

Rolling Door Seal (RDS)



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SYSCOM: Naval Sea Systems Command
(NAVSEA) | www.navsea.navy.mil

Program Sponsor: Naval Surface
Warfare Center Carderock

Other Potential Programs:

Arctic Deployed DDGs, Chemical Storage
Seals

Current TRL: 8

Projected TRL: 9 / Q4 2024

Keywords: DDG Helo-Bay Door Water
Seal, Marine Water Seal, Rolling Seal

THE CHALLENGE

Navy DDG Destroyer helo-bay doors are comprised of six door panels hinged together to form a single fan-fold door weighing ~10,000 lbs. The bottom edge of the bottom door panel is fitted with an elastomer water seal intended to prevent seawater and other fluids from entering the hangar bay when the door is closed. Currently deployed elastomer door seals fail rapidly after installation due to mechanical stress and strain-related damage. HMC's Phase I and Phase II goals were the development of a wear- and chemical-resistant Rolling Door Seal (RDS) for DDG-51 helo-bay doors that facilitates rapid installation and extended service life.

THE INNOVATION

With funding from the U.S. Navy SBIR program, HMC developed the RDS to address current DDG helo-bay door water seal performance and capability gaps. RDS is comprised of a hollow elastomer boot having a geometry that allows it to roll into place beneath the helo-bay door to form a wide and reliable liquid seal without the application of unnecessary compressive or bending stress. Importantly, the hollow RDS boot structure eliminates the formation of large mechanical stresses and subsequent strain-related damage that occurs during acute angle deformation of the current DDG water seal.

THE NAVY BENEFIT

RDS has already proven to deliver significant and tangible benefits to the Navy, including DDG Destroyer helo-bay doors consistently passing watertight testing; improved operational availability of DDG-deployed helicopters; significant reduction in the occurrence of seawater, fuel, and liquid infiltration; reduction in DDG-51 ship component damage; simplification of helo-bay door water seal installation logistics; reduced helo-bay door water seal maintenance requirements; and significant reduction in helo-bay door water seal capital costs.

THE FUTURE

The Navy will be HMC's initial customer for RDS technology; however, HMC is also pursuing other DoD branches and private sector firms with marine vessel operations that can benefit from the RDS's reliability, chemical resistance, and excellent in-service longevity. HMC is also pursuing military and private sector applications that require cold temperature, hot temperature, and corrosive chemical sealing performance that can be satisfied with RDS variants fabricated of various elastomers such as chloroprene and fluorosilicone, among others.

SBIR Pavilion



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