomers).

(a) *General*. Minimum 55 percent *n*-hexane.

(b) *Distillation range*. No distillate should come over below 150 °F and none above 160 °F.

(c) *Odor*. Characteristic odor.

[T.D. TTB-140, 81 FR 59462, Aug. 30, 2016]

§21.112-T2 *n*-Hexane.

(a) *General*. Minimum 97 percent purity.

(b) *Distillation range*. No distillate should come over below 150 °F and none above 160 °F.

(c) *Odor*. Characteristic odor.

[T.D. TTB-140, 81 FR 59462, Aug. 30, 2016]

§21.112-T3 High octane denaturant blend.

(a) *API Gravity at 60 °F*. 40 to 65.

(b) *Reid Vapor Pressure (PSI)*. 6 to 15.

(c) *Isopropyl alcohol*. 24 to 40 percent volume.

(d) *Methyl alcohol*. 1.6 to 9.6 percent volume.

(e) *Diisopropyl ether (DIPE)*. 4 to 12 percent volume.

(f) *tert-Butyl alcohol*. 4 to 12 percent volume.

(g) *Iso-pentane*. 4 to 9 percent volume.

(h) *Pentane*. 4 to 9 percent volume.

(i) *Pentene*. 0 to 2.4 percent volume.

(j) *Hexane*. 2 to 6 percent volume.

(k) *Heptane*. 1 to 3 percent volume.

(l) *Sulfur (ppm)*. 0 to 120.

(m) *Benzene (% vol.)*. 0 to 1.1.

(n) *Distillation (°F)*:

(i) *10 percent*. 80 to 168.

(ii) *50 percent*. 250.

(iii) *End point distillation*. 437.

[T.D. TTB-140, 81 FR 59462, Aug. 30, 2016]

§21.113 Isopropyl alcohol.

Specific gravity at 15.56 °/15.56 °C. 0.810 maximum.

[T.D. ATF-133, 48 FR 24673, June 2, 1983. Re-designated by T.D. ATF-442, 66 FR 12854, Mar. 1, 2001]

§21.114 Kerosene.

(a) *Distillation range*. (For applicable ASTM method, see 1980 Annual Book of ASTM Standards, Part 25, page 395, Standard No. D 3699-78 for burner fuel; see Part 23, page 849, Standard Nos. D 1655-80a for aviation turbine fuels and D 86-78 for distillation of petroleum products; for incorporation by reference, see §21.6(b).) No distillate should come over below 340 °F. and none above 570 °F.

(b) *Flash point*. 115 °F. minimum.

(c) *Odor*. Characteristic odor.

[T.D. ATF-133, 48 FR 24673, June 2, 1983. Re-designated by T.D. ATF-442, 66 FR 12854, Mar. 1, 2001]

§21.115 Kerosene (deodorized).

(a) *Distillation range*. No distillate should come over below 340 °F. and none above 570 °F.

(b) *Flash point*. 155 °F. minimum.

[T.D. ATF-133, 48 FR 24673, June 2, 1983. Re-designated by T.D. ATF-442, 66 FR 12854, Mar. 1, 2001]

§21.115-T1 Lemon oil (Citrus limonium).

(a) *Specific gravity at 25 °C*. 0.850 to 0.860.

(b) *Refractive index at 20 °C*. 1.4570 to 1.4580.

(c) *Optical rotation at 20 °C*. +55° to +65°.

(d) *Terpene content (as limonene)*. 65 percent minimum.

[T.D. TTB-140, 81 FR 59462, Aug. 30, 2016]

§21.115-T2 L(-)-Carvone.

(a) *Specific gravity at 25 °C*. 0.955 to 0.965.

(b) *Refractive index at 20 °C*. 1.495 to 1.500.

(c) *Angular rotation*. -57° to -62°.

(d) *Assay*. Not less than 97.0 percent.

[T.D. TTB-140, 81 FR 59462, Aug. 30, 2016]

§21.116 Methyl alcohol.

Specific gravity at 15.56 °/15.56 °C. 0.810 maximum.

[T.D. ATF-133, 48 FR 24673, June 2, 1983. Re-designated by T.D. ATF-442, 66 FR 12854, Mar. 1, 2001]

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§ 21.117 Methyl isobutyl ketone.

- (a) *Acidity (as acetic acid)*. 0.02 percent by weight, maximum.
- (b) *Color*. Colorless.
- (c) *Distillation range*. (For applicable ASTM method, see 1980 Annual Book of ASTM Standards, Part 29, page 147, Standard No. D 1153-77; for incorporation by reference, see § 21.6(b).) No distillate should come over below 111 °C. and none above 117 °C.
- (d) *Odor*. Characteristic odor.
- (e) *Specific gravity at 20 °/20 °C*. 0.799 to 0.804.

[T.D. ATF-133, 48 FR 24673, June 2, 1983. Redesignated by T.D. ATF-442, 66 FR 12854, Mar. 1, 2001]

§ 21.118 Methyl *n*-butyl ketone.

- (a) *Acidity (as acetic acid)*. 0.02 percent by weight, maximum.
- (b) *Color*. Colorless.
- (c) *Odor*. Characteristic odor.
- (d) *Refractive index at 20 °C*. 1.396 to 1.404.
- (e) *Specific gravity at 20 °/20 °C*. 0.800 to 0.835.
- (f) *Distillation range*. No distillate should come over below 123 °C. and none above 129 °C.

[T.D. ATF-133, 48 FR 24673, June 2, 1983. Redesignated by T.D. ATF-442, 66 FR 12854, Mar. 1, 2001]

§ 21.118-T1 Methyl tertiary butyl ether.

- (a) *Purity*. ≥ 97.0 percent.
- (b) *Color*. Clear, colorless.
- (c) *Odor*. Turpentine-like.
- (d) *Specific Gravity at 20 °C*. 0.70 to 0.80.
- (e) *Boiling Point (°C)*. 55.

[T.D. TTB-140, 81 FR 59462, Aug. 30, 2016]

§ 21.118-T2 Naphtha.

- (a) *API Gravity at 60 °F*. 30 to 85.
- (b) *Reid Vapor Pressure (PSI)*. 8 maximum.
- (c) *Specific Gravity at 20 °C*. 0.70 to 0.80.
- (d) *Distillation (°F)*:
 - (i) *I.B.P.* 85 maximum.
 - (ii) *10 percent*. 130 maximum.
 - (iii) *50 percent*. 250 maximum.
 - (iv) *90 percent*. 340 maximum.
- (e) *End point distillation*. 380 maximum.
- (f) *Copper corrosion*. One (1).

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- (g) *Sabolt color*. 28 minimum.

[T.D. TTB-140, 81 FR 59462, Aug. 30, 2016]

§ 21.118-T3 Natural gasoline.

Natural gasoline is a mixture of various alkanes including butane, pentane, and hexane hydrocarbons extracted from natural gas. It has a distillation range wherein no more than 10 percent by volume of the sample may distill below 97 °F; at least 50 percent by volume shall distill at or below 156 °F; and at least 90 percent by volume shall distill at or below 209 °F.

[T.D. TTB-140, 81 FR 59462, Aug. 30, 2016]

§ 21.119 Nicotine solution.

(a) *Composition*. Five gallons of an aqueous solution containing 40 percent nicotine; 3.6 avoirdupois ounces of methylene blue, U.S.P.; water sufficient to make 100 gallons.

(b) *Color*. One mL of the nicotine solution (previously agitated in the presence of air) is measured into 100 mL of water and thoroughly mixed. Fifty mL of this colored solution is compared, using Nessler tubes, with 50 mL of a standard color solution containing 5 grams of CuSO₄·5H₂O, C.P. in 100 mL of water. The color intensity of the solution tested should be equal to or greater than that of the standard solution.

(c) *Nicotine content*. The above solution must contain not less than 1.88 percent of nicotine determined by the following process: 20 mL of the solution are measured into a 500 mL Kjeldahl flask provided with a suitable bulb tube, 50 mL of 0.1 N NaOH added and the mixture distilled in a current of steam until the distillate is no longer alkaline (about 500 mL). The distillate is then titrated with 0.1 N H₂SO₄ using rosolic acid or methyl red as indicator. Not less than 23.2 mL should be required for neutralization.

[T.D. ATF-133, 48 FR 24673, June 2, 1983. Redesignated by T.D. ATF-442, 66 FR 12854, Mar. 1, 2001]

§ 21.120 Nitropropane, mixed isomers of.

- (a) *Nitropropane content*. A minimum of 94 percent by weight.
- (b) *Total nitroparaffin content*. A minimum of 99 percent by weight.
- (c) *Distillation range*. 119° to 113 °C.

(d) *Specific gravity at 20°/20 °C.* 0.992 to 1.003.

[T.D. ATF-133, 48 FR 24673, June 2, 1983. Re-designated by T.D. ATF-442, 66 FR 12854, Mar. 1, 2001]

§ 21.121 Peppermint oil, Terpeneless.

(a) *Specific gravity at 25 °C.* 0.890 to 0.910.

(b) *Refractive index at 20 °C.* 1.455 to 1.465.

(c) *Esters as menthyl acetate.* 5 percent minimum.

(d) *Menthol (free and esters).* 5 percent minimum.

[T.D. TTB-140, 81 FR 59462, Aug. 30, 2016]

§ 21.122 Potassium Hydroxide.

(a) *Color.* White or yellow.

(b) *Specific gravity at 20 °C.* 1.95 to 2.10.

(c) *Melting point.* 360 °C.

(d) *Boiling point.* 1320 °C.

(e) *pH (0.1M solution).* 13.5.

[T.D. TTB-140, 81 FR 59462, Aug. 30, 2016]

§ 21.123 Pyronate.

Pyronate is a product of the destructive distillation of hardwood meeting the following requirements:

(a) *Acidity (as acetic acid).* Not more than 0.1 percent by weight, determined as follows:

Add 5.0 mL sample to 100 mL distilled water in an Erlenmeyer flask and titrate with 0.1 N NaOH to a bromthymol blue endpoint.

(b) *Color.* The color shall be no darker than the color produced by 2.0 grams of potassium dichromate in 1 liter of water. The comparison shall be made in 4-ounce oil sample bottles viewed crosswise.

(c) *Distillation range.* When 100 mL are distilled not more than 5 mL shall distill below 70 °C., not less than 50 mL below 160 °C., and not less than 90 mL below 205 °C.

NOTE. Any material submitted as pyronate must agree in color, odor, taste and denaturing value with a standard sample furnished by the Alcohol and Tobacco Tax and Trade Bureau to chemists authorized to examine samples of denaturants.

[T.D. ATF-133, 48 FR 24673, June 2, 1983. Re-designated by T.D. ATF-442, 66 FR 12854, Mar. 1, 2001]

§ 21.124 Quassin.

(a) Quassin is the bitter principle of quassia wood (occurring as a mixture of two isomeric forms). It shall be a good commercial grade of purified amorphous quassin, standardized as to bitterness.

(b) *Bitterness.* An aqueous solution of quassin shall be distinctly bitter at a 1 to 250,000 dilution. To test: Dissolve 0.1 gram of quassin in 100 mL of 95 percent alcohol, then dilute 4 mL of the solution to 1,000 mL with distilled water, mix well and taste.

(c) *Identification test.* Dissolve about 0.5 gram of quassin in 10 mL of 95 percent alcohol and filter. To 5 mL of the filtrate, add 5 mL of concentrated hydrochloric acid and 1 mg of phloroglucinol and mix well. A red color develops.

(d) *Optical assay.* When 1 gram of quassin (in solution in a small amount of 95 percent alcohol) is dissolved in 10,000 mL of water, the absorbance of the solution in a 1 cm cell at a wavelength of 258 millimicrons shall not be less than 0.400.

(e) *Solubility.* When 0.5 gram of quassin is added to 25 mL of 190 proof alcohol, it shall dissolve completely.

[T.D. ATF-133, 48 FR 24673, June 2, 1983. Re-designated by T.D. ATF-442, 66 FR 12854, Mar. 1, 2001]

§ 21.124-T Raffinate.

(a) *API Gravity at 60 °F.* 30 to 85.

(b) *Reid Vapor Pressure (PSI).* 5 to 11.

(c) *Octane (R+M/2).* 66 to 70.

(d) *Distillation (°F):*

(i) *10 percent.* 120 to 150.

(ii) *50 percent.* 144 to 180.

(iii) *90 percent.* 168 to 200.

(iv) *End point distillation.* 216 to 285.

[T.D. TTB-140, 81 FR 59462, Aug. 30, 2016]

§ 21.125 Rubber hydrocarbon solvent.

(a) Rubber hydrocarbon solvent is a petroleum derivative.

(b) *Distillation range.* When 10 percent of the sample has been distilled into a graduated receiver, the thermometer shall not read more than 170 °F. nor less than 90 °F. When 90 percent has

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been recovered in the receiver the thermometer shall not read more than 250 °F.

[T.D. ATF-133, 48 FR 24673, June 2, 1983. Re-designated by T.D. ATF-442, 66 FR 12854, Mar. 1, 2001; T.D. TTB-140, 81 FR 59462, Aug. 30, 2016]

§ 21.126 Safrole.

- (a) *Congealing point*. 10.0° to 11.2 °C.
- (b) *Refractive index at 20 °C*. 1.5363 to 1.5385.
- (c) *Specific gravity at 15 °/15 °C*. 1.100 to 1.107.
- (d) *Odor*. Characteristic odor.

[T.D. ATF-133, 48 FR 24673, June 2, 1983. Re-designated by T.D. ATF-442, 66 FR 12854, Mar. 1, 2001]

§ 21.127 Shellac (refined).

- (a) *Arsenic content*. Not more than 1.4 parts per million as determined by the Gutzeit Method (AOAC method 25.020; for incorporation by reference, see § 21.6(c)).

- (b) *Color*. White or orange.

(c) *Rosin content*. None when tested by the following method: Add 20 mL of absolute alcohol or glacial acetic acid (m. p. 13° to 15 °C.) to 2 grams of the shellac and thoroughly dissolve. Add 100 mL of petroleum ether and mix thoroughly. Add approximately 2 liters of water and separate a portion of the ether layer (at least 50 mL) and filter if cloudy. Evaporate the petroleum ether and test as follows: Solution A—5 mL of phenol dissolved in 10 mL of carbon tetrachloride. Solution B—1 mL of bromine dissolved in 4 mL of carbon tetrachloride. To the residue obtained above add 2 mL of Solution A and transfer the mixture to a porcelain spot plate, filling one cavity. Immediately fill an adjacent cavity with solution B. Cover the plate with a watch glass and observe any color formation in Solution A. A decided purple or deep indigo blue color is an indication of the presence of rosin.

[T.D. ATF-133, 48 FR 24673, June 2, 1983. Re-designated by T.D. ATF-442, 66 FR 12854, Mar. 1, 2001]

§ 21.128 [Reserved]

§ 21.129 Spearmint oil, terpeneless.

- (a) *Carvone content*. Not less than 85 percent by weight.

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- (b) *Refractive index at 20 °C*. 1.4930 to 1.4980.

- (c) *Specific gravity at 25 °/25 °C*. 0.949 to 0.956.

- (d) *Odor*. Characteristic odor.

[T.D. ATF-133, 48 FR 24673, June 2, 1983. Re-designated by T.D. ATF-442, 66 FR 12854, Mar. 1, 2001]

§ 21.130 Spike lavender oil, natural.

- (a) *Alcohol content (as borneol)*. Not less than 30 percent by weight.

- (b) *Esters (as bornyl acetate)*. Not less than 1.5 percent by weight.

- (c) *Refractive index at 20 °C*. 1.4630 to 1.4680.

- (d) *Specific gravity at 25 °/25 °C*. 0.893 to 0.909.

- (e) *Odor*. Characteristic odor.

[T.D. ATF-133, 48 FR 24673, June 2, 1983. Re-designated by T.D. ATF-442, 66 FR 12854, Mar. 1, 2001]

§ 21.130–T Straight run gasoline.

- (a) *General*. Straight run gasoline is a mixture consisting predominantly (greater than 60 percent by volume) of C₄, C₅, C₆, C₇ and/or C₈ hydrocarbons, and is either:

(1) A petroleum distillate coming straight from an atmospheric distillation unit without being cracked or reformed, or

(2) A condensate coming directly from an oil/gas recovery operation.

- (b) *API gravity*. 72° minimum, 85° maximum.

- (c) *Reid vapor pressure (PSI)*. 15 maximum.

- (d) *Sulfur*. 120 ppm maximum.

- (e) *Benzene*. 1.1 percent by volume maximum.

- (f) *Distillation (°F)*:

(1) *10 percent*. 97 minimum, 158 maximum.

(2) *50 percent*. 250 maximum.

(3) *Final boiling point*. 437 maximum.

[T.D. TTB-140, 81 FR 59462, Aug. 30, 2016]

§ 21.131 Sucrose octaacetate.

- (a) Sucrose octaacetate is an organic acetylation product occurring as a white or cream-colored powder having an intensely bitter taste.

(b) *Free acid (as acetic acid)*. Maximum percentage 0.15 by weight when determined by the following procedure: Dissolve 1.0 gram of sample in 50 mL of

neutralized ethyl alcohol (or S.D.A. No. 3-A, No. 3-C, or No. 30) and titrate with 0.1 N sodium hydroxide using phenolphthalein indicator.

Percent acid as acetic acid = mL NaOH used
× 0.6 / weight of sample

(c) *Insoluble matter*. 0.30 percent by weight maximum.

(d) *Melting point*. Not less than 78.0 °C.

(e) *Purity*. Sucrose octaacetate 98 percent minimum by weight when determined by the following procedure: Transfer a weighed 1.50 grams sample to a 500 mL Erlenmeyer flask containing 100 mL of neutral ethyl alcohol (or S.D.A. No. 3-A, No. 3-C, or No. 30) and exactly 50.0 mL of 0.5 N sodium hydroxide. Reflux for 1 hour on a steam bath, cool and titrate the excess sodium hydroxide with 0.5 N sulfuric acid using phenolphthalein indicator.

Percent sucrose octaacetate = (mL NaOH – mL H₂SO₄) × 4.2412 / weight of sample

[T.D. ATF-133, 48 FR 24673, June 2, 1983. Redesignated by T.D. ATF-442, 66 FR 12854, Mar. 1, 2001]

§ 21.132 Toluene.

(a) *Specific Gravity at 15.56°/15.56 °C*. 0.80 to 0.90.

(b) *Boiling point (°C)*. 110.6.

(c) *Distillation range (°C)*. Not more than 1 percent by volume should distill below 109, and not less than 99 percent by volume below 112.

(d) *Odor*. Characteristic odor.

[T.D. TTB-140, 81 FR 59463, Aug. 30, 2016]

§ 21.133 Vinegar.

(a) *Vinegar, 90-grain*:

Acidity (as acetic acid). 9.0 percent by weight, minimum.

(b) *Vinegar, 60-grain*:

Acidity (as acetic acid). 6.0 percent by weight, minimum.

[T.D. ATF-133, 48 FR 24673, June 2, 1983. Redesignated by T.D. ATF-442, 66 FR 12854, Mar. 1, 2001]

Subpart F—Uses of Specially Denatured Alcohol and Specially Denatured Rum

§ 21.141 List of products and processes using specially denatured alcohol and rum, and formulas authorized therefor.

This section lists, alphabetically by product or process, formulas of specially denatured alcohol authorized for use in those products or processes, and lists the code numbers assigned thereto. Specially denatured rum, as well as specially denatured alcohol, may be used in tobacco sprays and flavors, Code No. 460, under Formula No. 4.

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Product or process	Code No.	Formulas authorized
Acetaldehyde	551	1, 2-B, 29.
Acetic acid	512	29, 35-A.
Adhesives and binders	036	1, 3-A, 3-C, 23-A, 30.
Aldehydes, miscellaneous.	552	1, 2-B, 29.
Alkaloids (processing) ..	344	1, 2-B, 3-A, 3-C, 13-A, 23-A, 30, 32, 35-A.
Animal feed supplements.	910	35-A.
Antibiotics (processing)	343	1, 2-B, 3-A, 3-C, 13-A, 23-A, 30, 32, 35-A.
Antifreeze, proprietary ..	760	1.
Antiseptic solutions, U.S.P. or N.F.	244	23-A, 37, 38-B, 38-F.
Bath preparations	142	1, 3-A, 3-C, 23-A, 30, 36, 38-B, 39-B, 39-C, 40, 40-A, 40-B, 40-C.
Bay rum	112	23-A, 37, 38-B, 39-B, 39-D, 40, 40-A, 40-B, 40-C.
Biocides, miscellaneous	410	1, 3-A, 3-C, 23-A, 23-H, 30, 37, 38-B, 39-B, 40, 40-A, 40-B, 40-C.
Blood and blood products (processing).	345	1, 3-A, 3-C, 13-A, 23-A, 30.
Brake fluids	720	1, 3-A, 3-C.
Candy glazes	015	13-A, 23-A, 35-A, 45.
Cellulose coatings	011	1, 3-A, 3-C, 23-A, 30.
Cellulose compounds (dehydration).	311	1, 2-B, 3-A, 3-C, 32.
Cellulose intermediates	034	1, 3-A, 3-C, 13-A, 19, 23-A, 32.
Chemicals (miscellaneous).	579	1, 2-B, 3-A, 3-C, 13-A, 29, 30, 32, 36.
Cleaning solutions	450	1, 3-A, 3-C, 23-A, 23-H, 30, 36, 39-B, 40, 40-A, 40-B, 40-C.
Coatings, miscellaneous	016	1, 3-A, 3-C, 23-A.
Collodions, industrial	034	1, 3-A, 3-C, 13-A, 19, 23-A, 32.
Collodion, U.S.P.	241	13-A, 19, 32.
Colognes	122	38-B, 39-B, 39-C, 40, 40-A, 40-B, 40-C.
Crude drugs (processing).	341	1, 2-B, 3-A, 3-C, 23-A, 30.
Cutting oils	730	1, 3-A, 3-C.
Dehydration products, miscellaneous.	315	1, 2-B, 3-A, 3-C.

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USES OF SPECIALLY DENATURED ALCOHOL ¹—
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Product or process	Code No.	Formulas authorized
Dentifrices	131	31-A, 37, 38-B, 38-D.
Deodorants (body)	114	23-A, 38-B, 39-B, 39-C, 40, 40-A, 40-B, 40-C.
Detergents, household	450	1, 3-A, 3-C, 23-A, 23-H, 30, 36, 39-B, 40, 40-A, 40-B, 40-C.
Detergents, industrial ...	440	1, 3-A, 3-C, 23-A, 30.
Detonators	574	1.
Disinfectants	410	1, 3-A, 3-C, 23-A, 23-H, 30, 37, 38-B, 39-B, 40, 40-A, 40-B, 40-C.
Drugs and medicinal chemicals.	575	1, 2-B, 3-A, 3-C, 13-A, 29, 30, 32.
Drugs, miscellaneous (processing).	349	1, 2-B, 3-A, 3-C, 13-A, 23-A, 30, 35-A, 38-B.
Duplicating fluids	485	1, 3-A, 3-C, 30.
Dyes and intermediates	540	1, 2-B, 3-A, 3-C, 29, 36.
Dyes and intermediates (processing).	351	1, 2-B, 3-A, 3-C.
Dye solutions, miscellaneous.	482	1, 3-A, 3-C, 23-A, 30.
Embalming fluids, etc ...	420	1, 3-A, 3-C, 23-A.
Esters, ethyl (miscellaneous).	523	1, 2-B, 13-A, 29, 32, 35-A.
Ether, ethyl	561	1, 2-B, 13-A, 29, 32.
Ethers, miscellaneous ..	562	1, 2-B, 13-A, 29, 32.
Ethyl acetate	521	1, 2-B, 29, 35-A.
Ethylamines	530	1, 2-B, 3-A, 3-C, 29, 36.
Ethyl chloride	522	1, 2-B, 29, 32.
Ethylene dibromide	571	1, 2-B, 29, 32.
Ethylene gas	572	1, 2-B, 29, 32.
Explosives	033	1, 2-B, 3-A, 3-C.
External pharmaceuticals, not U.S.P. or N.F.	210	23-A, 23-H, 36, 37, 38-B, 38-F, 39-B, 40, 40-A, 40-B, 40-C.
External pharmaceuticals, miscellaneous, U.S.P. or N.F.	249	23-A, 25, 25-A, 38-B, 40-B.
Fluid uses, miscellaneous.	750	1, 3-A, 3-C, 23-A, 30.
Food products, miscellaneous (processing).	332	1, 2-B, 3-A, 3-C, 13-A, 23-A, 30, 32, 35-A.
Fuel uses, miscellaneous.	630	1, 3-A, 3-C, 28-A.
Fuels, airplane and supplementary.	612	1, 3-A, 3-C, 28-A.
Fuels, automobile and supplementary.	611	1, 3-A, 3-C, 28-A.
Fuels, proprietary heating.	620	1, 3-A, 3-C, 28-A.
Fuels, rocket and jet	613	1, 3-A, 3-C, 28-A.
Fungicides	410	1, 3-A, 3-C, 23-A, 23-H, 30, 37, 38-B, 39-B, 40, 40-A, 40-B, 40-C.
Glandular products (processing).	342	1, 2-B, 3-A, 3-C, 13-A, 23-A, 30, 32, 35-A.
Hair and scalp preparations.	111	23-A, 23-H, 37, 38-B, 39-B, 39-C, 39-D, 40, 40-A, 40-B, 40-C.
Hormones (processing)	342	1, 2-B, 3-A, 3-C, 13-A, 23-A, 30, 32, 35-A.
Incense	470	3-A, 3-C, 37, 38-B, 39-B, 39-C, 40, 40-A, 40-B, 40-C.
Inks	052	1, 3-A, 3-C, 13-A, 23-A, 30, 32, 35-A, 40-B.
Insecticides	410	1, 3-A, 3-C, 23-A, 23-H, 30, 37, 38-B, 39-B, 40, 40-A, 40-B, 40-C.

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Product or process	Code No.	Formulas authorized
Iodine solutions (including U.S.P. and N.F. tinctures).	230	25, 25-A.
Laboratory reagents (for sale).	811	3-A, 3-C, 30.
Laboratory uses, general (own use only).	810	3-A, 3-C, 30.
Lacquer thinners	042	1, 23-A.
Liniments, U.S.P. or N.F.	243	38-B.
Lotions and creams (body, face, and hand).	113	23-A, 23-H, 31-A, 37, 38-B, 39-B, 39-C, 40, 40-A, 40-B, 40-C.
Medicinal chemicals (processing).	344	1, 2-B, 3-A, 3-C, 13-A, 23-A, 30, 32, 35-A.
Miscellaneous chemicals (processing).	358	1, 2-B, 3-A, 3-C, 13-A, 23-A, 30, 35-A.
Miscellaneous products (processing).	359	1, 2-B, 3-A, 3-C, 13-A, 23-A, 30, 35-A.
Mouth washes	132	37, 38-B, 38-D, 38-F.
Organo-silicone products.	576	2-B, 3-A, 3-C, 30.
Pectin (processing)	331	1, 2-B, 3-A, 3-C, 13-A, 23-A, 30, 35-A.
Perfume materials (processing).	352	1, 2-B, 3-A, 3-C, 13-A, 30.
Perfumes and perfume tinctures.	121	38-B, 39-B, 39-C, 40, 40-A, 40-B, 40-C.
Petroleum products	320	1, 2-B, 3-A, 3-C.
Photoengraving dyes and solutions.	481	1, 3-A, 3-C, 13-A, 30, 32.
Photographic chemicals (processing).	353	1, 2-B, 3-A, 3-C, 13-A, 30.
Photographic film and emulsions.	031	1, 2-B, 3-A, 3-C, 13-A, 19, 30, 32.
Pill and tablet manufacture.	349	1, 2-B, 3-A, 3-C, 13-A, 23-A, 30, 35-A, 38-B.
Plastics, cellulose	021	1, 2-B, 3-A, 3-C, 13-A, 30.
Plastics, non-cellulose (including resins).	022	1, 2-B, 3-A, 3-C, 13-A, 30.
Polishes	051	1, 3-A, 3-C, 30.
Preserving solutions	430	1, 3-A, 3-C, 13-A, 23-A, 30, 32, 37, 38-B, 44.
Product development and pilot plant (own use only).	812	All formulas.
Proprietary solvents	041	1, 3-A.
Refrigerating uses	740	1, 3-A, 3-C, 23-A, 30.
Resin coatings, natural	014	1, 23-A.
Resin coatings, synthetic.	012	1, 3-A, 3-C, 23-A, 30.
Resins, synthetic	590	3-A, 3-C, 29, 30, 35-A.
Room deodorants	470	3-A, 3-C, 37, 38-B, 39-B, 39-C, 40, 40-A, 40-B, 40-C.
Rosin (processing)	354	1, 3-A, 3-C.
Rotogravure dyes and solutions.	481	1, 3-A, 3-C, 13-A, 30, 32.
Rubber (latex) (processing).	355	1, 3-A, 3-C.
Rubber, synthetic	580	29, 32.
Rubbing alcohol	220	23-H.
Scientific instruments ...	710	1, 3-A, 3-C.
Shampoos	141	1, 3-A, 3-C, 23-A, 31-A, 36, 38-B, 39-B, 40, 40-A, 40-B, 40-C.
Shellac coatings	013	1, 23-A.
Soaps, industrial	440	1, 3-A, 3-C, 23-A, 30.

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Product or process	Code No.	Formulas authorized
Soaps, toilet	142	1, 3-A, 3-C, 23-A, 30, 36, 38-B, 39-B, 39-C, 40, 40-A, 40-B, 40-C.
Sodium ethylate, anhydrous (restricted).	524	2-B.
Sodium hydrosulfite (dehydration).	312	1, 2-B, 3-A, 3-C.
Soldering flux	035	1, 3-A, 3-C, 23-A, 30.
Solutions, miscellaneous.	485	1, 3-A, 3-C, 13-A, 23-A, 30, 32, 35-A, 40-B, 40-C.
Solvents and thinners (other than proprietary solvents or special industrial solvents).	042	1, 23-A, 30.
Solvents, special (restricted sale).	043	1, 3-A, 3-C.
Stains (wood)	053	1, 3-A, 3-C, 23-A, 30.
Sterilizing solutions	430	1, 3-A, 3-C, 13-A, 23-A, 30, 32, 37, 38-B, 44.
Theater sprays	470	3-A, 3-C, 37, 38-B, 39-B, 39-C, 40, 40-A, 40-B, 40-C.
Tobacco sprays and flavors.	460	4.
Toilet waters	122	38-B, 39-B, 39-C, 40, 40-A, 40-B, 40-C.
Transparent sheetings ..	032	1, 2-B, 3-A, 3-C, 13-A, 23-A.
Unclassified uses ²	900	1, 3-A, 3-C.
Vaccine (processing)	343	1, 2-B, 3-A, 3-C, 13-A, 23-A, 30, 32, 35-A.
Vinegar	511	18, 29, 35-A.
Vitamins (processing) ...	342	1, 2-B, 3-A, 3-C, 13-A, 23-A, 30, 32, 35-A.
Xanthates	573	1, 2-B, 29.
Yeast (processing)	342	1, 2-B, 3-A, 3-C, 13-A, 23-A, 30, 32, 35-A.

¹Other products or processes may be authorized under §21.31(c).

²Persons desiring other formulas for this use should indicate the fact in the space provided for this purpose on TTB Form 5150.19.

[T.D. ATF-133, 48 FR 24673, June 2, 1983, as amended by T.D. ATF-199, 50 FR 9183, Mar. 6, 1985; T.D. ATF-435, 66 FR 5475, Jan. 19, 2001; T.D. ATF-442, 66 FR 11854, Mar. 1, 2001; T.D. TTB-140, 81 FR 59463, Aug. 30, 2016]

Subpart G—Denaturants Authorized for Denatured Spirits

§21.151 List of denaturants authorized for denatured spirits.

Following is an alphabetical listing of denaturants authorized for use in denatured spirits:

DENATURANTS AUTHORIZED FOR COMPLETELY DENATURED ALCOHOL (C.D.A), SPECIALLY DENATURED ALCOHOL (S.D.A.), AND SPECIALLY DENATURED RUM (S.D.R.)

Acetaldehyde S.D.A. 29.

DENATURANTS AUTHORIZED FOR COMPLETELY DENATURED ALCOHOL (C.D.A), SPECIALLY DENATURED ALCOHOL (S.D.A.), AND SPECIALLY DENATURED RUM (S.D.R.)—Continued

Acetone, U.S.P	S.D.A. 23-A, 23-H.
Acetaldol	C.D.A. 18.
Alkylate	C.D.A. 20.
Almond oil, bitter, N.F.X	S.D.A. 38-B.
Alpha Terpineol	S.D.A. 38-B.
Ammonia, aqueous	S.D.A. 36.
Ammonia solution, strong, N.F. ...	S.D.A. 36.
Anethole, N.F	S.D.A. 38-B.
Anise oil, N.F	S.D.A. 38-B.
Bay oil (myrcia oil), N.F.XI	S.D.A. 38-B, 39-D.
Benzaldehyde, N.F	S.D.A. 38-B.
Bergamot oil, N.F.XI	S.D.A. 38-B.
Boric acid, N.F	S.D.A. 38-F.
Brucine alkaloid	S.D.A. 40.
Brucine sulfate, N.F.IX	S.D.A. 40.
<i>n</i> -Butyl alcohol	S.D.A. 44.
<i>tert</i> -Butyl alcohol	S.D.A. 39-B, 40, 40-A, 40-B, 40-C.
Camphor, U.S.P	S.D.A. 38-B.
Caustic soda, liquid	S.D.A. 36.
Cedar leaf oil, U.S.P.XIII	S.D.A. 38-B.
Chlorothymol, N.F.XII	S.D.A. 38-B, 38-F.
Cinnamic aldehyde (cinnamaldehyde), N.F.IX.	S.D.A. 38-B.
Cinnamon oil, N.F	S.D.A. 38-B.
Citronella oil, natural	S.D.A. 38-B.
Clove oil, N.F	S.D.A. 38-B.
Coal tar, U.S.P	S.D.A. 38-B.
Corrmint oil	S.D.A. 38-B.
Cyclohexane	S.D.A. 3-A.
Denatonium benzoate, N.F.	S.D.A. 1, 40-B.
Diethyl phthalate	S.D.A. 39-B, 39-C.
Distilled lime oil	S.D.A. 38-B.
Ethyl acetate	C.D.A. 35; S.D.A. 29, 35-A.
Ethyl ether	S.D.A. 13-A, 19, 32.
Ethyl tertiary butyl ether	C.D.A. 20.
Eucalyptol, N.F.XII	S.D.A. 37, 38-B.
Eucalyptus oil, N.F	S.D.A. 38-B.
Eugenol, U.S.P	S.D.A. 38-B.
Formaldehyde solution, U.S.P.	S.D.A. 38-D.
Gasoline	C.D.A. 18, 19; S.D.A. 28-A.
Gasoline, unleaded	C.D.A. 18, 19, 20; S.D.A. 28-A.
Glycerin (Glycerol), U.S.P	S.D.A. 31-A.
Guaiaicol, N.F.X	S.D.A. 38-B.
Heptane	C.D.A. 18, 19; S.D.A. 2-B, 28-A.
Hexane	S.D.A. 2-B.
<i>n</i> -Hexane	S.D.A. 2-B.
High octane denaturant blend	C.D.A. 20.
Hydrochloric acid, N.F	S.D.A. 38-F.
Iodine, U.S.P	S.D.A. 25, 25-A.
Isopropyl alcohol	S.D.A. 3-C.
Kerosene	C.D.A. 18, 19, 20.
Kerosene (deodorized)	C.D.A. 18, 19, 20.
L(–)-Carvone	S.D.A. 38-B.
Lavender oil, N.F	S.D.A. 38-B.
Lemon oil	S.D.A. 38-B.
Menthol, U.S.P	S.D.A. 37, 38-B, 38-D, 38-F.
Methyl alcohol	S.D.A. 1, 3-A, 30.
Methylene blue, U.S.P	S.D.A. 4; S.D.R. 4.
Methyl isobutyl ketone	C.D.A. 18, 19; S.D.A. 1, 23-H.
Methyl <i>n</i> -butyl ketone	C.D.A. 18, 19; S.D.A. 1.
Methyl salicylate, N.F	S.D.A. 38-B.
Methyl tertiary butyl ether	C.D.A. 20.
Mustard oil, volatile (allyl isothiocyanate), U.S.P.XII.	S.D.A. 38-B.

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DENATURANTS AUTHORIZED FOR COMPLETELY DENATURED ALCOHOL (C.D.A), SPECIALLY DENATURED ALCOHOL (S.D.A.), AND SPECIALLY DENATURED RUM (S.D.R.)—Continued

Naphtha	C.D.A. 20.
Natural gasoline	C.D.A. 20.
Nicotine solution	S.D.A. 4; S.D.R. 4.
Nitropropane, mixed isomers of	C.D.A. 18, 19; S.D.A. 1.
Peppermint oil, N.F.	S.D.A. 38–B.
Peppermint oil, terpeneless	S.D.A. 38–B.
Phenol, U.S.P.	S.D.A. 38–B.
Phenyl salicylate (salol), N.F.XI	S.D.A. 38–B.
Pine needle oil, dwarf, N.F.	S.D.A. 38–B.
Pine oil, N.F.	S.D.A. 38–B.
Poloxamer 407, N.F.	S.D.A. 38–F.
Polysorbate 80, N.F.	S.D.A. 38–F.
Potassium hydroxide	S.D.A. 36.
Potassium iodide, U.S.P.	S.D.A. 25, 25–A.
Pyronate	C.D.A. 18.
Quassin	S.D.A. 40.
Quinine bisulfate, N.F.XI	S.D.A. 39–D.
Quinine sulfate, U.S.P.	S.D.A. 39–D.
Raffinate	C.D.A. 20.
Rosemary oil, N.F. XII	S.D.A. 38–B.
Rubber hydrocarbon solvent	C.D.A. 18, 19, 20; S.D.A. 2–B, 28–A.
Safrole	S.D.A. 38–B.
Sassafras oil, N.F.XI	S.D.A. 38–B.
Shellac (refined)	S.D.A. 45.
Soap, hard, N.F.XI	S.D.A. 31–A.
Sodium iodide, U.S.P.	S.D.A. 25, 25–A.
Sodium salicylate, U.S.P.	S.D.A. 39–D.
Spearmint oil, N.F.	S.D.A. 38–B.
Spearmint oil, terpeneless	S.D.A. 38–B.
Spike lavender oil, natural	S.D.A. 38–B.
Storax, U.S.P.	S.D.A. 38–B.
Straight run gasoline	C.D.A. 20.
Sucrose octaacetate	S.D.A. 40–A.

DENATURANTS AUTHORIZED FOR COMPLETELY DENATURED ALCOHOL (C.D.A), SPECIALLY DENATURED ALCOHOL (S.D.A.), AND SPECIALLY DENATURED RUM (S.D.R.)—Continued

Thyme oil, N.F.XII	S.D.A. 38–B.
Thymol, N.F.	S.D.A. 37, 38–B, 38–F.
Tolu balsam, U.S.P.	S.D.A. 38–B.
Toluene	C.D.A. 12–A; S.D.A. 2–B.
Turpentine oil, N.F.XI	S.D.A. 38–B.
Vinegar	S.D.A. 18.
Zinc chloride, U.S.P.	S.D.A. 38–F.

[T.D. ATF–133, 48 FR 24673, June 2, 1983, as amended by T.D. ATF–442, 66 FR 12854, Mar. 1, 2001; T.D. TTB–140, 81 FR 59463, Aug. 30, 2016; T.D. TTB–196, 89 FR 87940, Nov. 6, 2024]

Subpart H—Weights and Specific Gravities of Specially Denatured Alcohol

§21.161 Weights and specific gravities of specially denatured alcohol.

The weight of one gallon of each formula of specially denatured alcohol at 15.56 °C. (60 °F.) is as listed in this section. The specific gravity of each formula of specially denatured alcohol at 15.56 °C./15.56 °C. (60 °F./60 °F.) in air is as listed in this section. (Weight of 1 gallon of water at 15.56 °C. (60 °F.) is 8.32823 pounds in air.)

WEIGHTS AND SPECIFIC GRAVITIES OF SPECIALLY DENATURED ALCOHOL ¹

[Slight deviations from this table may occur due to variations in specific gravities of authorized denaturants. Values for 190 proof determined experimentally in air. Other values calculated from these gravities.]

S.D.A. Formula No.	Finished formula (gals)	190 proof		192 proof		200 proof	
		Wt./gal. in air (lbs)	Sp. gr. in air	Wt./gal. in air (lbs)	Sp. gr. in air	Wt./gal. in air (lbs)	Sp. gr. in air
1	104.0	6.788	0.8151	6.756	0.8112	6.611	0.7938
2–B	100.5	6.795	.8159	6.762	.8119	6.612	.7939
3–A	105.0	6.787	.8149	6.755	.8111	6.611	.7938
3–C	105.0	6.784	.8146	6.752	.8107	6.608	.7935
4	100.8	6.823	.8193	6.791	.8154	6.640	.7973
13–A	109.7	6.740	.8093	6.710	.8057	6.572	.7891
18	195.4	7.802	.9368	7.785	.9348	7.708	.9255
19	197.9	6.468	.7766	6.452	.7747	6.375	.7655
23–A	107.9	6.788	.8151	6.758	.8115	6.619	.7948
23–H	109.45	6.785	.8147	6.755	.8111	6.617	.7945
25	100.9	7.080	.8501	7.047	.8462	6.897	.8282
25 ²	100.9	7.083	.8505	7.050	.8465	6.900	.8285
25–A	102.5	7.119	.8548	7.087	.8510	6.939	.8332
25–A ²	102.5	7.117	.8546	7.085	.8507	6.938	.8331
28–A	101.0	6.786	.8148	6.753	.8109	6.603	.7929
29	100.76	6.808	.8175	6.775	.8135	6.624	.7954
30	110.0	6.785	.8147	6.755	.8111	6.617	.7945
31–A	111.5	7.167	.8606	7.138	.8571	7.002	.8408
32	104.8	6.769	.8128	6.737	.8089	6.593	.7916
35–A ³	105.0	6.817	.8185	6.785	.8147	6.641	.7974
35–A ⁴	104.25	6.826	.8196	6.794	.8158	6.649	.7984
36	102.7	6.837	.8209	6.804	.8170	6.657	.7993
37	100.9	6.794	.8158	6.762	.8119	6.612	.7939
38–B	101.3	6.804	.8170	6.772	.8131	6.622	.7951
38–D	102.7	6.863	.8241	6.830	.8201	6.682	.8023
38–F	100.9	6.828	.8199	6.796	.8160	6.646	.7980

WEIGHTS AND SPECIFIC GRAVITIES OF SPECIALLY DENATURED ALCOHOL ¹—Continued

[Slight deviations from this table may occur due to variations in specific gravities of authorized denaturants. Values for 190 proof determined experimentally in air. Other values calculated from these gravities.]

S.D.A. Formula No.	Finished formula (gals)	190 proof		192 proof		200 proof	
		Wt./gal. in air (lbs)	Sp. gr. in air	Wt./gal. in air (lbs)	Sp. gr. in air	Wt./gal. in air (lbs)	Sp. gr. in air
39-B	102.7	6.857	.8233	6.825	.8195	6.677	.8017
39-C	101.0	6.819	.8188	6.792	.8155	6.642	.7975
39-D	101.3	6.819	.8188	6.787	.8149	6.637	.7969
40	100.1	6.795	.8159	6.762	.8119	6.611	.7938
40-A	100.2	6.798	.8163	6.765	.8123	6.613	.7941
40-B	100.1	6.794	.8158	6.761	.8118	6.610	.7937
40-C	103.0	6.788	.8151	6.756	.8112	6.609	.7936
44	110.0	6.790	.8153	6.760	.8117	6.622	.7951
45	129.8	7.545	.9060	7.520	.9030	7.403	.8889

¹ Where alternate denaturants are permitted, the above weights are based on the first denaturant or combination listed in the formula.

² With sodium iodide.

³ Calculated on the basis of 85 percent ethyl acetate.

⁴ Calculated on the basis of 100 percent ethyl acetate.

[T.D. ATF-133, 48 FR 24673, June 2, 1983, as amended by T.D. TTB-140, 81 FR 59463, Aug. 30, 2016]

PART 22—DISTRIBUTION AND USE OF TAX-FREE ALCOHOL

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