



# Fivealloy™ Plasma Spray Coating





## Advanced Compressor Rod and Cylinder Repair Technology

With more than 25 years of proven performance, the original Fivealloy™ coating and plasma spray process, supplied exclusively through CPI, part of the Howden group, is an ideal method for repairing compressor piston rods, cylinders and cylinder liners to better-than-new condition and in many cases as an alternative to replacement where the component could not be otherwise repaired. CPI can also provide new components coated with Fivealloy™ to safely extend the life of each product.

Developed to withstand some of the most severe conditions in the oil and gas industry, Fivealloy™ offers superior performance to tungsten, stainless steel and chrome.

Through its unique material formulation and advanced plasma application technology, the Fivealloy™ process results in superior wear resistance, friction characteristics and oil-holding capacity, even in sour gas, high and low pressure applications, and with marginal or intermittent lubrication.



### What is Plasma Coating?

Although it conducts electricity, plasma is electrically neutral. When gas passes through the electric arc, it loses one of its electrons and becomes hot plasma. Powder material is introduced into the plasma stream, becomes molten and is projected against the surface being coated. When individual particles impact against the surface, energy is transferred to the substrate. This energy produces forces that cause plastic deformation of the particles and the surface area, creating interatomic bonds. Plasma sprayed materials can be sprayed onto virtually any prepared surface. Normally, this preparation requires special grit blasting to roughen the surface and remove surface contamination after primary degreasing and/or cleaning.





The Fivealloy plasma coatings are recommended for applications where the durability of your rods, packing, rings and cylinders are important. Improve your plant's reliability and longevity with our plasma coatings.

## Fivealloy™ Plasma Spray Coating

### A Superior Process

The proprietary Fivealloy™ process was developed to overcome limitations with other plasma spray materials, which were difficult to use, quick to wear out or created operation problems when put into service. Over the course of 14 years of research and testing, the Fivealloy™ material was refined to provide a unique combination of characteristics:

- Exceptional durability— Resists sour gas, extreme temperatures and high pressures
- Low coefficient of friction— Reduces damage to packing cases, piston rings and rider bands
- Oil-holding capability— Reduces damage to components in case of lubrication failure

Today, Fivealloy™ is the preferred coating material for compressors experiencing rod-packing problems, for extending packing life and for sour/acid gas applications.



## Technical Details

### Common Applications:

- Compressor piston rods, new and recoated
- Cylinders

### Operating Capabilities

TEMPERATURE	Up to 500°F (260°C)
PRESSURE	Up to 5,500 psi (380 bar)
BOND STRENGTH	4,700 psi
HARDNESS	RC-45
INSIDE DIAMETER COATING	2.5" to 38" (63.5mm to 965.2mm)

# CPI Western Canada Service Centers Capabilities:

## COMPRESSOR PISTON RODS

- Five-Alloy™ premium rod finish
- Manufacture
- Reconditioning
  - Polishing
  - Tungsten carbide thermal spray
- Exchange rods for most compressors
- Thread rolling

## COMPRESSOR PISTON & RINGS

- Manufacture
  - Aluminum, cast iron, steel
  - Anodizing
  - Modifications to ring/rider design
- Piston rings
  - PTFE
  - Thermoplastic
  - PEEK
- Rider ring/bands
- Packing case manufacture

## COMPRESSOR CYLINDER RECONDITIONING

- Liners and sleeves
- Thermal spray
- Honing
- Re-sleeving

## SPRAY TESTING

- Standard testing for adhesion or cohesion strength of thermal spray coatings

## CROSSHEADS & CONNECTING RODS

- Rebuild/polishing
- Reconditioning/re-bushing
- Thermal spray
- Aluminum babbitt

## COMPRESSOR ROD PACKING

- Supply packing
  - CPI (France) packing
  - Wide selection of materials
  - Access to design engineering
- Packing case overhaul
- Packing case manufacture
- Manufacture

## COMPRESSOR VALVES

- Reconditioning of all makes
- Manufacture for all makes & models
- CPI Hi-Flo™ valves
  - Hi-FLo™ RS (Replaceable Seat)
  - Hi-FLo™ VP (V profile)
  - Hi-FLo™ RD (Radiused disc)
- Replacement parts

## LUBRICATION FIELD SERVICE

- Compressor lubrication products
- Complete system design and installation
- Field service / PM

## COMPRESSOR FRAMES

- Align bore
- Manufacture and repair coupling hub

## LARGE BORING CAPABILITY

- TOS Varnsdorf WHN(Q) 13 Universal CNC machine with 15- ton crane capacity

## ENGINEERING SERVICES

- Valve dynamic calculations
- Compressor capacity curves
- Valve performance optimization
- Finite element analysis of all manufacture components
- Field service/PM

## ENGINE BLOCK MACHINING

- General machining
- Decking for combustion face
- Thread repair and inserts
- Liner fit repair
- Field liner fit machining and installation of SS sleeves

## PLANT EQUIPMENT REPAIR

- Pumps, fans, shafts, gear boxes
- Flange facing vessels and bottles
- Seal fits
- Flame spray
- Base plate machining

## WELL SERVICE FLUID ENDS

- Plungers manufacture & reconditioning
- Plasma & flame spray
- Fluid end recondition

## Contact Info

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CPI, part of the Howden Group, is an industry-leading manufacturer of precision engineered components for reciprocating compressors used in petrochemical, refining, natural gas, and offshore industries. The CPI product range includes packing, piston and rider rings and a complete line of compressor valves designed to provide each customer with maximum performance and reliability for their application. In addition, CPI offers the highest quality lubrication system technology for further compressor efficiency and protection.