

ENGINEERING PRACTICE STUDY

TITLE: MIL-PRF-6106 PERFORMANCE SPECIFICATION RELAYS, ELECTROMAGNETIC GENERAL SPECIFICATION FOR; (1) Paragraph 1.2.1 Type designators to reflect supporting documents of SUPPLEMENT, and (2) Paragraph 3.10 Seal to identify standard leak rate (Fine Leak) of individually sealed, non-hermetically sealed, and unsealed relays.

22 December 2025

STUDY PROJECT (SEE ATTACHMENT 1)

FINAL REPORT

Study Conducted By DLA Land and Maritime

Project Number: 5945-2026-005

Prepared by:

Erika Baker

ATTACH 1

I. OBJECTIVES: This engineering practice study is being conducted to examine (1) MIL-PRF-6106; 1.2.1 Type designators to reflect the supporting documents as identified in SUPPLEMENT, and (2) 3.10 to determine if a fine leak inspection is required for relays classified as individually sealed, non-hermetically sealed, and unsealed, and identify standard leak rate.

II. BACKGROUND: At this time, (1) MIL-PRF-6106 1.2.1 Type designators support the following:

Type I: Continuous duty, hermetically sealed.

Type II: Continuous duty, unsealed.

Type III: Intermittent duty (hermetically sealed, environmentally sealed, unsealed).

Type IV: Continuous duty, environmentally sealed, (nonhermetic).

However, the supporting documents deviate from the type designators as described below:

MS24152	- Relays, Electromagnetic, 25 AMP, 3 PDT, N.O., Type II, Non-Hermetically Sealed (Mechanically Interlocked).
MS24166	- Relays, Electromagnetic, 50 Amperes, 1 PST, (N.O.), Type II, Non-Hermetically Sealed.
MS24172	- Relays, Electromagnetic, 200 Amperes, 1 PST, (N.O.), Type III, Non-Hermetically Sealed, Intermittent Duty.
MS24178	- Relays, Electromagnetic, 55 Amperes, 2 PST, (N.O.), Type II, Non-Hermetically Sealed.
MS24179	- Relays, Electromagnetic, 400 Amperes, 1 PST, (N.O.), Type III, Non-Hermetically Sealed.
MS24185	- Relays, Electromagnetic, 400 Amperes, 1 PST, (N.O.), Type II, Non-Hermetically Sealed.
MS24187	- Relays, Electromagnetic, 50/25 Amperes, 1 PDT (N.O./N.C.), Type II, Non-Hermetically Sealed.
MS24192	- Relays, Electromagnetic 25 Amperes, 3 PST, (N.O.), Type II, Non-Hermetically Sealed.
MS24193	- Relays, Electromagnetic, 50 Amperes, 3 PST, (N.O.), Type II, Non-Hermetically Sealed.
MS25030	- Relays, 50 AMP, 2 PDT, N.O. Type II, Non-Hermetically Sealed, Mechanically Interlocked.
MS25031	- Relays, 100 AMP, 2 PDT, N.O. Type II, Non-Hermetically Sealed, Mechanically Interlocked.
MS25032	- Relays, 200 AMP, 2 PDT, N.O. Type II, Non-Hermetically Sealed, Mechanically Interlocked.
MS27714	- Relay, 75 Amperes, 3 PST, N.O., Type I, Coil and Contacts Individually Sealed.
MS27715	- Relay, 150 AMP, 3 PST, N.O., Type I, Coil and Contacts Individually Sealed.

Also, MIL-PRF-6106 nor the SUPPLEMENT documents provide a standard leak rate value for individually, non hermetically, and unsealed relays.

IV. CONCLUSIONS: MIL-PRF-6106 and supporting documents were reviewed, and a DoD position determined the document shall be modified to reflect product listing and identify requirements of seal inspection.

V. RECOMMENDATIONS: Update MIL-PRF-6106; 1.2.1 Type designators to reflect Program listing, and add 4.7.5 a Seal of individual, mechanical, non-hermetic, and unseal to reflect Seal inspection methods and seal inspection to evaluate relays.

FROM

Type I: Continuous duty, hermetically sealed.

Type II: Continuous duty, unsealed.

Type III: Intermittent duty (hermetically sealed, environmentally sealed, unsealed).

Type IV: Continuous duty, environmentally sealed, (nonhermetic).

TO

Type I: Continuous duty - environmentally sealed, hermetically sealed, individually sealed, mechanically sealed.

Type II: Continuous duty - non-hermetically sealed, unsealed.

Type III: Intermittent duty - environmentally sealed, hermetically sealed, non-hermetically sealed, unsealed.

Type IV: Continuous duty - environmentally sealed, non-hermetically sealed.

1. Does an individually, non-hermetically, and unsealed relay require a fine leak inspection, and if so, what is the appropriate standard leak rate? For reference, most environmentally sealed relays have a standard leak rate at 6×10^{-4} STD cc/s and the hermetically sealed standard leak rate is 1×10^{-6} atm cm³/s of air.

The QPL-6106 Program requires fine leak inspection for relays classified as hermetically sealed and environmentally sealed. The QPL-6106 Program does not require fine leak inspection for relays classified as individually sealed, mechanically sealed, non-hermetically sealed, and unsealed relay. Update MIL-PRF-6106 to add Paragraph 4.7.5.a Seal of individual seal, mechanical seal, non-hermetic seal, and unseal. The fine leak inspection is not required.

2. What is the difference between an environmentally sealed and a non-hermetically sealed relay? The environmentally sealed and non-hermetically sealed relay have similar properties, but do not have the same parameters. Environmentally sealed relays are to resist dust, moisture, extreme temps, and corrosive gases. Non-hermetically sealed relays are to resist dust, moisture, and flux and are not required to be gas tight.
3. Does an environmentally seal and a non-hermetically seal relay require a different standard leak rate? Yes, an environmentally sealed and a non-hermetically sealed relay requires a different standard leak rate because the requirements are different.

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