

Anti-Corrosion Protective Systems For Walk-Behind and Ride-On Electric Pallet Trucks

**The Raymond Corporation
Greene, N.Y.**

RAYMOND
Above. And beyond.®

The Raymond Corporation provides the industry benchmark in anti-corrosion protection for electric pallet trucks by employing the latest protective technology—the foundation of this being the galvanization process. While there are multiple kinds of galvanization, such as “electro-galvanization” and sprayed zinc protection, Raymond uses “hot dip” galvanization. This is where the truck is dipped in a bath of zinc, heated to 830 degrees F, forming the most durable of all galvanized coatings for electric forklifts. Forming this physical barrier provides maximum resistance to harsh environmental factors.

Anti-corrosion protection systems target the metal parts that protect three key areas of the pallet truck: (1) structural metal parts, (2) electrical and electronic components, and (3) the joints inherent in lifting mechanisms. Galvanization completely coats both the outside and inside frame metal surfaces, strongly adhering (3600 psi) to the surface. However, if all three key areas are not effectively addressed, one of them becomes “the weakest link”, and truck failure, with downtime and costly repairs, becomes the consequence. While environments where trucks must be washed daily to meet FDA requirements are a main market for this process, any environment where corrosive elements, either in the ambient environment or in the cleaning process, are candidates for this state-of-the-art anti-corrosion protection system.

The first of these three systems, galvanization, however, is not pure science, and while all galvanization houses aspire to provide the best coating, only a few succeed, because it is in the art of the process, that quality, both in appearance and in durability, comes through.

After several years of research, Raymond has teamed up with Valmont Industries, Inc., which is the largest, and in our estimation, the most sophisticated galvanizing house in the world. The operative word is “teamwork”, because in order to achieve optimal results in the galvanization process, the product manufacturer must provide a product designed and fabricated to maximize the protective qualities of the galvanic surface. With guidance from Valmont experts, Raymond manufactures our products to the following criteria to ensure the even galvanic coating of the steel:

1. Specialized component design resulting in:
 - A. Truck part design facilitating venting (heat dissipation) and drainage.
 - B. Drainage holes to eliminate “puddles” of zinc on truck parts.
2. Steel composition of truck parts with a uniform silicon level resulting in:
 - A. Long, durable life of the coating.*
 - B. Uniform, pleasing aesthetic appearance to the product.



3. Meticulous post-fabrication surface preparation resulting in:

- A. Components free of silicone contaminants.
- B. Weld and joint finishes smooth, even and clean.

A good, uniform surface appearance and superior protection are far from accidental, so, for its part, Valmont maintains absolute, rigid control over all segments of the coating process:

1. Cleaning – a multi-bath cleaning process with rigid controls over:

- A. Bath chemical composition.
- B. Bath temperature control.
- C. Cleaning solution drainage.

2. Coating – a “ Hot dip” zinc coating process using:

- A. Premium “High Grade” source zinc with 0.03% (Pb) or less.
- B. Uniform “Spangle” or surface-coating crystallites which are highly dependent on proper: aluminum content, particulate size and cooling controls.
- C. Coating thickness for Raymond product held consistently to 4.5 mils, which is optimal within the 3.9 mils to 5 mils range recommended for structural steel.

3. Drainage and cooling – a process ensuring even zinc adherence to metal

- A. Dipping tank large enough to fully accommodate components.
- B. Hanging racks and hanging expertise which avoids zinc “pooling” and uneven heat dissipation.

4. Post dip surface finish – meticulous inspection and hand finishing of product to remove any process blemishes and inconsistencies

For the “rest of the story”, Raymond focuses on the two other areas of the truck that are highly susceptible to rust and corrosion in wet and corrosive environments: the electrical and the lift linkage systems.

Beginning with measures applied to the electrical system, Raymond uses both fabricated devices and state-of-the-art technology protection to minimize possible water penetration during wash down or in corrosive environments:

1. Plastic/metal covers are fabricated and placed over/around sensitive components to protect them from water or brine splash.



2. Raymond uses, as standard, state-of-the-art, water-tight wiring harness connector technology instead of water-repellant silicone gel.

A truck undercarriage may be exposed to an ambient corrosive environment, or wet cleaning processes, with the result that the lift system linkage joints become the next “weakest link” in the system. Raymond uses components designed with technology applicable to construction and military equipment in the pins and bushings which join together the pull rods, the wheel forks and other lift linkage system components. To complete the protective “system” begun with frame galvanization, Raymond uses benchmark technology in the system:

1. Pins – are either nickel-plated or custom-made stainless steel to combat rust and corrosion thereby resisting joint “wallow-out” and costly repairs.
2. Bearings (or bushings) – unlike conventional greaseable bearings, have bearing surfaces that are not steel, but a special, totally rust-resistant, poly composition, the perfect companion to the special rust-resistant pins.

Electrically powered pallet trucks are complex pieces of equipment and when they operate in environments where they are subjected to caustic solutions, brine, and cold, it is critical that they be well-protected to minimize costly down-time and repairs. Raymond’s solution covers the three areas most susceptible to corrosion and damage: steel, electrical and lift system components.

With our selection of Valmont Industries Inc., the world leader in galvanizing processes; electrical component shields and water-tight wiring harness connectors; and leading the industry standard in nickel/stainless steel pins and composite bushings; Raymond has established the industry benchmark for a corrosion protection system for electrically powered pallet trucks.

The benefits to our customers are clear, and testimonials and repeat purchases attest to the validity of our products:

1. Extended product life in environments where wash down is required.
2. Significantly reduced lift linkage component wear.
3. Reduced downtime due to repair caused by rust and corrosion.
4. Overall lower cost of ownership.

Through our dealers, we welcome your interest and inquiries of the *Raymond*® line of electric pallet trucks available with this state-of-the-art corrosion protection system. Or please visit us at raymondcorp.com to experience a video record of this system and to request more information.

*Note: The Raymond Corporation implies no warranty or expression of fitness for use of any *Raymond* product undergoing a galvanizing process other than those expressly granted in the specific Raymond product warranty. Galvanization is a coating applied to base metal used in the fabrication of trucks. Truck life span will be affected by application, maintenance, component life, etc., and the potential service life of the truck should not be inferred to be equal to the service life of the galvanized steel.



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