

Case Study: TripleHard Mining



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Context:

- Comparison with hexavalent chromium (Cr^{6+}) and Savroc's trivalent chromium (Cr^{3+}) coating TripleHard®
- Cr^{6+} : Base material AISI 329 and 20MnV6
- TripleHard®: Base material 20MnV6 normal steel
- Very demanding environment in Australian mines
- Salt and high temperature → Corrosion

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20MnV6 + Cr⁶⁺:

- After 2 months
- Base material: 20MnV6 – normal steel
- Poor corrosion resistance – easy to see a lot of rust

Consequence: cylinder replacement is necessary



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AISI 329 + Cr⁶⁺:

- After 4 months
- Base material: AISI 329 – stainless-steel
- Sub-optimal corrosion resistance – easy to see a rust

Even stainless-steel rod is rusty



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20MnV6 + TripleHard:

- After 34 months
- Base material: 20MnV6 normal steel
- Excellent corrosion resistance – no rust

Normal steel coated with TripleHard performs significantly better than stainless-steel coated with Cr^{6+}



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Comparison rods: 1m d 60mm

SAMPLE	BASE MATERIAL	LIFETIME	BASE MATERIAL PRICE	COATING PRICE	TOTAL PRICE	CYLINDER ROD PRICE AFTER 1 YEAR	CYLINDER PRICE AFTER 1 YEAR FOR END CUSTOMER	CYLINDER PRICE AFTER 3 YEARS FOR END CUSTOMER
Cr ⁶⁺	AISI 329	< 4 months	110 €	35 €	145 €	435 €	4050 €	12 150 €
Cr ⁶⁺	20MnV6	< 2 months	22 €	35 €	57 €	342 €	6300 €	18 900 €
TripleHard®	20MnV6	≥ 36 months	22 €	78 €	100 €	100 €	0 €	0 €

AISI 329 5 €/kg, 20MnV6 1 €/kg, Cr⁶⁺ 2 €/dm², TripleHard® 4,1 €/dm² *TripleHard® lasts at least 3 years



Commercial Cr⁶⁺ coatings vs. TripleHard® after 5 days of mine water spraying