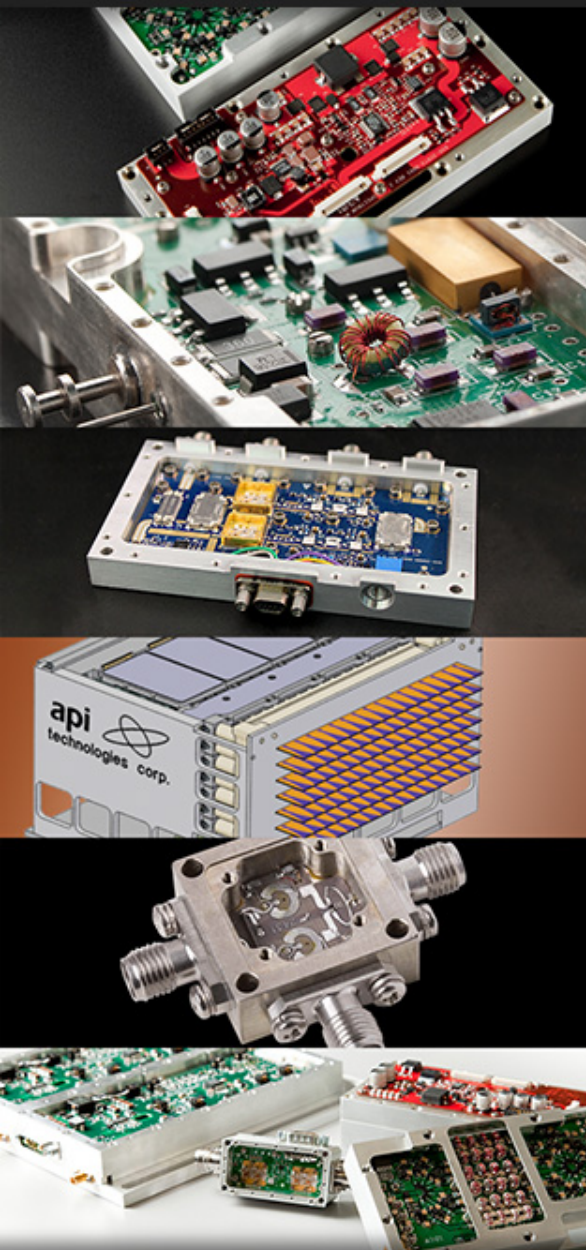


api 
technologies corp.

Switched Filter Banks
Product & Capabilities Overview



COMPANY OVERVIEW

- Provider of technically demanding RF/microwave, electromagnetic, power, and security solutions for defense, aerospace and commercial industries
- Founded in 1981; Listed on NASDAQ June 2011 with a new company vision
 - Today, one of the largest non-Prime provider of RF/Microwave and microelectronics
- 1,975 employees worldwide
- 3,000+ customers worldwide
- Revenue breakdown
 - ~75% Domestic / 25% International
 - ~60% Defense & Government / 40% Commercial

SWITCHED FILTER BANKS

Advanced Technologies

- Filter Technologies: Compline, Interdigital, Lumped, Microstrip, Suspended Substrate Stripline, Dielectric Resonator
- Switch Technologies: Pin Diode, GaAsFET, High Power, High Speed
- Broadband (DC-40) and Standard EW Bands
- Multi-Octave and Sub-Octave Designs Available
- Solid Temperature Stability

By combining filter and switch design expertise, **API Technologies** can provide integrated switched filter assemblies that not only reduce the overall mechanical footprint, but also offer improved electrical performance.

FILTER PRODUCTS

Broad Filter Capability Supporting Optimization of Program Performance, Size and Cost Requirements

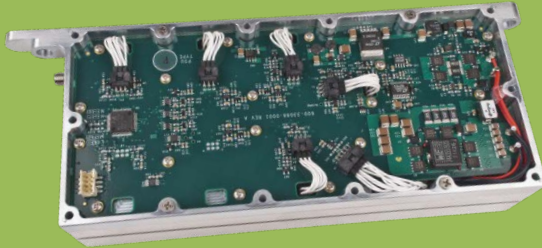
- Lumped Element Filters
- Cavity /Comblne/Interdigital Filters
- Tubular Filters
- Waveguide Filters
- Ceramic
- Suspended Substrate Stripline
- Surface Acoustic Wave (SAW)
- Bulk Acoustic Wave (BAW)



FILTER PRODUCTS

Filter Complexity

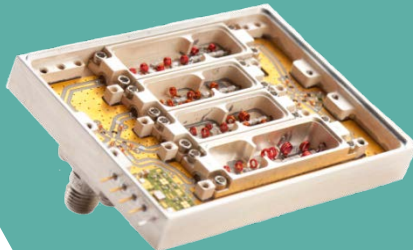
Integrated Microwave Assemblies



IMAs

- Digital Frequency Discriminators
- Upconverters/Downconverters
- Amplified Preselectors
- Frequency Activity Detectors
- Frequency Multipliers

Switched Filter Banks



Switched Filter Banks

- High Isolation (>80 dB)
- Fast Switching Speeds (<25 ns)
- High Power (100 watts +)
- In-house Filter & Switch Design
- Multiple Control Interfaces (LVTTTL, RS-232, USB)

Filters



Filter Optimization

- Cavity
- Lumped Element
- Ceramic
- SAW
- Suspended Substrate

VALUE-ADDED FEATURES



Value-added Features:

- Leading designer and manufacturer of RF/Microwave filters and switches
- Uniquely able to optimize Switched Filter Bank designs
- Talented staff of filter, switch and thin film design engineers
- Skilled in designing and manufacturing hybrid PIN drivers
- Utilize high performance Schottky diodes to prevent damage in a harsh application environment

VERTICAL INTEGRATION

More than just single function product designs!
We are vertically integrated, drawing from specialists in multiple disciplines such as...

- Thin Film Fabrication
- PIN Diode Switches
- FET Switches
- GaAs Switches
- RF & Microwave Filters
- Switched Filter Banks & Integrated Products
- Driver Circuits – Hybrid & SMT

THE FILTER SPECIALISTS

Our customers are able to weigh the benefits of:

- Size vs. Loss
- Rejection vs. Size
- Selectivity vs. Group Delay

and select the perfect filter to optimize system performance and value.



EXPERT CRAFTSMANSHIP



Expert Craftsmanship

- Hand Wound Torroids
- Precision Substrates
- Skilled Hand Assembly
- Automated Pick-and-Place

ENGINEERING CAPABILITIES

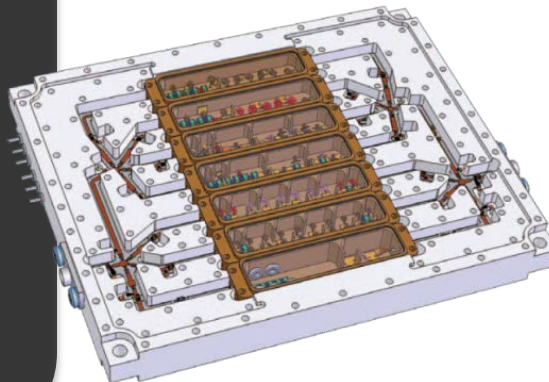
State-of-the-Art Engineering

Using state-of-the-art software and simulation tools, our experienced engineering team is able to quickly take a requirement from concept to production.

All switched filter bank designs are based on simulations using tools such as

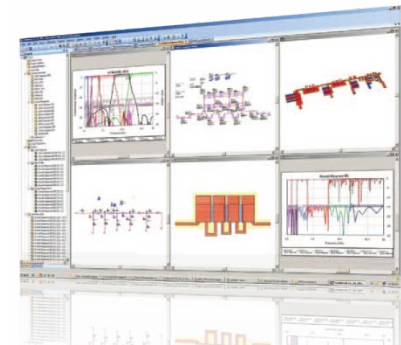
- HFSS
- ADS
- Microwave Office
- Genesys

in order to provide high isolation, compact, low weight units in the shortest possible time.



Tools and software our RF Engineers routinely use:

- Ansoft HFSS
- Microwave Office
- Agilent ADS Design Suite
- SolidWorks
- Labview
- Agilent Genesys
- AutoCAD
- Cadence Allegro
- Ansoft Designer
- Sonnet EM Simulator



3D SolidWorks modeling is used to predict filter profiles as well as to optimize PCB layouts.

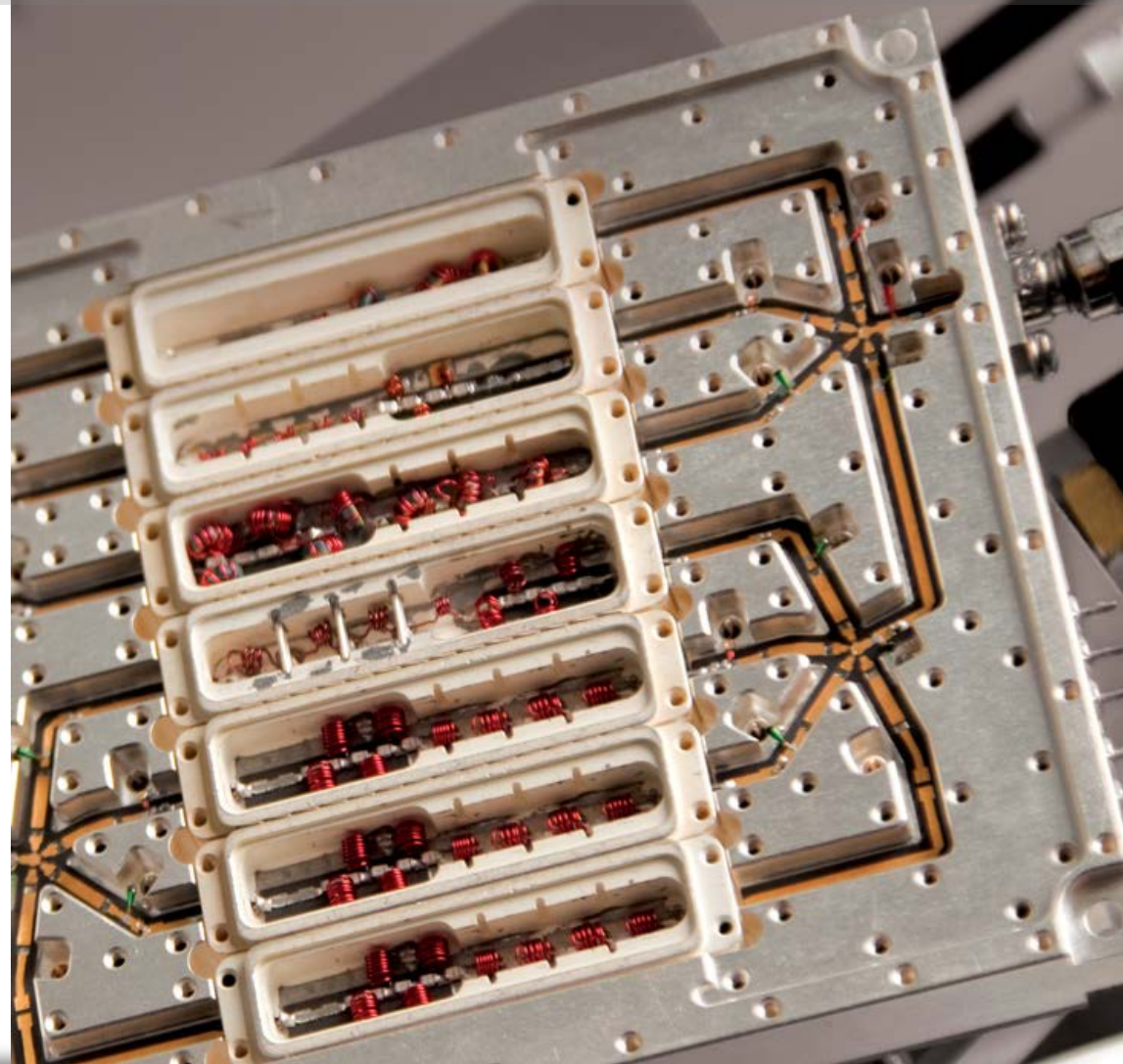
Partnering with our Customers

Using Genesys and CAD models allows us to integrate the Switched Filter Bank into our customer's system level assembly to ensure proper fit and overall integrity.

PERFORMANCE ENHANCEMENTS

We offer value added features for our lineup of Switched Filter Banks including:

- Programmable logic for complex switch configurations
- Active gain compensation over temperature
- Channel-to-channel gain leveling
- Multiple control interfaces (LVTTTL, RS-232, USB)
- DC-DC converters for high efficiency



SUPERIOR QUALITY

Our employees:

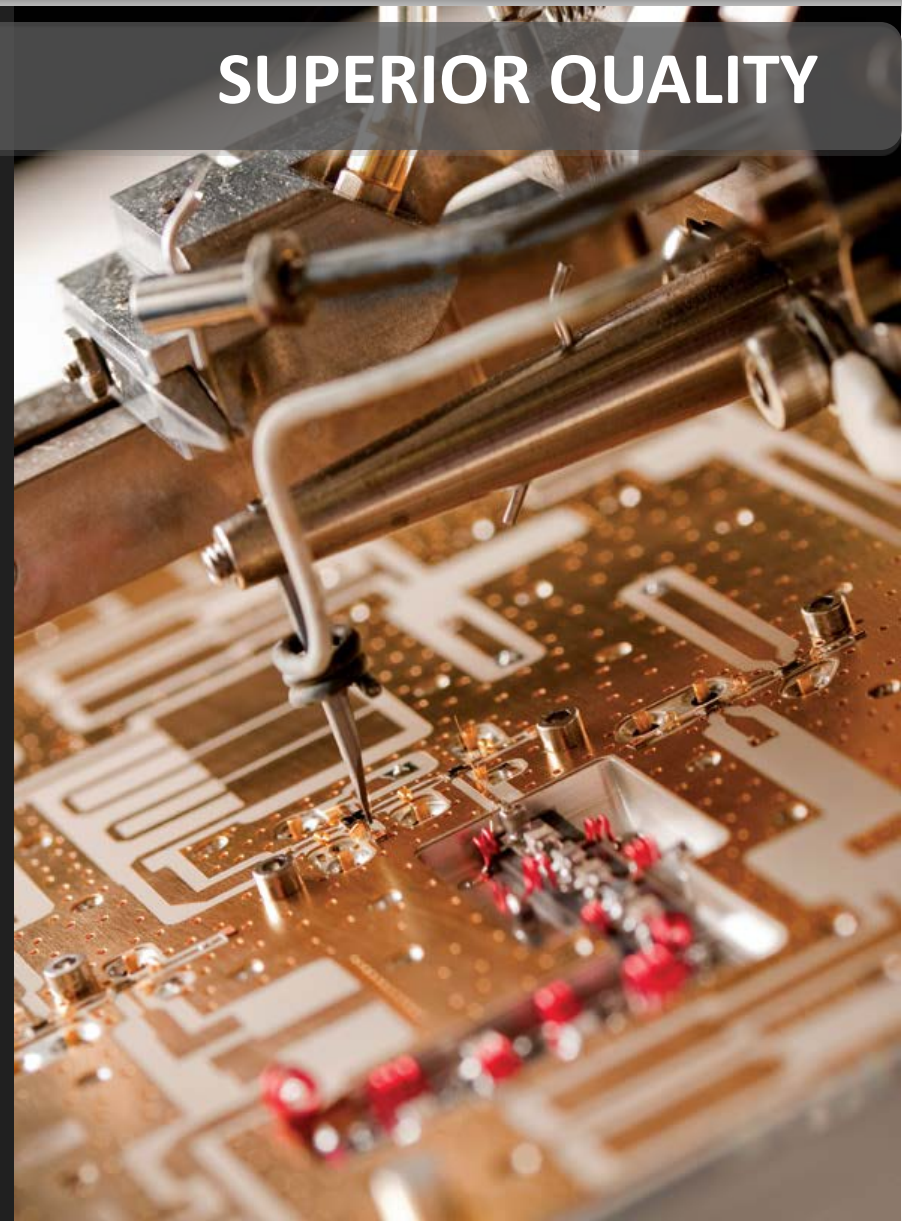
- Are encouraged to suggest product improvements
- Have the skills and tools to identify the slightest imperfections
- Continually strive to exceed the goals placed before them
- Know that our success is directly related to the satisfaction of our customers

- ✓ All Manufacturing Facilities Certified to ISO 9001:2008
- ✓ Six Certified AS9100 Facilities
(more facilities to be certified soon!)

SUPERIOR QUALITY

Quality techniques that our design engineers build into every filter:

- Spring-loaded, self-locking tuning bushings and rotors reducing the risk of metallic slivers which can lead to premature failure in cavity designs.
- Annealing of inductors to remove any metal stress memory for consistent and reliable inductor performance.
- Designs incorporating smooth angles and edges for superior plating adhesion and higher operating power.





SUPERIOR QUALITY

Process Monitoring

We monitor critical phases of the production process with proprietary data logging technology.

We incorporate strategic disciplined processes including APQP (Advanced Product Quality Planning) to ensure that a specific, structured sequence of operations is completed to prevent potential quality problems.

FILTER MANUFACTURING CAPABILITIES

Prototype Machining



CMM (Coordinate
Measurement Machine)



Laser Welding



J-STD-001, Class 3
Soldering



SMT/Pick n Place



Hybrid Assembly



Automated Test &
Data Recording



Extensive Burn-in and
Thermal Cycling Capabilities



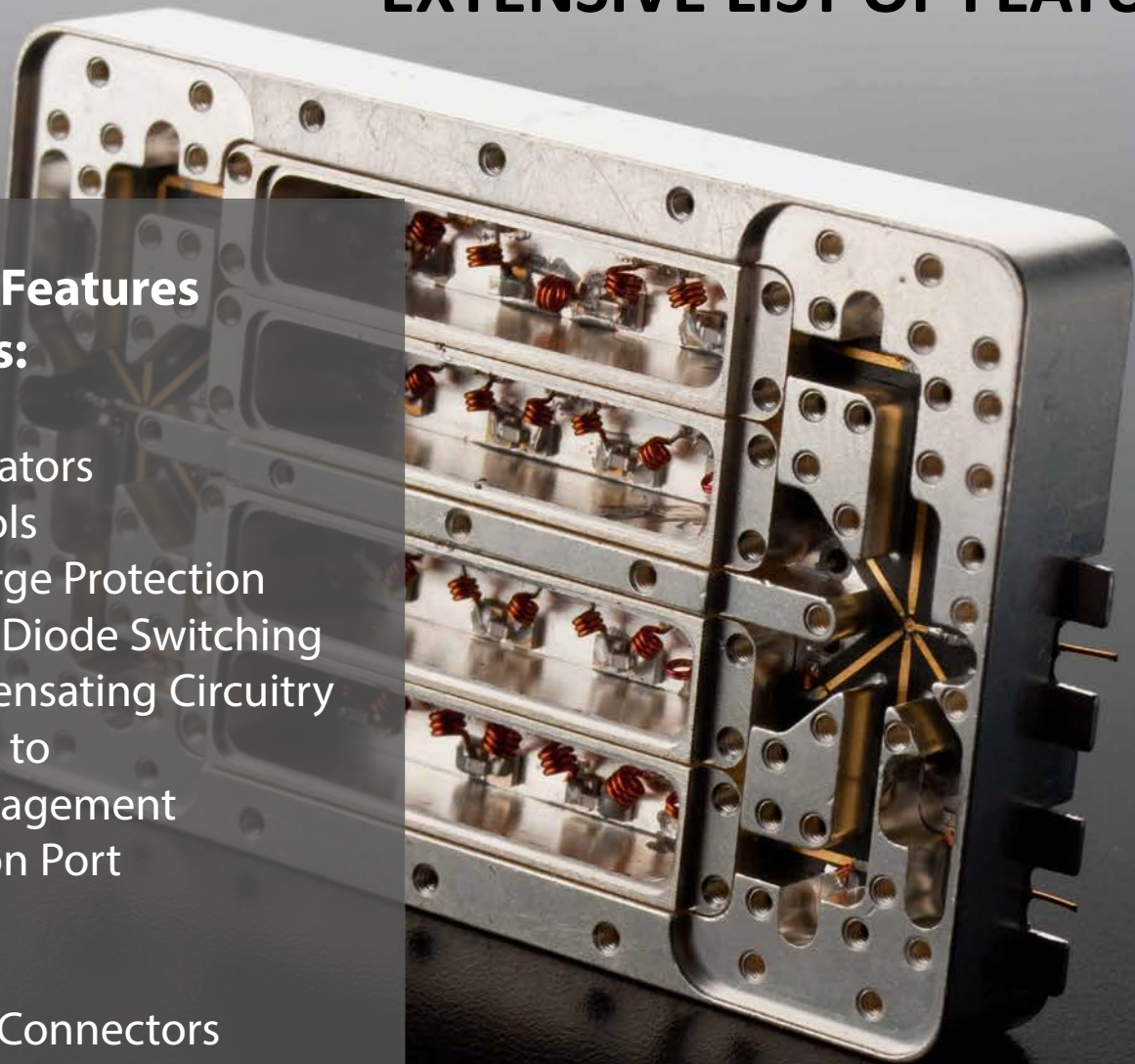
Shock & Vibration
Testing



EXTENSIVE LIST OF FEATURES

Extensive Standard Features and Custom Options:

- ❖ Input Voltage Regulators
- ❖ TTL or CMOS Controls
- ❖ Input DC and RF Surge Protection
- ❖ Optional FET or PIN Diode Switching
- ❖ Temperature Compensating Circuitry
- ❖ Integrated Couplers to Support Power Management
- ❖ Input Signal Injection Port
- ❖ Laser Welding
- ❖ EMI Pins
- ❖ D-Sub and Micro-D Connectors

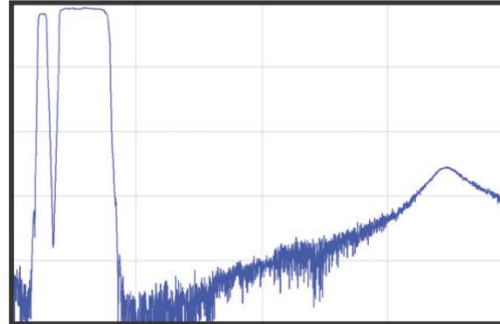


MULTIPLE CONFIGURATIONS

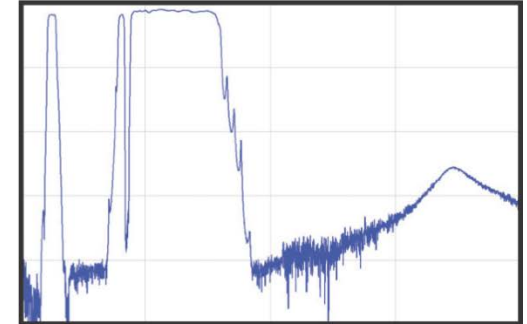
We offer multiple configurations and combinations:

- 2^n switched channel combinations (n=number of channels)
- Switching notches
- Any combination of notches and passbands
- Switching contiguous bands

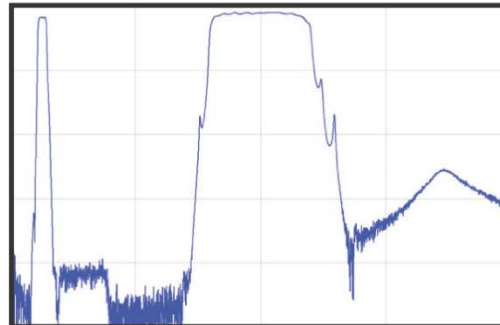
Channel 1 & 2



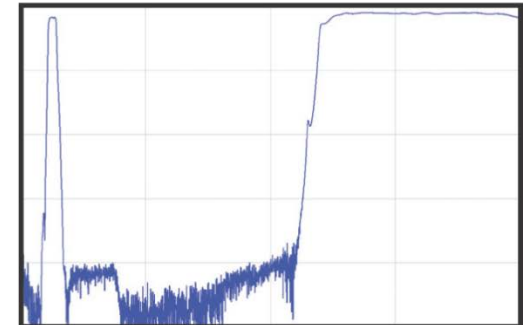
Channel 1 & 3



Channel 1 & 4



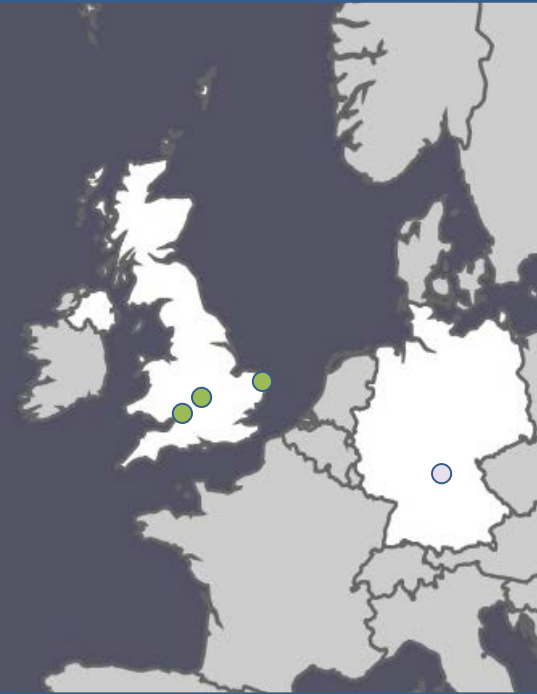
Channel 1 & 5



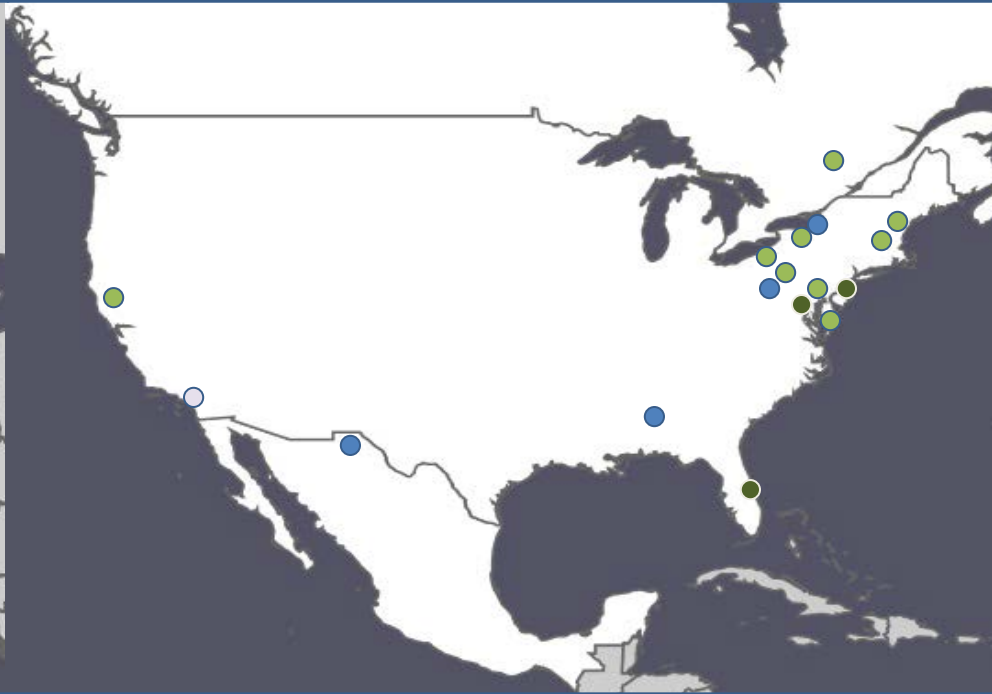
● Design & Manufacturing ● Design Center ● Manufacturing Center ● Sales Office

OUR FOOTPRINT

Europe



North America



Asia



- 12 Trusted facilities worldwide (US, UK, Canada)
- Technology focused: Nearly 20% of our employees are engineers and skilled design professionals
- International manufacturing locations are API companies - not subcontractors; same equipment and processes as U.S.

POINTS OF CONTACT

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