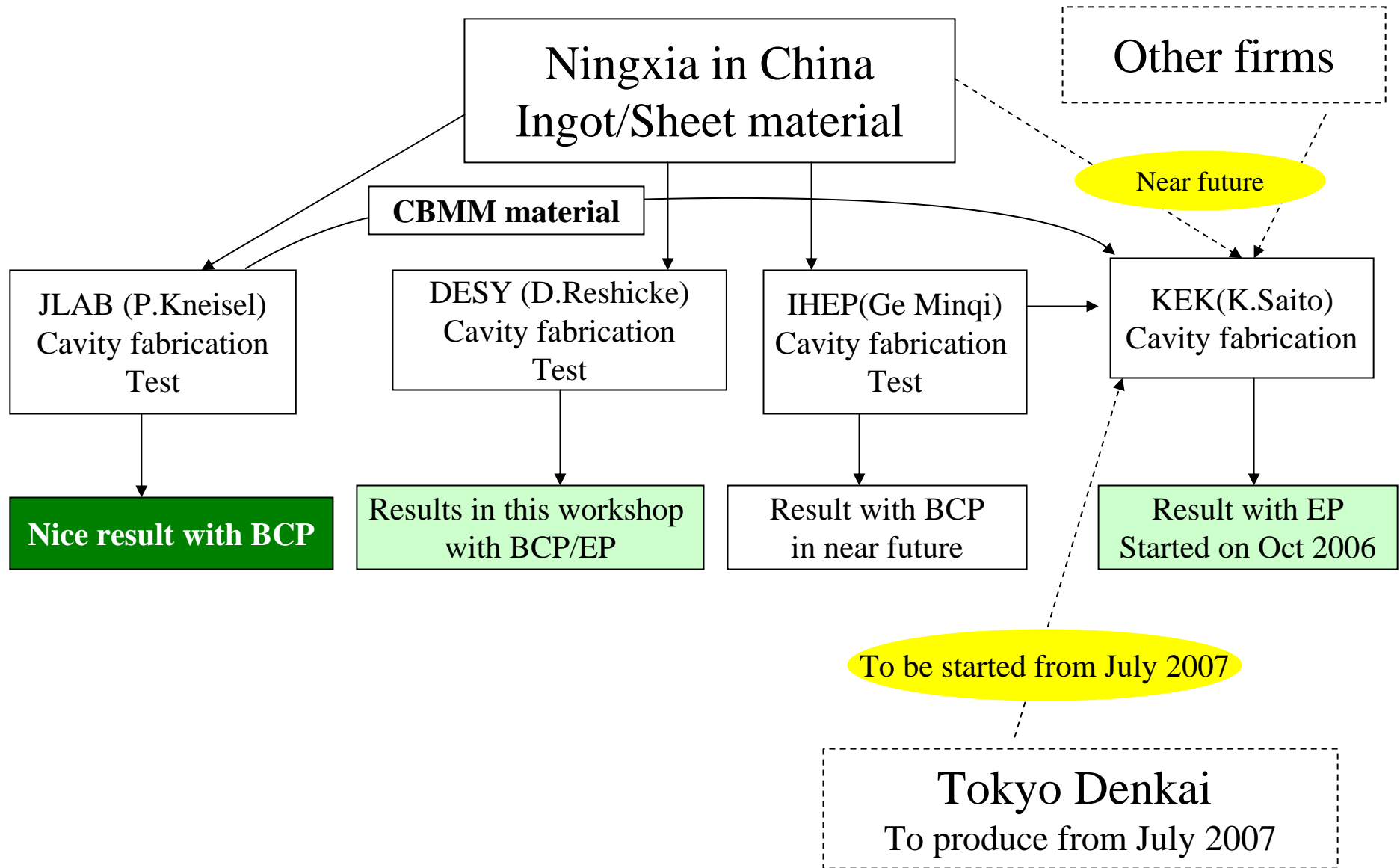


Status and Summary of Results from Large Grain in Asia

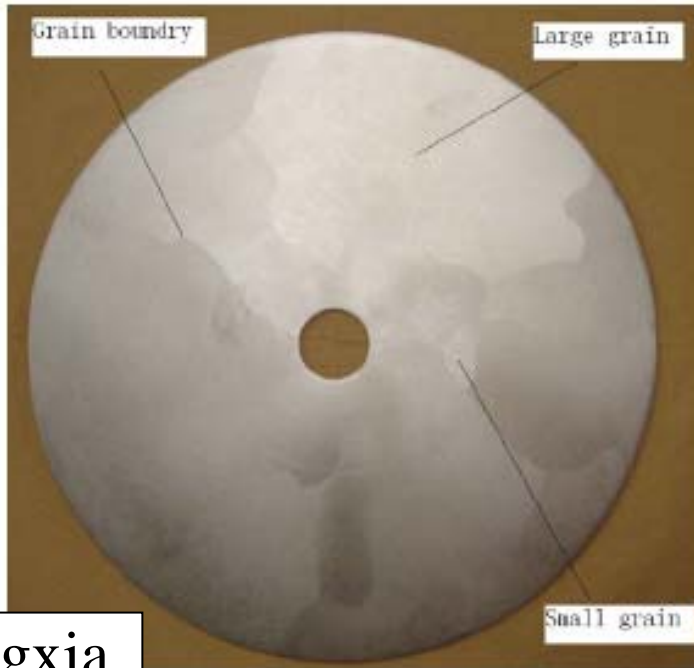
K.Saito and WG-5 Asia

Large Grain Niobium Activities in Asia



Ningxia niobium sheet from IHEP (Dr. Gao)

Six pieces from Ningxia China.
Diameter: 270 mm



Ningxia

6 sheets from IHEP

Sheet number	Side	Number of the Grains per surface	Grain radius_ Max (mm)	Grain radius_ Min (mm)
China-1	Front	17	89.1	2.99
	Back	19	87.1	2.99
China-2	Front	21	79.6	2.11
	Back	19	78.9	1.38
China-3	Front	14	86.4	2.26
	Back	18	92.9	2.26
China-4	Front	18	99.6	1.38
	Back	16	99.6	2.26
China-5	Front	19	83.4	1.95
	Back	19	83.7	2.26
China-6	Front	20	95.9	1.69
	Back	21	89.33	2.99

Grain size is smaller than CBMM by factor ~2.

Material cleaning @ KEK

BCP



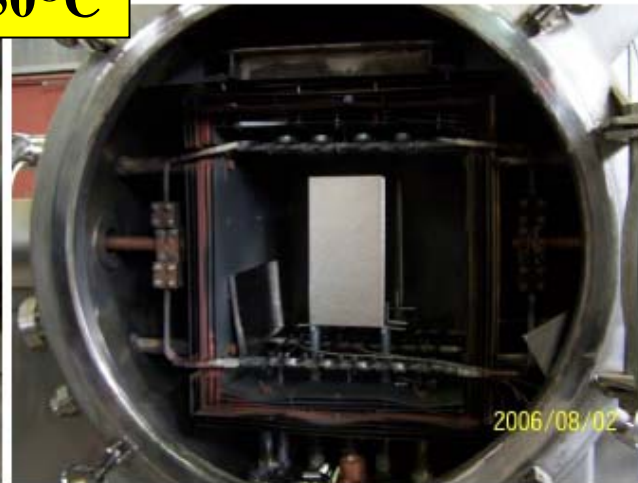
Ultrasonic rinsing



HF, HNO₃ and H₃PO₄ in the ratio 1:1:1; about one minute per piece.

Annealing @ 750°C

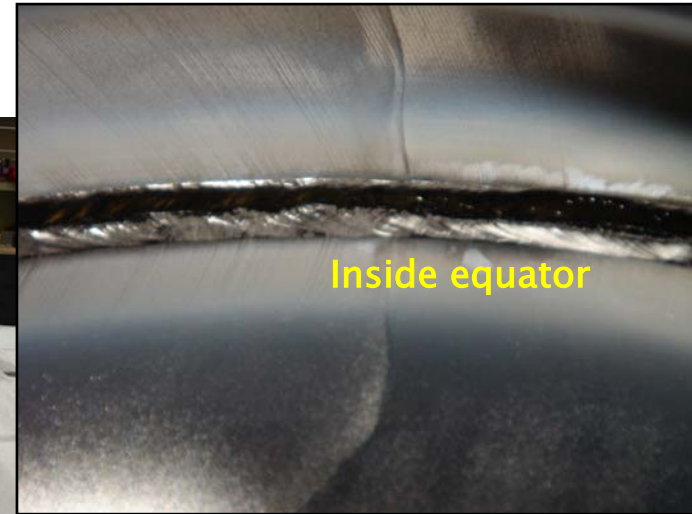
Ti box



Deep Drawing for Ningxia material



EBW @ KEK Machine Shop



CBP(Centrifugal Barrel Polishing)

Rotated ~100rpm on a oppositely rotating table

CBMM cavity

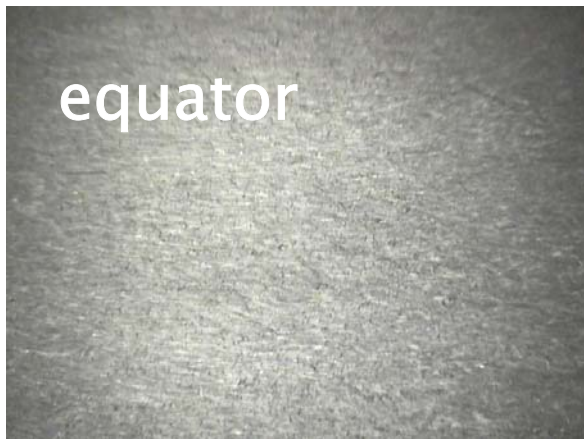
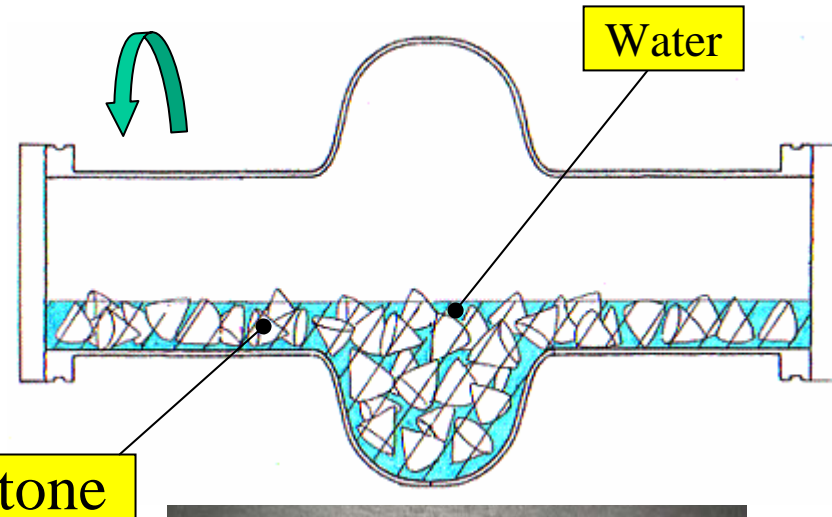
Rough stone : 5 times

Green stone : Once

Brown stone : Once

White stone : Once

Totally ~ 200 μm removed @ equator



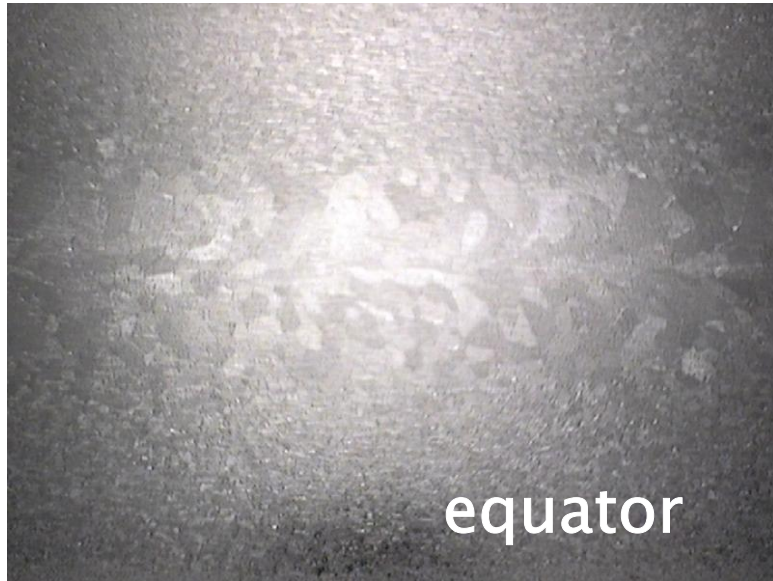
Fine grain cavity after CBP

Remove
large defects!



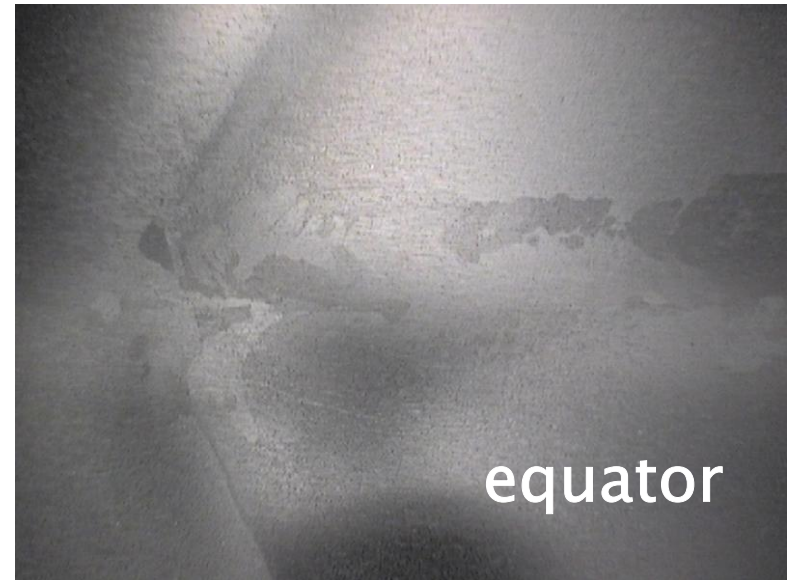
Large grain cavity after CBP

Surface Cleaning by BCP($\sim 10\mu\text{m}$) after BCP



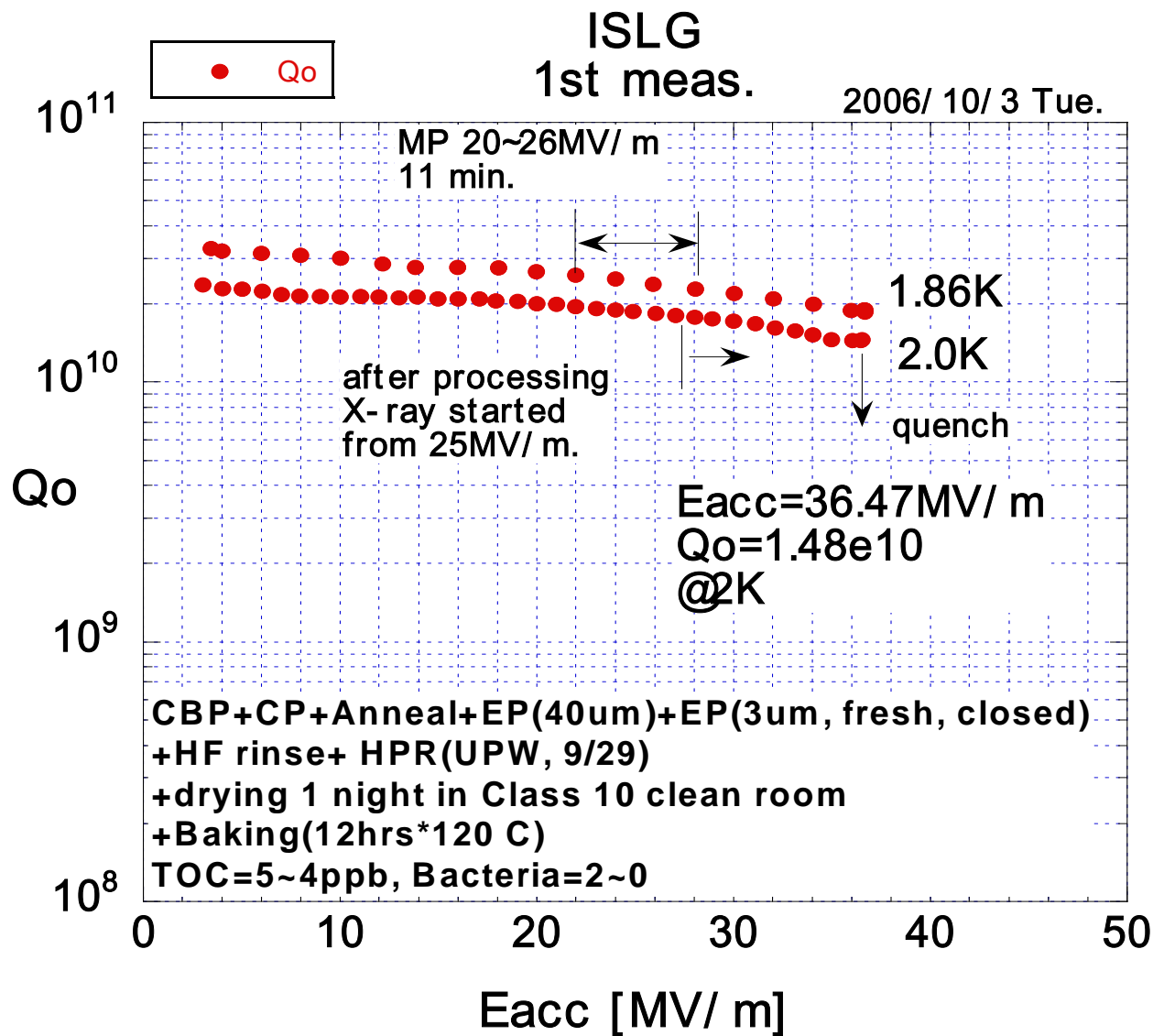
**Fine Grain Cavity after CP
and Annealing**

10 μm each

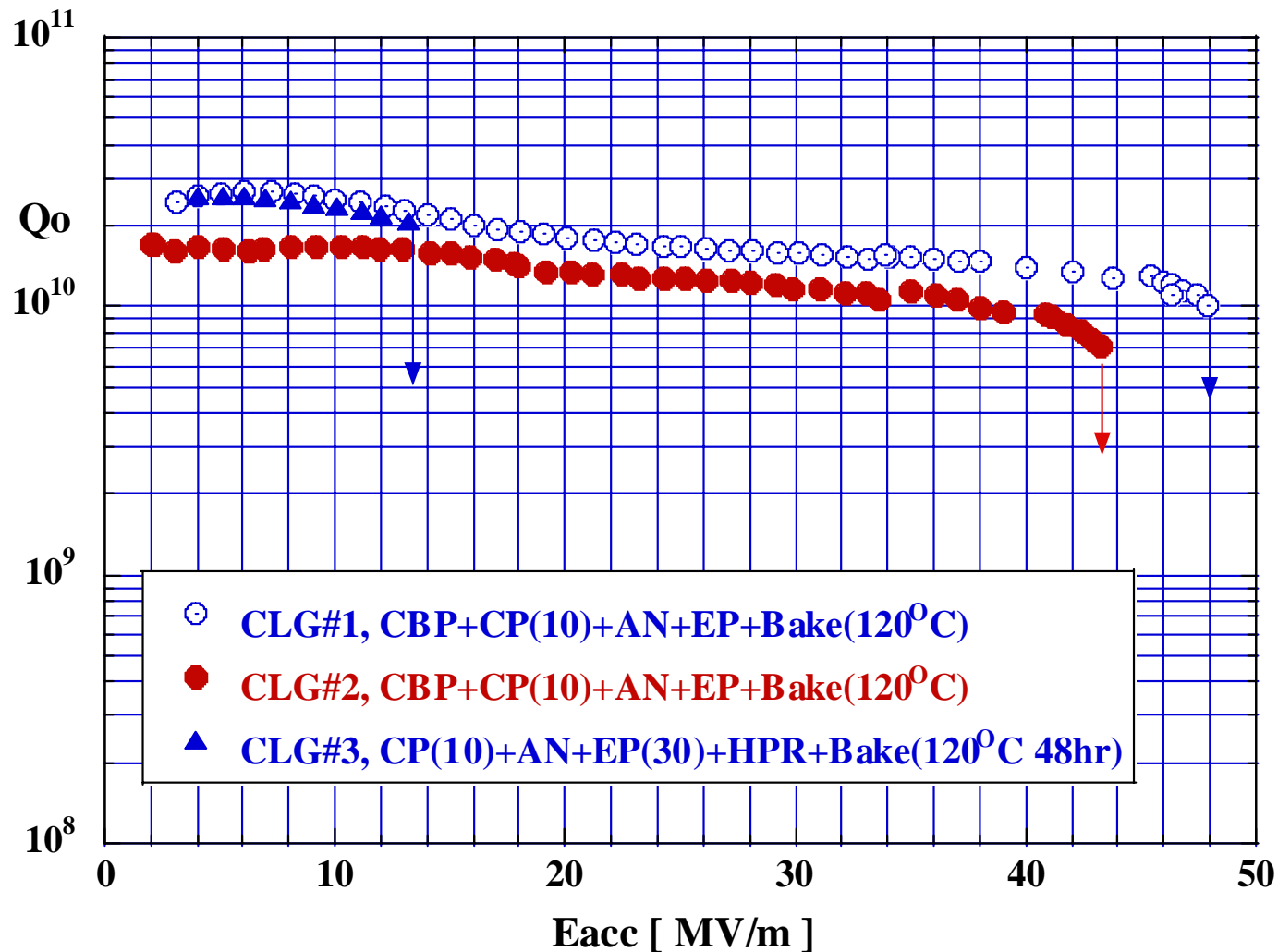


**Large Grain Cavity after CP
and Annealing**

First vertical test result of CBMM LG cavity @ KEK

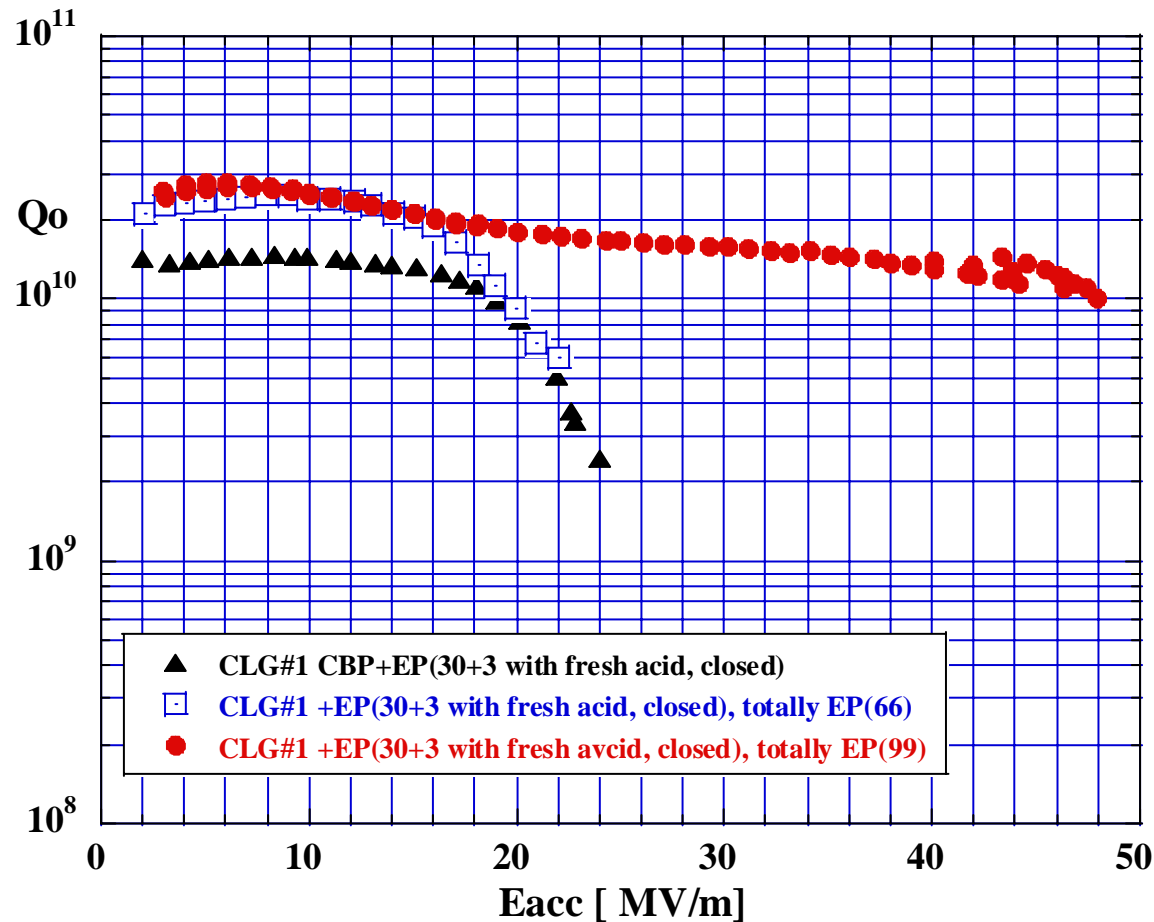


NingXia Large Grain Cavity Results



High gradient performance is similar to fine grain cavity on case of electropolishing.

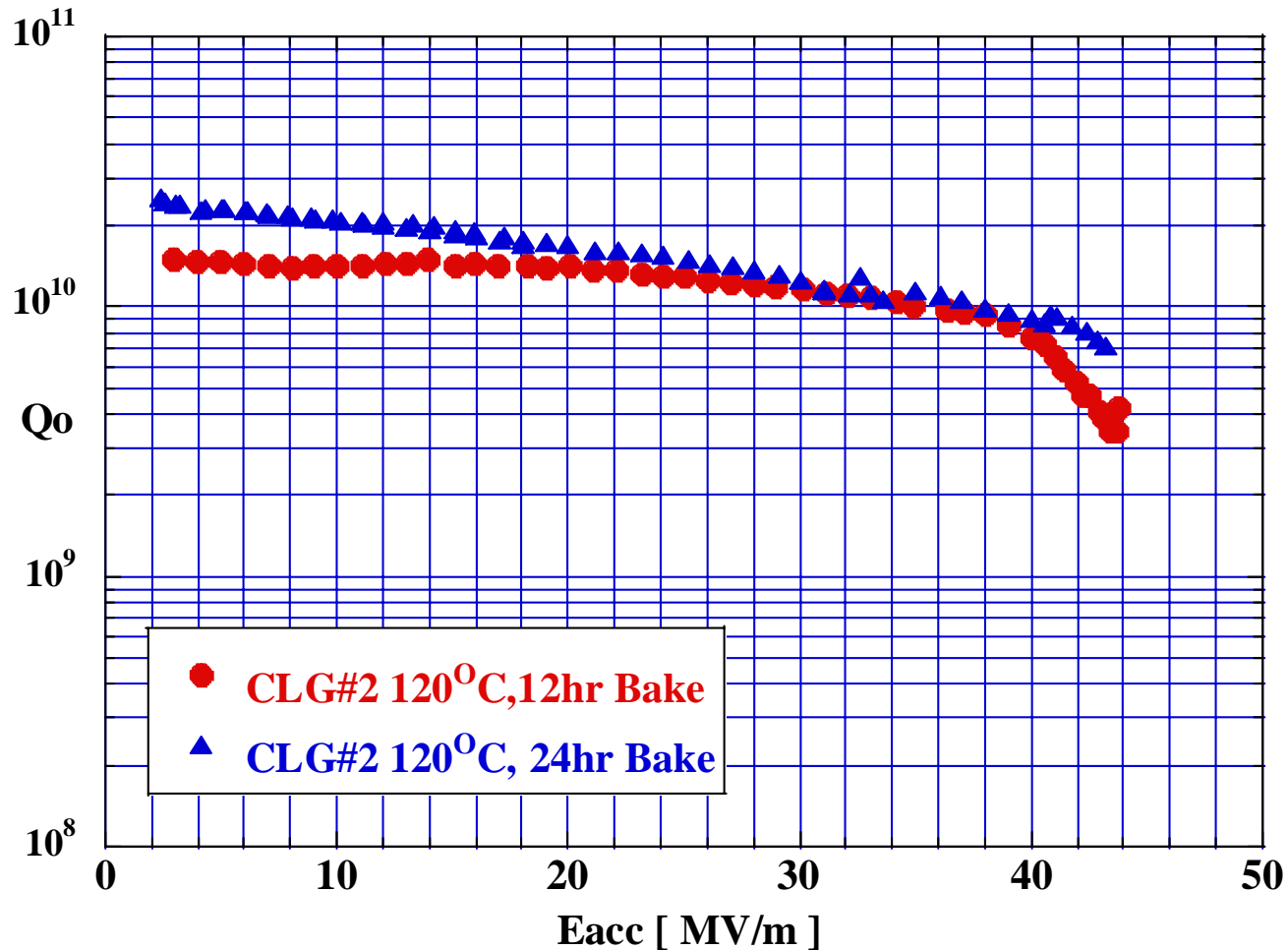
Cavity performance depended on EP material removal after CBP



EP material removal of $100\mu\text{m}$ would be needed after CBP for large grain cavity.

The needed material removal is similar to fine grain cavity.

Cavity performance depended on 120°C Baking period



Baking @ 120°C period of 12hr is too short on electropolished cavity. 48 hr is needed.

Summary

- Large grain material has not so many benefits on cavity performance in case of electropolishing.
- Amount of material removal or baking period is similar to fine grain cavity.
- Forming tolerance should be improved on large grain material.
- The concern is the material cost. If a fast ingot slicing machine is successively developed, it could be realized.