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Environmental Program



**Finding a Better Lubricant
and Corrosion Protectant**



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A Better Lubricant and Corrosion Protectant on the Horizon

Dogged pursuit of a better lubricant and corrosion protectant for P-3 flap tracks and jack screws has uncovered a lubricant that saves maintenance time, requires smaller quantities, provides superior protection against corrosion and reduces hazardous waste. The product, Super Corr-B, has exceeded expectations and is now being used on the Navy's F-18 and EA-6B platforms. It is also under consideration for use on other platforms and devices across the Fleet.

Background

P-3 squadron (VP-30) at Naval Air Depot (NADEP) Jacksonville initiated a search for a new lubricant when it asked for approval of a different lubricant to protect aircraft flap tracks and jack screws from corrosion. Although the product substitute for which they first requested approval ultimately did not meet standards, the request resulted in finding an even better product.

Flaps in the aircraft's wings are moved back and down to obtain more lift at lower speeds (during landing) or retracted in flight (to get more speed and less lift). The wing flaps ride on flap tracks via a carriage with roller wheels on the top and bottom of the track. Jack screws are long threaded rods used to engage and retract aircraft wing flaps.

Each time jack screws get wet—due to rain, post-flight rinses in “bird baths” and regular monthly



A P-3 aircraft going through a “bird bath.”

aircraft washings—they must be re-lubricated and protected against corrosion. They are also re-lubricated during the daily turnaround inspection. This application regime requires a lot of time on the part of P-3 maintenance personnel and requires the use of a large volume of material.

The squadron highlighted three criteria for a new lubricant:

- Ensure for the proper lubrication of the jack screws,
- Require less frequent application, and
- Provide sufficient protection against corrosion.

The lubricant first identified as a possible substitute was tested in a salt fog chamber against the existing product (VV-L-800) and the corrosion protection benchmark (MIL-C-81309). Not only did the test results demonstrate that the requested substitute was inadequate, they also triggered efforts to locate a product that worked better than the VV-L-800.

Lektro-Tech, Super Corr-B (MIL-L-87177A) Identified and Tested

Literature and database searches provided some leads on possible substitutes being used by the Air Force. One lubricant, Lektro-Tech Super Corr-B, stood out from the others and was selected for testing. This product was subjected to the salt fog chamber test along with the then approved product, VV-L-800, and the MIL-C-81309 benchmark. (For additional results information, please see Materials Laboratory Report from May, 2002)

Following up on the encouraging results, testing moved from the laboratory to the field. Demonstration and validation work with Super Corr-B began at the local P-3 Squadron. Aircraft were subjected to normal Florida weather conditions, and numerous rinses following Super Corr-B application. During the demonstration, the time between applications was gradually extended and conditions carefully monitored.

Super Corr: The Basics

- **Product Name:** Lektro-Tech Super Corr-B
- **Mil-Spec:** Mil-L-87177A
- **Manufacturer:** Lektro-Tech, Inc. of Tampa, Florida
- **Product Description:** An anti-corrosive water displacing film
- **Product Attributes:** Type I, Grade B Corrosion Preventative Lubricant
- **Product Number:** 12-350
- **National Stock Number (NSN):** 6850-01-328-3617†



A U.S. Customs Service P-3 going its 28-day wash at the wash rack in Jacksonville. Notice the powerful water stream used to remove contaminants from the skin and exposed components.

Ultimately the application cycle was validated at 28 days without corrosion or build-up. This compares to daily applications of the previously approved VV-L-800.

Savings Detailed

The change from daily application to application every 28 days results in substantial reductions in personnel time, materials and hazardous waste while improving operational readiness. Average application time of VV-L-800 or Super Corr-B (MIL-L-87177A) is approximately one-half hour per aircraft. Lubricating the flap tracks, actuators and jack screws of the 265 aircraft in the P-3 fleet once every 28 days versus daily can save more than 46,000 man hours per year. Under another assumption of only 80% of aircraft flying at a given time, with the other 20% out for scheduled maintenance and modifications, roughly 30,000 man hours a year can be saved.

The quantity of Super Corr-B used per application was consistent with the quantity of VV-L-800. Overall material consumption, however, is reduced from seven (7) cans of VV-L-800 per aircraft per 28 days, to one quarter (1/4) of a can of Super Corr-B per aircraft every 28 days. Although the cost of one can of Super Corr-B is seven times that of VV-L-800, it requires just 1/28th the amount needed of VV-L-800. Thus, Super Corr-B costs are only 25% that of VV-L-800 per 28

Impact on Readiness

↓ Sailor Workload

- Easier to apply.
- Time between applications is longer (28 days versus daily).
- Less hazardous material is stocked and issued.
- Fewer empty aerosol containers are processed.

↓ Chemical Costs

- Less lubricant is procured.
- Fewer empty aerosol containers are generated.

↑ Asset Availability

- Corrosion protection is improved.
- Manhours can be redirected to priority operational tasks.

What Else Needs to Be Done

Sailors

- Review platform VV-L-800 requirements.
- Generate manual change requests.
- Discuss potential manual changes with Fleet Support Team leader.

Fleet Support Teams & Program Staff

- Obtain engineering field data from NADEP Jacksonville Materials Laboratory.
- Issue Interim Rapid Action Changes (IRAC) where appropriate.
- Incorporate substitute for VV-L-800 into regular manual update cycle.
- Contact HAT manager (Eric Rasmussen) for exact page references to support manual reviews.

Environmental Managers & Material Handlers

- Review VV-L-800 use at field activities.
- Communicate potential benefits of VV-L-800 substitution to sailors and marines.
- Support authorization and use of substitute material (Super Corr) once manual changes are complete.



Jackscrews on a P-3 aircraft before and after the application of Super Corr.

day cycle. Fleet-wide annual material savings for this specific application alone could reach more than \$32,000. The savings take on even greater significance when extrapolated across additional aircraft and ground support equipment application points.

Others Could Benefit

The P-3 VP-30 squadron at NADEP Jacksonville is not the only group currently using VV-L-800. The entire Fleet might benefit from substituting Super Corr-B for VV-L-800. What are some of the other uses for the lubricant? One place to start is to find manual references to VV-L-800. NAVAIR has roughly 20,500 active maintenance manuals. Just over 8,000 of the manuals are included in the HMAUL Analysis Tool (HAT). A HAT search for VV-L-800 produced results showing 41 programs, 274 manuals and 1,622 pages in the manuals referenced VV-L-800. (See table at right for more details on use levels).

A value of “—” means that no data were collected and/or available via ESA.

HIGH = 3,001 pounds or greater used
 MEDIUM = 1,001 to 3,000 pounds used
 LOW = 0 to 1,000 pounds used

The recorded usage levels contained in this table were extracted from the ESA database for the calendar years 1999, 2000 and 2001.

A search was performed for mil-spec MIL-PRF-32033 (VV-L-800 (Lubricating Oil, General Purpose, Preservative, (Water-Displacing, Low Temperature))).

VV-L-800 Across the Fleet: References In General and Type/Model Series Manuals & Recorded Usage Levels

Program or Product Line	Manuals That Contain VV-L-800 References	No. Pages That Contain VV-L-800 References	Recorded VV-L-800 Use
P-3	22	378	HIGH
EA6B	12	120	HIGH
FA-18ABCD	21	108	MEDIUM
F-14	7	73	HIGH
General Series	12	71	—
H-53	15	71	MEDIUM
CSE	17	70	MEDIUM
E2C	13	67	LOW
S-3	8	59	MEDIUM
AV8B	13	52	HIGH
H-1	15	50	LOW
Guns	9	41	—
FA-18EF	7	38	—
H-3	7	36	LOW
Mobile Equipment	14	36	—
H-60	5	32	HIGH
H-46	5	30	MEDIUM
Accessories	3	28	—
C-2	5	26	LOW
E-6	5	25	—
T-2	2	24	—
Bomb Racks	6	22	—
T-45	4	22	LOW
Survival	5	18	—
Missiles	6	15	LOW
ALRE	2	14	—
Ordnance	2	13	—
AMCM	2	12	—
F-14D	5	12	—
A-4	2	10	—
C-9	1	9	LOW
C-130	6	7	HIGH
F-402	3	7	—
UAV	4	7	—
T-56	2	4	—
Engines	2	3	—
F-110	1	3	—
T-39	1	3	—
V-22	1	3	LOW
NSTM	1	2	—
Launchers	1	1	—
TOTALS	274	1,622	



AM1 Brian Keppers of VP-30 lubricates jackscrews and flap tracks on a P-3 aircraft.

Devices currently being lubricated with VV-L-800 may be candidates for Super Corr-B. In addition to the flap tracks and jack screws, personnel have extended its use to EA-6B gear boxes and are considering its use on hydraulic fitting B-nuts, avionic electrical connectors, and counter measure devices. VP-30 will soon begin a prototype application on electronics connectors, avionics, and other mechanical components. Avionics demonstration and validation are on a case-by-case basis. Considerations include viscosity, penetration and water displacement. Additional testing is planned that could provide more detailed directions.

Approval and Availability

P-3 FST-4 Engineering in Jacksonville is in the process of updating maintenance manuals to reflect the application of MIL-L-87177A Super Corr-B on flap tracks and jackscrews as the preferred maintenance method.

An Interim Rapid Action Change (IRAC) to the Aircraft Weapons Systems Cleaning and Corrosion Control Manual (NA 01-1A-509) will be considered

following additional testing by Naval Air Station (NAS) Patuxent River. Super Corr-B has a National Stock Number (NSN: 6850-01-328-3617).

Conclusion

Super Corr-B offers great potential for the Fleet to achieve substantial savings on lubrication and corrosion protection. This substitution could help achieve both an environmental benefit and an operational readiness objective.

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