SUMITOMO ELECTRIC LIGHTWAVE

National Shipbuilding Research Program (NSRP) FY25 Navy Directed Project "High-Density Blown Optical Fiber Cable & Tooling for Shipboard Installations Qualification"

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NEXT GENERATION THINKING™

SUMITOMO ELECTRIC GROUP

Project Overview

- SEL is under contract with Advanced Technology International (ATI) under Base Task Order Agreement No. 2025-372
- Summary of project is to achieve QPL qualification for the following fiber bundles
  - 12f, loose fiber SMF and MMF (OM1/62.5um), (MIL-PRF-85045/27)
  - 48f, FFR SMF (MIL-PRF-85045/38)
  - 72f, FFR SMF (MIL-PRF-85045/39)

What are Air Blown Fibers?

Sumitomo Electric Lightwave was the first to introduce air blown fiber technology in North America and is the leading Air-Blown Fiber provider for over 30 years.

FutureFLEX® Air-Blown Fiber offers unprecedented ease of installation, flexibility, and cost savings across a wide range of design needs for current and future network requirements.

FutureFLEX® Air-Blown Fiber greatly reduces initial man-hour installation costs as well as future network/capacity expense.

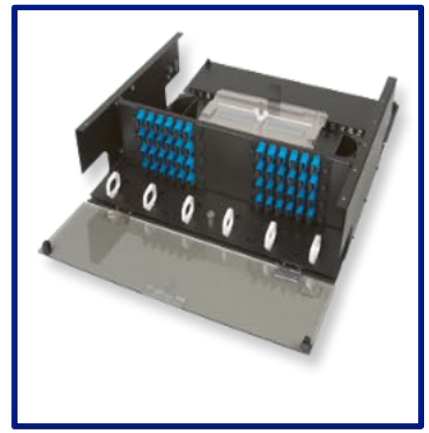
FiberFutureFLEX® Air-Blown Fiber consists of five key components all of which are produced by Sumitomo:

Tube Cables

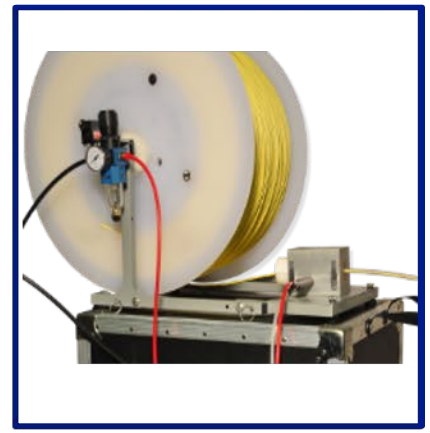
Fiber Bundles

Only product seeking QPL certification

Distribution Equipment



Fiber Termination Equipment



Blowing Equipment

Air Blown Fiber System - Quick and Easy Installation

Simple 3 Steps

Step 1 – Create an End-to-End Pathway
- Tube Cable, Distribution, and Termination Boxes

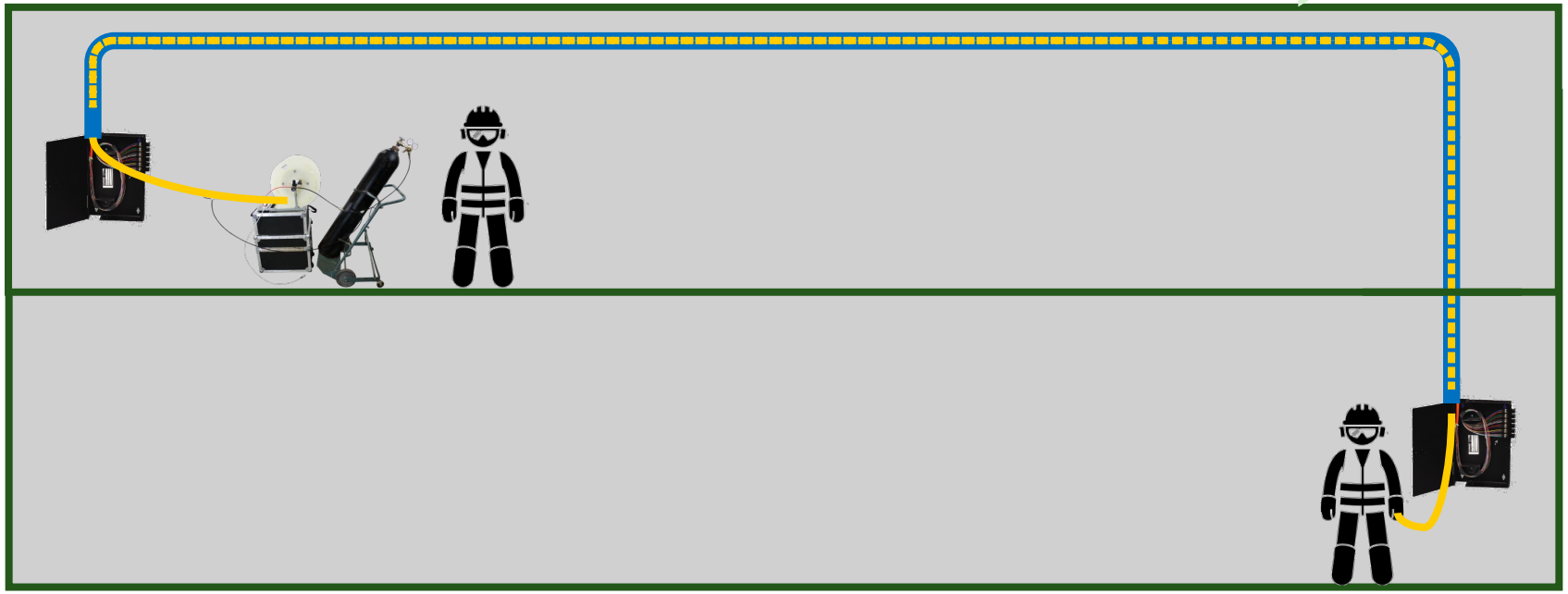
Step 2 – Select & Install the Fiber Bundle

Step 3 – Terminate the Fiber Bundles at Required termination locations

Air Blown Fiber System - Quick and Easy Installation

FEATURES & BENEFITS

- Easily and quickly install fiber from point A to B
- Same deck, multiple decks, etc.
- Minimal personnel needed



Design and Construction

- **12f:**
  - Fibers = SM and MM (MIL-PRF-49291)
  - λ ≤ 3 g/m
  - OD = 1.2 mm to 2.2 mm
- **48f:**
  - Fibers = SM, 12f pliable ribbon
  - λ ≤ 6 g/m
  - OD = 3.1 mm
- **72f:**
  - Fibers = SM, 12f pliable ribbon
  - λ ≤ 6 g/m
  - OD = 3.7 mm

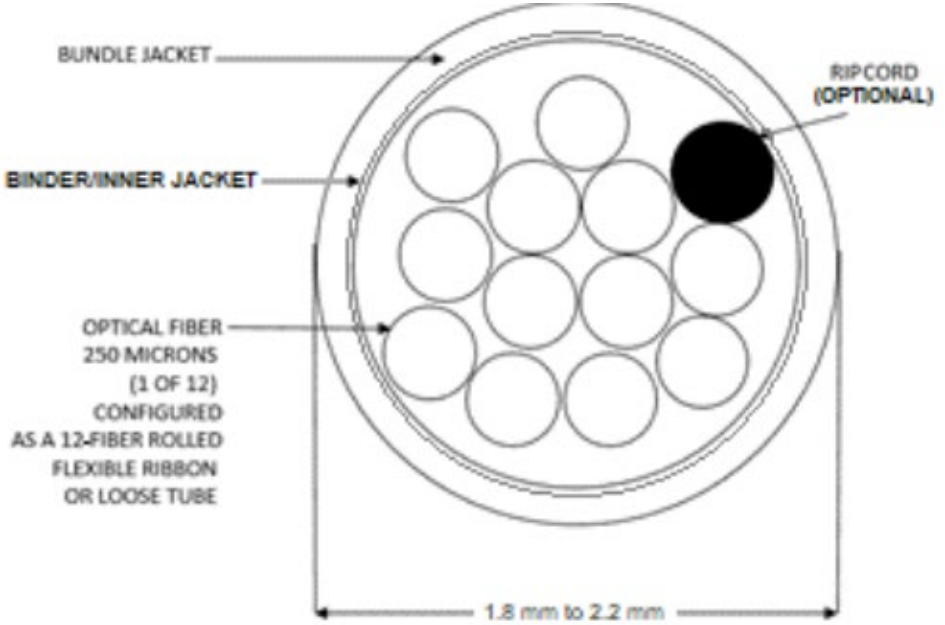


FIGURE 1. Blown optical 12-fiber bundle.

Design and Construction: 48f and 72f

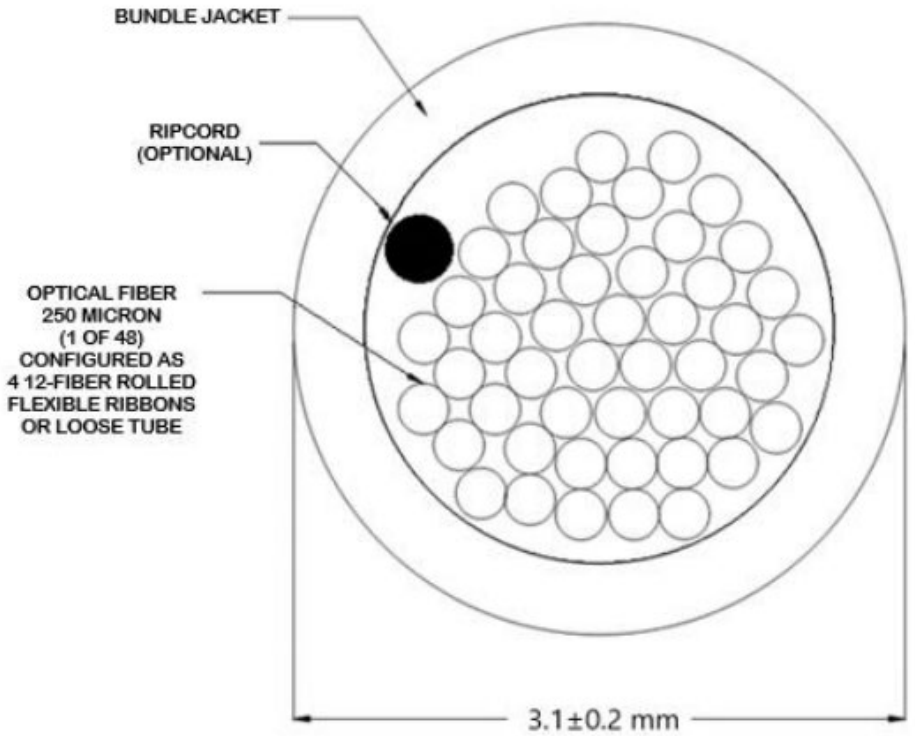


FIGURE 1. Fiber bundle, blown optical fiber, 48-fiber rolled flexible ribbon or loose tube.

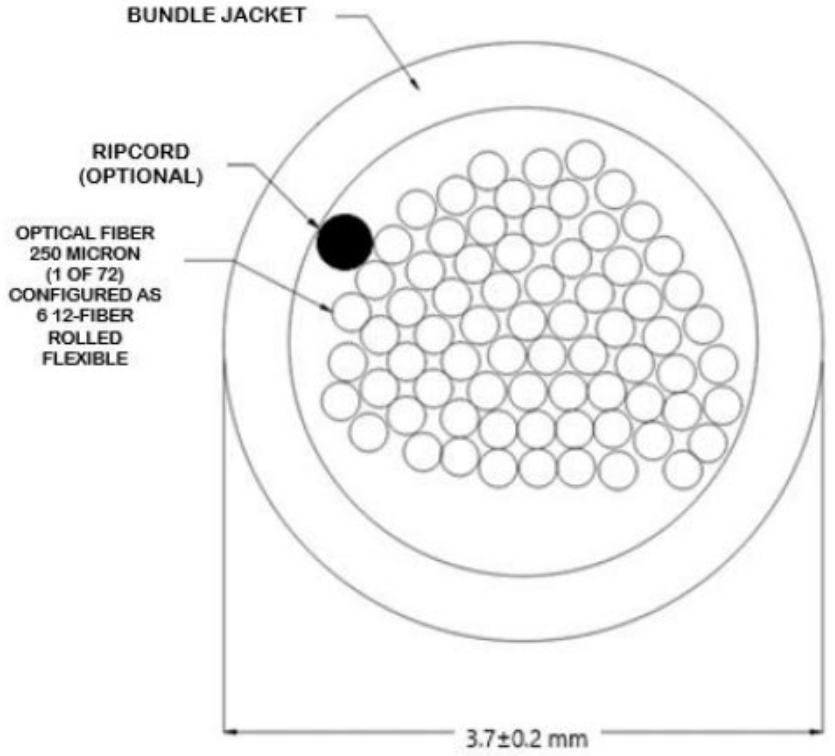


FIGURE 1. Fiber bundle, blown optical fiber, 72-fiber rolled flexible ribbon, six 12-fiber subunits.

Qualifications

TABLE II. Qualification and conformance inspection.

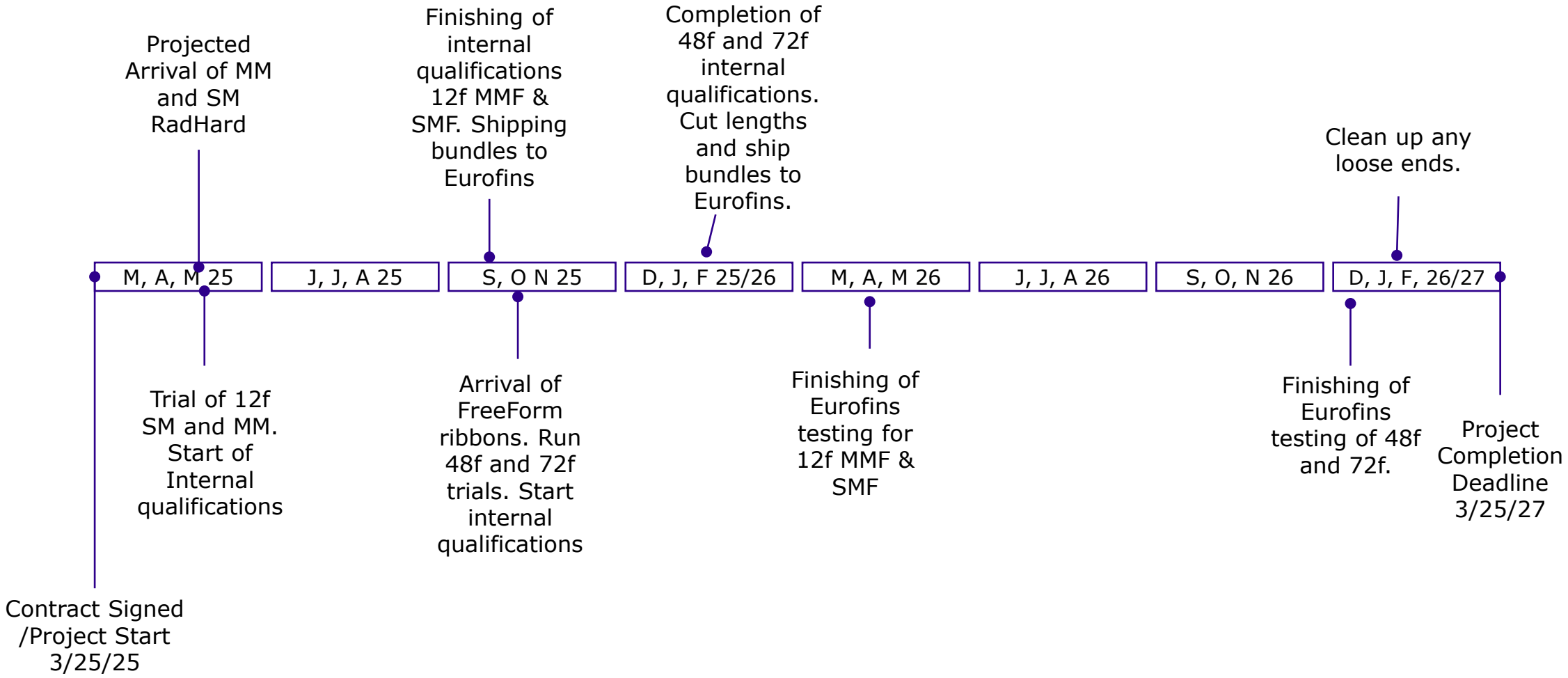
Group	Qualification inspection	Requirement paragraph	Test paragraph	Cable length 1/, 2/, 3/, 4/	Conformance inspection
I	Visual and mechanical inspection	3.4, 3.9, 3.10	4.7.2	Three samples, 0.5 km each 5/	A
	Attenuation rate	3.5.1	4.7.4.1	Three samples, 0.5 km each 6/	A
	Point discontinuity	7/	7/	Three samples, 0.5 km each 6/	--
II	Crosstalk	3.5.3	4.7.4.3	Three samples, 0.5 km each 6/	--
III	Temperature cycling	3.7.1	7/	Two samples, 0.5 km each 6/ (one on reel, one off)	C
	Temperature humidity cycling	3.7.3	4.7.6.3	Two samples, 0.5 km each 8/	C
	Storage temperature	3.7.4	4.7.6.4	Two samples, 0.5 km each 8/	--
	Cyclic flexing	3.6.4	4.7.5.4	Six specimens, 5 m each 9/ (two specimens at each temp)	--
	Temperature life (life aging)	7/	7/	Two specimens, 300 m each 10/	C
	Fungus resistance	3.8.4	4.8.4	Two specimens, 0.5 m each 10/	--
	Cable element removability	3.6.18	4.7.5.18	Two specimens, 0.5 m each 10/	C
IV	Thermal shock	3.7.2	4.7.6.2	One specimen, 0.5 km 6/ (on reel)	--
	Jacket self-adhesion or blocking	3.7.11	4.7.6.11	One specimen, 30 m 11/	--
	Shock	3.7.13	4.7.6.13	One specimen, 30 m 11/	--
V	Dripping	3.6.13	4.7.5.13	One specimen, 30 cm 11/	--
	Cable jacket tear strength	3.6.14	4.7.5.14	Five flat extruded jacket material strips 12/	C
	Cable shrinkage	3.6.17	4.7.5.17	Three specimens, 0.5 m each 11/	C
	Flame extinguishing and smoke generation	3.7.12.2	4.7.6.12.2	One specimen, 50 m 11/	C
	Water absorption	3.7.14	4.7.6.14	Two specimens, extruded jacket material strips 12/	--
VI	Acid gas generation	3.8.1	4.8.1	One specimen, 1 m 13/	C
	Halogen content	3.8.2	4.8.2	One specimen, 1 m 13/	--
	Toxicity index	3.8.3	4.8.3	One specimen, 1 m 13/	C
	Smoke index	3.8.5	4.8.6	One specimen, 1 m 13/	C

- Eurofins
- Retention = SEL/Eurofins

TABLE II. Qualification and conformance inspection – Continued.

Group	Qualification inspection	Requirement paragraph	Test paragraph	Cable length 1/, 2/, 3/, 4/	Conformance inspection
VII 14/	Ribbon strippability	7/	7/	Three specimens, 2 m each 14/	--
	Ribbon delamination	7/	7/	Three specimens, 2 m each 14/	--
	Ribbon separation	7/	7/	One specimen, 0.5 m 14/	--

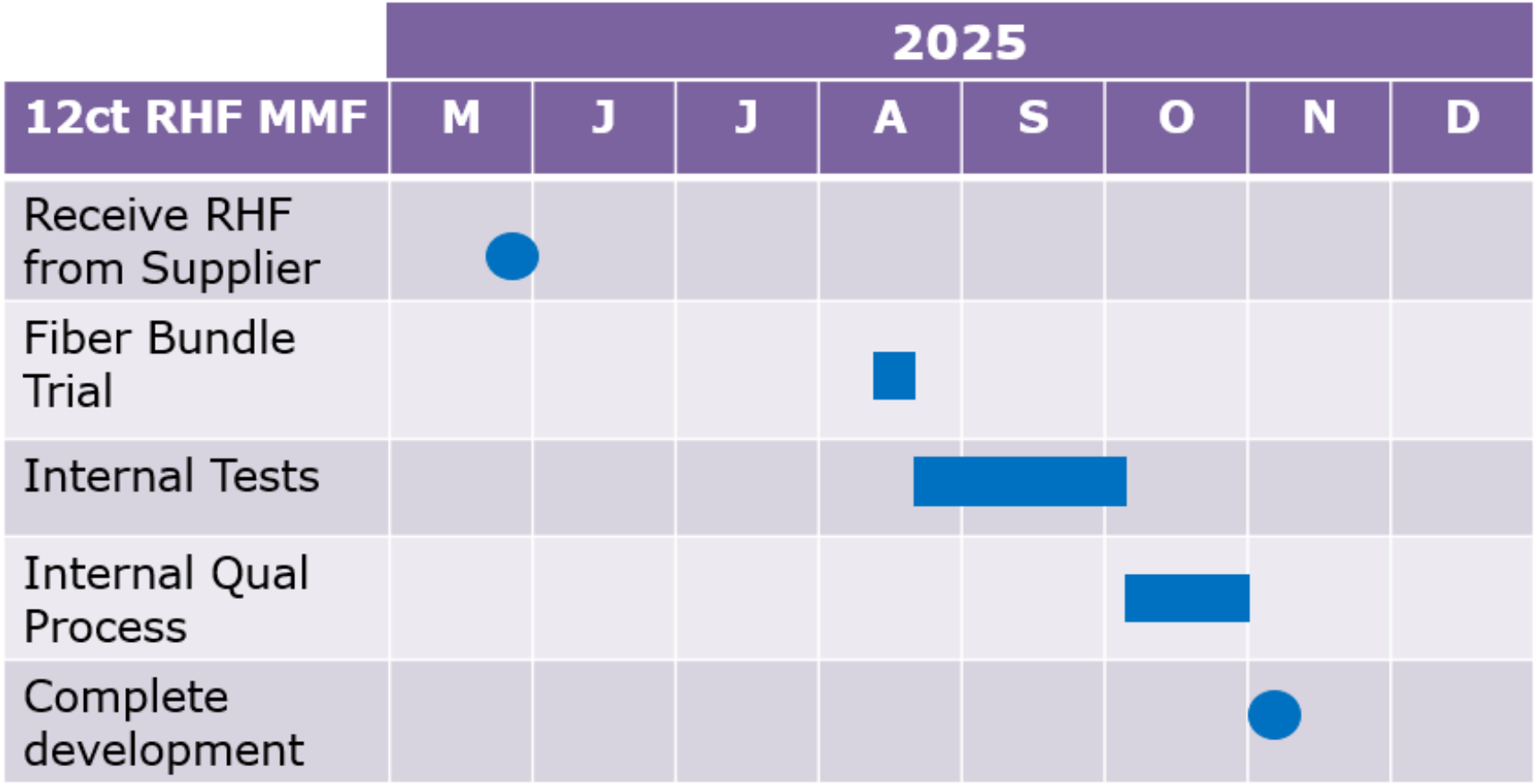
Complete Projected Time-Line



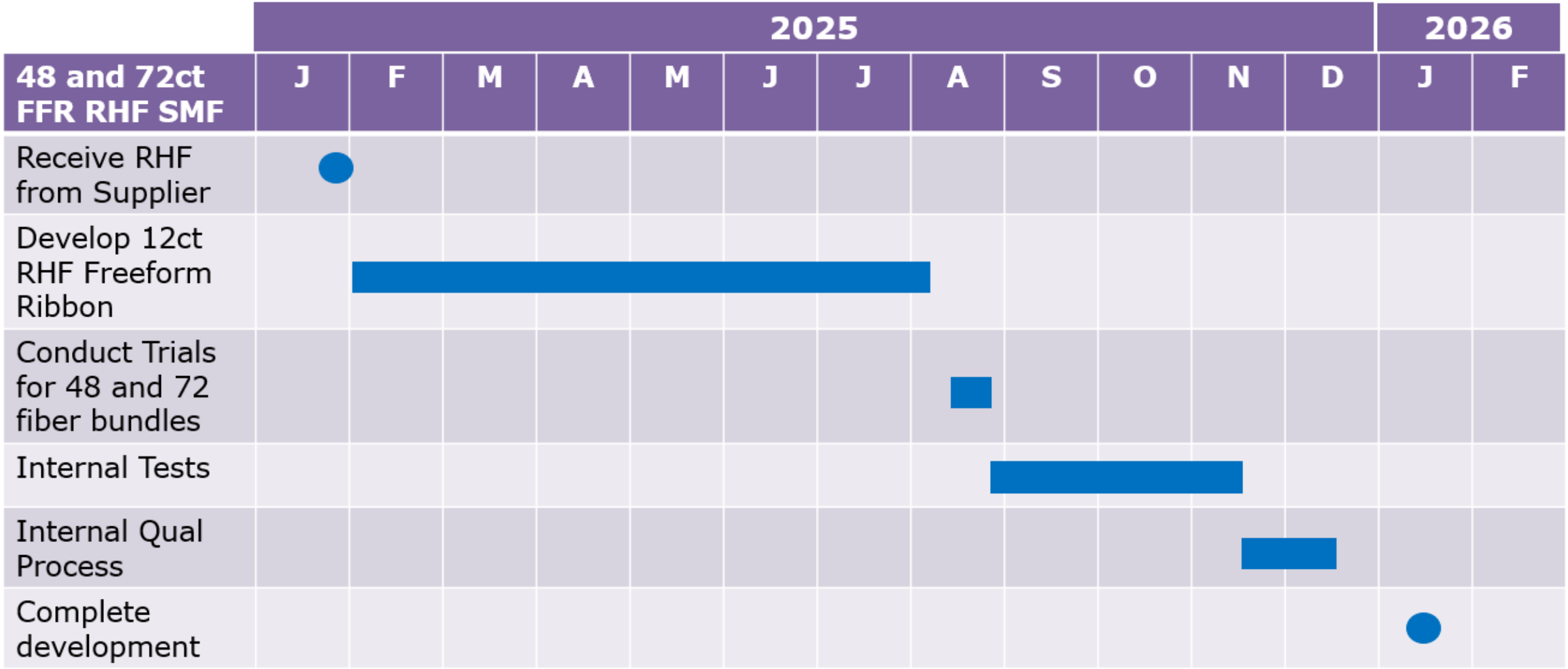
12ct RHF bundle development - SMF

12ct RHF SMF	May	June	July	August	September
Receive RHF from Supplier					
Fiber Bundle Trial					
Internal Tests					
Internal Qual Process					
Complete development					

12ct RHF bundle development - MMF



SMF Freeform Ribbon w/ RHF plus 48 and 72 fiber bundle development



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