

# Don K. Mukai

## MECHANICAL ENGINEER

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June 1, 2010

Rev. 10.24.11

**Mrs. Paola Recendez**

S. Bravo Systems, Inc.  
2929 Vail Ave.  
Commerce, CA 90040

**Re: Specification approved by a state registered professional engineer**  
CCR Title 23, Division 3, Chapter 16, Article 3, Section 2631(d)

**This letter is for an engineering specification review and approval of a secondary containment system component which is not an integral part of primary containment for an underground fuel tank storage system in California. The authority for this approval comes from the California Code of Regulations (CCR) Title 23, Division 3, Chapter 16, Article 3, Section 2631(d).**

I have examined and reviewed the following specifications on the Bravo F-Series fiberglass split retrofit "Retrofit-S" and "Retrofit-SD-AB" fittings:

- 1) UL Certifications Directory MH26018 for Vipel F-764 and F-774 resins
- 2) AOC Vipel Product Selection Guide & Corrosion Resistance Guide
- 3) Bravo datasheets F-Series-SW-10A, F-Series-DW-10A, F-Series-BLR-11A, F-Series-D-BLR-S-11B, F-Series-Retrofit-S-11B and F-Series-Retrofit-SD-AB-11A
- 4) Bravo Installation Manuals ii-F-SERIES-TS-11A, ii-F-SERIES-TS-D-11A, ii-F-SERIES-SS-09B, ii-F-SERIES-TS-ADJ-INSERT, ii-F-SERIES-1X-SS-11A, ii-F-SERIES-1X-SS-D-11A, ii-F-SERIES-LCX-09B, ii-F-SERIES-LCX-D-09B, ii-FS-RETROFIT-S-10C, ii-FS-RETROFIT-SD-AB-10A, ii-SANDKIT-11B
- 5) Bravo Systems Third Party document 3RP-F-Series and 3RP-FS-F1X-D-BLR-S
- 6) Bravo Systems UL Approval document CUL-FSeries
- 7) Bravo material compatibility letters Sumps\_AlternativeFuels\_R1 and Fittings\_AlternativeFuels\_R1
- 8) Smith Bulletin D4025, D4010 and B2102
- 9) Ameron PSX-20 Adhesive Kit - Bondstrand Product Data FP698B
- 10) Bravo ADHESIVE-EPOXY-KIT and ADHESIVE-RETROFIT-EPOXY-KIT

This system provides a bonded retrofit solution to replace from the inside of a single wall fiberglass containment sump or from both sides of a double wall fiberglass containment sump, a suspect or failing flexible penetration fitting. This product maintains the integrity of a single walled containment sump or both the primary and secondary wall of a double wall containment sump including the integrity of it's existing interstice by permanently bonding the sump wall to the fiberglass pipe or conduit at each entry point

For the purposes of this review, I have:

- 1) Reviewed the construction and installation procedures for the single wall (Retrofit-S) and double wall (Retrofit-SD-AB) F-Series Retrofit Split Fiberglass fittings for conduit.
- 2) Reviewed the construction and installation procedures for the single wall (Retrofit-S) and double wall (Retrofit-SD-AB) F-Series Retrofit Split Fiberglass fittings for fiberglass pipe.
- 3) Reviewed add-on parts that are used to increase the angle of entry. These wedges are made from the same material as the fittings and provide incremental degrees of additional angle.
- 4) Reviewed materials used to construct the secondary containment system for sufficient thickness, density and corrosion resistance to prevent structural weakening or damage to the secondary containment system as a result of contact with hazardous substances contained in common fuels.

Upon review of the manufacturing procedures, the employment of the materials used in the Bravo Systems F-Series Retrofit-S and Retrofit-SD-AB product lines and the manufacturer's installation guidelines, it is my conclusion that sound design and engineering of this product for use with fiberglass single wall and double walled containment structures and aforementioned pipe types will meet or exceed the secondary containment requirements for corrosion resistance and material compatibility of all motor vehicle fuels, alternative fuels or their additives currently used by petroleum marketers today. I approve the above engineering specifications for the following Bravo F-Series fittings:

**F-Series SingleWall Fiberglass Split Retrofit Fittings for flat sump walls:**

For Conduit: F-05-Retrofit-S, F-07-Retrofit-S, F-10-Retrofit-S

For Pipe: F-20-Retrofit-S, F-30-Retrofit-S, F-40-Retrofit-S, F-60-Retrofit-S

For LCX Pipe: F-20-Retrofit-S-LCX, F-30-Retrofit-S-LCX, F-40-Retrofit-S-LCX

**F-Series SingleWall Fiberglass Split Retrofit Fittings for round sump walls:**

For Conduit: F-05-Retrofit-S-RND, F-07-Retrofit-S-RND, F-10-Retrofit-S-RND

For Pipe: F-20-Retrofit-S-RND, F-30-Retrofit-S-RND, F-40-Retrofit-S-RND, F-60-Retrofit-S-RND

For LCX Pipe: F-20-Retrofit-S-RND-LCX, F-30-Retrofit-S-RND-LCX, F-40-Retrofit-S-RND-LCX

**F-Series DoubleWall (Double-Sided) Fiberglass Split Retrofit Fittings for flat sump walls:**

For Conduit: F-05-Retrofit-SD-AB, F-07-Retrofit-SD-AB, F-10-Retrofit-SD-AB

For Pipe: F-20-Retrofit-SD-AB, F-30-Retrofit-SD-AB, F-40-Retrofit-SD-AB, F-60-Retrofit-SD-AB

For LCX Pipe: F-20-Retrofit-SD-AB-LCX, F-30-Retrofit-SD-AB-LCX, F-40-Retrofit-SD-AB-LCX

**F-Series DoubleWall (Double-Sided) Fiberglass Split Retrofit Fittings for round sump walls:**

For Conduit: F-05-Retrofit-SD-AB-RND, F-07-Retrofit-SD-AB-RND, F-10-Retrofit-SD-AB-RND


For Pipe: F-20-Retrofit-SD-AB-RND, F-30-Retrofit-SD-AB-RND, F-40-Retrofit-SD-AB-RND,  
F-60-Retrofit-SD-AB-RND

For LCX Pipe: F-20-Retrofit-SD-AB-RND-LCX, F-30-Retrofit-SD-AB-RND-LCX,

F-40-Retrofit-SD-AB-RND-LCX

Please contact me with any questions at 323-888-4136.

Sincerely,



Don K. Mukai  
Mechanical Engineer

