

The next generation:

# Automotive-compliant eNiP coating system

**Enayati is setting new standards with the development of a new eNiP process, an electrolytically deposited, measurable and reliable nickel-phosphorus coating system.**

The basis for the development is the well-known NiP surface coating, which has been further developed by Enayati into an automotive-compliant and optimally applicable coating system in strip finishing on series production plants.

It is used in contact materials and can usually substitute precious metals such as gold (AuCo 0.8 µm) and palladium (PdNi 0.65 µm). The coating system is composed of nickel (Ni matte), nickel-phosphorus (NiP) and a nanoscale layer of gold (AuCo flash), and greasing, as an option.

User-specific adjustments are possible and can be done on both a series-authentic model plant and on a series production plant.

**new**

## Top benefits of eNiP

### Automotive-compliant process

Process capability exists both for the coating parameters and for the resulting coating system, so eNiP can be used in an automotive-compliant manner.

- The measuring system capability is verified using the standards of the Deutsche Akkreditierungsstelle (DAkkS), the national accreditation body of the Federal Republic of Germany.
- The phosphorus content in the separation is determined using compatible measuring technology.
- All electrolyte parameters are determined using compatible means, the pH value too.

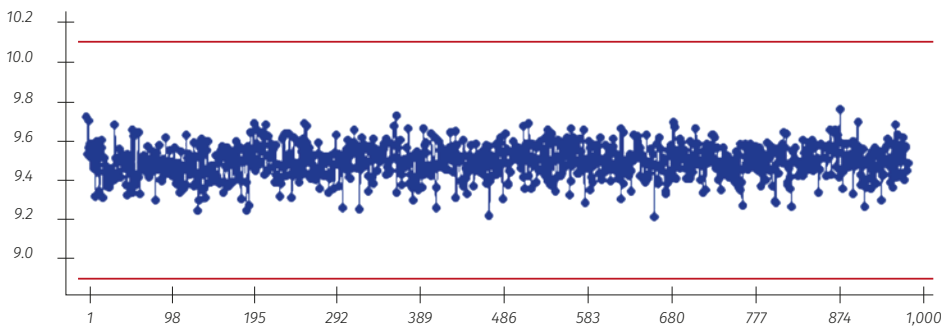


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[Phosphorus %]



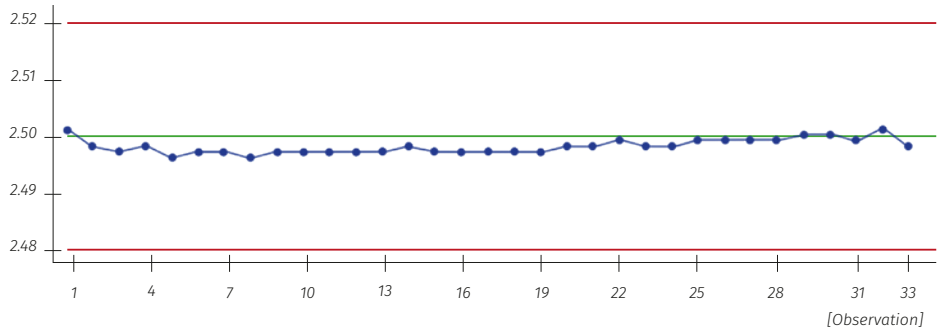
### Measuring system analysis using an innovative method

The measuring system analysis proves that the innovative measuring method is sufficiently precise for the target phosphorus content over a long period of time, independently of external influences. The graph shows the reproducibility.

### Automotive-compliant process due to compatible pH measurement

The precise and stable measurement of the pH value is essential to be able to conduct a compatible process according to automotive requirements. For this, we were able to achieve a measuring system capability within a narrow tolerance range and thus advance the current state of the art to the next level.

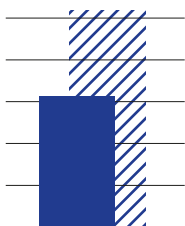
[pH value]



Tolerance: 0.2

Measuring potential (Cg): 5.18

Measuring system capability index (Cgk): 4.66



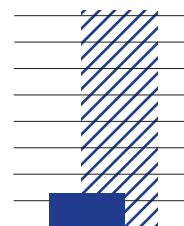
Relative comparison of total costs for AuCo min. 0.8 µm VS eNiP/AuCo 0.1 µm

### Reduction of total costs\*

Considerable savings can be generated in total costs by substituting precious metals. Here in comparison: hard gold with eNiP.

AuCo min. 0.8 µm

eNiP [P > 10%] + AuCo 0.1 µm



Carbon footprint in relative comparison AuCo 0.8 µm VS eNiP/AuCo

### Significant improvement in carbon footprint

CO<sub>2</sub> emissions could be reduced by approximately 80% compared to the use of today's typical precious metal coatings, as in the example AuCo 0.8 µm.

AuCo min. 0.8 µm

eNiP [P > 10%] + AuCo 0.1 µm

## More top benefits of eNiP



### Availability

Enayati has a series reel-to-reel plant. We look forward to your inquiry.



### Reliability\*

Reliable robustness thanks to extremely wear-resistant and exceptionally corrosion-resistant coating system.

### Commercial risk reduction

Decoupling from precious metal price changes by substituting precious metals – reduced dependence on international precious metal producers.



### Technical benefits\*

Improved friction corrosion of connectors, e.g. after substitution of conventional palladium-nickel or AuCo coating systems.

\*We will be happy to discuss with you to what extent these benefits can be realized in your project.