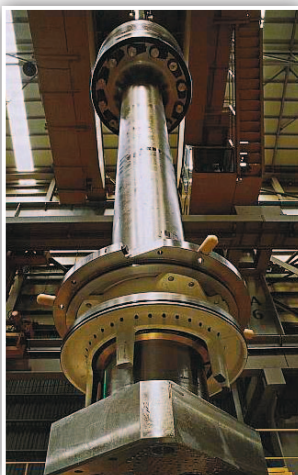


Two-stroke marine diesel engines operate without a dedicated lubrication system. This mechanical fact causes rapid wear of the piston rods.

Aludra's engineering department has developed a new surface coating that strengthens the piston rods with a shield-like, durable surface layer. Once applied, this coating will ensure a greatly extended, care free life span of two-stroke marine diesel engines.



Aludra has developed an innovative coating (+ applying process) to make piston rods more wear resistant and perform longer under extreme conditions



FACT: NO MEASURABLE WEAR

Aludra's newly engineered, two-stroke piston rod coating has been successfully used to recondition UEC-85-LS, RTA 76 and RTA 58 types of piston rods. During a long term study, piston rods (processed by Aludra) were put to use in several Sulzer RTA-84 engines. Since then, the piston rods have been in service for more than 30 thousand running hours (often under extreme load capacity). They are still without any measurable traces of wear.

LET'S START WHERE IT COUNTS: RIGHT AT THE SURFACE!

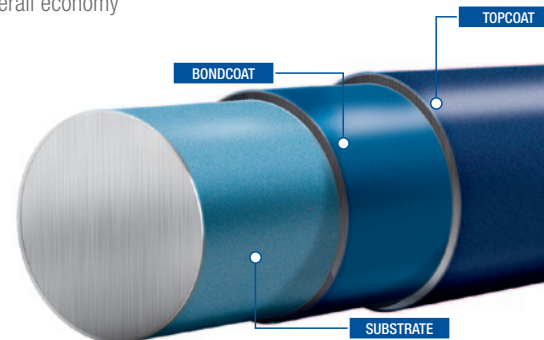
With Aludra's engineered coatings, advanced spraying technology and pre- & post machining facilities you can count on:

- Improved micro hardness (DPH100>600)
- Improved surface resistance
- Improved abrasive and adhesive resistance
- Improved topography
- Decreased friction coefficient (no stick slip)
- Minimal wear on stuffing boxes
- Decreased oil usage

ALUDRA'S SURFACE ADDED STRENGTH

Ensure yourself of a great return on investment, with a solid pay back in terms of:

- Longer lifespan
- Reduced maintenance (down time & costs)
- Increased lead times
- Improved durability & sustainability
- Improved overall economy



IN HOUSE PRE- AND POST TREATMENT FACILITIES

Aludra's total surface treatment services include an experienced machining department which is fully equipped to perform all pre- and post machining activities such as turning & grinding, super finishing & lapping, drilling, milling and boring.

ENHANCEMENT OF UNDERSIZED OR WORN PARTS

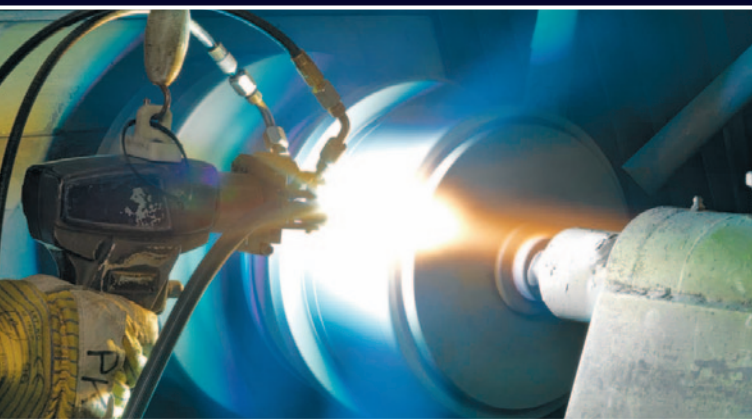
One of Aludra's money saving specialties is the treatment of undersized or worn parts with a variety of enhancement techniques such as (computer guided) plasma spraying.



AT YOUR SURFACE! FOR MORE THAN FORTY YEARS

As a - former - division of Stork Industries, Aludra started in 1968. Since that time the company build to a leading position in the field of surface treatment technology, appliance and consultancy. Aludra currently operates independently and is staffed by ± 30 enthusiastic and professional employees. The technicians are trained comprehensively in order to achieve an unparalleled level of consistent quality that will safeguard Aludra's position at the national and international top of sustainable surface treatment specialists.





EXTENSIVE THERMAL ENHANCEMENT SPRAYING KNOWLEDGE AND TECHNIQUES

For over forty years Aludra is specialized in the lifespan improvement of a wide range of mechanical parts used in most (production) industries such as Petro/Chemical, Power Generation, Oil & Gas, Marine, Automotive, Aerospace, Dredging, Food, Hydraulics, etc..

Part of Aludra's services consists of the appliance of a protective coating by means of several thermal spraying methods. With these techniques the protective coating particles are converted to a semi molten phase, using temperatures up to 15.000° C and then accelerated to the substrate with velocities up to 1.500 m/sec.. As only the injected coating particles are heated, the subjected machine part will not exceed temperatures over $\pm 125^{\circ}$ C and will therefore not undergo structural changes.

THERMAL SPRAYING PROCESSES UP
TO $\varnothing 2000^* 180000$ MM

AWS Arc Wire Spraying

APS Atmospheric Plasma Spraying

CPS Combustion Powder Spraying

HVOF High Velocity Oxygen Fuel



TYPES OF 2-STROKE PISTON RODS

RTA 58 UEC 85 LS

RTA 62 S 50 MC

RTA 72 B&W 80 GF

RTA 76 RND 90

RTA 84 RND 68 M

RTA 84T MAN 90/160

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- advanced thermalspraying technology
- specially developed engineered coatings
- extensive in house machining facilities

- objective consulting and advising
- single parts or high volume production runs
- new construction or repair possibilities

- trough sand deflectors
- worm gear pump spindles
- dairy valves
- 2-stroke piston rods
- exhaust manifolds