Phosmatt *- Phosphating Process*

Vapormatt "Phosmatt" Phosphating System.

THE PHOSMATT PROCESS

The Phosmatt Process will apply the phosphate coating to previously dirty, greasy, scaled and corroded surfaces, removing the contaminants and starting the phosphate layer, all in one process. Even painted surfaces can be stripped and re-phosphated without added complications.
The Phosmatt process time required, including all surface preparation is half that necessary for the conventional phosphate stage alone in a normal dip method.
(Excluding up to five extra pre-phosphating stages for de-rusting, de-greasing and rinsing, which are necessary with conventional methods).

The Phosmatt Process is simple in principle. It uses a normal closed-circuit wet blast technique, as perfected by Vapormatt Engineers over many years, to simultaneously etch, de-grease, de-rust and de-scale the surface - leaving a very clean, chemically active surface which is totally unprotected from its surroundings. The Phosmatt Process uses a heated phosphate solution as the carrier for the blast media: chemical action immediately starts with the phosphate when the virgin, unprotected metal surface is exposed. Small, fast growing crystals result.

To continue the crystal growth, without re-blasting them away (once all the surface contaminants have been removed), the surface is further rinsed with phosphate solution alone, from a special nozzle. This produces the main build-up of the phosphate layer, a very fast build-up which in practice takes only the same time as rinsing the component to remove surface debris. With zinc phosphate, coating weights of 6 grms/metre squared can quickly be obtained.

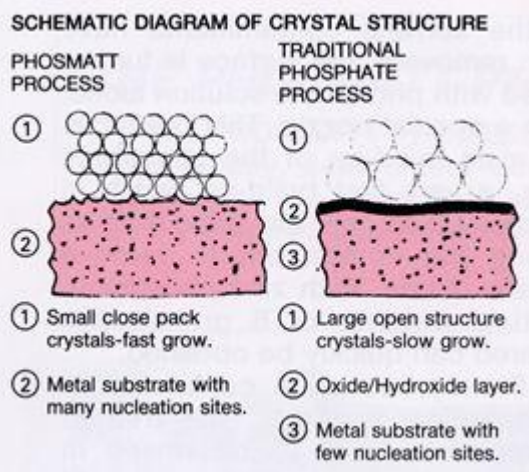
Finally, as with conventional phosphating methods, the treated components have to be rinsed in running water to avoid corrosion, and then dried. However, if a water-based coating paint is the next process, this is not necessary.

Phosmatt Process

Advantages

- Much quicker process - minutes rather than hours.
- No pre-treatment required (No separate degreasing, de-rusting, or cleaning is necessary).
- Considerably less space required.
- Less energy and phosphate solution consumed: all solutions kept in thermally-insulated closed surrounds.
- Less water used.
- Phosphate solutions are automatically filtered to remove flock and other contaminants.
- Only simple ventilation is required, unlike open tanks in conventional systems.
- Environmentally safer process.
- Solutions are auto-electronically monitored, giving high quality control.
- Re-phosphating of selected areas, without stripping whole component, can be achieved.

The Phosmatt Process is suitable for automatic or manual operation, dependent upon the quantity, form, size and variety of components to be processed.



The Phosmatt Process produces many close packed crystals which adhere directly onto the metal substrate.

This gives a far more corrosion and shock resistant coating than the larger, less well adhered crystals which are formed using traditional processes.

Typical Applications Of The Phosmatt Process

1. Removal of old paint and substrates from ordnance and engineering components, then re-phosphating.
2. De-scaling of metal billets, wire, rod, tube then phosphating prior to cold extrusion or drawing.
3. Oil and scale removal from metal parts, then phosphating to improve adhesion of paint.
4. Cleaning and phosphating of transmission components and sliding engineering parts, to provide or assist lubrication.
5. Cleaning and phosphating of metal parts to provide a corrosion-free surface layer.
6. Preparation of surface to provide very high rubber-to-metal bond strength.

Typical applications of the Phosmatt Process.

VAPORMATT REPORT

PHOS*MATT* - An Alternative Phosphating System

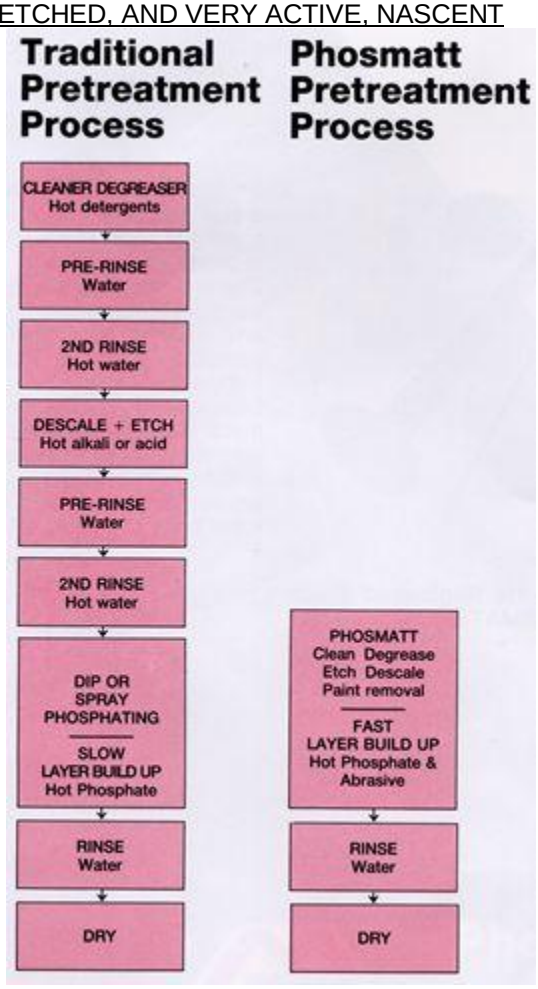
The Phosphating of steel surfaces has long been recognised as an excellent pre-treatment for painting, coating, or bonding. The chemical interchanges are fully understood and the materials available are sophisticated, easy to use, and their sales are backed-up by high standards of expertise and technical support.

However, the methods of applying the chemicals have changed little over the last 50 years, so that for most companies, this still means that a long series of immersion or spray operations are necessary to clean, degrease, etch, phosphate, neutralise, rinse and dry. In many instances, up to 12 separate operations are necessary.

There is however a system which offers IN A SINGLE OPERATION - simultaneous degreasing, cleaning, etching, and phosphating. In most cases the ONLY additional stations are a post-phosphating rinse and drying. The savings in space and time can be spectacular. The system is called PHOSMATT.

THE PHOSMATT SYSTEM

It has long been accepted that wet-blasting is an effective preparation for phosphating, since it is environmentally friendly and produces a CLEAN, ETCHED, AND VERY ACTIVE, NASCENT SURFACE. Provided no delay occurs between wet blast cleaning and phosphating, then excellent results are achieved.



It follows therefore, that if delays were reduced to nil, results should be even better. By adding the correct mixture of chemicals to the water in a wet blast system, the conditions for immediate application of chemical to the nascent surface are achieved.

Blasting takes place at pressures of up to 80 p.s.i. and the surface is bombarded by a fast-cutting grit, water containing the chemical mix, and compressed air. As the surface is cleaned and etched, the chemicals, already in contact, react to begin the formation of phosphate crystals. Obviously if blasting at high pressure continues, then the crystals would be constantly removed and replaced, but by moving the blasted surface out of line of direct impingement, or by reducing pressure, the crystals develop to form a complete coating. At this point, chemical reaction ceases and the coating is complete.

Coatings are applied very quickly - often in seconds. The rapid build-up and violent agitation produces a fine-textured, very dense coating, giving excellent bond strength and highly effective "creep" protection.

COATING TYPE (BS 3189)				
TYPE	APPLICATION	METAL ION	COATING WEIGHTS (g/m2) MIN	MAX
1a	Protection under sealants wear resistance	Fe (Iron) Mn (Manganese)	7.5	—
1b	Protection under sealants cold extrusion	Zn (Zinc)	7.5	—
2	Paint base wire and tube drawing	Zn (Zinc)	4.5	7.5
3	Paint base	Zn (Zinc)	1.5	4.5
4	Paints base	Fe (Iron)	0.2	1.5

LIMITATIONS

No process caters for every possibility and although Phosmatt is adaptable and versatile, it has its' weaknesses.

Difficulty can be experienced if complex components are involved, since abrasive grits can be trapped in fine holes - particularly threads or blind holes. Finally, when heavy primary scale is present, the system may prove to be too slow and the build-up of removed scale can be detrimental to the chemical balance.

EQUIPMENT

Generally speaking, the equipment is similar to that used in conventional wet or vapour blast cabinets. Because of the chemical element, stainless steel or coated steels are used throughout.

Manually operated machines are not very practical because of the relatively high temperatures, but simple machines of this type are available. More practical and useful are tumble blasting units, conveyorised or through-flow machines, and a variety of rotary table types. However, the majority of the Phosmatt machines supplied to date would be considered custom-built or designed for a specific range of components.

Vapormatt 1217 Phosmatt Barrel Machine.

Vapormatt 1210 Phosmatt Tumble Barrel Machine.

Filtration is an important feature of Phosmatt equipment and use is made of a wide range of techniques. A free-standing filtration tank is used to provide the control and management of the chemical balance. Slurry from the blast / phosphate station passes through a centrifugal separator which removes the blast media (grit). The liquids pass on to the filter tank where re-heating takes place and where sensors detect and indicate the need for fresh chemicals. These are injected by a metering system so that the correct balance is always maintained.

Phosmatt filtration and chemical re-heating tank.

Waste products including ; oil, grease, fine oxide particles, broken-down media, and chemical by-products are constantly removed as the liquids pass through a moving bed filter unit equipped with a paper roll filter.
The entire process and management systems are programably controlled.

CONCLUSIONS

1). **Phosmatt** offers an alternative method of applying phosphate coatings.

2). **Phosmatt** offers degreasing, cleaning, etching, phosphating in a single operation.

3). **Phosmatt** uses conventional, proven chemicals throughout.

4). **Phosmatt** saves space, time and energy.

5). **Phosmatt** provides superlative coatings, while reducing environmental health hazards.

For Further Information please contact:-

Vapormatt
Monarch Centre,
Venture Way,
Priorswood Industrial Estate,
Taunton
Somerset,
U.K,
TA2 8DE

Tel: +44 (0)1823 257976

Fax: +44 (0)1823 336446

E-mail: sales@vapormatt.com

Web: www.vapormatt.com