

materials may also be coated with biobased materials to provide color, retard biodegradation, or reduce loss from wind or water erosion.

Agricultural and animal wastes are fertilizers and may be in composted form or, in the case of manures, may be applied as fertilizers without further composting or processing.

Proposed Minimum Content—Landscaping Materials, Compost, and Fertilizer Category

To be included in the landscaping materials and compost category, the minimum biobased content of each item must be:

Items	Minimum biobased content (%)
Landscaping materials	100
Compost	100
Fertilizer	80

Lubricants and Functional Fluids Category

Biobased lubricants and functional fluids are important materials used to reduce friction between moving surfaces or between moving and stationary surfaces in engines and other machinery, to reduce wear and dissipate heat on those surfaces, and to provide other benefits such as corrosion protection. Items like 2-cycle engine oils can be formulated from biobased sources. These formulated lubricants are added to fuels used in 2-cycle engines found in lawnmowers, chainsaws, string trimmers, and other small machinery.

Biobased functional fluids are used as items that transfer heat and/or pressure to or from surfaces, reduce friction in machining operations, provide electrical insulation, and for many other purposes. There is a broad range of biobased lubricant and functional fluid items, each carefully designed to meet particular performance needs and applications. These materials often need to be replaced on a routine schedule to maintain their expected performance.

Biobased lubricants and functional fluids are typically made from multiple components, including one or more base stocks plus additives that enhance performance or extend the life of the item. A variety of agricultural-based oils can be used as biobased lubricants and functional fluids, including but not limited to canola, corn, rapeseed, soybean, sunflower, other plant materials, and animal fats. The base oil used must have sufficient natural or enhanced stability to be used as base stock for biobased lubricants. Biobased

items in this category can be base stock (the starting material into which additives and other materials are blended to make the final formulated product), lubricant or functional fluid additive (materials that are used for specific performance benefits such as lower pour point, increased flash point, greater extreme pressure properties, a desired viscosity, or reduced foam), or formulated lubricant or functional fluid (the final product including base stock and all additives).

Vehicles, heavy machinery, and mobile equipment use lubricant items such as crankcase oils and greases, and functional fluids such as transmission fluids, coolants, power steering fluids, brake fluids, and others. Industrial equipment uses for lubricants include metal working fluids (cutting and drilling oils/lubricants, stamping and forming lubricants), hydraulic fluids, and process fluids (heat transfer and dielectric fluids). Total loss lubricants are released directly into the environment in such applications as rail and flange, wire rope, and chain saw lubricants; concrete and asphalt form release fluids; and 2-cycle engine oils.

Biobased lubricants can include bar, chain, and sprocket oils or general purpose lubricants used for general cleaning, lubrication, and corrosion prevention of metal parts including wheels, bearings, gears, rollers, chains, hinges, hand tools, guns, and sporting equipment.

Biobased hydraulic fluid items can be used in construction equipment, industrial pumps, and other equipment, as well as in specialty uses where incidental food contact may occur. These specialty fluids can also be used in transmission systems of vehicles and other transportation equipment.

Biobased functional fluid items include the fluids used to lubricate and cool equipment/metals and nonmetal parts during cutting and parts fabrication, as well as drilling and machining operations.

Biobased functional fluids can be used for specialty purposes items such as mold release agents that are applied to wood, metal, or plastic forms prior to pouring concrete to facilitate the removal of forms after concrete has cured, or to foundry molds prior to pouring the foundry metal to facilitate the removal of metal parts from the molds. These biobased items can also be used as dielectric fluids that are used in electric transformers to provide insulation and to dissipate heat generated by the transmission of electric current.

Proposed Minimum Content—Lubricants and Functional Fluids Category

To be included in this lubricants and functional fluids category, the minimum biobased content of each item must be:

Items	Minimum biobased content (%)
Crankcase oils (water cooled engines)	10
Crankcase oils (air cooled engines)	50
2-cycle engine oils	50
Fifth-wheel grease	40
Automotive and other metal complex grease	25
Total loss lubricants (wire rope, bar-chain, etc.)	50
Turbine and other industrial lubricants	50
Penetrating oils	50
General purpose and other	90
Hydraulic, power steering, transmission fluids	50
Brake fluids	20
Cutting, drilling, and tapping oils (neat use)	50
Metal working concentrates (for dilution)	30
Forming pastes and extreme pressure stamping	30
Concrete and asphalt release	70
Metal foundry and mold release	50
Transformer oil and dielectric fluids	70

Plastics Category

Most plastics are made from petroleum-based monomers and polymers. Biobased plastics from renewable resources are sometimes biodegradable and have positive life-cycle benefits. Biobased plastics can be derived from a wide variety of agricultural and forest materials in the form of starch, cellulose, and other polymers or synthesized from plant oil and process byproduct monomers.

Biobased plastic polymers include cellulose, the most plentiful carbohydrate since 40 percent of all organic matter in the world is cellulose; starch, found in corn, potatoes, wheat, tapioca, and other plants can be used for such nonfood items as paper, cardboard, textile sizing, and adhesives; collagen, the most abundant protein found in mammals, including gelatin used to make sausage casings, capsules for drugs and vitamin preparations, and other miscellaneous industrial applications, including photography; and casein, a commercial product derived mainly from milk, used in adhesives, binders, protective coatings, and other biobased items. Corn, soy, and wheat proteins are abundant and can be