IDT-WG2 report

KEK / IDT-WG2
Shin MICHIZONO (KEK)

- WG2 members
- Post-ITN preparation (discussed at previous ITN information meeting)

IDT-WG2 (Nov. 2026-)

I am inviting new members from Korea University and IFIC.
Hiroshi Sakai is the leader of the KEK ITN project, and I have also appointed him as deputy leader.

IDT EB

IDT WG2
Shin Michizono (Chair)
Benno List (Deputy)
Hiroshi Sakai (Deputy)

ML&SRF group

Yasuchika Yamamoto	***KEK***
Sergey Belomestnykh	**FNAL**
Nuria Catalan	CERN
Enrico Cenni	**CEA**
Dimitri Delikaris	CERN
Eun-San Kim	Korea Univ.
Luis Garcia Tabares	CIEMAT
Rongli Geng	**JLAB**
Bob Laxdal	Triumf
Matthias Liepe	Cornell
Peter McIntosh	**STFC**
Laura Monaco	**INFN Milano**
Olivier Napoly	CEA
Sam Posen	FNAL
Robert Rimmer	JLAB
Roger Ruber	JLAB
Marc C. Ross	SLAC
Hiroshi Sakai	**KEK**
Kensei Umemori	KEK
Hans Weise	DESY
Akira Yamamoto	**KEK**

DR/BDS/Dump group

Toshiyuki Okugi	***KEK***
Karsten Buesser	DESY
Philip Burrows	**U. Oxford**
Rohan Dowd	Australian Synchrotron
Daniel Esperante	IFIC
Angeles Faus-Golfe	**IJCLab**
Andrea Latina	CERN
Eun-San Kim	Korea Univ.
Kiyoshi Kubo	KEK
Jenny List	DESY
Thomas Markiewicz	SLAC
Brett Parker	BNL
Concepcion Oliver Amoros	CIEMAT
David L. Rubin	**Cornell**
Nikolay Solyak	FNAL
Nobuhiro Terunuma	**KEK**
Kaoru Yokoya	KEK
Mikhail Zobov	INFN LNF

Dump sub-group

Nobuhiro Terunuma	***KEK***
Toshiyuki Okugi	KEK

Crab sub-group

Peter McIntosh	***STFC***
Yasuchika Yamamoto	KEK

Sources group

Gudrid Moortgat-Pick	**U. Hamburg**
Jim Clarke	STFC
Steffen Doebert	CERN
Joe Grames	**JLAB**
Masao Kuriki	U. Hiroshima
Benno List	DESY
Jenny List	DESY
Toshiyuki Okugi	**KEK**
Sabine Riemann	DESY
Hiroshi Sakai	KEK
Peter Sievers	CERN – retired
Tohru Takahashi	U. Hiroshima
Kaoru Yokoya	KEK

Civil engineering group

Nobuhiro Terunuma	***KEK***
John Andrew Osborne	CERN
Tomoyuki Sanuki	U. Jikei

Sources group:
Yoshinori Enomoto has left to join the industry. As a result, I would like to appoint Gudi Moortgat-Pick as the new group leader.
Hiroshi Sakai and Toshiyuki Okugi from KEK will also join as Sources members.

Those in red are Steering members.

Post-ITN

- We are now asked to propose “post-ITN” work-packages.

(Step 1) SRF, NanoBeam, and the Source Group should submit their work-package (WP) titles **by Christmas (2026)**.

(Assumption)

- Up to 5 years starting in April 2028.
- These are not items on a “Wish List,” but rather items for which each lab. intends to request funding on an in-kind basis.

(Step 2) Following that, IDT-EB will discuss the proposals (to ensure they align with ITN requirements and identify any missing elements).

(Step 3) Prepare one PowerPoint slide each WP **by March 2027**.

Examples of post-ITN Work-packages

- SRF
  - High-Q/High-G,
  - Future High-G(Nb3Sn,Thin film,Traveling wave etc.)
  - Cryomodule Assembly and commissioning
  - Robotics
  - AI for LLRF
  - High Efficiency Multi Beam Klystron
  - ERL
- ATF
  - Beam tuning with AI, digital twin
  - Nanobeam generation with high charge
- Positron (only KEK is difficult to extend more)
  - Simulation of full prototype

By end of this Christmas (2026)

Examples of WPs

	WP title	Short description ~50 words	Proposed by	collaboration candidates1	2
SRF	High-Q/High-G,		KEK		
	Future High-G(Nb3Sn,Thin film,Traveling wave etc.)		KEK		
	Cryomodule Assembly and commissioning		KEK		
	Robotics		KEK		
	AI for LLRF		KEK		
	High Efficiency Multi Beam Klystron		KEK		
	ERL		KEK		
Nanobeam	Beam tuning with AI, digital twin		KEK		
	Nanobeam generation with high charge		KEK		
Sources					

Example

By March 2027

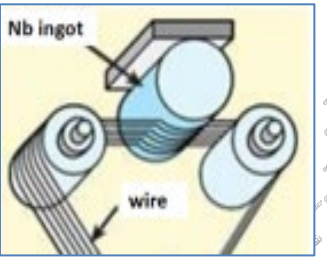
Prepare one page PPT (see next pages)

WP-prime 1: SRF Cavity
(Scoping the Industrial-Production Readiness)

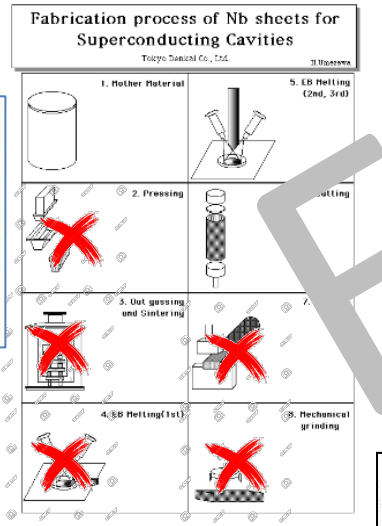
- Research with single-cell cavities to establish the best production process including:
  - Advanced Nb sheet production method
  - Advanced surface treatment recipe(mainly developed by **FNAL**)
- Globally common design with compatible High Pressure Gas Safety (HPGS) regulation
- 24 nine-cell cavities are to be developed for industrial-production readiness
  - 8 cavities in each region
  - Production process encouraged to be optimized in each region
  - Cavity performance expected: E_{acc} = <35 MV/m> (+/− 20%), Q_0 = 1.0 x 10^{10}, Yield = ≥90%
- RF performance/success yield to be examined (including 2nd pass and further)
  - 3rd pass to be examined if effective

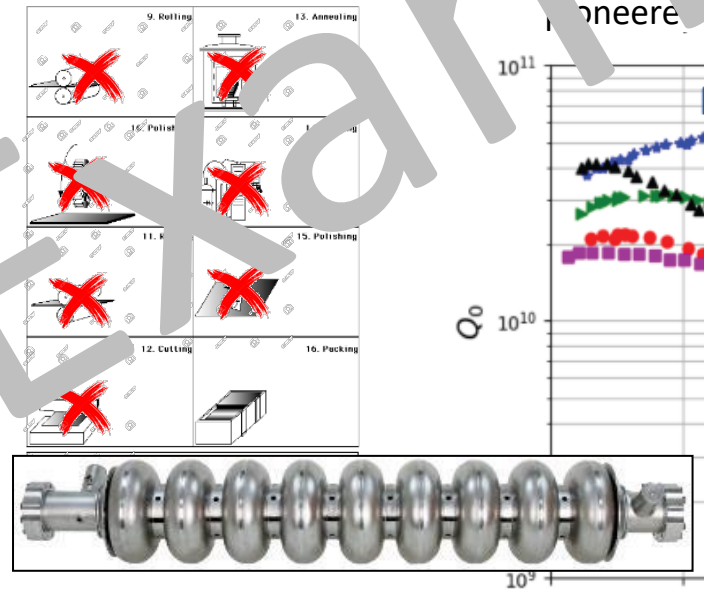
	# of cavities to be produced		
	Americas	Europe	JP/Asia
single-cell	2	2	2
nine-cell	8	8	8

Advanced Nb sheet production by direct slicing

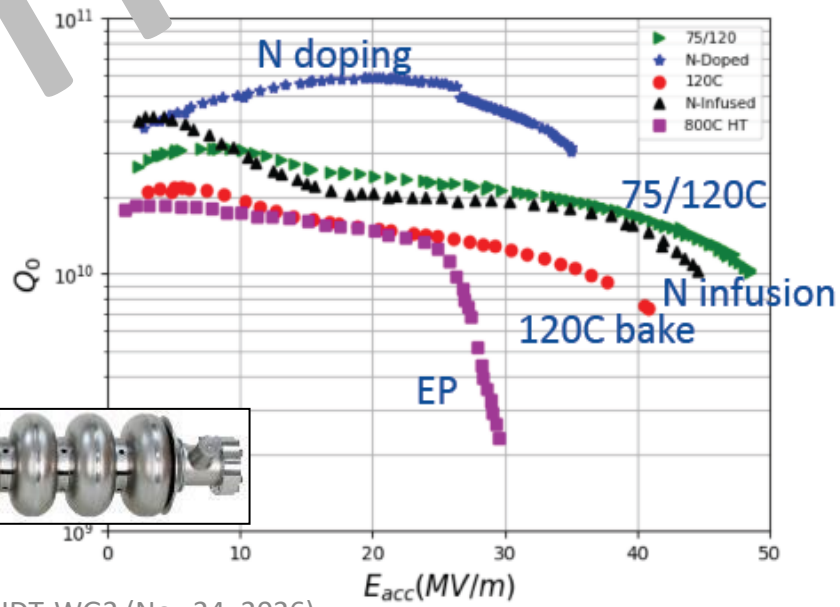


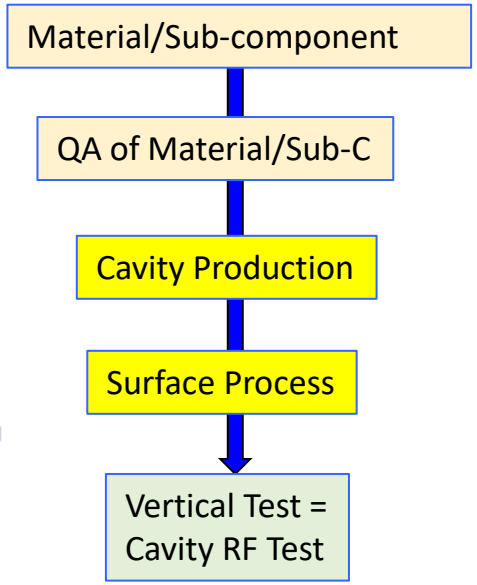






Advanced surface treatment technologies pioneered by FNAL



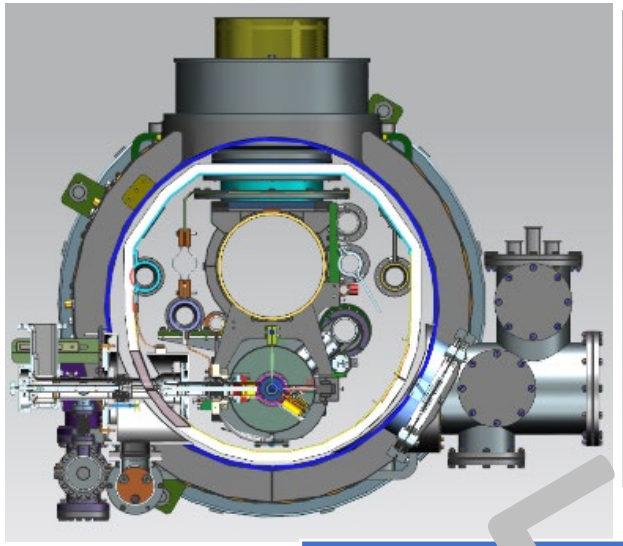


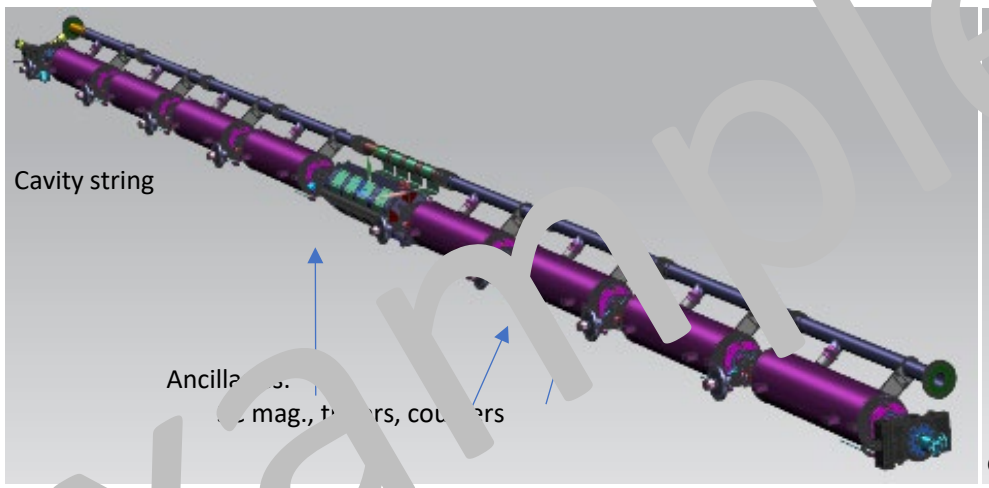
Production process

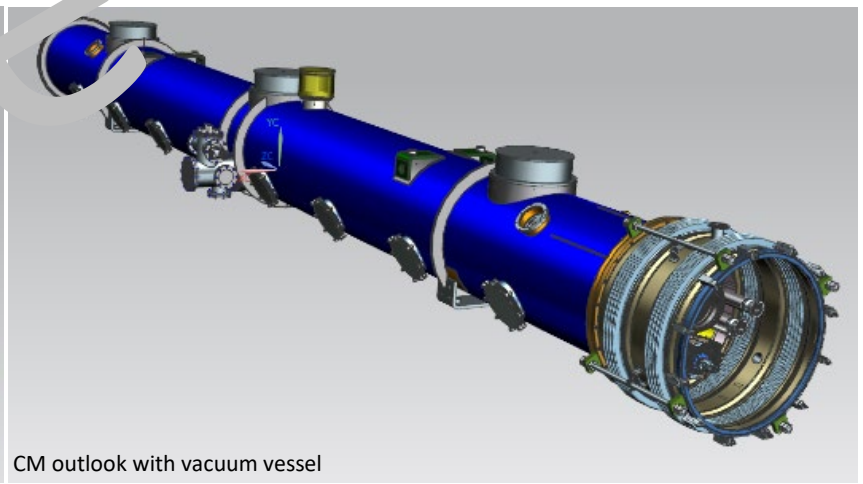
Example

WP-prime 2: Cryomodule (CM) Design
(Scoping the CM Global Transfer and Performance Assurance)

- ◆Unify cryomodule (CM) design with ancillaries, based on globally common engineering design, drawings & data-base
- ◆Establish globally compatible safety design base to be approved/authorized by HPGS regulations individually in each region, most likely referring ASME guidelines to be compatible with Japanese regulations.







CM outlook with vacuum vessel

Example

Region Regulation	Americas ASME	Europe Eu-EN, TUV	Japan/Asia JP-HPGS Act
CM tech. design base	LCLS-II	Euro-XFEL	KEK-STF, AST-IFMIF
ILC CM design	Common CM design globally compatible to HPGS regulation in all regions, and most likely ASME guidelines to be compatible with Japanese regulations.		