

Fatty Acid Methyl Ester & Fatty Acid Ethyl Ester Standards (FAME & FAEEs)

Free fatty acids (also referred to as volatile fatty acids or carboxylic acids), in short carbon chains, that are volatile, are typically measured in free form as opposed to Fatty Acid Methyl Esters (FAME's) using Gas Chromatography (GC). Analysis in free form typically confers the advantage of having easier and faster sample preparation and avoids the formation of derivatisation artefacts. However, free fatty acids may be difficult to analyse because these highly polar compounds tend to form hydrogen bonds causing column adsorption problems or in the case of unsaturated fatty acids the slight difference between different compounds may be difficult to distinguish without the neutralisation step involved in esterification.

The esterification of fatty acids is an important tool for both characterising fats and oils and for determining the total fat content in foods and foodstuffs. It is also an important technique for assessing the quality and purity of biofuels. Fats are extracted using a non-polar solvent, saponised to acids and analysed by gas chromatography (GC). GC is an important technique for fats and oils analysis because accurate results can be obtained for complex as well as simple sample matrices. Several compendium from organisations such as the Association of Official Agriculture Chemists (AOAC), American Oil Chemists Society (AOCS) and the European Pharmacopoeia (EP) contain derivatisation procedures. FAME's may be produced from vegetable oils, animal fats or waste cooking oils by transesterification. In this process a glyceride reacts with an alcohol in the presence of a catalyst forming a mixture of fatty acid esters and an alcohol thus producing biodiesel. Using triglycerides as the fat source, results in the production of glycerol.

Rapeseed, sunflower, soybean and palm oils are the most common raw materials used for the production of biodiesel. Using methanol in the transesterification process has the advantage that the resulting glycerol can be separated simultaneously during the transesterification process. When using ethanol, the ethanol needs to be free of water and the oil needs to have a low water content as well, to achieve an easy glycerol separation. Where ethanol is used it is fatty acid ethyl esters (FAEE's) that are produced. The end products of the transesterification process are raw biodiesel and raw glycerol. After a cleaning step biodiesel is produced. The purified glycerol can be used in the food and cosmetic industries as well as in the electrochemical industry and as a substrate for anaerobic digestion. Reagecon offers several FAME and FAEE individual compounds and mixtures which can be used to calibrate the GC instrument prior to analysis or as Quality Control Materials during analysis. Deuterated versions are also available for use as internal standards. Such products may be offered as neat materials or in pre-prepared liquid matrices.

Unsaturated Methyl Esters

Product No.	Description	Concentration in Matrix	Pack Size
REUFA001N	Methyl cis-9-hexadecenoate (Palmitoleate) C16:1	Neat	10mg
REUFA001S	Methyl cis-9-hexadecenoate (Palmitoleate) C16:1	10000µg/ml in Heptane	1ml
REUFA002N	Methyl trans-9-hexadecenoate C16:1	Neat	10mg
REUFA002S	Methyl trans-9-hexadecenoate C16:1	10000µg/ml in Heptane	1ml
REUFA003N	Methyl cis-6-octadecenoate (Petroselinate) C18:1	Neat	10mg
REUFA003S	Methyl cis-6-octadecenoate (Petroselinate) C18:1	10000µg/ml in Heptane	1ml
REUFA004N	Methyl trans-6-octadecenoate (Petroselaidate) C18:1	Neat	10mg
REUFA004S	Methyl trans-6-octadecenoate (Petroselaidate) C18:1	10000µg/ml in Heptane	1ml
REUFA005N	Methyl cis-9-octadecenoate (Oleate) C18:1 112-62-9	Neat	10mg
REUFA005S	Methyl cis-9-octadecenoate (Oleate) C18:1 112-62-9	10000µg/ml in Heptane	1ml
REUFA006N	Methyl trans-9-octadecenoate (Elaidate) C18:1 2462-84-2	Neat	10mg
REUFA006S	Methyl trans-9-octadecenoate (Elaidate) C18:1 2462-84-2	10000µg/ml in Heptane	1ml
REUFA007N	Methyl cis-11-octadecenoate (Vaccenate) C18:1 1937-63-9	Neat	10mg
REUFA007S	Methyl cis-11-octadecenoate (Vaccenate) C18:1 1937-63-9	10000µg/ml in Heptane	1ml
REUFA008N	Methyl 12-hydroxy-cis-9-octadecenoate (Ricinoleate) C18:1	Neat	10mg
REUFA008S	Methyl 12-hydroxy-cis-9-octadecenoate (Ricinoleate) C18:1	10000µg/ml in Heptane	1ml
REUFA010N	Methyl linoleate (Linoleate) C18:2	Neat	10mg
REUFA010S	Methyl linoleate (Linoleate) C18:2	10000µg/ml in Heptane	1ml
REUFA011N	Methyl linoelaidate (Linoelaidate) C18:2	Neat	10mg
REUFA011S	Methyl linoelaidate (Linoelaidate) C18:2	10000µg/ml in Heptane	1ml
REUFA012N	Methyl octadecadienoate (Conjugated) C18:2	Neat	10mg
REUFA012S	Methyl octadecadienoate (Conjugated) C18:2	10000µg/ml in Heptane	1ml
REUFA014N	Methyl linolenate (Linolenate) C18:3	Neat	10mg
REUFA014S	Methyl linolenate (Linolenate) C18:3	10000µg/ml in Heptane	1ml
REUFA015N	Methyl g-linolenate (Gamma Linolenate) C18:3	Neat	10mg
REUFA015S	Methyl g-linolenate (Gamma Linolenate) C18:3	10000µg/ml in Heptane	1ml
REUFA016N	Methyl trans-11-eicosenoate C20:1	Neat	10mg

Unsaturated Methyl Esters

Product No.	Description	Concentration in Matrix	Pack Size
REUFA016S	Methyl trans-11-eicosenoate C20:1	10000µg/ml in Heptane	1ml
REUFA017N	Methyl cis-8-eicosenoate C20:1	Neat	10mg
REUFA017S	Methyl cis-8-eicosenoate C20:1	10000µg/ml in Heptane	1ml
REUFA018N	Methyl cis-11-eicosenoate C20:1	Neat	10mg
REUFA018S	Methyl cis-11-eicosenoate C20:1	10000µg/ml in Heptane	1ml
REUFA019N	Methyl cis-5-eicosenoate C20:1	Neat	10mg
REUFA019S	Methyl cis-5-eicosenoate C20:1	10000µg/ml in Heptane	1ml
REUFA020N	Methyl cis-11,14-eicosadienoate C20:2	Neat	10mg
REUFA020S	Methyl cis-11,14-eicosadienoate C20:2	10000µg/ml in Heptane	1ml
REUFA022N	Methyl cis-8,11,14-eicosatrienoate (Homogamma linolenate) C20:3	Neat	10mg
REUFA022S	Methyl cis-8,11,14-eicosatrienoate (Homogamma linolenate) C20:3	10000µg/ml in Heptane	1ml
REUFA023N	Methyl cis-11,14,17-eicosatrienoate C20:3	Neat	10mg
REUFA023S	Methyl cis-11,14,17-eicosatrienoate C20:3	10000µg/ml in Heptane	1ml
REUFA024N	Methyl arachidonate (Arachidonate) C20:4	Neat	10mg
REUFA024S	Methyl arachidonate (Arachidonate) C20:4	10000µg/ml in Heptane	1ml
REUFA025N	Methyl 5,8,11,14,17-Eicosapentaenoate C20:5	Neat	10mg
REUFA025S	Methyl 5,8,11,14,17-Eicosapentaenoate C20:5	10000µg/ml in Heptane	1ml
REUFA026N	Methyl cis-7,10,13,16,19-Docosapentaenoate (DPA) C22:5	Neat	10mg
REUFA026S	Methyl cis-7,10,13,16,19-Docosapentaenoate (DPA) C22:5	10000µg/ml in Heptane	1ml
REUFA027N	Methyl cis-13-docosenoate (Erucate) C22:1	Neat	10mg
REUFA027S	Methyl cis-13-docosenoate (Erucate) C22:1	10000µg/ml in Heptane	1ml
REUFA028N	Methyl trans-13-docosenoate (Brassicdate) C22:1	Neat	10mg
REUFA028S	Methyl trans-13-docosenoate (Brassicdate) C22:1	10000µg/ml in Heptane	1ml
REUFA029N	Methyl cis-13,16-docosadienoate C22:2	Neat	10mg
REUFA029S	Methyl cis-13,16-docosadienoate C22:2	10000µg/ml in Heptane	1ml
REUFA030N	Methyl cis-13,16,19-docosatrienoate C22:3	Neat	10mg
REUFA030S	Methyl cis-13,16,19-docosatrienoate C22:3	10000µg/ml in Heptane	1ml
REUFA031N	Methyl cis-7,10,13,16-Docosatetraenoate C22:4	Neat	10mg
REUFA031S	Methyl cis-7,10,13,16-Docosatetraenoate C22:4	10000µg/ml in Heptane	1ml
REUFA032N	Methyl cis-4,7,10,13,16,19-Docosahexenoate C22:6	Neat	10mg
REUFA032S	Methyl cis-4,7,10,13,16,19-Docosahexenoate C22:6	10000µg/ml in Heptane	1ml
REUFA033N	Methyl cis-15-tetracosenoate (Nervonate) C24:1	Neat	10mg
REUFA033S	Methyl cis-15-tetracosenoate (Nervonate) C24:1	10000µg/ml in Heptane	1ml

Saturated Methyl Esters

Product No.	Description	Concentration in Matrix	Pack Size
RESFA001N	Methyloctanoate (Caprylate) C8:0	Neat	10mg
RESFA001S	Methyloctanoate (Caprylate) C8:0	10000µg/ml in Heptane	1ml
RESFA002N	Methylnonoate (Pelargonate) C9:0	Neat	10mg
RESFA002S	Methylnonoate (Pelargonate) C9:0	10000µg/ml in Heptane	1ml
RESFA003N	Methyldecanoate (Caprate) C10:0	Neat	10mg
RESFA003S	Methyldecanoate (Caprate) C10:0	10000µg/ml in Heptane	1ml
RESFA004N	Methylundecanoate C11:0	Neat	10mg
RESFA004S	Methylundecanoate C11:0	10000µg/ml in Heptane	1ml
RESFA005N	Methyldodecanoate (Laurate) C12:0	Neat	10mg
RESFA005S	Methyldodecanoate (Laurate) C12:0	10000µg/ml in Heptane	1ml
RESFA006N	Methyltridecanoate C13:0	Neat	10mg
RESFA006S	Methyltridecanoate C13:0	10000µg/ml in Heptane	1ml
RESFA007N	Methyltetradecanoate (Myristate) C14:0	Neat	10mg
RESFA007S	Methyltetradecanoate (Myristate) C14:0	10000µg/ml in Heptane	1ml
RESFA008N	Methylpentadecanoate C15:0	Neat	10mg
RESFA008S	Methylpentadecanoate C15:0	10000µg/ml in Heptane	1ml
RESFA009N	Methylhexadecanoate (Palmitate) C16:0	Neat	10mg
RESFA009S	Methylhexadecanoate (Palmitate) C16:0	10000µg/ml in Heptane	1ml
RESFA010N	Methylheptadecanoate (Margarate) C17:0	Neat	10mg
RESFA010S	Methylheptadecanoate (Margarate) C17:0	10000µg/ml in Heptane	1ml
RESFA011N	Methyloctadecanoate (Stearate) C18:0	Neat	10mg
RESFA011S	Methyloctadecanoate (Stearate) C18:0	10000µg/ml in Heptane	1ml
RESFA012N	Methyl 12-hydroxystearate C18:0	Neat	10mg
RESFA012S	Methyl 12-hydroxystearate C18:0	10000µg/ml in Heptane	1ml
RESFA013N	Methylnonadecanoate C19:0	Neat	10mg
RESFA013S	Methylnonadecanoate C19:0	10000µg/ml in Heptane	1ml
RESFA014N	Methyleicosanoate (Arachidate) C20:0	Neat	10mg
RESFA014S	Methyleicosanoate (Arachidate) C20:0	10000µg/ml in Heptane	1ml
RESFA015N	Methylheneicosanoate C21:0	Neat	10mg
RESFA015S	Methylheneicosanoate C21:0	10000µg/ml in Heptane	1ml
RESFA016N	Methyldocosanoate (Behenate) C22:0	Neat	10mg
RESFA016S	Methyldocosanoate (Behenate) C22:0	10000µg/ml in Heptane	1ml
RESFA017N	Methyltricosanoate C23:0	Neat	10mg
RESFA017S	Methyltricosanoate C23:0	10000µg/ml in Heptane	1ml
RESFA018N	Methyltetracosanoate (Lignocerate) C24:0	Neat	10mg
RESFA018S	Methyltetracosanoate (Lignocerate) C24:0	10000µg/ml in Heptane	1ml

Fatty Acid Ethyl Esters

Product No.	Description	Concentration in Matrix	Pack Size
REFAEE001N	Ethyl palmitoleate	Neat	100mg
REFAEE001S	Ethyl palmitoleate	10mg/ml in Hexane	1ml
REFAEE002N	Ethyl caprylate	Neat	100mg
REFAEE002S	Ethyl caprylate	10mg/ml in Hexane	1ml
REFAEE003N	Ethyl caprate	Neat	100mg
REFAEE003S	Ethyl caprate	10mg/ml in Hexane	1ml
REFAEE004N	Ethyl laurate	Neat	100mg
REFAEE004S	Ethyl laurate	10mg/ml in Hexane	1ml
REFAEE005N	Ethyl myristate	Neat	100mg
REFAEE005S	Ethyl myristate	10mg/ml in Hexane	1ml
REFAEE006N	Ethyl palmitate	Neat	100mg
REFAEE006S	Ethyl palmitate	10mg/ml in Hexane	1ml
REFAEE007N	Ethyl stearate	Neat	100mg
REFAEE007S	Ethyl stearate	10mg/ml in Hexane	1ml
REFAEE008N	Ethyl arachidate	Neat	100mg
REFAEE008S	Ethyl arachidate	10mg/ml in Hexane	1ml
REFAEE009N	Ethyl behenate	Neat	100mg
REFAEE009S	Ethyl behenate	10mg/ml in Hexane	1ml
REFAEE010N	Ethyl lignocerate	Neat	100mg
REFAEE010S	Ethyl lignocerate	10mg/ml in Hexane	1ml
REFAEE011N	Ethyl erucate	Neat	100mg
REFAEE011S	Ethyl erucate	10mg/ml in Hexane	1ml
REFAEE012N	Ethyl linoleate	Neat	100mg
REFAEE012S	Ethyl linoleate	10mg/ml in Hexane	1ml
REFAEE013N	Ethyl nervonate	Neat	100mg
REFAEE013S	Ethyl nervonate	10mg/ml in Hexane	1ml
REFAEE014N	Ethyl oleate	Neat	100mg
REFAEE014S	Ethyl oleate	10mg/ml in Hexane	1ml
REFAEE015N	Ethyl heptadecanoate	Neat	100mg
REFAEE015S	Ethyl heptadecanoate	10mg/ml in Hexane	1ml
REFAEE016N	Ethyl linolenate	Neat	100mg
REFAEE016S	Ethyl linolenate	10mg/ml in Hexane	1ml

Should you require FAMES or FAEs in deuterated form, please email sales@reagecon.ie

FAME Calibration Standards

Product No.	Description	% Concentration	Solvent	Pack Size
REFAME-CAL0.5V-250	FAME	0.5	Cyclohexane	250ml
REFAME-CAL1.25V-250	FAME	1.25	Cyclohexane	250ml
REFAME-CAL2.5V-250	FAME	2.5	Cyclohexane	250ml
REFAME-CAL3.75V-250	FAME	3.75	Cyclohexane	250ml
REFAME-CAL5V-250	FAME	5	Cyclohexane	250ml
REFAME-CAL7V-250	FAME	7	Cyclohexane	250ml
REFAME-CAL2V-250	FAME	2	Chevron Phillips High Cetone	250ml
REFAME-CAL4V-250	FAME	4	Chevron Phillips High Cetone	250ml
REFAME-CAL6V-250	FAME	6	Chevron Phillips High Cetone	250ml
REFAME-ENCAL7V-250	FAME	7	Chevron Phillips High Cetone	250ml
REFAME-CAL10V-250	FAME	10	Chevron Phillips High Cetone	250ml
REFAME-CAL15V-250	FAME	15	Chevron Phillips High Cetone	250ml
REFAME-CAL20V-250	FAME	20	Chevron Phillips High Cetone	250ml
REFAME-CAL25V-250	FAME	25	Chevron Phillips High Cetone	250ml
REFAME-CAL30V-250	FAME	30	Chevron Phillips High Cetone	250ml