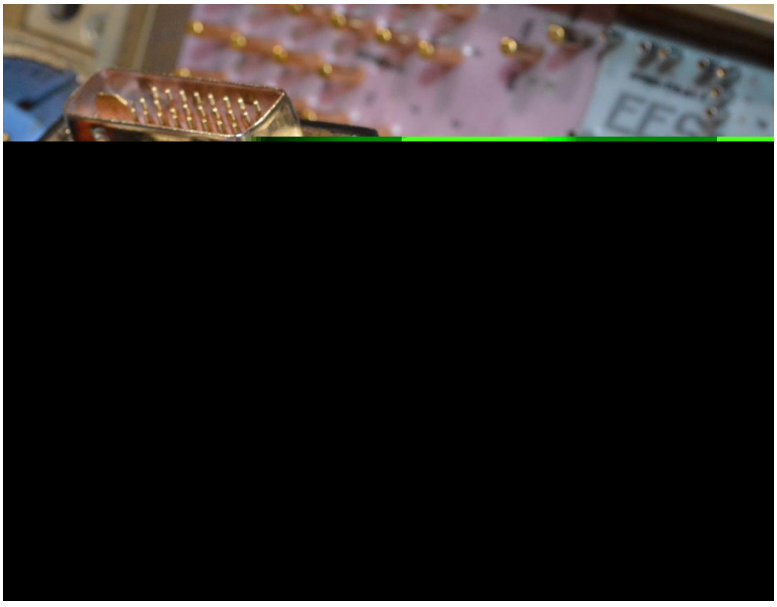
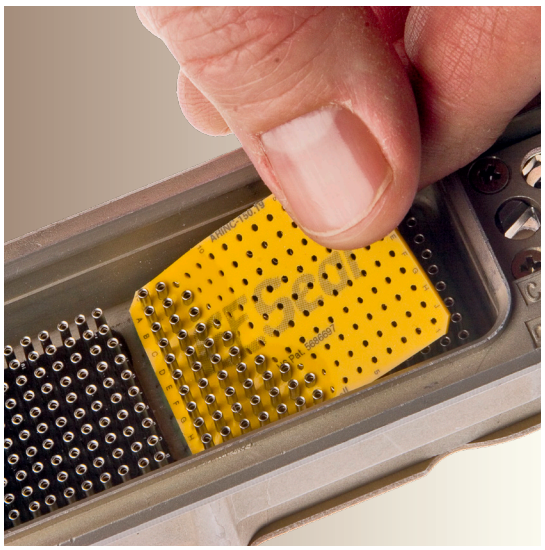
EESEAL® ADDS EMI AND ESD PROTECTION TO YOUR CONNECTOR IN SECONDS...

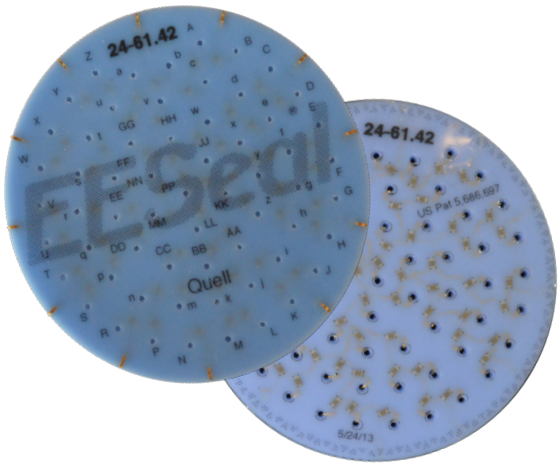




Quell

www.EESeal.com

How EESeal® Filters Work



How It Works

EESeal® EMI Filter inserts (and Transient Suppressors) for connectors are an easy retrofit compared to bulky adapters, filtered connectors, and other traditional devices. Our EESeals® are made of resilient silicone rubber that is quick and easy to install, even in the field. Their patented construction allows them to survive even extreme environmental abuse. By using just your finger tip, you can easily retrofit and install an EESeal® insert in your connector in just seconds.

Silicone Rubber Packaging Technology

Virtually "invisible" once installed, EESeal® inserts for connectors are made of the same super-resilient material used in the interfacial seals of high-reliability, ruggedized military connectors.

The secret behind EESeal® is Quell's innovative electronic packaging technology. Our patented Elastomeric Body and Adaptive Interconnect System suspends, isolates and protects discrete electrical components.

EESeals® adapt to the mating forces within a connector and the surfaces of the EESeal® morph into a shape that mimics the cork and bottle structure of the connector interface.

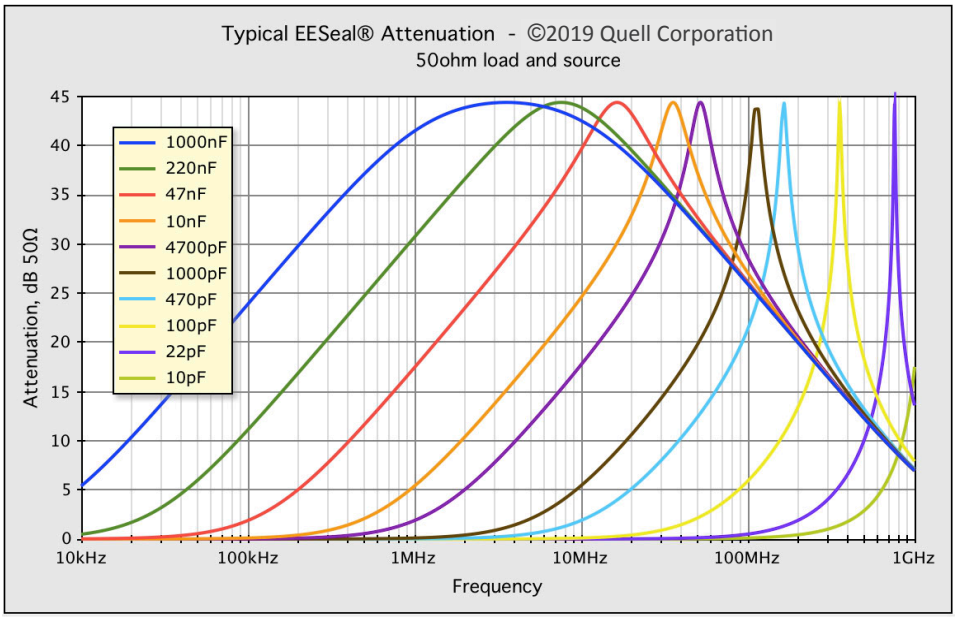
Typical Capacitor Ranges

Connector Insert Density	WVDC (Working Voltage DC)	Max Capacitance Values(min 1pf)
Very High	50VDC →	1µF
	1000VDC →	8.2nf
Medium to Low	50VDC →	4.7µF
	2000VDC →	4.7nf

Other values may be available

Make Your Standard Connector an EMI Filtered Connector, in Seconds.

Typical Capacitor Attenuation Curve - MIL-C-38999 Connector



Design Flexibility

EESeals® offer you the flexibility to have your insert your way. A wide variety of SMD components, typically 0402 or 0603 devices, can be selected to meet your application's exact requirements.

Your EESeal® can have components (capacitors, resistors, MOV's, TVS's and more) connected Pin to Pin, Pin to shell, shorts, opens, etc. and every pin can have a different individual treatment.

How EESeal® Filters Work

EESeal® creates & exploits silicone body compression.

The EESeal® compression is created and focused by undersizing and off-setting pinholes, over-sizing outer diameter and using the connector mating forces.

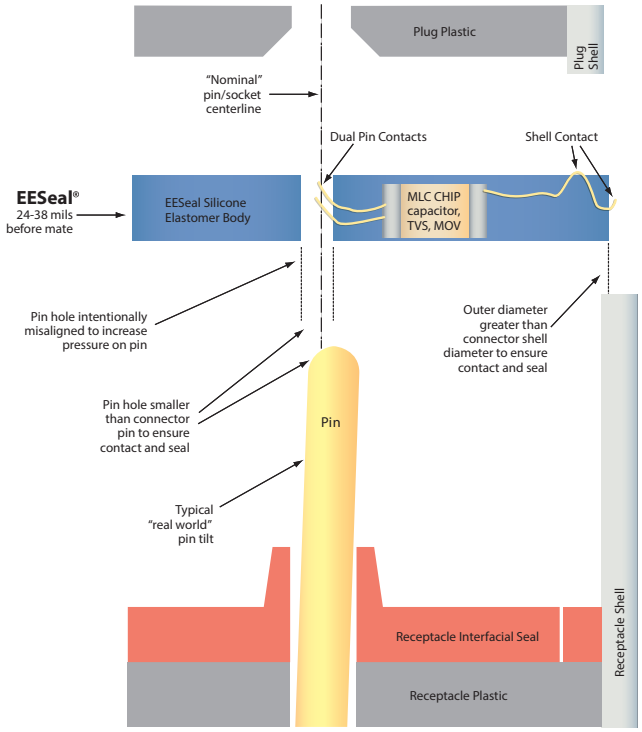
The compression is used to allow EESeals® to change their shape, adapt to misaligned pins, support easy installation and to create a reliable/re-usable connection for the gold-plated annealed-copper pins and edge contacts. Finally this compression is used to maintain/create the environmental seal and mechanically isolate all of the internal components.

- Two Gold plated (MIL-G-45204) contacts per pin.
- Multiple Gold plated peripheral shell contacts. (MIL-G-45204)
- Environmental seal created for the host connector.
- Individual components and intercon-nections move as the body changes shape while maintaining electrical and mechanical integrity.
- Body acts as conformal coat and electrical isolation for suspended components.

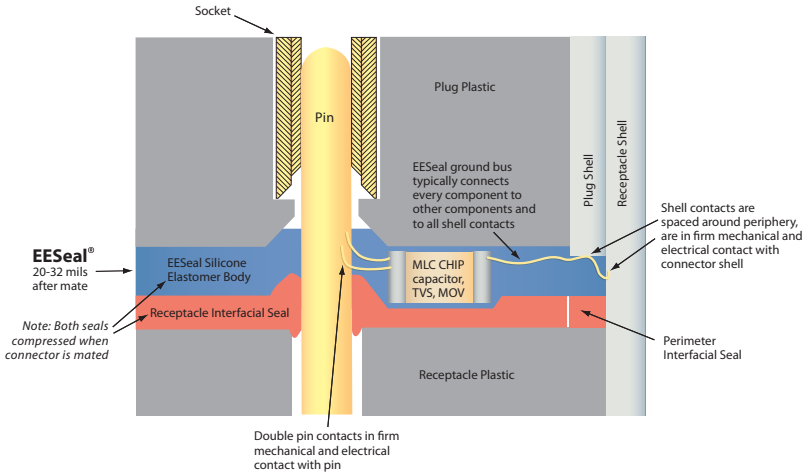
Inherent compressive forces are exploited to activate re-usable electrical contacts that can withstand extreme abuse (severe misalignments, vibration, even wrong pin sizes).

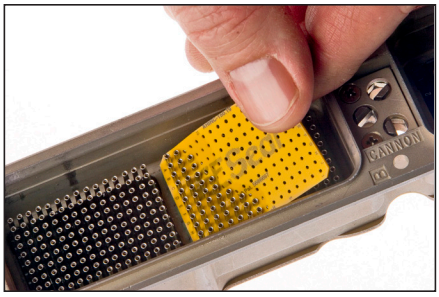
Invented by Engineers with Design, Quality, Ruggedness, Speed and Overall Value in Mind

Cross Section of EESeal® Before It's Seated in a Connector



Cross Section of EESeal® After It's Seated in a Connector





EESeal® Harsh Environments

The EESeal® EMI Filter insert can withstand extreme mechanical & environmental abuse. Environmental and mechanical tests conducted by independent laboratories show that even severe environments do not affect the integrity of EESeal® FilterSeal EMI filter inserts or the host connectors:

- Shock •MIL-STD-1344A Method 2004.1, Test Condition C (except 150g instead of 100g): 1/2 sine, 6 ms, 6 shocks/axis, total 3 axes
- Vibration •MIL-STD-1344A Method 2005.1, Test Condition IV: 10-2000Hz, 20g, 4 hours/axis, total 3 axes and MIL-STD-810E paragraph 514.4: 3.75Hz @ 0.07g to 33.75Hz @ 2.5g to 500Hz @ 0.002g2/Hz, 4 hours/axis, total 3 axes
- Salt Spray •Method 1001.1: 48 hr exposure at 95F
- Thermal Cycling •RTCA/DO160C: -55C to +125C, 20 cycles
- Humidity Exposure •RTCA/DO160C Category A: 95%RH @ 50C for 24hr, @ 30C for 24hr
- Temperature-Altitude •MIL-STD-5400 ¶4.6.2.3 Class 1A: -55C to 125C, 30,000 ft
- Durability •MIL-STD-1344A Method 2016: 250, 375 & 500 mate/demate cycles
- Fluid Immersion •MIL-STD-1344A Method 1016, Fluids a, c, d & e, with connectors mated: 5 minute immersion @ 85C in each of Hydraulic Fluid, 2 Lubricating Oils & JP-5
- Removal Re-Use Assessment •128pin EESeal® completely removed from connector and re-inserted 12 times
- Porosity •MIL-STD-1344A Method 1017: Contacts exposed to 70% HNO3 (concentrated reagent grade nitric acid) for 75 minutes at 23C, 10 minutes in air @ 125C, no corrosion observed
- Fungus •MIL-STD-810F Method 508.5 modified to 84 days
- Out-gassing ASTM E-595-07, TML <1%; CVCM <0.1%, Post bake required, 24 hours @300F

Full test reports are available to download from website at http://eeseal.com/performance/…

Our Quality Mission

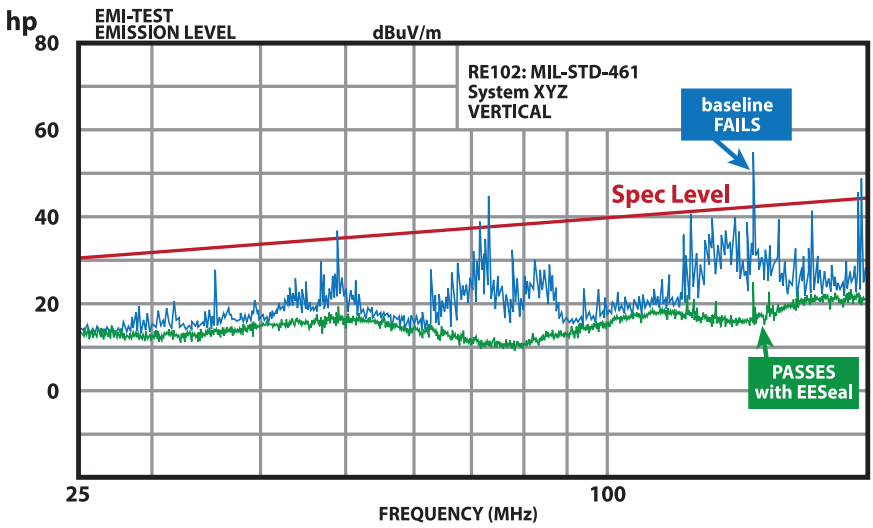
Our commitment is excellence in all that we do. We consistently provide customers with high quality, high reliability products. Our customers have recognized Quell's excellence with numerous awards for outstanding quality and product delivery.

Quell Corporation is ISO 9001 and AS9100 Certified

EMC Compliance / Transient Protection

Compliance

Quell Corporation engineers will be happy to work with you to solve your EMI and transient protection problems. Contact us today by phone or email — it's easy and you won't be sorry. First, we will determine what EESeal® insert design is right for you and then we will gladly provide you with a FREE sample. We can usually design, build and ship FREE custom samples within a day or two of your request. Our engineers can "tweak" your EESeal filter design to maximize performance and focus on solving your application's exact problem. We manufacture EESeal® inserts for a wide range of military-spec, commercial and custom connectors, including MIL-C-38999, MIL-C-26482, MIL-C-5015, MIL-C-83723, ARINC, Lemo, MDM, D-Subminiature and custom connectors too.



EMI Filters

EESeal® is a better solution than those pricey and bulky EMI Filter Connectors or EMI filter adapters. So why leave your EMI test with a failure on your mind when we can usually fix it immediately?

Achieve Compliance today!
MIL-STD-461
DO-160
IEC61000-4-2

Transient Protection

Available Devices-

MLC MOV –

- IEC 61000-4-2 (air) 15kV, (contact) 8kV
- High power handling, 150-450pF (0402/0603 only)

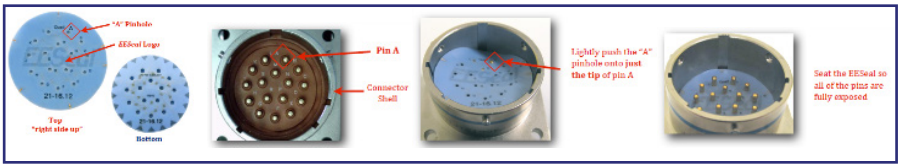
TVS Diodes -

- IEC 61000-4-2 (air) 16kV, (contact) 8kV
- 10pF junction capacitance

Quell can incorporate any 0402 or 0603 SMD component - your choice

EESeal® Installation

Step by step instructions are available on our website under support.



Circular Connectors
- •MIL-C-38999 s1 plug
- •MIL-C-38999 s1 receptacle
- •MIL-C-38999 s2 plug
- •MIL-C-38999 s2 receptacle
- •MIL-C-38999 s3 plug
- •MIL-C-38999 s3 receptacle
- •MIL-C-38999 s4 plug
- •MIL-C-38999 s4 receptacle
- •MIL-C-26482 s1&2 plug
- •MIL-C-26482 s1&2 receptacle
- •MIL-C-5015 plug
- •MIL-C-5015 receptacle
- •MIL-C-83723 s3 plug
- •MIL-C-83723 s3 receptacle
- •MIL-C-81511 s2 receptacle
- •MIL-C-81511 s3 receptacle
- •MIL-C-26500 receptacle
- •MIL-C-55181 plug
- •JN1003 Eurofighter receptacle
- •JN1003 Eurofighter plug
- •MIL-C-28840 receptacle

DSub Connectors
- •DSubminiature 9, 15, 25, 37, 50, combos
- •Micro-DSub (MDM) 9, 15, 21, 25, 31, 37, 51, 69, 100, combos
- •Double & High Density DSub 15, 19, 26, 31, 44, 52, 62, 78, 104 combos
- •Combo DSub

Headers
- •Centronix
- •Header

DIN
- •circular DIN
- •miniDIN
- •rectangular DIN

ARINC & Rack
- •ARINC404
- •ARINC600
- •ITT Cannon DPDMA insert

LEMO
- •LEMO various connectors

Custom Connectors and More

Benefits & Advantages

BENEFITS of EESeal® FilterSeals

EESeal® can quickly and easily *RETROFIT* any connector with EMI & transient protection

- Easy to install & remove in field by non expert personnel with no special tools
- Virtually "invisible" once installed - they look like a normal part of a connector
- Maintains environmental seal of host connector
- Adapts to real world variations & stress commonly associated with connectors and connector pins (bent pins, severe shock & vibration, rough handling, etc.)
- Rugged design proven via Mil-Std & FAA/DO-160C environmental stress testing
- Extremely low weight
- Filter can be designed/modified very late in design process

ADVANTAGES
Over Existing EMI Filters

No circuit-board, substrate or brittle materials of any kind. EESeal® is made with a silicone elastomer material, like the interfacial seal in most circular connectors so it doesn't create air pockets or defeat the existing environmental seal.

Install an EESeal® FAST At The Test Site - Test It, Remove It, Re-Test to Confirm Baseline and Reinstall!

Components and wiring are fully embedded in protective silicone material (components cannot "pop off" and won't be damaged/cracked during installation or use) all external and internal wiring is gold plated (50-70µin Au over Ni flash per MIL-G-45204); withstands severe temperature ranges and exposure to many deteriorating influences such as ozone, chemicals, aging and UV.

No "brittle" spring metal contacts (e.g., BeCu), so EESeal® contacts can accommodate severe misalignment and mismatch without degradation and will not be "sprung" by overstress during installation or use.

Customer Testimonial

Holy Toledo!!! We got improvement in our problem areas, much better than I expected. As close to a silver bullet as I've ever seen! Excellent product from a company with excellent customer service.

- K.H.