

INTRODUCTION

Sierra's involvement with lanolin began over two decades ago, with the inclusion of lanolin into many of our formulations as an emollient. Ongoing research uncovered many unique properties from this natural resource, and our development of dozens of specialized products built around these properties led us to specialized application, such as; lanolin washes – detergent based cleaners that imparts a protective coating on equipment, and vehicles, polishes that not just shine, but protect against the elements – and many more. Sierra continue to expand this range with an ongoing commitment to further lanolin development.

Lanolin is a natural substance secreted by sheep through their skin to provide a protective coating on their fleece. This provides the sheep a "waterproofing" effect against rain. The preservative and lubricant properties of Lanolin have been known and used for thousands of years. It was used in ancient times by to protect and lubricate weaponry, whilst shipbuilders and sailors used it to protect the timbers and metal components of their vessels.

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In Australia, Lanolin was used widely for many years as an anti-corrosive coating. However, its use declined from the late 1940's onwards as toxic chemicals such as DDT and arsenic became popular for use in sheep treatments. These toxic chemicals were readily absorbed into the woolgrease. In addition, cheaper synthetic anti-corrosive products produced from crude oil were also coming on to the market replacing lanolin.

Woolgrease is actually a complex mix of wax esters of long chain fatty acids and alcohols (lanosterol, dihydrolanosterol and cholesterol). Sierra processes the woolgrease to produce a fine, industrial grade of grease that can then be used for production of both liquid as well as solid (grease) products. Further processing then enables the lanolin to be saponified for use in polishes and vehicle protective washes.

WHY USE LANOMAX LANOLIN ?

The question of **why** when considering the use of lanolin is answered in the first part by two important points;

1. **Non Toxic.** Enabling you to replace often toxic and carcinogenic materials with lanolin.
2. **Natural.** Lanolin is a uniquely natural product, making it a very eco friendly material.

Additionally, Lanomax lanolin is UV stable, meaning that if left for extended periods in direct sunlight, it will not break down. This allows for greater variety of uses, especially in industrial uses, such as corrosion protection.

Lanomax lanolin is of the highest grade lanolin with the lowest moisture content. This is of utmost importance when using against corrosion.

Lanomax lanolin is of a consistent quality. Whilst some small variances do occur due to the "natural" nature of lanolin, Sierra's Lanomax lanolin is further processed to maintain low moisture levels and cleanliness. This ensures the highest performance when in use.

Simplicity – In the liquid state, Sierra produce **one** product, with the industry's highest lanolin content, which the client can then dilute down for a multitude of uses. In contrast, there are many competitors in the marketplace that produce liquids with one or more of the following; higher moisture levels, much lower lanolin content, or confusing grades for varying uses.

THE LANOMAX PRODUCT RANGE

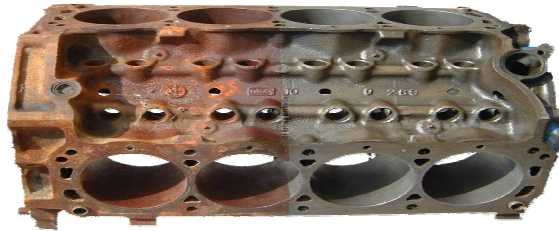
The lanomax range of lanolin comprises both solid (grease) as well as liquid.

- **Grease** (Available in 500gm, 2 and 20 kg containers.)
- **Aerosol Liquid** (Available in 350gm aerosol can)
- **Liquid Lanolin** (Available in 500 ml 1, 5 & 20 and 200 litre containers)

Corrosion Control

The areas of use for corrosion control are enormous, and are in almost every conceivable industry. Some examples are;

1. Factory environments – for use on machinery surfaces, covers, screws, nuts and bolts. Tools and equipment. Storage of parts. Implements, chains, wire rope and all exposed surfaces.
2. Sheet Metal Industry. Protection of sheet metal; before and after fabrication. Fixings, hinges and fasteners.
3. Marine – all metal surfaces.
4. Water Cooling Towers
5. Fertilizer plants (highly alkaline environment) – all exposed metal surfaces.
6. Any exposed metals, that are subject to corrosion.



Benefits:

Sierra's Lanomax's lanolin based products provide on-going lubrication and protection from corrosion. They are a nontoxic, high performance and environmentally safe alternative to petro-chemically based products. Sierra's Lanomax's products will penetrate into inaccessible areas providing an impervious barrier against moisture and other contamination.

The acid resistant properties of the products will protect steelwork and other metal surfaces against industrial pollution which is usually acidic and very corrosive.

Note – When subjected to heat $>42^{\circ}\text{C}$ the lanolin will become mobile and tend to flow. This can lead to reduced coverage on vertical surfaces.

Application Details:

All surfaces should be clean and dry before application. Allow approximately 60 minutes for penetration and for the solvent carrier to evaporate before use.

Structures – for walls, ceilings, fastenings and other structural areas apply **Lanomax** using an atomizing spray. **Lanomax** can be applied at up to 30 sq. m/l on non-porous substrates.

Lanomax can also be applied to smooth surfaces by rolling on with a lamb wool applicator.

One coat of **Lanomax** is usually sufficient, but extra applications may be necessary if applying to an absorbent surface, eg unpainted timber.

Plant & Equipment – remove any loose rust or scale. Spray **Lanomax** over all surfaces. (Note – when used in a dusty environment, dust will adhere to the lanolin. This is not detrimental.

Lanomx can be applied to light fittings, electronic circuit boards, cables and switchgear.

On linkages and chains use **Grease**. Also, apply **Grease** to protruding bolts to prevent corrosion which can cause seizing.

Note –DO NOT pack **Grease** into bearings or bushings. The grease should only be smeared onto the surface. **Lanolin Grease** is not recommended for use on high speed bearings.

Marine Applications

Areas of Use:

Outboard Motors/Stern Drives, linkages, hinges
Engine Rooms, Winches, Cables, Anchors & Anchor Lockers
Voids & Ballast Tanks, Hydraulic Fittings, Valves & Pumps
Propellers, Control Cables
Fishing Equipment, Timber decking, timber paneling and trims.
Aerials, connections, locks and lockers.

Note: Exposed alloy can also be protected with a very fine coating of Lanomax lanolin

Benefits:

Sierra's Lanomax's lanolin based products provide on-going protection from corrosion and the effects of electrolysis (galvanic action) from the use of dissimilar metals by forming a barrier coating, thereby excluding moisture and oxygen from the surfaces treated.

The application of **Lanomax lanolin** to the below water surfaces of the hull will aid in reducing hull friction, improving its glide through the water. Whilst **Lanomax lanolin** is not an anti-fouling, the waxy nature of the lanolin will reduce the adherence of marine growth making it easier to remove.

Application Details:

All surfaces should be clean and dry before application. Allow ~60 minutes for penetration of the Sierra's Lanomax product used and evaporation of the solvent carrier before use.

- **Voids and Ballast Tanks** – spray **Lanomax Lanolin** over all surfaces.
- **Hulls** - Thoroughly clean. Remove any loose flakes of paint, amrine growth and algae. Apply **Lanomax Lanolin** to the hull surfaces and into water intakes. Two coats are usually sufficient. Allow 3 to 4 hours between coats.
- **Engine Rooms** – apply **Lanomax Lanolin** to engines, power generators, batteries and terminals, tools and hoses.
- Use **Grease** on linkages and return springs.
- **Propellers** – thoroughly clean and then heat to ~ 85°C. Apply **Lanomax Grease** for maximum coverage and build up of film.
- **Outboard Motors & Stern Drives** – spray **Lanomax lanolin** over the entire powerhead & inside the cowling. Use **Lanomax Grease** on linkages, prop shaft and pivots
- **Winches, Cables, Anchors & Anchor Lockers** – apply **Lanomax lanolin** to prevent corrosion.
- **Hydraulic Fittings, Valves & Pumps** – **Lanomax lanolin** and **Lanomax Grease** will protect "O" rings & seals against perishing.
- **Control Cables** – to prevent corrosion cables should be soaked in **Lanomax Lanolin** prior to installation.
- **Fishing Equipment** – spray **Lanomax Lanolin** onto a cloth and wipe onto rods, reels and tackle to lubricate and prevent corrosion.
- **Timber** – spray **Lanomax lanolin** over the timber surface and allow to absorb. Any excess may be polished off using a cloth or lambs wool pad. The polishing will produce a smooth natural finish, enhancing the grain of the timber.
- **Aerials** - apply **Lanomax Grease** to connections, and apply spray to all other metal surfaces of aerials and fittings.



Automotive / Transport

Areas of Use:

- Mechanicals • Wheels & Hubs
- Chassis/Bodywork • Electrical
- Air Systems
- Hinges



Benefits:

Forklifts, semi-trailers, 4-wheel drives and many other forms of transport can all benefit from the use of Sierra's Lanomax's lanolin based products.

The products provide on-going protection from corrosion and lubrication in the harsh and often corrosive environments in which many of the forms of transport operate. They also provide an environmentally safe alternative to the traditionally used petro-chemical based products.

Application Details:

All surfaces should be clean and dry before application. Allow ~60 minutes for penetration the Sierra's Lanomax product used and evaporation of the solvent carrier before use.

Mechanicals – apply **Lanomax Lanolin** to all springs, twist locks and brake hardware. **Lanomax Lanolin** penetrates chains, wire rope and cables providing long lasting corrosion protection and lubrication.

Lanomax Lanolin applied to nuts and bolts will penetrate and prevent siezing.

Lanomax Grease (a light smear only) on linkages and to prevent squealing of drive belts and tensioners.

Chassis/Bodywork – spray **Lanomax Lanolin** on to chassis rails and the internals of body panels. The roof lifting poles of pop top taut liners may also be treated.

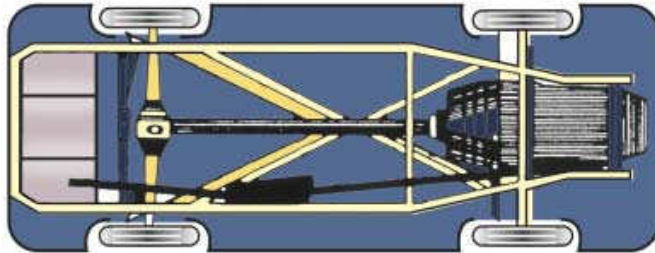
A light spray only should be used to protect and lubricate lock assemblies.

Vinyl, plastic and leather can be protected and rejuvenated by spraying on **Lanomax Lanolin**. Once the spray has dried and excess can be polished off to leave a shiny, protected finish.

Wheels Hubs – apply **Lanomax Lanolin** to protect and lubricate. Apply to bud stud wheels and washers prevents binding.

Electrical – spray **Lanomax Lanolin** onto control boxes, switch gear, electrical connectors, toggle switches alternators, generators and starter motors to prevent corrosion.

Air Systems – apply **Lanomax Lanolin** for lubrication of "O" rings and seals and protection of internal components against oxidation.





Timber / Woodwork

Benefits:

The application of Sierra's Lanomax products will prevent the drying out and splitting of timber. It will also water-proof the surface, thereby protecting it from rot. Wood treated with **Lanomax Lanolin** shows natural highlights and textures. Unlike synthetic wood treatments, **Lanomax Lanolin** is non toxic, and therefore may be safely handled or touched by humans.

Application Details:

1. General

All timbers are different and display differing rates of absorption, eg hardwoods are less absorbent than softwood such as pine. The moisture content of the timber will also affect the rate of absorption, which can lead to a patchy colouring of the timber. High levels of tannin and oily resins can also lead to this effect, so it is important that the timber is clean and dry before applying Sierra's Lanomax timber preservative products. If the timber has turned grey due to weathering, sand the surface to remove dead fibre

Lanomax Lanolin is best applied by spraying or, for decking surfaces, with a lambswool applicator, or by brush. Knapsack or garden pump type applicators are suitable when applying to large areas, such as in local parks.

Apply coats lightly and sparingly. Allow approximately 6 hours between coats.

NOTE - Lanomax Lanolin is compatible with most solvents, so thinning may be done with solvents such as thinners, mineral turpentine, white spirits or kerosene. Since the lanolin content in Sierra's Lanomax liquid is very high, it is advisable that it be diluted with solvent first. One part Lanomax to 2 parts solvent.

2. Seasoned and Kiln Dried Dressed Timber – Verandahs, decking, indoor & outdoor furniture

Apply **Lanomax Lanolin** to all endgrains, bearers, checkouts, end plates, bolts and drill holes before assembly. To maximize protection from moisture and help reduce any future warping, twisting, and splintering, spray all exposed surfaces.

Apply light coats of **Lanomax Lanolin** using a mist spray or ideally, a flat lambswool applicator. Remember to "**let the timber do the talking**" as the amount of coats you apply will depend upon the timber's absorption rate.

After the lanolin has fully penetrated into the timber and the carrier has evaporated, to avoid any tackiness, the timber must be rubbed or polished (eg: with dry toweling or similar polishing cloth) to seal the wax and maximise the protective seal, highlighting the timber's natural grain.

3. Rough Sawn Timber – General and major construction

Construction stage:

Liberally spray **Lanomax Lanolin** on decking, bearers, joists, end grains, checkouts, drill holes etc before assembly.

For base plates, large bearers (eg wharves and timber bridges) bollard capping and threaded rods and bolts use **Lanomax Grease**.

Lanomax Lanolin and Lanomax Grease can be easily combined to produce slurries that overcomes application problems in cold weather.

Finishing Stage:

Apply light coats of **Sierra's Lanomax** using a direct spray method to minimise overspray. Allow time for the lanolin to penetrate into the timber between coats



Electrical / Electronics

Areas of Use:

- Radios & Television Equipment • Alternators and Generators & BATTERIES
- Switchgear and Connectors • Electric Motors
- Electronic Equipment

Benefits:

Each year many thousands of dollars worth of marine and general electrical equipment is rendered worthless by corrosion. By taking a few precautions maintenance and replacement costs can be reduced whilst reliability and safety are improved.

Sierra's Lanomax's lanolin based products provide on-going protection from corrosion, verdigris creep, crystallisation and the effects of electrolysis (galvanic action) from the use of dissimilar metals by forming a barrier coating, thereby excluding moisture and oxygen from the treated surfaces.

Sierra's Lanomax's products have been successfully tested as a non-conductive insulation coating – tested to 70kV by an independent NATA certified laboratory.

Application Details:

All surfaces should be clean and dry before application. Allow ~60 minutes for penetration the Sierra's Lanomax product used and evaporation of the solvent carrier before use.

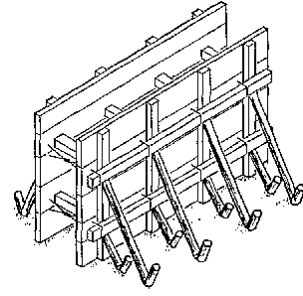
- **Radios and Television Equipment** – spray onto circuit boards & ECU's, aerials.
- **Switchgear & Connectors** – spray over all surfaces (light spray only).
- **Alternators & Generators** – apply to both the internal and external parts of alternators & generators.
- **Electric Motors** – spray onto armatures and housings to seal the surfaces.
- **Electronic Equipment** – spray circuit boards & ECU's.



Concrete Formwork

Areas of Use:

Formwork • Metal & Wood Moulds



Benefits:

Everyday in Australia many thousands of tonnes of concrete are poured on construction sites throughout the country. As part of these processes, vast amounts of formwork and moulds are used to ensure that the correct shape or design is obtained.

The use of the formwork or mould presents a major problem for the construction industry – how to ensure ease of removal once the concrete has set. In order to achieve this, the formwork or mould is sprayed with a release agent to prevent the concrete adhering.

Currently the release agents used are many and varied, but almost all of them have one common element – they are based on petro-chemicals. These petro-chemicals present hazards to both the users and the environment due to their toxicity.

Sierra's Lanomax provides the following benefits;

- Non-toxic, non-carcinogenic
- Bio-degradable and environmentally friendly
- Significantly extends the life of timber formwork – up to 4 times has been reported
- Metal moulds and formwork protected against rust and corrosion
- Smoother surface finishes can be achieved

Lanomax Lanolin is non-leaching and will not wash off with water. Therefore formwork can be coated and left in the rain before use.

Application Details:

All surfaces should be clean and dry before application. Allow ~60 minutes for penetration of the Sierra's Lanomax product used and evaporation of the solvent carrier before use.

Apply **Lanomax Lanolin** by spray using a knapsack sprayer. Apply as a concentrate or diluted up to 40:1 with diesel.

Metal Working

Areas of Use:

- Lathing of metal components
- Drilling
- Tapping
- Welding



Benefits:

Lanolin improves both on the quality of the 'cut' on a metals surface as well as preserving the cutting implement. By microfine lubrication, cutting implements such as drill bits/blades last much longer when used in conjunction with lanolin, as well as being protected from fine incidences of corrosion. Additionally the quality of the drilled surface is improved with cleaner, less jagged edges. So marked is the improvement, that drill bits have had their useful 'lifespan' improved by as much as 3 times longer. Additionally, the ease of the cut is vastly improved, especially noticeable when used on very thick or hard surfaces.

Welding spatter is almost eliminated when lanolin is thinly applied to the surfaces first. Excess lanolin harmlessly burns off, leaving a cleaner, smoother welded surface. Whilst there are many products on the market that do a good job of this too, no other product is non toxic, as in the case of lanolin.

Lathed metal components are generally smoother, with the swaging often removed in long 'strings' instead of fine 'chippings'. Again the cutting implements life span between sharpening is increased dramatically.

Tapping with lanolin leaves a finer, cleaner thread. Once again the cutting implement is preserved longer.

In all of these cases, lanolin leaves behind one very crucial advantage over other toxic alternatives; a protective coating that resists corrosion and preserves the work longer. Cleaner cuts, longer working life of cutting implements and corrosion protection – all from a natural and non toxic resource.

- Non-toxic, non-carcinogenic
- Bio-degradable and environmentally friendly
- Significantly extends the life of cutting implements
- Vastly improved cut (cleaner edges, walls or threads)
- Anti spatter for welding
- Corrosion protection from residual lanolin



Application:

In most metal working applications, the solid form of the **Lanomax Grease** is most desirable. In fact in any application that involves heat, the **Lanomax Liquid Lanolin** may ignite, causing a hazard. However in low temperature applications; such as tapping or lathing, the liquid form is more desirable from a 'ease of use' point of view.

Drilling

Liquid **Lanomax** lanolin may be applied to the drilling surface just prior to drilling when used in low speed applications. Where higher speeds are involved (ie higher temperatures), the sold form of **Lanomax lanolin** should be used. In these applications, simply apply a small amount to the tip prior to drilling. When drilling very thick or very hard metals, a second or third application may be required.

Welding

The use of lanolin as an anti spatter can be done in two ways. One is to lightly smear the **Lanomax Lanolin Grease** onto the surface to be welded prior to welding, or alternatively, if the surfaces can be sprayed an hour or two prior to welding, then a liberal spray of **Lanomax Lanolin** may be safely done. Once again in cooler climates the blending of both the **Lanomax Lanolin** and the **Lanomax Lanolin Grease** may be done to produce a 'slurry'. This slurry may then applied to the surfaces prior to welding.

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