

COMMISSION OF THE EUROPEAN COMMUNITIES

COM (77) 344 Final

Brussels, 20 July 1977

Proposal for a Council Directive laying down specific criteria of purity for emulsifiers, stabilizers, thickeners and gelling agents for use in foodstuffs.

(presented by the Commission to the Council)

Explanatory note

The Council Directive (74/329/EEC) of 18 June 1974 on the approximation of the laws of the Member States relating to emulsifiers, stabilizers, thickeners and gelling agents for use in foodstuffs (1) as amended (2) lays down a single list of such substances which may be authorized by the Member States for the treatment of foodstuffs.

The Directive lays down the general purity criteria which the substances must satisfy and requires that the Commission should propose specific criteria for each substance (Article 7). The present proposal implements the provisions of the Directive in this respect.

During the elaboration of these purity criteria it has become evident that some substances, nominally permitted by the basic Directive are not commercially available. It has also become apparent that there are certain uncertainties in the text of the Directive. These are the subject of a proposed modification to the text of Directive 74/329/EEC which has been submitted to the Council.

(1) O.J. N° L 189, 12/7/1974, p. 1

(2) Written procedure 1081/77

Proposal for a Council Directive laying down specific criteria of purity for emulsifiers, stabilizers, thickeners and gelling agents for use in foodstuffs.

THE COUNCIL OF THE EUROPEAN COMMUNITIES,

Having regard to the Treaty establishing the European Economic Community,

Having regard to Council Directive 74/329/EEC of 18 June 1974 on the approximation of the laws of the Member States relating to emulsifiers, stabilizers, thickeners and gelling agents for use in foodstuffs (1) as amended by Directive 77/ /EEC (2), and in particular Article 7.1 thereof ;

Having regard to the proposal from the Commission ;

Whereas under Article 6 of the Directive 74/329/EEC the emulsifiers, stabilizers, thickeners and gelling agents must satisfy specific criteria of purity established in accordance with Article 7.1 of that Directive,

HAS ADOPTED THIS DIRECTIVE :

Article 1

The specific criteria of purity referred to in Article 6.1 (b) of the Directive 74/329/EEC are given in the Annex to this Directive.

Article 2

Within eighteen months of receipt of notification of this Directive, Member States shall put into effect the regulations and administrative measures necessary to comply with the provisions of this Directive and shall inform the Commission thereof without delay.

Article 3

This Directive is addressed to the Member States.

Done at Brussels,

For the Council,

The President

(1) OJ N° 189, 12/7/1974 p. 1
(2) Written procedure 1081/T

ANNEX

Specific criteria of purity for emulsifiers, stabilizers, thickeners and gelling agents for use in foodstuffs.

General observations

Where interpretation of the criteria set out below requires the definition of certain technical details, reference should be made to the methods of analysis established pursuant to Article 7.2 of Directive 74/329/EEC.

E 400 Alginic acid

- CHEMICAL DESCRIPTION : Linear glycuronoglycan consisting mainly of beta (1 → 4) linked D-mannuronic and alpha (1 → 4) linked L-guluronic acid units in pyranose ring form. Hydrophilic colloidal carbohydrate extracted by the use of dilute alkali from various species of brown seaweeds.
- DESCRIPTION : Nearly odourless, tasteless white to yellowish fibrous powder.
- CONTENT : Yields, on a volatile matter-free basis, not less than 20% and not more than 23% of carbon dioxide corresponding to not less than 91.0% and not more than 104.5% of alginic acid (equivalent weight 200).
- ASH : Not more than 4% on a volatile matter-free basis determined at 600° C after drying at 105° C for 4 hours.
- INSOLUBLE MATTER : Not more than 0.5%.
(using dilute NaOH)
- VOLATILE MATTER : Not more than 15% determined by drying at 105° C for 4 hours.
- ACID INSOLUBLE ASH : Not more than 0.5%.
(insoluble in approx.
3 N hydrochloric acid)

E 401 Sodium alginate

<u>CHEMICAL NAME :</u>	Sodium salt of alginic acid.
<u>DESCRIPTION :</u>	Nearly odourless, tasteless white to yellowish fibrous or granular powder.
<u>CONTENT :</u>	Yields, on a volatile matter-free basis, not less than 18% and not more than 21% of carbon dioxide corresponding to not less than 90.8% and not more than 106.0% of sodium alginate (equivalent weight 222).
<u>ASH :</u>	Not less than 18.0% and not more than 27.0% on a volatile matter-free basis determined at 600° C after drying at 105° C for 4 hours.
<u>INSOLUBLE MATTER :</u> <u>(in dilute NaOH)</u>	Not more than 0.5%
<u>VOLATILE MATTER :</u>	Not more than 15% determined by drying at 105° C for 4 hours.
<u>ACID-INSOLUBLE ASH :</u> <u>(insoluble in approx.</u> <u>3 N hydrochloric acid)</u>	Not more than 0.5%.

E 402 Potassium alginate

CHEMICAL NAME :

Potassium salt of alginic acid.

DESCRIPTION :

Nearly odourless, tasteless white to yellowish fibrous or granular powder.

CONTENT :

Yields, on a volatile matter-free basis, not less than 16.5% and not more than 19.5% of carbon dioxide corresponding to not less than 89.2% and not more than 105.5% of potassium alginate (equivalent weight 238).

ASH :

Not less than 23% and not more than 32% on a volatile matter-free basis determined at 600° C after drying at 105° C for 4 hours.

INSOLUBLE MATTER :

Not more than 0.5%.

(in dilute NaOH)

VOLATILE MATTER :

Not more than 15% determined by drying at 105° C for 4 hours.

ACID-INSOLUBLE-ASH :

Not more than 0.5%.

(insoluble in approx.

3 N hydrochloric acid)

E 403 Ammonium alginate

CHEMICAL NAME : Ammonium salt of alginic acid.

DESCRIPTION : White to yellowish fibrous or granular powder.

CONTENT : Yields, on a volatile matter-free basis, not less than 18% and not more than 21% of carbon dioxide corresponding to not less than 88.7% and not more than 103.6% of ammonium alginate (equivalent weight 217).

ASH : Not more than 4% on a volatile matter-free basis determined at 600° C after drying at 105° C for 4 hours.

INSOLUBLE MATTER : Not more than 0.5%.
(in dilute NaOH)

VOLATILE MATTER : Not more than 15% determined by drying at 105° C for 4 hours.

ACID INSOLUBLE ASH : Not more than 0.5%.
(insoluble in approx.
3 N hydrochloric acid

E 404 Calcium alginate

CHEMICAL NAME :

Calcium salt of alginic acid.

DESCRIPTION :

Nearly odorless, tasteless white to yellowish fibrous or granular powder.

CONTENT :

Yields, on a volatile matter-free basis, not less than 18% and not more than 21% of carbon dioxide corresponding to not less than 89.6% and not more than 104.5% of calcium alginate (equivalent weight 219).

ASH :

Not less than 15% and not more than 24% on a volatile matter-free basis determined at 600° C after drying at 105° C for 4 hours.

INSOLUBLE MATTER :

Not more than 0.5%.

(in dilute NaOH using sodium polyphosphate, E 450 c)

VOLATILE MATTER :

Not more than 15% determined by drying at 105° C for 4 hours.

ACID-INSOLUBLE ASH :

Not more than 0.5%.

(insoluble in approx. 3 N hydrochloric acid)

E 405 Propane-1,2-diol alginate

<u>CHEMICAL DESCRIPTION</u> :	Propane-1,2-diol ester of alginic acid; varies in composition according to its degree of esterification and the percentages of free and neutralized carboxyl groups in the molecule.
<u>DESCRIPTION</u> :	Nearly odourless and tasteless, white to yellowish fibrous or granular powder.
<u>CONTENT</u> :	Yields, on a volatile matter-free basis, not less than 16% and not more than 20% of carbon dioxide.
<u>ASH</u> :	Not more than 10% on a volatile matter-free basis determined at 600° C after drying at 105° C for 4 hours.
<u>PROPANE-1,2-DIOL CONTENT</u> :	Not less than 15% and not more than 20%.
<u>INSOLUBLE MATTER</u> : (in dilute NaOH)	Not more than 0.5%.
<u>VOLATILE MATTER</u> :	Not more than 20% determined by drying at 105° C for 4 hours.
<u>ACID INSOLUBLE ASH</u> : (insoluble in approx. 3 N hydrochloric acid)	Not more than 0.5%.

E 406 Agar

CHEMICAL DESCRIPTION :

A hydrophilic colloidal polygalactoside, about 90% of the galactose molecules being of the D-form and 10% of the L-form. On about every tenth D-galactopyranose unit one of the hydroxyl groups is esterified with sulphuric acid which is neutralized by calcium, magnesium, potassium or sodium. It is extracted from certain marine algae of the families Gelidiaceae and Sphaerococcaceae and related red algae of the class Rhodophyceae.

DESCRIPTION :

It occurs as white to pale yellow powder, fibres or flakes and is either odourless, or has a slight characteristic odour and a mucilaginous taste.

ASH :

Not more than 6.5% determined at 550° C on a volatile matter-free basis.

ACID-INSOLUBLE ASH :

(insoluble in approx.

3 N hydrochloric acid)

Not more than 0.5% determined at 550° C on a volatile matter-free basis.

GELATIN AND OTHER

PROTEINS :

Dissolve about 1 g agar in 100 ml of boiling water and allow to cool to about 50° C.

To 5 ml of the solution add 5 ml of trinitrophenol solution (1 g of anhydrous trinitrophenol/100 ml hot water). No turbidity appears within 10 minutes.

INSOLUBLE MATTER :

(in hot water)

Not more than 1%.

VOLATILE MATTER :

Not more than 20% determined by drying at 105° C for 5 hours.

STARCH AND DEXTRINS :

Boil 100 mg agar in 100 ml of water.

Cool and add a few drops of iodine solution (14 g I₂ in a solution of 36 g KI in 100 ml H₂O, add 3 drops HCl and dilute to 1000 ml).

No blue or red colour is produced.

WATER ABSORPTION :

Place 5 g agar in a 100 ml graduated cylinder, fill to the mark with water, mix and allow to stand at about 25° C for 24 hours. Pour the contents of the cylinder through moistened glass wool, allowing the water to drain into a second 100 ml graduated cylinder. Not more than 75 ml water is obtained.

E 407 Carrageenan

CHEMICAL DESCRIPTION : Carrageenan is obtained by aqueous extraction of seaweeds of GIGARTINACEAE, SOLIERIACEAE, HYPNEACEAE and FURCELLARIACEAE families of the class RHODOPHYCEAE (red seaweeds). No organic precipitants shall be used other than methanol, ethanol and isopropanol. Carrageenan consists chiefly of the potassium, sodium, magnesium and calcium salts of polysaccharide sulphate esters which, on hydrolysis, yield galactose and 3,6-anhydrogalactose. Carrageenan shall not be hydrolysed or otherwise chemically degraded.

DESCRIPTION : Yellowish to colourless, coarse to fine powder which is practically odourless and has a mucilaginous taste.

VOLATILE MATTER : Not more than 12% determined by drying at 105° C for 4 hours.

SULPHATE : Not less than 15% and not more than 40% on a volatile matter-free basis.
(expressed as SO₄)

ACID-INSOLUBLE ASH : Not more than 2% on a volatile matter-free basis.
(insoluble in approx. 1% v/v sulphuric acid)

ASH : Not less than 15% and not more than 40% determined at 550° C on a volatile matter-free basis.

VISCOSITY of a 1.5 % solution at 75° C : Not less than 5 centipoises

METHANOL , ETHANOL ,

ISOPROPANOL CONTENT : Not more than 1% singly or in combination.

E 408 Furcellaran

Note : Deleted in proposal for 1st Modification to the basic Directive 74/329/EEC.

E 410 Locust bean gum

CHEMICAL DESCRIPTION : Consists mainly of a high molecular weight hydrocolloidal polysaccharide, composed of galactopyranose and mannopyranose units combined through glycosidic linkages, which may be described chemically as galactomannan.

DESCRIPTION : Locust bean gum is the ground endosperm of the seeds of the carob tree, Ceratonia siliqua (L) Taub. (Fam. Leguminosae). It is a white to yellowish white nearly odourless powder.

GALACTOMANNAN

CONTENT : Not less than 75 %.

INSOLUBLE MATTER : Not more than 4 % after digestion for 6 hours.
(In 0.4 N sulphuric acid)

ASH : Not more than 1.2 % determined at 800° C.

VOLATILE MATTER : Not more than 14 % determined by drying to constant weight at 102° - 105° C (3 - 5 hours).

PROTEIN (N X 6.25) : Not more than 7 %.

E 411 Tamarind seed flour

Note : Deleted in proposed 1st modification to the basic Directive 74/329/EEC.

E 412 Guar gum

<u>CHEMICAL DESCRIPTION :</u>	Consists mainly of a high molecular weight hydrocolloidal polysaccharide, composed of galactopyranose and mannopyranose units combined through glycosidic linkages, which may be described chemically as galactomannan.
<u>DESCRIPTION :</u>	Guar gum is the ground endosperm of the seeds of the guar plant, <u>Cyamopsis tetragonolobus</u> (L) Taub. (Fam. <u>Leguminosae</u>). It is a white to yellowish-white nearly odourless powder.
<u>GALACTOMANNAN</u>	
<u>CONTENT :</u>	Not less than 75 % .
<u>INSOLUBLE MATTER :</u> <u>(In 0.4 N sulphuric acid)</u>	Not more than 4 % after digestion for 6 hours.
<u>ASH :</u>	Not more than 1.5 % determined at 800° C.
<u>VOLATILE MATTER :</u>	Not more than 14 % determined by drying to constant weight at 102° - 105° C (3 - 5 hours).
<u>PROTEIN (N X 6.25) :</u>	Not more than 7 % .

E 413 Tragacanth

CHEMICAL DESCRIPTION : Consists mainly of high molecular weight polysaccharides composed of galacto-arabans and acidic polysaccharides containing galacturonic acid groups.

DESCRIPTION : Tragacanth is a dried gummy exudate obtained from Astragalus gummifer Labillardiere, or other Asiatic species of Astragalus (Fam. Leguminosae). Unground Tragacanth occurs as flattened, lamellated, frequently curved fragments or straight or spirally twisted linear pieces from 0.5 to 2.5 mm in thickness. It is white to pale yellow in colour. It is odourless and has an insipid, mucilaginous taste. Powdered Tragacanth is white to yellowish white in colour.

VISCOSITY OF A 1%

SOLUTION AT 25° C : Not less than 250 centipoises.

ASH : Not more than 3.5% determined at 550° C.

ACID-INSOLUBLE ASH : Not more than 0.5% determined at 550° C.

(insoluble in approx.
3 N hydrochloric acid)

KARAYA GUM : Boil 1 g with 20 ml of water until a mucilage is formed. Add 5 ml of hydrochloric acid and again boil the mixture for 5 minutes. No permanent pink or red colour develops.

E 414 Acacia

CHEMICAL DESCRIPTION : Consists mainly of high molecular weight polysaccharides and their calcium, potassium and magnesium salts, which on hydrolysis yield arabinose, galactose, rhamnose and glucuronic acid. It is obtained as a dried gummy exudate from the stems and branches of Acacia senegal (L) Willd. or of related species of Acacia (Fam. Leguminosae).

DESCRIPTION : Unground acacia occurs as white, yellowish white or pale pinkish spheroidal tears of varying sizes or in angular fragments. It is also available commercially in the form of white or yellowish white flakes, granules or powder.

ASH : Not more than 4% determined at 550° C.

ACID INSOLUBLE ASH : Not more than 0.5% determined at 550° C.
(insoluble in approx.
3 N hydrochloric acid)

INSOLUBLE MATTER : Not more than 1%.
(in approx. 3 N
hydrochloric acid)

VOLATILE MATTER : Not more than 15% determined by drying at 105° C for 5 hours.

STARCH OR DEXTRIN : Boil a 1 in 50 solution of the gum and cool. To 5 ml add one drop of iodine solution (14 g iodine in a solution of 36 g potassium iodide in 100 ml water, add 3 drops hydrochloric acid and dilute to 1000 ml). No bluish or reddish colour is produced.

TANNIN : To 10 ml of a 1 in 50 solution add about 0.1 ml of ferric chloride solution (9 g $\text{FeCl}_3 \cdot 6\text{H}_2\text{O}$ made up to 100 ml with water). No blackish colouration or blackish precipitate is formed.

E 420 Sorbitol

<u>CHEMICAL NAME</u> :	D-sorbitol.
<u>DESCRIPTION</u> :	White hygroscopic crystalline powder, flakes or granules, having a sweet taste.
<u>CONTENT</u> :	Sorbitol contains not less than 98% of glycitols and not less than 91% of D-sorbitol, on a dry-matter basis in each case. Glycitols are compounds with the structural formula $\text{CH}_2\text{OH}(\text{CHOH})_n\text{CH}_2\text{OH}$ where 'n' is an integer. That part of the product which is not D-sorbitol is composed mainly of mannitol, together with small quantities of other glycitols, where $n \leq 4$, and minor quantities of hydrogenated oligosaccharides.
<u>WATER</u> :	Not more than 1% (Karl Fischer).
<u>REDUCING SUGARS</u> :	Not more than 0.3% on a dryweight basis, expressed as dextrosed.
<u>TOTAL SUGARS</u> :	Not more than 0.7% on a dryweight basis, expressed as dextrose.
<u>SULPHATED ASH</u> :	Not more than 0.1% at $800 \pm 25^\circ \text{C}$ on a dryweight basis.

SULPHATE : Not more than 0.01% on a dryweight basis.
(expressed as SO_4)

CHLORIDE : Not more than 0.005% on a dryweight basis.
(expressed as Cl)

NICKEL : Not more than 2 mg/kg.
(expressed as Ni)

SORBITOL SYRUP

DESCRIPTION : Sweet-tasting, clear, colourless liquid.

CONTENT : Sorbitol solution is an aqueous solution containing not less than 69% W/W total solids and not less than 50% W/W of D-sorbitol. That part of the product which is not D-sorbitol is composed mainly of hydrogenated oligosaccharides formed by the hydrogenation of any glucose syrup used as raw material; mannitol together with minor quantities of other glycitols where $n \leq 4$.

SULPHATED ASH : Not more than 0.1% on a dryweight basis.

SULPHATE : Not more than 0.01% on a dryweight basis.
(expressed as SO_4)

CHLORIDE : Not more than 0.005% on a dryweight basis.
(expressed as Cl)

NICKEL : Not more than 2 mg/kg.
(expressed as Ni)

E 411 Mannitol

<u>CHEMICAL NAME</u> :	D-mannitol
<u>DESCRIPTION</u> :	White crystalline solid which is odourless and has a sweet taste.
<u>CONTENT</u> :	Not less than 98% of D-mannitol ($C_6H_{14}O_6$) on a volatile matter-free basis after drying at 105° C for 4 hours.
<u>MELTING RANGE</u> :	165° C - 169° C.
<u>SPECIFIC ROTATION</u> :	Not less than +23.0° and not more than +24.3°.
$[\alpha]_D^{25}$	
<u>VOLATILE MATTER</u> :	Not more than 0.3% determined by drying at 105° C for 4 hours.
<u>REDUCING SUGARS</u> :	Not more than 0.05% (as dextrose).
<u>SULPHATE</u> :	Not more than 0.01%.
<u>(expressed as SO₄)</u>	
<u>CHLORIDE</u> :	Not more than 0.007%.
<u>(expressed as Cl)</u>	
<u>ASH</u> :	Not more than 0.1% determined at 800° C ± 25° C.
<u>NICKEL</u> :	Not more than 2 mg/kg.
<u>(expressed as Ni)</u>	

E 422 Glycerol

- DESCRIPTION : Clear, colourless hygroscopic syrupy liquid with a sweet taste accompanied by a sensation of heat to the tongue.
- CONTENT : Not less than 98% of glycerol ($C_3H_8O_3$) on a w/w basis.
- SPECIFIC GRAVITY : Not less than 1.257.
(25/25° C)
- REFRACTIVE INDEX : 1.471 - 1.474
 \bar{n}_D^{20}
- ACROLEIN, GLUCOSE AND AMMONIUM COMPOUNDS : Heat a mixture of 5 ml glycerol and 5 ml of potassium hydroxide solution (1 in 10) at 60° C for 5 minutes. It neither becomes yellow nor emits an odour of ammonia.
- BUTANETRIOLS : Not more than 0.2%.
- CHLORINATED COMPOUNDS : Not more than 0.003%.
(expressed as Cl)
- FATTY ACIDS AND ESTERS : Not more than 0.1% calculated as butyric acid.
- SULPHATED ASH : Not more than 0.01% determined at 800° ± 25° C.

E 440 (a) Pectin

<u>CHEMICAL DESCRIPTION :</u>	Pectins consist mainly of the partial methyl esters of polygalacturonic acid and their sodium, potassium, calcium or ammonium salts produced at a pH not greater than 5. Pectins are obtained by aqueous extraction of appropriate edible plant material, usually citrus fruits or apples. No organic precipitants shall be used other than methanol, ethanol and isopropanol.
<u>DESCRIPTION :</u>	White, light yellow, light grey or light brown powder.
<u>GALACTURONIC ACID :</u>	Not less than 65% calculated on an ash and volatile matter-free basis.
<u>VOLATILE MATTER :</u>	Not more than 12% after drying at 105° C for 2 hours.
<u>ACID-INSOLUBLE ASH :</u> <u>(insoluble in approx.</u> <u>3 N hydrochloric acid)</u>	Not more than 1%.
<u>FREE METHANOL, ETHANOL</u> <u>AND ISOPROPANOL</u>	
<u>CONTENT :</u>	Not more than 1% singly or in combination on a volatile matter-free basis.
<u>SULPHUR DIOXIDE</u>	
<u>RESIDUE :</u>	Not more than 50 mg/kg on a volatile matter-free basis.
<u>COPPER :</u> <u>(expressed as Cu)</u>	Not more than 60 mg/kg on a volatile matter-free basis.

E 440 (b) Amidated Pectin.

CHEMICAL DESCRIPTION : Amidated pectins consist mainly of the partial methyl esters and amides of polygalacturonic acid and their ammonium, sodium, potassium and calcium salts. They are obtained by aqueous extraction of appropriate edible plant material, usually citrus fruits or apples, and treatment with ammonia under alkaline conditions. No organic precipitants shall be used other than ethanol and isopropanol.

DESCRIPTION : White, light yellow, light grey or light brown powder.

DEGREE OF AMIDATION : Not more than 25% of total carboxyl groups.

GALACTURONIC ACID : Not less than 65% calculated on an ash and volatile matter-free basis.

VOLATILE MATTER : Not more than 12% after drying at 105° C for 2 hours.

ACID-INSOLUBLE ASH : Not more than 1%.

(insoluble in approx.
3 N hydrochloric acid)

FREE METHANOL, ETHANOL
AND ISOPROPANOL

CONTENT : Not more than 1% singly or in combination on a volatile matter-free basis.

SULPHUR DIOXIDE

RESIDUE : Not more than 50 mg/kg on a volatile matter-free basis.

COPPER : Not more than 60 mg/kg on a volatile matter-free basis.
(expressed as Cu)

E 450 (a) (i) disodium dihydrogen diphosphate (Na₂H₂P₂O₇)

<u>DESCRIPTION</u> :	White powder or grains.
<u>CONTENT</u> :	Not less than 95.0% of Na ₂ H ₂ P ₂ O ₇ .
<u>CONTENT IN P₂O₅</u> :	Not less than 63.0% and not more than 64.0%.
<u>VOLATILE MATTER</u> :	Not more than 0.5% determined by drying at 105° C for 4 hours.
<u>pH OF 1% SOLUTION</u> :	Not less than 3.7 and not more than 4.4.
<u>WATER INSOLUBLE MATTER</u> :	Not more than 0.6%.
<u>NEUTRALIZING VALUE</u> :	Not less than 72.
<u>FLUORIDE</u> :	Not more than 10 mg/kg.
<u>(expressed as F)</u>	

E 450 (a) (ii) trisodium diphosphate ($\text{Na}_3\text{HP}_2\text{O}_7$)

- DESCRIPTION : White powder or grains.
Occurs anhydrous or as a monohydrate.
- CONTENT : Not less than 95.0% of $\text{Na}_3\text{HP}_2\text{O}_7$ after ignition at 550°C for 30 minutes.
- CONTENT IN P_2O_5 : Not less than 57.5% and not more than 58.5% for the anhydrous salt.
Not less than 53.6% and not more than 54.6% for the monohydrate.
- pH OF A 1% SOLUTION : Not less than 6.7 and not more than 7.3.
- VOLATILE MATTER : Not more than 0.5% determined by drying at 105°C for 4 hours.
- WATER INSOLUBLE MATTER : Not more than 0.2%.
- FLUORIDE : Not more than 10 mg/kg.
(expressed as F)

450 a (iii) tetraSodium diphosphate (Na₄P₂O₇)

- DESCRIPTION : White, crystalline or granular powder.
Occurs anhydrous or as a decahydrate.
- CONTENT : Not less than 95.0% of Na₄P₂O₇ after ignition at 550° C for 30 minutes.
- CONTENT IN P₂O₅ : Not less than 52.5% and not more than 54.0% for the anhydrous salt.
Not less than 31.5% and not more than 32.5% for the decahydrate.
- LOSS ON IGNITION : Not more than 0.5% for the anhydrous salt, not less than 38% and not more than 42% for the decahydrate after drying at 105° C for 4 hours, followed by ignition at 550° C for 30 minutes.
- pH OF A 1% SOLUTION : Not less than 9.9 and not more than 10.7.
- WATER INSOLUBLE MATTER : Not more than 0.2%.
- FLUORIDE : Not more than 10 mg/kg.
(expressed as F)

E 450 (a) (iv) tetraPotassium diphosphate ($K_4P_2O_7$)

- DESCRIPTION : Colourless crystals or white, very hygroscopic powder.
- CONTENT : Not less than 95.0% of $K_4P_2O_7$ after ignition at 550° C for 30 minutes.
- CONTENT IN P_2O_5 : Not less than 42.0% and not more than 43.7%.
- LOSS ON IGNITION : Not more than 2% after drying at 105° C for 4 hours followed by ignition at 550° C for 30 minutes.
- pH OF A 1% SOLUTION : Not less than 10.0 and not more than 10.7.
- WATER INSOLUBLE MATTER : Not more than 0.2%.
- FLUORIDE : Not more than 10 mg/kg.
(expressed as F)

E 450 (b) (i) pentaSodium triphosphate ($\text{Na}_5\text{P}_3\text{O}_{10}$)

- DESCRIPTION : White, slightly hygroscopic granules or powder.
Occurs anhydrous or as a hexahydrate.
- CONTENT : Not less than 85.0 % of $\text{Na}_5\text{P}_3\text{O}_{10}$ after ignition at 550° C for 30 minutes, the remainder being principally other sodium phosphates (E450).
- CONTENT IN P_2O_5 : Not less than 56.0 % and not more than 58.0 % for the anhydrous salt.
Not less than 43.0 % and not more than 45.0 % for the hexahydrate.
- LOSS ON IGNITION : Not more than 0.5 % for the anhydrous salt,
Not more than 23.2 % for the hexahydrate after drying at 105° C for 4 hours followed by ignition at 550° C for 30 minutes.
- pH of a 1 % SOLUTION : Not less than 9.3 and not more than 10.1
- WATER INSOLUBLE MATTER : Not more than 0.2 %
- FLUORIDE : Not more than 10 mg/kg
(expressed as F) :

E 450 (b) (ii) pentaPotassium triphosphate ($K_5P_3O_{10}$)

- DESCRIPTION : White very hygroscopic powder
- CONTENT : Not less than 85 % of $K_5P_3O_{10}$ after ignition at 550° C for 30 minutes, the remainder being principally other potassium phosphates (E 450).
- CONTENT in P_2O_5 : Not less than 46.5 and not more than 48.0 %.
- LOSS ON IGNITION : Not more than 0.5 % calculated on the P_2O_5 content after drying at 105° C for 4 hours followed by ignition at 550° C for 30 minutes.
- pH of a 1 % SOLUTION : Not less than 9.3 and not more than 10.1.
- WATER INSOLUBLE MATTER : Not more than 0.2 %
- FLUORIDE : Not more than 10 mg/kg
(expressed as F)

E.450 (c) (1) sodium polyphosphates

- CHEMICAL DESCRIPTION : Heterogenous mixtures of sodium salts of linear condensed polyphosphoric acids of general formula $H_{(n+2)} P_n O_{(3n+1)}$ where 'n' is not less than 2.
- DESCRIPTION : Fine white powders or crystals or colourless glassy platelets.
- CONTENT IN P_2O_5 : Not less than 59.5% and not more than 70.0%, calculated on the ignited basis.
- LOSS ON IGNITION : Not more than 0.5% after drying at 105° C for 4 hours followed by ignition at 550° C for 30 minutes.
- pH OF A 1% SOLUTION : Not less than 3.6 and not more than 9.0.
- WATER INSOLUBLE MATTER : Not more than 0.2%.
- FLUORIDE : Not more than 10 mg/kg.
(expressed as F)

E 450 (c) (ii) potassium polyphosphates

CHEMICAL DESCRIPTION : Heterogenous mixtures of potassium salts of linear condensed polyphosphoric acids of general formula $H_{(n+2)} P_n O_{(3n+1)}$ where 'n' is not less than 2.

DESCRIPTION : Fine white powders or crystals or colourless glassy platelets.

CONTENT IN P_2O_5 : Not less than 53.5% and not more than 61.5%, calculated on the ignited basis.

LOSS ON IGNITION : Not more than 2% after drying at 105° C for 4 hours followed by ignition at 550° C for 30 minutes.

pH OF A 1% SOLUTION : Not more than 7.8.

WATER INSOLUBLE MATTER : Not more than 0.2%.

FLUORIDE : Not more than 10 mg/kg.

(expressed as F)

E 460 microcrystalline cellulose

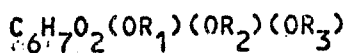
<u>CHEMICAL DESCRIPTION</u> :	Microcrystalline cellulose is purified partially depolymerised cellulose prepared by acid hydrolysis of alpha cellulose obtained directly from fibrous plant material. It has a molecular weight of about 36,000.
<u>DESCRIPTION</u> :	A fine white or almost white odourless powder.
<u>VOLATILE MATTER</u> :	Not more than 5% determined by drying to constant weight at 105° C.
<u>pH</u> :	Shake about 5 g with 40 ml of carbon dioxide-free water for 20 minutes and centrifuge. The pH of the supernatant liquid is between 5.5 and 7.0.
<u>SULPHATED ASH</u> :	Not more than 0.1% determined at 800 ± 25° C.
<u>WATER SOLUBLE SUBSTANCES</u> :	Not more than 0.16%.
<u>DIETHYL ETHER EXTRACTABLE MATTER</u> :	Not more than 200 mg/kg.
<u>CHLORIDE</u> : (expressed as Cl)	Not more than 350 mg/kg.
<u>SULPHATE</u> : (expressed as SO ₄)	Not more than 600 mg/kg.

E 461 Methylcellulose

CHEMICAL DESCRIPTION : Methylcellulose is cellulose obtained directly from fibrous plant material and partially etherified with methyl groups.

DESCRIPTION : Slightly hygroscopic white or slightly yellowish or greyish odourless and tasteless granular, or fibrous powder.

CHEMICAL FORMULA : The polymers contain substituted glucosidic units with the following general formula :



where R_1 , R_2 and R_3 each may be -H or $-CH_3$ or $-CH_2CH_2OH$.

MOLECULAR WEIGHT : From about 20,000 to 380,000.

CONTENT OF SUBSTITUTED GROUPS : Not less than 25% and not more than 33% of methoxyl groups ($-OCH_3$). Not more than 5% of hydroxyethoxyl groups ($-OCH_2CH_2OH$).

VOLATILE MATTER : Not more than 10% determined by drying to constant weight at $105^\circ C$.

SULPHATED ASH : Not more than 1.5% determined at $800 \pm 25^\circ C$.

pH of a 1% solution : ^{caps} Not less than 5 and not more than 8.

E 462 Ethyl cellulose

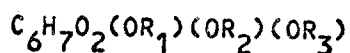
Note : Deleted by the proposed 1st modification to the basic Directive 74/329/EEC.

E 463 Hydroxypropylcellulose

CHEMICAL DESCRIPTION : Hydroxypropylcellulose is cellulose obtained directly from fibrous plant material and partially etherified with hydroxypropyl groups.

DESCRIPTION : Slightly hygroscopic white or slightly yellowish or greyish odourless and tasteless, granular or fibrous powder.

CHEMICAL FORMULA : The polymers contain substituted glucosidic units with the following general formula :



where R_1 , R_2 and R_3 each may be any one of the following :

- H
- $CH_2CHOHCH_3$
- $CH_2CHO(CH_2CHOHCH_3)CH_3$
- $CH_2CHO \overline{CH_2CHO(CH_2CHOHCH_3)CH_3} \overline{CH_3}$

MOLECULAR WEIGHT : From about 30,000 to 1,000,000.

CONTENT OF SUBSTITUTED GROUPS : Not more than 80.5% of hydroxypropoxyl groups ($OCH_2CHOHCH_3$) on a volatile matter-free basis, equivalent to not more than 4.6 hydroxypropyl groups per anhydroglucose unit.

pH OF A 1% SOLUTION : Not less than 5.0 and not more than 8.0.

VOLATILE MATTER : Not more than 10% determined by drying to constant weight at 105° C.

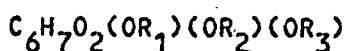
SULPHATED ASH : Not more than 0.5% determined at 800 ± 25° C.

E 464 Hydroxypropylmethylcellulose

CHEMICAL DESCRIPTION : Hydroxypropylmethylcellulose is an ether of methylcellulose (E 461) containing a small degree of hydroxypropyl substitution.

DESCRIPTION : Slightly hygroscopic white or slightly yellowish or greyish odourless and tasteless, granular or fibrous powder.

CHEMICAL FORMULA : The polymers contain substituted glucosidic units with the following general formula:



where R_1 , R_2 and R_3 each may be any one of the following:

- H
- CH_3
- $CH_2CHOHCH_3$
- $CH_2CHO(CH_2CHOHCH_3)CH_3$
- $CH_2CHO \overline{CH_2CHO(CH_2CHOHCH_3)CH_3} \overline{CH_3}$

MOLECULAR WEIGHT : From about 13,000 to 200,000.

CONTENT OF SUBSTITUTED GROUPS : Not less than 19% and not more than 30% of methoxyl groups ($-OCH_3$) and not less than 3% and not more than 12% hydroxypropoxyl groups ($-OCH_2CHOHCH_3$) on a volatile matter-free basis.

pH OF A 1% SOLUTION : Not less than 5.0 not more than 8.0.

VOLATILE MATTER : Not more than 10% determined by drying to constant weight at 105° C.

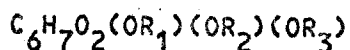
SULPHATED ASH : Not more than 1.5% for products with viscosities greater than 50 cP and not more than 3.0% for products with viscosities of 50 cP or below, determined at $800 \pm 25^\circ C$.

E 465 Methylcellulose

CHEMICAL DESCRIPTION : Methylcellulose is cellulose obtained directly from fibrous plant material and partially etherified with methyl and ethyl groups.

DESCRIPTION : Slightly hygroscopic white or slightly yellowish or greyish odourless and tasteless, granular or fibrous powder.

CHEMICAL FORMULA : The polymers contain substituted glucosidic units with the following general formula :



where R_1 , R_2 and R_3 each may be any one of the following

- H
- CH_3
- CH_2CH_3

MOLECULAR WEIGHT : From about 30,000 to 40,000.

CONTENT OF SUBSTITUTED GROUPS : Not less than 14.5% and not more than 19.0% of ethoxyl groups ($-OC_2H_5$) and not less than 3.5% and not more than 6.5% of methoxyl groups ($-OCH_3$) on a volatile matter-free basis.

VOLATILE MATTER : Fibrous form : Not more than 15%.
Powdered form : Not more than 10%.
Determined by drying to constant weight at 105° C.

SULPHATED ASH : Not more than 0.6% determined at 800 ± 25° C.

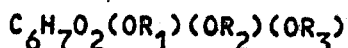
pH of a 1 % SOLUTION : Not less than 5 and not more than 8.

E 466 Sodium carboxymethylcellulose

CHEMICAL DESCRIPTION : Sodium carboxymethylcellulose is the sodium salt of a carboxymethyl ether of cellulose; the cellulose being obtained directly from fibrous plant material.

DESCRIPTION : Slightly hygroscopic white or slightly yellowish or greyish odourless and tasteless, granular or fibrous powder.

CHEMICAL FORMULA : The polymers contain substituted glucosidic units with the following general formula :



where R_1 , R_2 and R_3 each may be any one of the following :

- H
- CH_2COONa
- CH_2COOH

MOLECULAR WEIGHT : From about 17,000 to 500,000.

CONTENT : Not less than 99.5% of sodium carboxymethylcellulose calculated on a volatile matter-free basis. The accuracy of the determination of the content by the "direct methods" is about 0.5%, therefore the content should be verified by subtracting from 100% the sum of the percentages of sodium chloride and sodium glycolate (free glycolate).

SODIUM CHLORIDE AND SODIUM GLYCOLATE : Not more than 0.5% total, and not more than 0.4% of sodium glycolate.

DEGREE OF SUBSTITUTION : Not less than 0.2 and not more than 1.0 carboxymethyl groups (CH_2COOH) per anhydroglucose unit.

SODIUM : Not more than 9.7% on a volatile matter-free basis.

VOLATILE MATTER : Not more than 12% determined by drying to constant weight at 105° C.

pH OF A 1% SOLUTION : Not less than 6 and not more than 8.5.

E 470 Sodium, potassium and calcium salts of food fatty acids

CHEMICAL DESCRIPTION : Sodium, potassium and calcium salts of fatty acids occurring in food fats.

DESCRIPTION : White or creamy white light powders, flakes, or semi-solids.

UNSAPONIFIABLE MATTER : Not more than 2%.

FREE FATTY ACIDS : Not more than 3% estimated as oleic acid.

FREE ALKALI : Not more than 0.1% expressed as NaOH.

TOTAL GLYCEROL : Not more than 1%.

(combined and free)

MATTER INSOLUBLE IN

ALCOHOL : Not more than 0.2% (sodium and potassium salts only).

VOLATILE MATTER : Not more than 3%.

CONTENT OF SODIUM, OR

POTASSIUM, OR CALCIUM : SODIUM Not less than 9.0% and not more than 14.0% expressed as Na₂O.

POTASSIUM Not less than 13.0% and not more than 21.5% expressed as K₂O.

CALCIUM Not less than 8.5% and not more than 13.0% expressed as CaO.

E 471 Mono- and di-glycerides of food fatty acids

CHEMICAL DESCRIPTION : Mono- and di-glycerides consist of mixtures of glyceryl-mono-, di- and tri-esters of fatty acids occurring in food fats. They may contain small amounts of free fatty acids and glycerol.

DESCRIPTION : The product varies from a pale straw to brown oily liquid to a white or slightly off-white hard waxy solid. The solids may be in the form of flakes, powders or small beads.

MONO- AND DI- ESTER

CONTENT : Not less than 70%.

FREE FATTY ACIDS : Not more than 3% estimated as oleic acid.

FREE GLYCEROL : Not more than 7%.

TOTAL GLYCEROL : Not less than 16% and not more than 33%.

POLYGLYCEROLS : Not more than 4% diglycerol and not more than 1% higher polyglycerols both based on total glycerol content.

WATER : Not more than 2% (Karl Fischer).

SULPHATED ASH : Not more than 0.5% determined at $800 \pm 25^{\circ}$ C.

NOTE : These criteria are based on the product without added E 470.

E 472 (a) Acetic acid esters of mono- and di-glycerides of food fatty acids

CHEMICAL DESCRIPTION : Esters of glycerol with acetic acid and fatty acids occurring in food fats. They may contain small amounts of free glycerol, free fatty acids, free acetic acid and free glycerides.

DESCRIPTION : Clear, mobile liquids to solids from white to pale yellow in colour.

TOTAL ACETIC ACID

CONTENT : Not less than 9% and not more than 32%.

FREE FATTY ACIDS : Not more than 3% estimated as oleic acid.
(and ACETIC ACID)

FREE GLYCEROL : Not more than 2%.

TOTAL GLYCEROL : Not less than 14% and not more than 31%.

SULPHATED ASH : Not more than 0.5% determined at $800 \pm 25^\circ \text{C}$.

E 472 (b) Lactic acid esters of mono and diglycerides of food fatty acids

CHEMICAL DESCRIPTION : Esters of glycerol with lactic acid and fatty acids occurring in food fats. They may contain small amounts of free glycerol, free fatty acids, free lactic acid and free glycerides.

DESCRIPTION : Soft to hard waxy solids.

TOTAL LACTIC ACID

CONTENT :

Not less than 13% and not more than 45%.

FREE FATTY ACIDS :

Not more than 3% estimated as oleic acid.

FREE GLYCEROL :

Not more than 2%.

TOTAL GLYCEROL :

Not less than 13% and not more than 30%.

SULPHATED ASH :

Not more than 0.5% determined at $800^{\circ} \pm 25^{\circ} \text{C}$.

NOTE : These criteria are based on the product without added E 470.

E 472 (c) Citric acid esters of mono and diglycerides of food fatty acids

CHEMICAL DESCRIPTION : Esters of glycerol with citric acid and fatty acids occurring in food fats. They may contain small amounts of free glycerol, free fatty acids, free citric acid, and free glycerides. They may be partially or wholly neutralized with sodium hydroxide or with potassium hydroxide.

DESCRIPTION : Yellowish or light brown liquids to waxy solids or semi-solids.

TOTAL CITRIC ACID:

CONTENT : Not less than 13% and not more than 50%.

FREE FATTY ACIDS : Not more than 3% estimated as oleic acid.

FREE GLYCEROL : Not more than 2%.

TOTAL GLYCEROL : Not less than 11% and not more than 29%.

SULPHATED ASH : Not more than 0.5% for the non-neutralized products and not more than 10.0% for the partially or wholly neutralized products determined at $800^{\circ} \pm 25^{\circ} \text{C}$.

pH OF A 1% SOLUTION : Not less than 3 and not more than 7.3.

E 472 (e) Tartaric acid esters of mono- and di-glycerides of food fatty acids

CHEMICAL DESCRIPTION : Esters of glycerol with tartaric acid and fatty acids occurring in food fats. They may contain small amounts of free glycerol, free fatty acids, free tartaric acid and free glycerides.

DESCRIPTION : Sticky viscous yellowish liquids to hard yellow waxes.

TOTAL TARTARIC ACID

CONTENT : Not less than 15% and not more than 50%.

FREE FATTY ACIDS : Not more than 3% estimated as oleic acid.

FREE GLYCEROL : Not more than 2%.

TOTAL GLYCEROL : Not less than 12% and not more than 29%.

SULPHATED ASH : Not more than 0.5% determined at $800 \pm 25^{\circ}$ C.

E 472(e) Mono and diacetyl tartaric acid esters of mono and diglycerides of food fatty acids

CHEMICAL DESCRIPTION : Esters of glycerol with mono- and diacetyl tartaric acids and fatty acids occurring in food fats. They may contain small amounts of free glycerol, free fatty acids, free tartaric and acetic acids and their combinations, and free glycerides. They hydrolyse in moist air giving off acetic acid.

DESCRIPTION : Sticky viscous liquids through a fat-like consistency to yellow waxes which hydrolyse in moist air to liberate acetic acid.

TOTAL TARTARIC ACID

CONTENT : Not less than 10% and not more than 40%.

TOTAL ACETIC ACID

CONTENT : Not less than 8% and not more than 32%.

FREE FATTY ACIDS : Not more than 3% estimated as oleic acid.

FREE GLYCEROL : Not more than 2%.

TOTAL GLYCEROL : Not less than 11% and not more than 28%.

SULPHATED ASH : Not more than 0.5% determined at $800^{\circ} \pm 25^{\circ} \text{C}$.

E 472 (f) Mixed acetic/tartaric acid esters of mono- and di-glycerides of food fatty acids

CHEMICAL DESCRIPTION : Esters of glycerol with acetic and tartaric acids and fatty acids occurring in food fats. They may contain small amounts of free glycerol, free fatty acids, free acetic and tartaric acids, and free glycerides.

DESCRIPTION : Clear mobile liquids to solids from white to pale yellow in colour.

TOTAL ACETIC ACID : Not less than 10% and not more than 20%.

TOTAL TARTARIC ACID : Not less than 20% and not more than 40%.

FREE ACETIC ACID : Not more than 8.5%.

FREE TARTARIC ACID : Not more than 1%.

FREE FATTY ACIDS : Not more than 3% estimated as oleic acid.

FREE GLYCEROL : Not more than 2%.

TOTAL GLYCEROL : Not less than 12% and not more than 27%.

SULPHATED ASH : Not more than 0.5% determined at $800^{\circ} \pm 25^{\circ} \text{C}$.

NOTE : Number included in proposed 1st modification to basic Directive (74/329/EEC).

E 473 Sucrose esters of food fatty acids

CHEMICAL DESCRIPTION : Essentially the mono- and di-esters of sucrose with fatty acids occurring in food fats. They may be prepared from sucrose and the methyl and ethyl esters of food fatty acids or by extraction from sucroglycerides. No organic solvents shall be used in their preparation other than dimethylformamide, ethyl acetate and isopropanol.

DESCRIPTION : Soft solids, stiff gels or white to greyish white powders.

TOTAL SUCROSE FATTY ACID ESTER CONTENT : Not less than 80%.

TOTAL GLYCERIDE CONTENT : Not more than 20%.

FREE SUCROSE CONTENT : Not more than 5%.

FREE FATTY ACID CONTENT : Not more than 3% estimated as oleic acid.

SULPHATED ASH : Not more than 2% determined at 800° + 25° C.

METHANOL CONTENT : Not more than 10 mg/kg.

DIMETHYLFORMAMIDE CONTENT : Not more than 1 mg/kg.

TOTAL ETHYL ACETATE AND ISOPROPANOL CONTENT : Not more than 350 mg/kg singly or in combination.

NOTE : These criteria are based on the product without added E 470.

E 474 Sucroglycerides

CHEMICAL DESCRIPTION : Sucroglycerides are produced by reacting sucrose with an edible fat or oil to produce a mixture of essentially mono- and di-esters of sucrose and fatty acids together with residual mono-, di- and tri-glycerides from that fat or oil. No organic solvents shall be used in their preparation other than dimethylformamide, ethyl acetate and isopropanol.

DESCRIPTION : Soft solid masses, stiff gels, or white to off-white powders.

TOTAL SUCROSE FATTY ACID ESTER CONTENT : Not less than 40% and not more than 60%.

TOTAL GLYCERIDE CONTENT : Not less than 40% and not more than 60%.

FREE SUCROSE CONTENT : Not more than 5%.

FREE FATTY ACID CONTENT : Not more than 3% estimated as oleic acid.

SULPHATED ASH : Not more than 2% determined at 800° + 25° C.

DIMETHYLFORMAMIDE CONTENT : Not more than 1 mg/kg.

TOTAL ETHYL ACETATE AND ISOPROPANOL CONTENT : Not more than 350 mg/kg singly or in combination.

NOTE : These criteria are based on the product without added E 470.

E 475 Polyglycerol esters of non-polymerized food fatty acids

CHEMICAL DESCRIPTION : Polyglycerol esters of fatty acids are produced by the esterification of polyglycerol with food fats or with fatty acids occurring in food fats. The polyglycerol moiety is predominantly di-, tri- and tetra-glycerol and contains not more than 10% of polyglycerols equal to or higher than heptaglycerol.

DESCRIPTION : Yellow or light brown liquids or semi-solids.

TOTAL FATTY ACID ESTER

CONTENT : Not less than 90%.

FREE FATTY ACIDS : Not more than 6% estimated as oleic acid.

TOTAL GLYCEROLS : Not less than 18% and not more than 60%.

FREE GLYCEROLS : Not more than 7%.

SULPHATED ASH : 0.5% determined at $800^{\circ} \pm 25^{\circ} \text{C}$.

NOTE : These criteria are based on the product without added E 470.

E 477 Propylene glycol esters of food fatty acids

DESCRIPTION : Propylene glycol (ie propane-1,2-diol) esters of fatty acids consist chiefly of mixtures of propane-1,2-diol mono- and di-esters of fatty acids occurring in food fats. The alcohol moiety is exclusively propane 1,2-diol together with dimer and traces of trimer. Organic acids other than food fatty acids are absent.

DESCRIPTION : Waxy white flakes, beads or solids.

TOTAL FATTY ACID

ESTER CONTENT : Not less than 85 %.

FREE PROPANE - 1,2 -

DIOL : Not more than 5%.

DIMER AND TRIMER

OF PROPANE 1,2-DIOL : Not more than 4 %.

FREE FATTY ACIDS : Not more than 6 % estimated as oleic acid

SULPHATED ASH : Not more than 0.5 % determined at $800^{\circ} \pm 25^{\circ}$ C.

TOTAL PROPANE - 1,2 -

DIOL CONTENT : Not less than 11% and not more than 31%.

NOTE : These criteria are based on the product without added E 470.

E 480 Stearoyl - lactic acid

Note : This substance has been deleted by the proposed 1st modification to the basis Directive 74/329/EEC.

E 481 Sodium stearoyl-2-lactylate

CHEMICAL DESCRIPTION : A mixture of the sodium salts of stearoyl lactic acids and minor amounts of sodium salts of other related acids, manufactured by the reaction of stearic acid and lactic acid. Other food fatty acids may also be present, free or esterified, due to their presence in the stearic acid used.

DESCRIPTION : Cream coloured powder or brittle solid with a characteristic odour.

SODIUM CONTENT : Not less than 2.5% and not more than 5%.

ESTER VALUE : Not less than 90 and not more than 190.

TOTAL LACTIC ACID (FREE AND COMBINED) : Not less than 15% and not more than 40%.

ACID VALUE : Not less than 60 and not more than 130 mg KOH/g.

E 482 Calcium stearoyl-2-lactylate

CHEMICAL DESCRIPTION : A mixture of calcium salts of stearoyl lactic acids with minor amounts of calcium salts of other related acids, manufactured by the reaction of stearic acid and lactic acid. Other food fatty acids may also be present, free or esterified, due to their presence in the stearic acid used.

DESCRIPTION : White or slightly yellowish powder or brittle solid with a characteristic odour.

CALCIUM CONTENT : Not less than 1.0% and not more than 5.2%.

ESTER VALUE : Not less than 125 and not more than 190.

TOTAL LACTIC ACID : Not less than 15% and not more than 40%.

(FREE AND COMBINED)

ACID VALUE : Not less than 50 and not more than 130 mg KOH/g.

E 483 Stearyl tartrate

CHEMICAL DESCRIPTION : Stearyl tartrate is produced by the esterification of tartaric acid with stearyl alcohol. It consists chiefly of the di-ester with minor amounts of mono-ester, tartaric acid and free stearyl alcohol. Other esters may also be present due to the presence in the stearyl alcohol used of alcohols derived from food fatty acids other than stearic acid.

DESCRIPTION : Cream coloured unctuous solid (at 25°C).

TOTAL ESTER CONTENT : Not less than 90%.

TOTAL TARTARIC ACID CONTENT : Not less than 18% and not more than 35%.

UNSATURIFIABLE MATTER : Not less than 77% and not more than 83%.

MELTING RANGE : 67° C - 77° C.

ESTER VALUE : Not less than 163 and not more than 180.

IODINE VALUE : Not more than 4 (Wijs).

ACID VALUE : Not more than 6 mg KOH/g.

Sulphated ASH : Not more than 0.5 % determined at 800° ± 25° C.