

Chapter NR 294

SOAP AND DETERGENT MANUFACTURING

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NR 294.01 Purpose. The purpose of this chapter is to establish effluent limitations, standards of performance, and pretreatment standards for discharges of process wastes from the soap and detergent manufacturing category of point sources and subcategories thereof.

Note: The authority for promulgation of this chapter is set forth in ch. NR 205.

History: Cr. Register, June, 1976, No. 246, eff. 7-1-76.

NR 294.02 Applicability. The effluent limitations, standards of performance, pretreatment standards, and other provisions in this chapter are applicable to pollutants or pollutant properties in discharges of process waste resulting from the manufacture of soap and detergent products, intermediate products, and associated processing operations in the following subcategories:

c1d Soap manufacture by the batch kettle process in which neat soap is produced through saponification of animal and vegetable fats and oils by boiling;

c2d Fatty acid manufacture by hydrolysis and subsequent processing to produce a suitable feed material for manufacture of soap by fatty acid neutralization,

cad Where subsequent processing does not include hydrogenation, and

cbd Where subsequent processing includes hydrogenation;

c3d Soap manufacture by neutralizing refined fatty acids with an alkaline material in approximately stoichiometric amounts;

c4d Glycerine concentration of sweet water from saponification or fat splitting to approximately 60 to 80% crude glycerine content;

c5d Glycerine distillation from crude glycerine to produce finished glycerine of various grades ce.g. UPSd;

c6d Manufacture of soap flakes and powders including all operations commencing with drying of the soap to and including packaging of the finished flakes and powders;

c7d Manufacture of bar soaps including all drying, milling, plodding, stamping, and packaging operations associated with conversion of neat soap to finished bar soaps;

c8d Manufacture of liquid soaps including the blending of ingredients and the packaging of the finished products;

c9d Manufacture of sulfonic acid and sulfuric acid esters by means of sulfonation and sulfation of raw materials, including but not limited to petroleum derived alkyls, employing oleum;

c10d Manufacture of sulfonic acid and sulfuric acid esters by means of sulfonation and sulfation employing air and sulfur trioxide;

c11d Sulfonation of organic reactants by the process in which the organic reactant and sulfur trioxide are fed through a mixing nozzle into a vacuum reactor;

c12d Sulfation processes in which sulfamic acid is employed as the sulfating agent;

c13d Sulfation of alcohols, alkylphenols, and alcohol ethoxylates utilizing chlorosulfonic acid as the sulfating agent;

c14d Neutralization of sulfated and sulfonated alkylbenzenes, alcohols, and other materials to convert them to neutral salts;

c15d Manufacture of spray dried detergents, including but not limited to, assembly and storage of raw materials, crutching, spray drying, blending including tumble spraying of additives, and packaging where there is, with or without fast turnaround operation, as defined in s. NR 294.03,

cad Normal operation of a spray drying tower, or

cbd Air quality restricted operation of a spray drying tower;

c16d Manufacture of liquid detergents commencing with the blending of ingredients to and including bottling or packaging finished products involving, as defined in s. NR 294.03, either normal liquid detergent operations, or fast turnaround operations;

c17d Manufacture of detergents by dry blending ingredients, including, but not limited to, blending and subsequent packaging;

c18d Manufacture of drum dried detergents including, but not limited to, drying of formulations on heated drums or rollers, conversion of dried detergents to powders or flakes, and the packaging of finished products; and

c19d Manufacture of detergent bars and cakes including, but not limited to, drying, milling, plodding, stamping, and packaging.

History: Cr. Register, June, 1976, No. 246, eff. 7-1-76.

NR 294.03 Definitions. The following special definitions are applicable to terms used in this chapter. Definitions of other terms and meanings of abbreviations are set forth in ch. NR 205.

c1d XAnhydrous productY means the theoretical product that would result if all water were removed from the actual product.

c2d XNeat soapY means the solution of completely saponified and purified soap containing 20-30% water which is ready for final formulation into a finished product.

c3d XSurfactantY means those methylene blue active substances amenable to measurement by the method described on page 131 of XMethods for Chemical Analysis of Water and WastesY, published 1971 by the Analytical Quality Control Laboratory of the Environmental Protection Agency. Copies of this document are available for inspection at the office of the department of natural resources, the secretary of state's office, and the office of the legislative reference bureau, and may be obtained for personal use from the Water Quality Office, U.S. EPA, 1014 Broadway, Cincinnati, Ohio, 45268.

c4d XSweet waterY means the solution of 8-10% crude glycerine and 90-92% water that is a by-product of saponification or fat splitting.

c5d XNormal operationY of a spray drying tower means operation utilizing formulations that present limited air quality problems from stack gases and associated need for extensive wet scrubbing, and without more than 6 turnarounds in a 30 day consecutive period, thus permitting complete recycle of waste water.

c6d XAir quality restricted operationY of a spray drying tower means an operation utilizing formulations ce.g. those with high non-ionic contentd which require a very high rate of wet scrubbing to maintain desirable quality of stack gases, and thus generate much greater quantities of waste water than can be recycled to process.

c7d XFast turnaround operationY of a spray drying tower means operation involving more than 6 changes of formulation in a 30 consecutive day period that are of such degree and type ce.g. high phosphate to no phosphated as to require cleaning of the tower to maintain minimal product quality.

c8d XNormal liquid detergent operationsY means all such operations except those defined as fast turnaround operation of automated fill lines.

c9d XFast turnaround operation of automated fill linesY means an operation involving more than 8 changes of formulation in a 30 consecutive day period that are of such degree and type as to require thorough purging and washing of the fill line to maintain minimal product quality.

c10d XBOD₇Y means the biochemical oxygen demand as determined by incubation at 20Z C for a period of 7 days using an acclimated seed. Agitation employing a magnetic stirrer set at 200 to 500 rpm may be used.

History: Cr. Register, June, 1976, No. 246, eff. 7-1-76; correction made in c3d under s. 13.92 c4d cbd 6., Stats., Register April 2013 No. 688.

NR 294.04 Compliance with effluent limitations and standards. Discharge of pollutants from facilities subject to the provisions of this chapter may not exceed, as appropriate:

c1d By July 1, 1977 effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available;

c2d By July 1, 1983 effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable;

c3d Pretreatment standards for discharges to publicly owned treatment works;

c4d Standards of performance for new sources.

History: Cr. Register, June, 1976, No. 246, eff. 7-1-76; r. and recr. Register, August, 1983, No. 332, eff. 9-1-83.

NR 294.06 Application of effluent limitations and standards. **c1d** The effluent limitations and standards set forth in this chapter shall be used in accordance with this section to establish the quantity or quality of pollutants or pollutant properties which may be discharged by a point source subject to the provisions of this chapter, except as;

cad They may be modified in accordance with subch. IV of ch. NR 220,

cbd They may be superseded by more stringent limitations and standards necessary to achieve water quality standards or meet other legal requirements, or

ccd They may be supplemented or superseded by standards or prohibitions for toxic pollutants or by additional limitations for other pollutants required to achieve water quality.

c2d The production basis for application of the limitations

and standards set forth in this chapter shall be the daily average for a maximum month for the facility in each subcategory subject to the provisions of this chapter.

c3d The process waste discharge limitations for a facility subject to the provisions of this chapter shall be the sum of effluent limitations determined for the production of the facility in each of the applicable process or product subcategories.

c4d For operations in subcategories c15d and c16d which are not fast turnaround operations the effluent limitations are as set forth in the tables of s. NR 294.10, 294.11 or 294.12 as appropriate. For such operations which are fast turnaround operations, those limitations shall be increased using the appropriate factor of said tables,

cad By addition to determine the daily maximum for either subcategory,

cbd By addition of the factor divided by 30 and multiplied by the number of turnarounds in excess of 6 in a 30 day period to determine the daily average limitation for subcategory c15d and

ccd By addition of the factor divided by 30 and multiplied by the number of turnarounds in excess of 8 in a 30 day period to determine the daily average limitation for subcategory c16d.

History: Cr. Register, June, 1976, No. 246, eff. 7-1-76; correction in c1d cad made under s. 13.92 c4d cbd 7, Stats., Register April 2018 No. 748.

NR 294.10 Effluent limitations, best practicable treatment. The following effluent limitations for all or specific subcategories when applied in accordance with s. NR 294.06 c3d and c4d establish, except as provided in subch. IV of ch. NR 220, the quantity or quality of pollutants or pollutant properties which may be discharged by a facility subject to the provisions of this chapter after application to process wastes of the best practicable control technology currently available.

c1d The pH of all discharges shall be within the range of 6.0 to 9.0.

c2d The 30-day average limitations for BOD₅, suspended solids, COD, surfactants, and oil and grease are set forth in Table I in lbs{ 1000 lbs or kg{ 1000 kg of anhydrous product.

c3d The daily maximum limitations are 3 times the daily average limitation except for subcategory c9d for which they are as set forth in parenthesis below the 30 day average limitations in table 1.

History: Cr. Register, June, 1976, No. 246, eff. 7-1-76; correction in cintro.d made under s. 13.92 c4d cbd 7, Stats., Register April 2018 No. 748.

NR 294.11 Effluent limitations, best available treatment. The following effluent limitations for all or specific subcategories when applied in accordance with s. NR 294.06 c3d and c4d establish the quantity or quality of pollutants or pollutant properties which may be discharged by a facility subject to the provisions of this chapter after application to process wastes of the best available technology economically achievable.

c1d The pH of all discharges shall be within the range of 6.0 to 9.0.

c2d The 30-day average limitations for BOD₅, suspended solids, COD, surfactant, and oil and grease are set forth in Table 2 in lbs{ 1000 lbs or kg{ 1000 kg of anhydrous products.

c3d Daily maximum limitations are 2 times the 30 day average limitations except for subcategory c9d for which they are 3 times the 30 day average.

History: Cr. Register, June, 1976, No. 246, eff. 7-1-76.

NR 294.12 Standards of performance. The following effluent limitations for all or specific subcategories when applied in accordance with s. NR 294.06 c3d and c4d establish the quantity or quality of pollutants or pollutant properties which may be

discharged by a facility which is a new source subject to the provisions of this chapter.

c1d The pH of all discharges shall be within the range of 6.0 to 9.0.

c2d The 30-day average limitations for BOD₅, suspended solids, COD, surfactant, and oil and grease are set forth in Table 3 in lbs{ 1000 lbs or kg{ 1000 kg of anhydrous product.

c3d The daily maximum limitations are 2 times the 30-day

average values except for subcategory c9d for which they are 3 times the 30-day average.

History: Cr. [Register, June, 1976, No. 246](#), eff. 7-1-76.

NR 294.13 Pretreatment standards. The pretreatment standards for discharges to publicly owned treatment works from sources subject to the provisions of this chapter shall be as set forth in ch. [NR 211](#).

History: Cr. [Register, June, 1976, No. 246](#), eff. 7-1-76; r. and recr. [Register, August, 1983, No. 332](#), eff. 9-1-83.