

# POLYFLAKE®

Engineering corrosion prevention  
solutions for new and existing  
equipment, pipes, tanks, pools &  
more.



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### Company history

- The core business, developed since 1989, provides coating technologies to combat corrosion and abrasion in new and existing machinery and plants.
- The Headquarters of the Company, located in Miami since 2007.
- Today, POLYFLAKE LLC provides specialized services to the Maritime Industry and, via our Partners to the and Water sectors. Mega- Yacht, Oil & Gas, Chemical



### Our Customers



### The POLYFLAKE Group

- POLYFLAKE LLC  
Miami - United States of America

### POLYFLAKE production centers:

- United States of America





# Turn-key Projects

POLYFLAKE project is performed using advanced, specialized equipment and tools for:

- Removal of existing treatments.
- Surface preparation.
- Application of POLYFLAKE® Coating Systems Resin, or Customer's products.
- QC & testing of surface preparation, and coatings.

The Turn-key Project includes:

- Expertise and customized technical solutions.
- Management and logistic.
- Materials, and consumables
- Equipment, tools and instruments.
- Skilled labor.
- Quality control.





## **POLYFLAKE® Specialized Resins System** for aggressive environments in the maritime, oil & gas, chemical, water, and wastewater industries

### **POLYFLAKE® Base materials bonding range**

Coating system Resins can be applied on a wide range of base materials, with minimal changes to the coating performances:

- Cast Iron
- Carbon steel
- Bronze
- Aluminum
- Aluminum brass
- Stainless steel
- Copper
- Copper nickel alloys

And a variety of surfaces as:

- GRP
- Concrete
- Rocks and woods
- Some Plastics

### **POLYFLAKE® Family and grade selection**

POLYFLAKE® Engineers select the base resin to be resistant to the Customer's environment in which the lining or coating is going to operate.

The selection depends on the following main factors:

- Corrosion environment
- Operating temperature
- Mechanical considerations
- Application conditions

## **Application fields**

### **Marine Industry**

Hulls - Decks - Rudders - Rudder Skegs – Cooler End-Covers – Condenser End-Covers - Flanged Pipe Systems - Turbo Cooling Pipes - Propellers – Propeller Housings - Heat Exchanger - Bow-Thruster Housings - Multi-Stage Saltwater Pumps - Oil Cooler Covers - Sewage Tanks – Water Tanks (FDA Approved) - Kort Nozzles - Sea Strainers - Internal Piping - Butterfly, Gate and Ball Valves - Exhaust Housings - Sheet Pilings – Whirlpools - Pools.

### **Chemical Process Industry**

**Pumps - Blowers - Storage Tanks - Pipe Systems - Bottom-Plates - Centrifugal Fans and Housings - Smoke Stacks - Ozone Tanks - Butterfly, Gate and Ball Valves.**

### **Sewage Purification Plants**

Water Box Covers - Pipe Systems - Sewage Pumps - Valves - Valve Cage – Cooling - Pumps - Basins - Tanks - Trenches - Concrete Tanks and Lining of Concrete Pipe Systems - Ozone Tanks - Digester Interiors - Clarifiers - Rake Assemblies - Catwalks.

### **Water Treatment Plants**

Butterfly, Gate and Ball Valves - Pipe Systems internals (large and small diameter) - Water Storage Tanks (FDA Approved).

### **Power Station / Hydro Station**

Water Boxes - Cooler End-Covers - Impellers - Centrifugal Pumps – Main Condenser Doors - Multi-Stage Pump Bowls - Vacuum Maintaining Pumps - Tube Plates - Penn Stock Interiors.

### **Transportation**

Railroad Hopper Cars - Truck Chassis Containers - Container Platforms – Cask for Tankers (also for food transportation, FDA Approved).





### POLYFLAKE's Lining Solutions

Anti-corrosion coating and GRP lining of pipes  
In-shop and on-site

**POLYFLAKE's Lining Solutions** creates a resistant liner, strongly bonded to the inner wall of new or old pipes; the liner extends on the flange's face, or to the exterior of the pipe-end when sliding joints are used, creating a continuous barrier to the corrosion.

Application techniques vary depending on the size and shape of the pipe.

**POLYFLAKE** provides:

- Guidelines to help the piping designer to create spool of pipe "optimized for coating".
- Suggests the combination of procedures, materials, tools, and equipment most suitable for each application.
- Provides estimates and the "Turn-Key" application to the Customer's piping system.

**POLYFLAKE Standard Lining System**     **POLYTUBE® Reverse Lining System**

are complementary technologies to efficiently solve the 100% of the pipe lining issue;



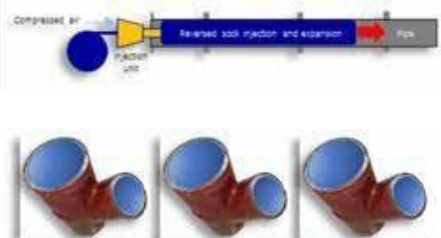
#### **POLYFLAKE® Standard Lining System**

- Suitable for pipes starting from 2", with no practical upper limits.
- Is the most suitable for complex pipe spools (3÷6m length – 10'÷20') including elbows, adapters, tees, weldolets, etc.; generally needs the disassembly of the spool of pipe from the line.
- The **POLYFLAKE® Coating System Resin**
- is applied by filling and rotation, by brush, roller, centrifugal spray, and airless spray equipment depending on pipe size and shape.



#### **POLYTUBE® Reverse Lining System**

- Ideal solution for pipe diameters from 2" to 12" on medium and long pipe lengths; works also in presence of more 90° elbows, and tees.
- The application is fast, up to 100m pipe in a single operation, injecting into the pipe the GRP sock that polymerize in place bonding to the internal pipe wall.
- Minimizes the disassembly of the pipes; it is only necessary to create the space to insert the liner injection unit and a minimal place on the other end of the pipe.



#### **POLYFLAKE's Lining Solutions**

is a "Turn-key" service that includes:

- The pipe surface treatment.
- The anti-corrosion **POLYFLAKE® Coating System Resins**, and **POLYTUBE®** materials.
- The application equipment and tools.
- The test instruments for the validation of the application.
- The expert Applicators Teams.



## Whirlpool Restoration in Situ.

Warranted performance up to 24 Months from application date.  
Emergency restoration can be performed in service with minimal impact to the passengers.





## Reconditioning of hydraulic cylinders for the maritime and Industrial sectors

POLYFLAKE® LLC, since 2014, provides the reconditioning of hydraulic cylinders with operating pressure up to 350bar (5,000 psi) and over. POLYFLAKE® cylinders overhaul program includes:

- Unit pre-inspection.
- Cylinder disassembly and checking including:
- External conditions and corrosion evaluation.
- Rod and body sliding surface check.
- Check of piston and rod bushing, sliding rings, and lip seal status
- Oil-ports check.
- Check of body and rod mechanical connections.

A detailed report is issued to the Customer for decisions before to proceed with any further repair.



The cylinder reconditioning includes, as appropriate:

- Body honing.
- Rod plating or replacement.
- Replacement of piston, rod and body sliding guides, seals, and lip seals; replaced parts are from primary suppliers or original manufacturers depending on availability or Customer request.
- Cylinder body side and rod side mechanical connections are renewed, reconstructed or replaced.
- Oil-ports rebuilt.
- Cylinder body is sandblasted and painted in the original color or coated with the POLYFLAKE Coating System Resin, to face aggressive environments as on weather deck application..

After the final assembly, the unit is pressure tested at 1.5 x Design Pressure,







## POLYFLAKE® Hydraulic & Mechanical Service Dept.



### Hydraulic cylinders range

- Cargo Access Equipment
- Cranes and davits
- Embarkation platforms
- Shell doors
- Ramps
- Elevators
- Car decks

The overhaul of hydraulic cylinders needs professional equipment to guarantee the disassembly and reassembly without damages to the unit



### POLYFLAKE® LLC is the Cruise market Agent for NE-SEAL

- Mechanical Seals
  - New supply
  - Seal reconditioning
- Spiral Wound Gasket for high pressure and temperature application (steam service)
- O-ring's'
- Sliding rings
- Lips seals
- Mechanical packing
- Gasket supply and custom cutting



POLYFLAKE's cylinder bench can handle units up to:

- Maximum length – 26' (7.9m); base unit extension for longer cylinders is available.
- Maximum diameter – 22" (509 mm)
- Available torque - 40,000 lb./ft. (5,532 kg/m)
- Rod extraction force - 7 Tons



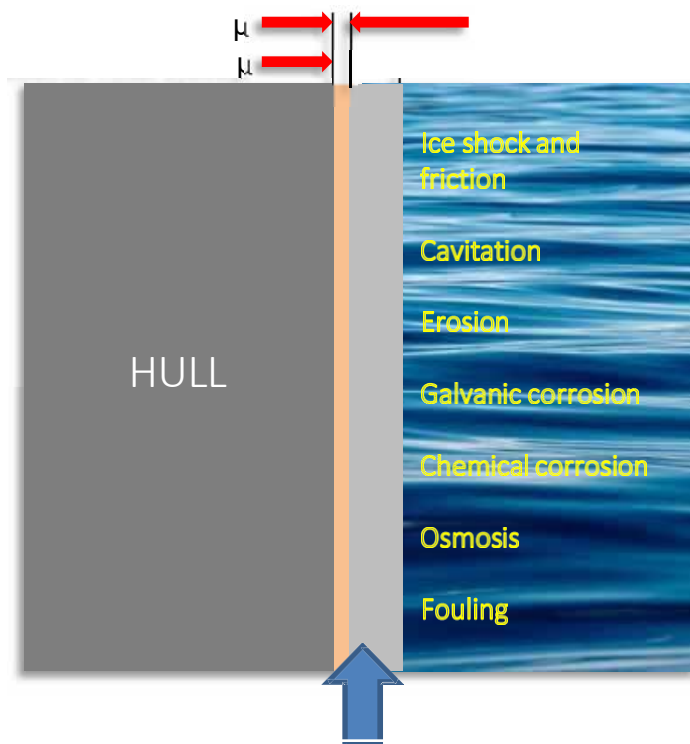
### Hydraulic cylinders are pressure vessels!

After ten years from the first installation and then at regular intervals of not over 10 years, the cylinders, like any other pressure vessel, need to be inspected, bolts and seals must be replaced, and the unit submitted to the pressure test, to demonstrate its structural integrity.





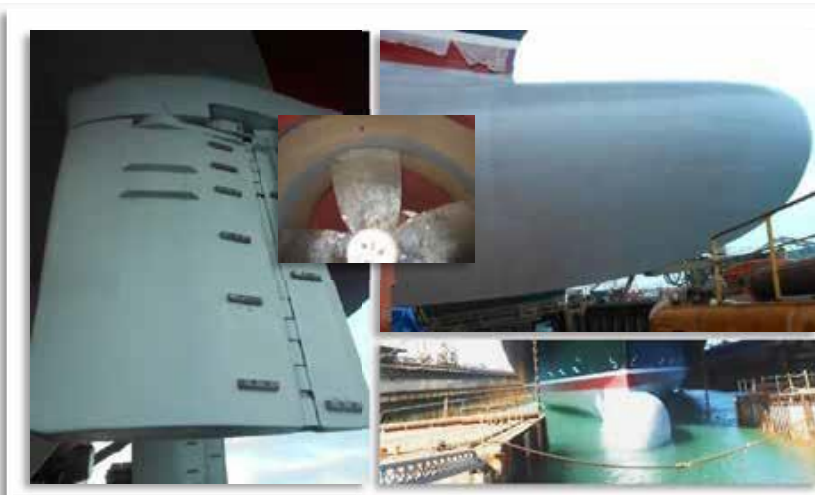
## POLYFLAKE® Underwater Hard-Coating Systems Lloyds register approved



### Case History

The first application of POLYFLAKE® Hard-Coat on the submerged hull, dated 2008, has permitted to repair large areas of the original coating on cruise vessels Disney Magic and Dream.

- During the periodical hull cleaning, the POLYFLAKE® Underwater Hard- Coating Systems shown, in respect to the original coating, a lower biological growth, a glossy efficient surface, easy to clean and resistant to the cleaning action without damages, no blisters, and a perfect adhesion to the hull. Savings on fuel has also been reported.
- The areas of application have been then extended to the whole hull and rudders.





## POLYFLAKE® Hydraulic & Mechanical Service Dept.

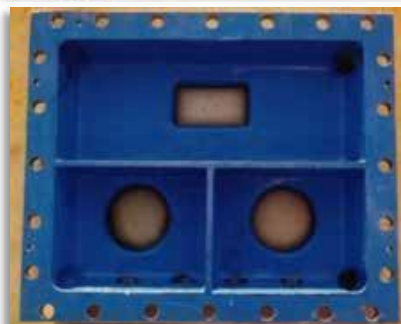
### Reconditioning of pumps and machinery for the maritime and industrial sectors

#### Turn-Key Service

**POLYFLAKE®** provides a complete **machinery overhaul** service entailing:

- Machinery dismantling.
- Condition evaluation and reporting.
- New parts manufacture, line boring, fitting, turning, etc.
- Surface reconditioning via honing, polishing, metal deposition, and galvanic treatments.
- Surface reconditioning by honing, polishing, metal deposition, galvanic treatments or shot blasting.
- Rebuilding and protection with POLYFLAKE® Coating System Resin.
- Dynamic balance.
- Workshop test, spark test, pressure test, electrical Insulation, etc.
- Class Survey and Certification if necessary.

Full QA Documentation and Certification according to ISO9001:2010.



#### Accurate and comprehensive reporting





## Deck and Superstructures Refurbishment Solutions Surface Preparation and Anti-corrosion coatings

POLYFLAKE®'s "Deck Refurbishment Solutions" is based on proven procedures and advanced equipment.

The "Turn-Key" Scope of Work includes:

- The removal and demolition of the existing deck treatment
- The steelwork repairs
- The surface preparation
- The application of the POLYFLAKE Coating System hi-tech resins or of a Customer products)

POLYFLAKE's service provides:

- Evaluation and estimate
- Organization
- Management
- Working Teams
- Supply of materials and consumables
- Specialized equipment for hi-speed/hi-quality:
  - Surface treatment removal
  - Steel repairing works
  - Surface preparation
  - Anti-corrosion coating application
- Instruments for the check of the anti-corrosion barrier integrity.



POLYFLAKE® pursues the continuous improvement of the technologies for the corrosion protection; results are:

- Works on-schedule,
- Long lasting performances.

POLYFLAKE® applies pollution free blasting technologies.

- Closed loop shot-blasting self-propelled units for the fast and accurate preparation of large deck areas.
- Vapor-blasting in critical areas.



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