

USBR Rust Busters Challenge

DRAFT Phase 2 Evaluation Rubric

Criteria		Maximum Score	Section scores
Laboratory Testing	See table below	14	30
		16	
Field Performance	See table below	20	20
Innovation	See guidelines below	15	15
Cost	How does the service life/cost per sqft balance compare with current materials and approaches?	15	15
Robustness	Can this approach be successfully deployed under a wide range of field conditions? Does it require expensive equipment or extensive training for a proper application?	20	20
		100	Total Maximum Score

Laboratory Testing	Type and Number of coupons	Maximum Score
Corrosion Testing		14
ASTM D1654 - HAR - undercutting	2 panels	2
ASTM D1654 - DI - undercutting	2 panels	2
ASTM D1654 - HAR - impedance	1 panel	3
ASTM D1654 - DI - impedance	1 panel	3
ASTM D5894, D1654 - Prohesion - undercutting	3 panels	2
BOR 1 wk alternating exposure: QUV, FOG, HAR, FOG, ASTM D1654 - undercutting	3 panels	2
Physical Testing*		16
Disbondment NACE TM0115 - immersed	3 4" disks	3

Erosion Resistance USBR-5071-2015 - stabilized weight loss rate on 11-inch diameter coated plate	2 11" disks	3
Abrasion Resistance ASTM D 4060 - weight loss after 1000 cycles, CS-17 wheels resurfaced after 500 cycles, 1 kg load	2 4" disks	2
Impact Resistance ASTM D2794	2 panels	3
Pull-off Adhesion ASTM D4541	1 panel	2
Pull-off Adhesion (wet) ASTM D4541 - performed on HAR and DI panels, post immersion	1 panel	2
Knife adhesion test (wet) ASTM D6677 - performed on HAR and DI panels, post immersion	1 panel	1

Field Performance	Maximum Score
Corrosion protection	20
EIS (ISO 16773 / ASTM G106)	5
ASTM G102 - corrosion rate / weight loss (before and after)	3
ASTM D660 - degree of checking	2
ASTM D661 - degree of cracking	2
ASTM D610 - degree of rusting	3
ASTM D1654 - undercutting	5

Innovation Scoring Guidelines
<p>How innovative is this approach? Will it have a large impact on the future of HSS corrosion protection because it can be used:</p> <ul style="list-style-type: none"> -on both gates and penstocks, or additionally on other types of HSS, -on existing and new structures, -in place of more costly alternatives, -instead of less environmentally friendly approaches, -to reduce downtime at field location -to minimize risk to personnel -to provide additional functionality beyond excellent corrosion protection