



# VSFF INNOVATION BRIEF

**SENKO®**  
Advanced Components

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# Innovative Optical Connectivity Solutions

SENKO is a leading company in the design and manufacture of innovative fiber optic connectors, including the VSFF range. We are committed to delivering the best possible solutions to our customers, and our track record of success is a testament to our dedication and expertise in this field.

At SENKO, we are constantly pushing the boundaries of what is possible. Our innovative approach has led to the development of some of the most cutting-edge fiber optic connectors on the market. We pride ourselves on our ability to turn concepts into realities. Our team of expert engineers and designers work tirelessly to bring new products to market as quickly as possible.

Our commitment to innovation is reflected in our extensive patent portfolio, which includes several key patents for VSFF connectivity. We are constantly exploring new technologies and ideas, and our ongoing research and development efforts are focused on creating even more advanced and effective fiber optic connectors for our customers.

In addition to our strong focus on innovation, we also place a high priority on collaboration and partnership. We believe that working closely with our customers is essential in order to understand their unique needs and challenges, and to develop customized solutions that meet their specific requirements.

In short, at SENKO, we are passionate about developing the best fiber optic connectors in the world, and we are dedicated to working closely with our customers to bring their ideas to life. We believe that our innovative approach, commitment to quality, and collaborative spirit make us the ideal partner for anyone looking to stay ahead of the curve in this rapidly evolving industry.

TELECOM **Data Centers** MEDICAL  
WIRELESS **Automotive** **Hyperscale**  
On-Board Optics SECURITY **FTTx** AVIATION  
and more...

# Exceeding Industry Standards

SENKO is actively involved in the development of standards for fiber optic connectivity. We work closely with industry standardization groups and Multi-Source Agreements (MSAs) to ensure that our products are designed to meet the latest industry standards and specifications.

Our team of experts participates in various standardization committees and MSAs, including the Telecommunications Industry Association (TIA), the Institute of Electrical and Electronics Engineers (IEEE), and the Small Form Factor Pluggable (SFP) MSA. By being at the forefront of these groups, we have a direct influence on the development of new standards and can ensure that our products meet the latest requirements.

We are committed to staying current with the latest standards and actively contribute to developing new standards to ensure that our customers receive the highest quality products that meet the latest industry requirements.



## Global Presence

With offices all around the world, SENKO aims to provide local service on a Global footprint.

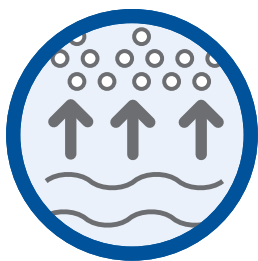


# COMMITMENT to QUALITY and RELIABILITY



**ENVIRONMENTAL  
TESTING**

- Thermal aging
- Thermal cycling
- Humidity aging
- Accelerated life



**RELIABILITY  
TESTING**

- Salt spray
- MFG
- Dust

At SENKO's Massachusetts facility, we boast an interdependent ISO-17025:2005 accredited reliability test laboratory equipped with a comprehensive range of environmental and mechanical reliability test equipment. Our expert team uses this equipment to qualify both passive components and connector-based products, ensuring that they meet our stringent quality standards.



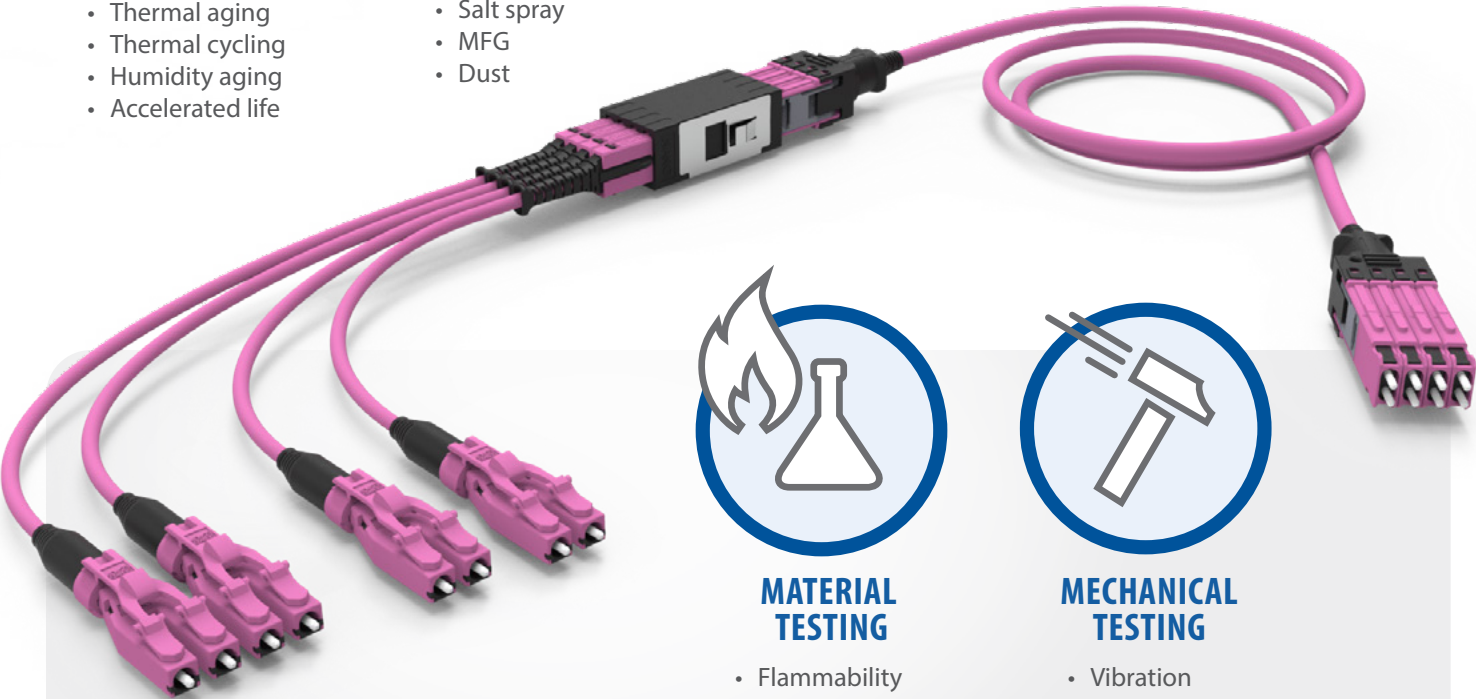
**MATERIAL  
TESTING**

- Flammability
- Fungus
- Glass transition temperature



**MECHANICAL  
TESTING**

- Vibration
- Flex
- Twist
- Cable retention
- Impact



## Your Source for Optical Interconnect Solutions

**Experience**

When "off the shelf" solutions just won't work, the highly experienced Senko product design and engineering staff are ready to collaborate with you in designing and developing solutions to meet your stringent requirements.

**Speed**

At SENKO we measure design and prototyping time in weeks, not months.

**Creativity**

SENKO is prepared to solve the most complex Interconnect dilemmas, be that of space requirements, optical performance, or the need for new technology.

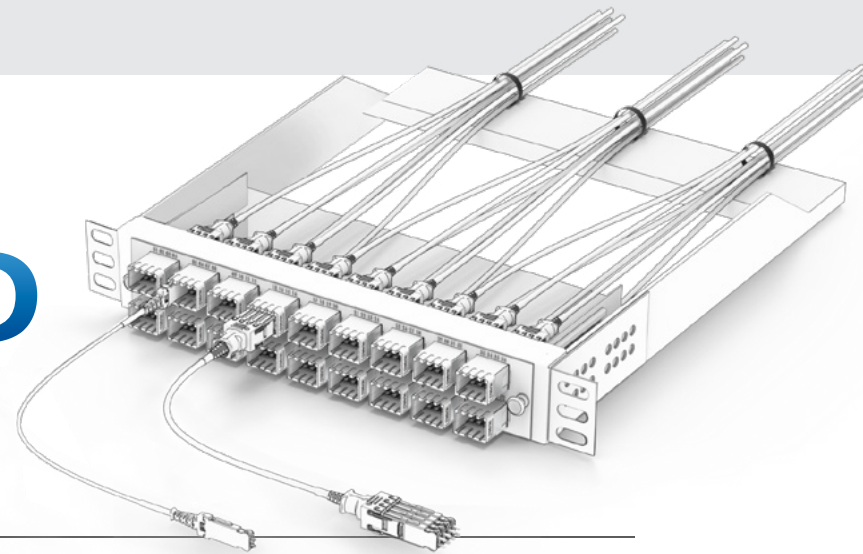
**Innovation**

We combine focused creativity, experienced insight, and a big-picture perspective to deliver breakthrough product design and engineering innovations that also meet manufacturing requirements and budget constraints. We are committed to supporting our customers with engineering and product development capabilities spanning mechanical, electrical, software, and systems engineering.





# CUSTOMIZED SOLUTIONS



At SENKO, we believe in truly understanding our customers' needs and collaborating with them to solve problems using our comprehensive design and engineering capabilities



We recognize the importance of staying ahead of the curve in an ever-changing market, and we continuously develop new products to address the diverse range of applications.

If a solution does not already exist, we take it upon ourselves to develop one. With global design, testing, and high-quality manufacturing capabilities, we are dedicated to meeting our customers' needs locally. At SENKO, our ultimate goal is to provide innovative solutions and outstanding customer service that exceeds expectations.

## Design, Test, Manufacture

### Concept Design

Before we design, we define the product's functionality and manufacturability including parts, materials and potential supply chain options. Our product specification solutions provide the foundation for a successful development process.



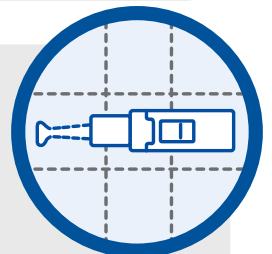
### Functional Prototyping

This phase involves the design & development of working models of the product, utilizing our in-house Stereo Lithography (SLA) capabilities. The objective of this step is to confirm that the product will perform and to verify that there are no production barriers.



### Engineering Design Development

We refine product specifications further during engineering design. Senko applies analytical rigor during this phase to evaluate how product specification changes will impact functionality, performance, reliability, and cost.



### Design Validation

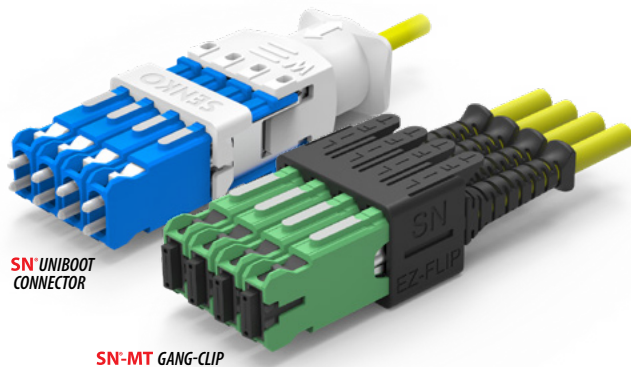
Certified 3rd party environmental and mechanical testing and verification of the applicable standards or client requirements is the last phase before finalizing product design. Our verification process ensures that the product design meets the client's desired specifications.



# SUSTAINABLE NETWORKS

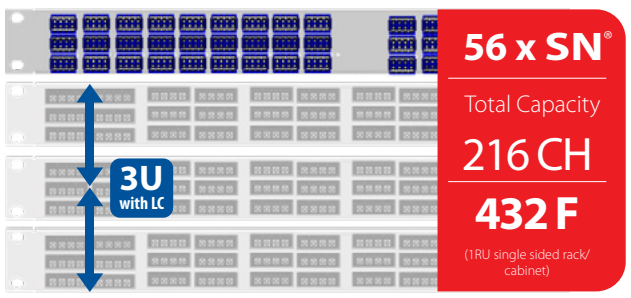
**SN<sup>®</sup> and SN<sup>®</sup>-MT**

Sustainability has become the primary focus of SENKO's corporate mission. We strive to make our products environmentally friendly and also economically and socially sustainable. This approach includes using eco-friendly materials and reducing waste during production, promoting energy-efficient usage of our products, and recycling them at the end of their life cycle.



## Increase Capacity to Hyper Density

SN<sup>®</sup> allows operators to increase the patch panel density by a factor of 3 versus legacy LC connectivity - up to 432 fibers per 1RU of rack space. This allows for huge cost-per-port savings and fewer connectors to clean, test and inspect for greater savings and a reduction in operating costs.



Let Go of the Past.  
Connect With the Now.

### Increased efficiency, less waste

SN connector is less than half the size of an LC duplex connector



**67%**  
Reduction in  
plastic

### Smaller footprint

Increase capacity and reduce the need for additional data centers



### Turn down the heat

Improve air flow to equipment and reduce energy consumption with SN<sup>®</sup> and SN<sup>®</sup>-MT





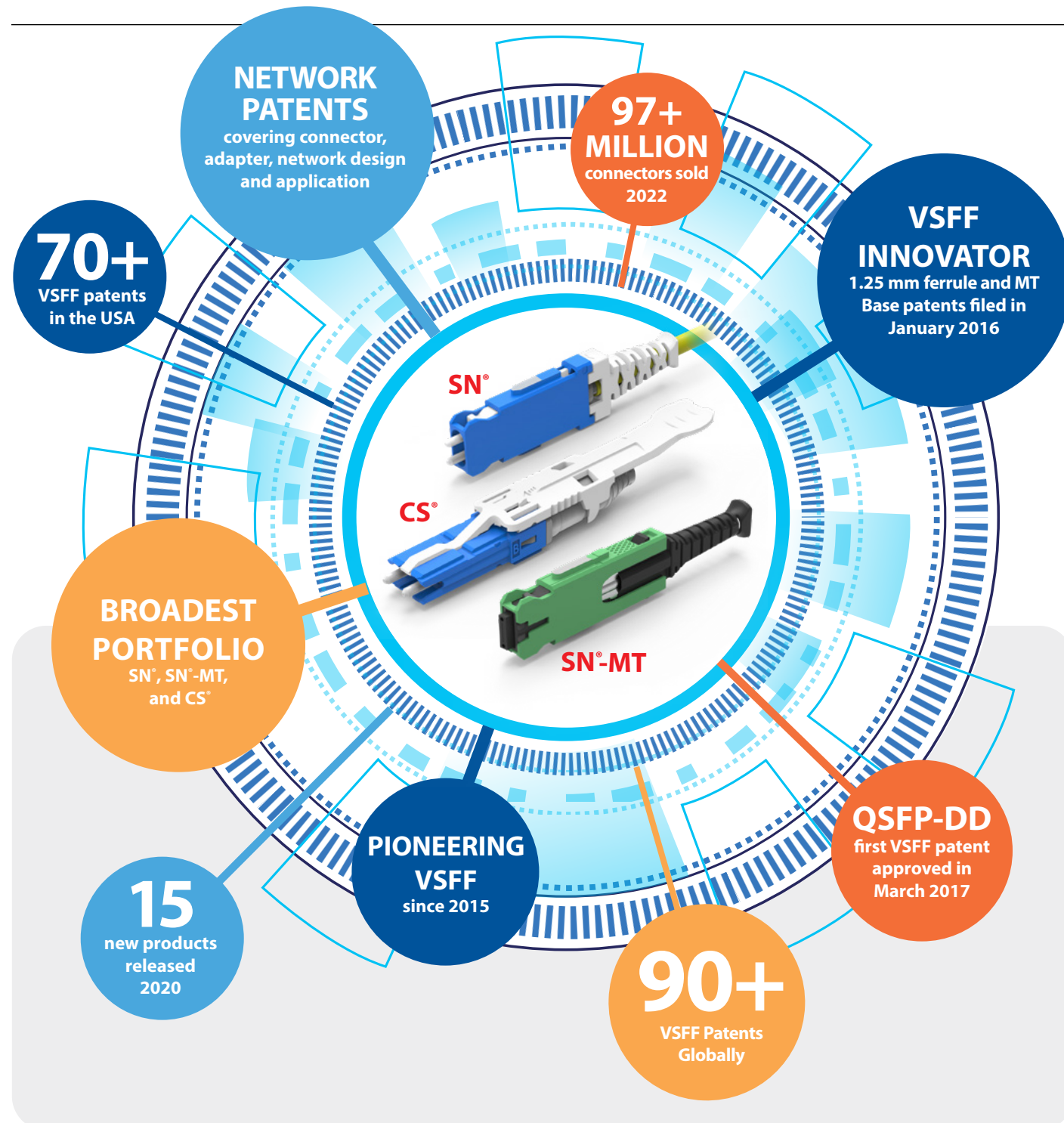
## What is the Industry Saying?

SENKO Advanced Components' SN<sup>®</sup>-MT Connector earned a 4.0 scored in the *2022 Lightwave Innovation Reviews*. The SN<sup>®</sup>-MT is a next-generation multi-fiber connector that can carry a maximum of 16 fibers in a single-row ferrule contained within a regular SN connector footprint.





# VSFF INDUSTRY PIONEER



## VSFF Pioneer and Technology Leader with 90+ Patents

SENKO is at the forefront of driving next-generation applications that require unprecedented amounts of data. The rise of supercomputing, AI, and Big Data has resulted in a demand for data rates as high as 400G, 800G, 1.6TB, or even beyond. In response to this need, we have developed our Very Small Form Factor (VSFF) connectivity, which is the first of its kind to deliver up to four optical channels within a standard transceiver footprint.

At SENKO, we understand that each connection matters, and we are committed to providing the best solutions for your specific connector requirements and application needs. Our team of experts are always available to assist you in finding the right connectivity solutions to meet unique specifications.

We take pride in delivering high-quality products with superior performance and reliability, ensuring that data transmissions are seamless and uninterrupted. Whether you require fiber optic connectors, cable assemblies, or other optical connectivity solutions, you can trust SENKO to deliver the best products and services to meet your needs.

### Patented Solutions

- SN<sup>®</sup>, SN<sup>®</sup>-MT, and CS<sup>®</sup> connectors are invented by SENKO Advanced Components and standardized in the QSFP-DD MSA and OSFP-MSA specifications. The CS<sup>®</sup> is currently standardized within TIA under TIA-604-19, and the SN<sup>®</sup> is in the process of standardization within IEC under IEC 61754-36.
- SENKO is the global leader in VSFF connectivity, and our portfolio represents the broadest range of application-focused connectors and adapters on the market.
- SENKO provides a licensing program to approved partners to manufacture SN<sup>®</sup>, SN<sup>®</sup>-MT and CS<sup>®</sup> connectors and adapters without the risk of direct/indirect patent infringement

Innovation is everything



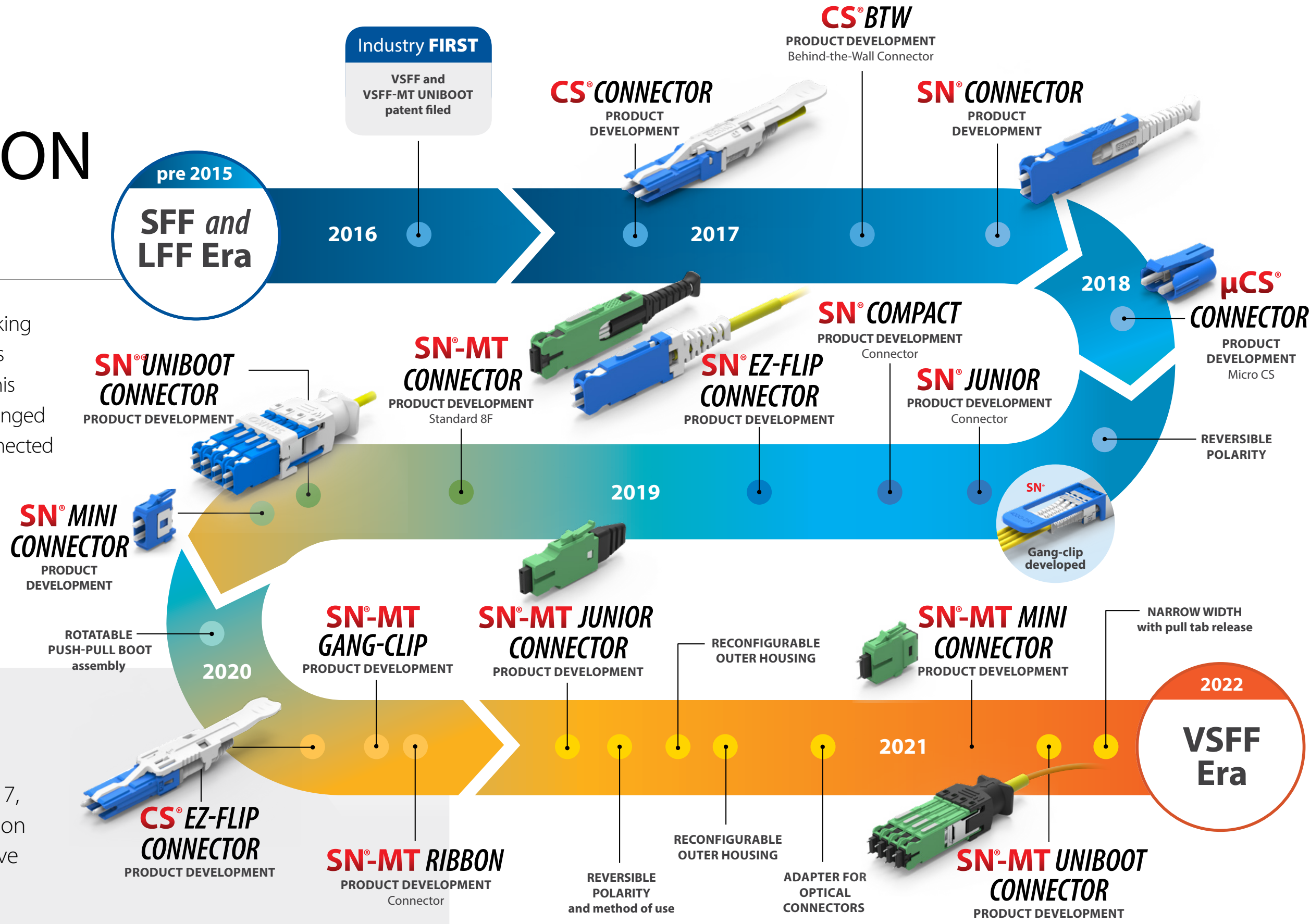
# VSFF INNOVATION TIMELINE

Since 2015, SENKO has been working to facilitate multi-port transceivers with direct-breakout capability. This pioneering work has not only changed the way that transceivers are connected in spine-leaf architecture, but it has also led to the broadest range of VSFF connectors on the market today, including the CS®, SN® and SN®-MT connectors.



SENKO's first VSFF patent was granted in 2017, and we continue to build on this success with innovative ideas shaping the world.

\*Note: The images shown are for illustrative purposes only and may not be an exact representation of the actual product or used to interpret or determine the scope of the patent. Any interpretation of the patent should be based solely on the text of the patent itself, including the claims and specifications. Senko makes no representations or warranties as to the accuracy or completeness of the information contained in the images, and any reliance on such information is at your own risk. Senko reserves the right to change the images at any time without notice.





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