LHCB Muon Chamber

Production

PNPI Factory2

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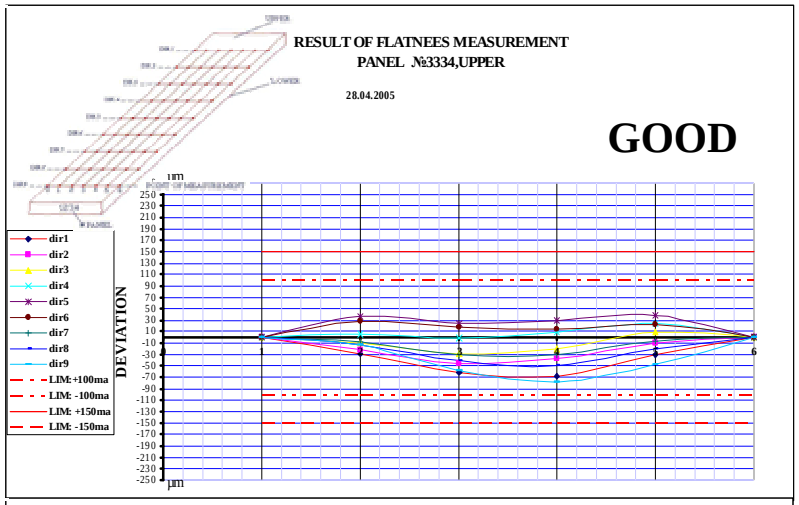
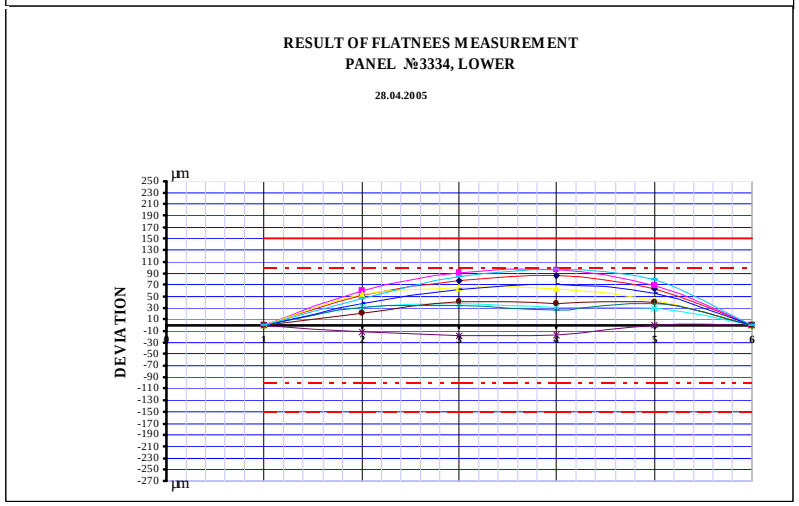
Panel planarity

Panel planarity





MEASUREMENT OF FLATNESS

MADE ACROSS PANELS

ALONG 9 DIRECTION ON 6 POINTS.

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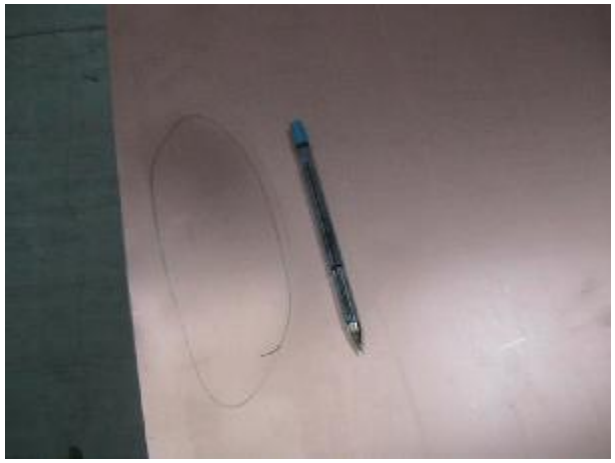
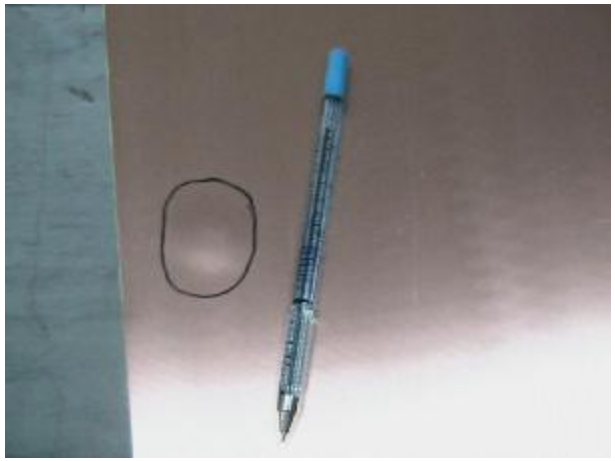
Input Control

SALIENCE ON PANEL





PRACTICALY MOST PANELS HAVE THAT DEFECT.

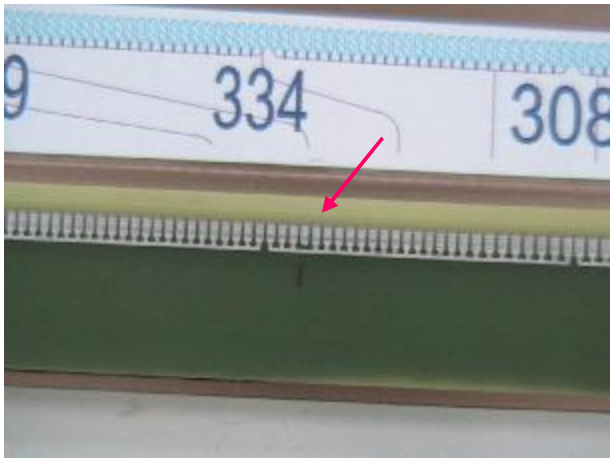
IF A SALIENCE IS MORE 150μm THIS PANEL IS REJECTED AS DEFECTIVE.

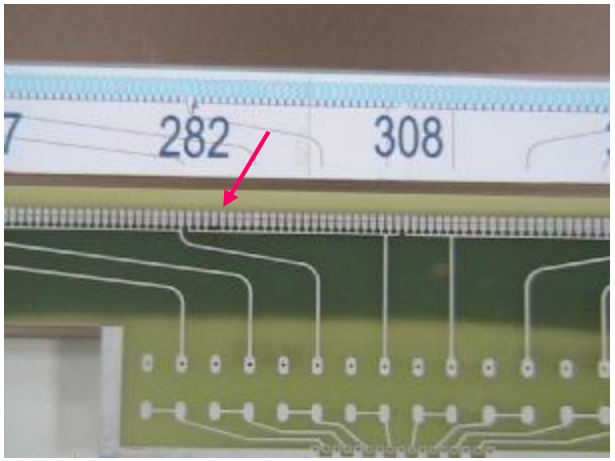
IF A SALIENCE IS IN AREA OF BAR GLUING AND HAS HEIGHT MORE 50μm THIS PANEL IS REJECTED ALSO.

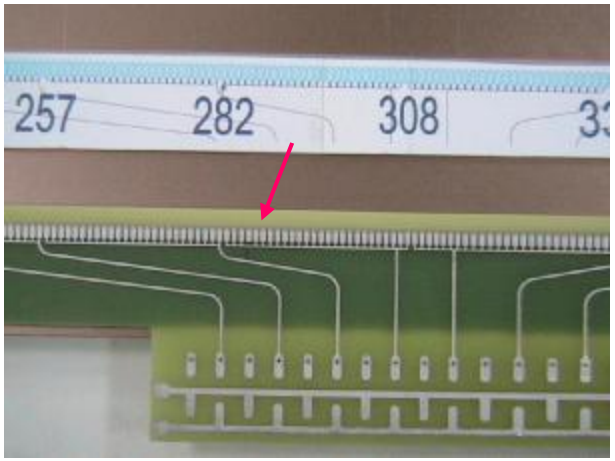
APPROXIMATELY 2% OF PANELS ARE REJECTED BECAUSE OF THESE REASONS.

Input Control of bars

BRAKE IN FOIL PATH







PRACTICALY 50% OF HV_ CAP AND HV_RES BARS HAVE SUCH BREAKE.

<u>METHOD OF REPAIR:</u>

DURING WIRE SOLDERING THESE BREAKES ARE COATED WITH SOLDER.

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ANODE PANEL CUTTING

Panel surface polishing

Bar gluing tables

Production Process

MOMENT OF GLUE COATING ON BARS WITH LINEAR DISPENSER

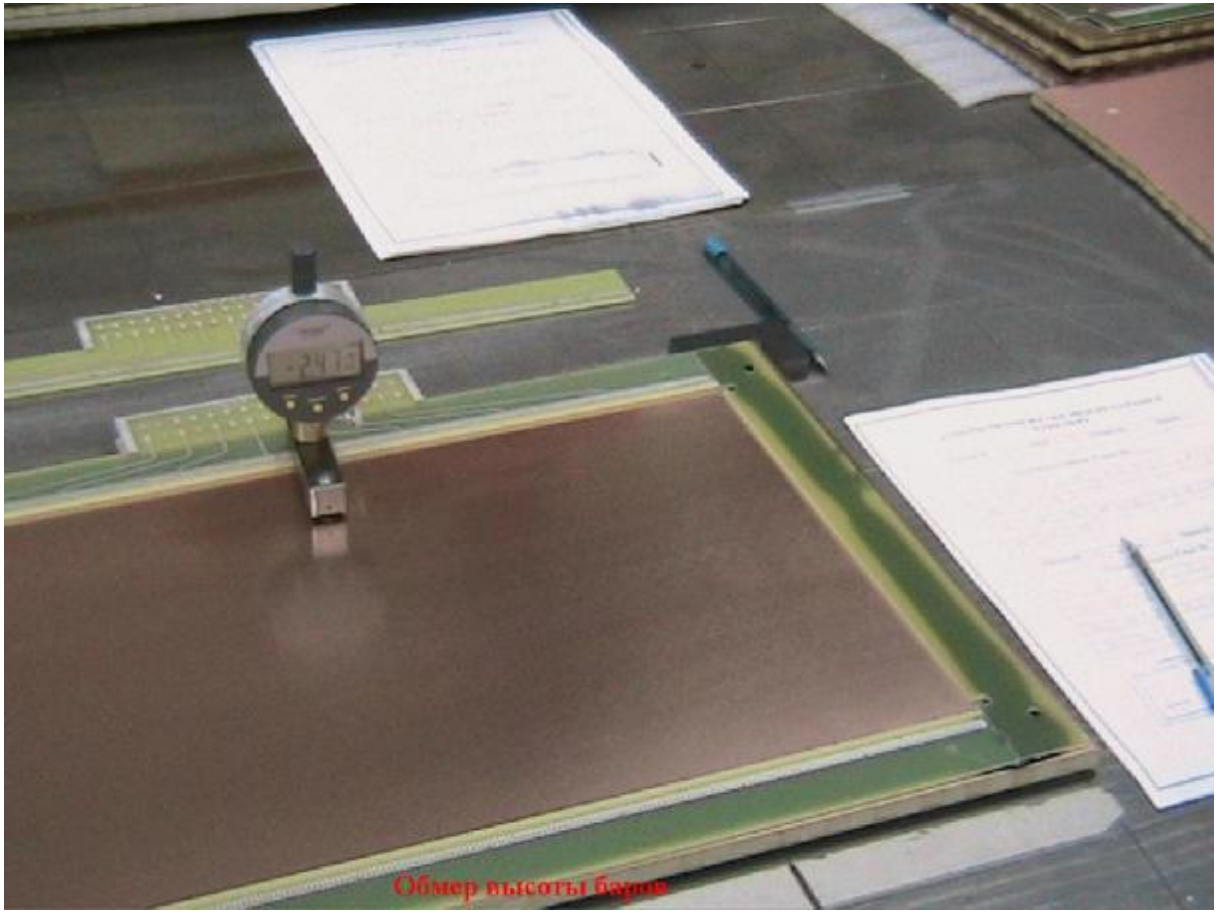
USING OF LINEAR DISPENSER ALLOWS TO DOSE EPOXY GLUE.

Production Process

MOMENT OF BAR INSTALLING ON GLUING APPARATUS

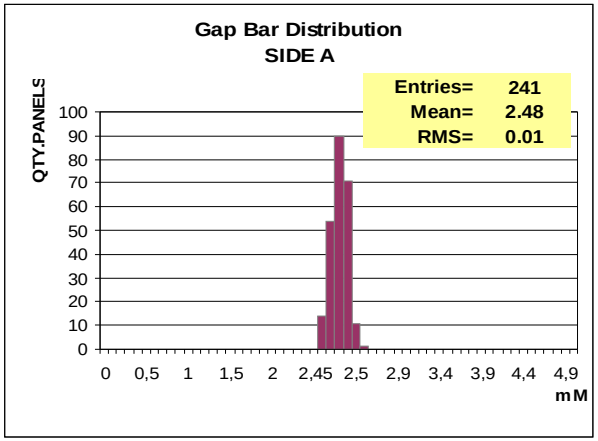
Production Process

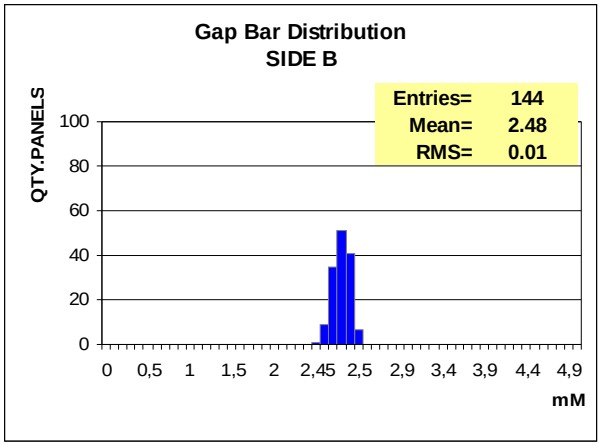
MEASURING OF BAR HIGHT

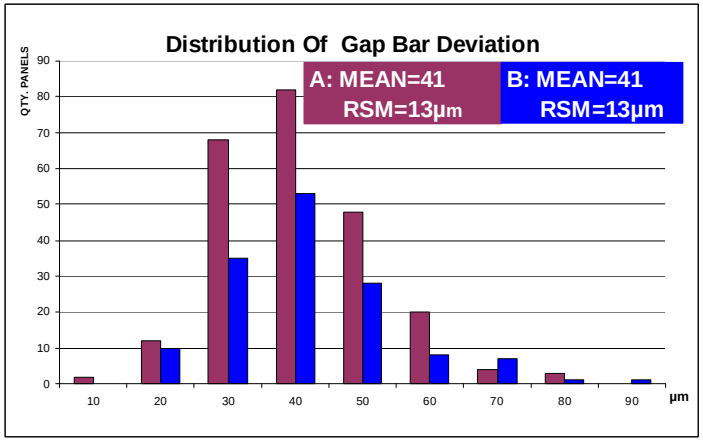


Production Process

GAP BAR DISTRIBUTION







WIRING PROCESS

MOMENT OF COMB INSTALLATION

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WIRING PROCESS

WINDING MACHINE

WE ARE USING THE WINDING MACHINE FROM FNAL, RESERVED FOR PNPI FACTORY=2 AFTER COMPLETION THE CMS CHAMBER PRODUCTION.

WIRE FIXATION

MOMENT OF GLUE COATING ON LAVSAN TAPE

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WIRE PITCH MEASUREMENT

PITCH AND TENSION MEASURING MACHINE

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Wire pitch measurement

RESULT OF PTTCH MEASURING BEFORE GLUING

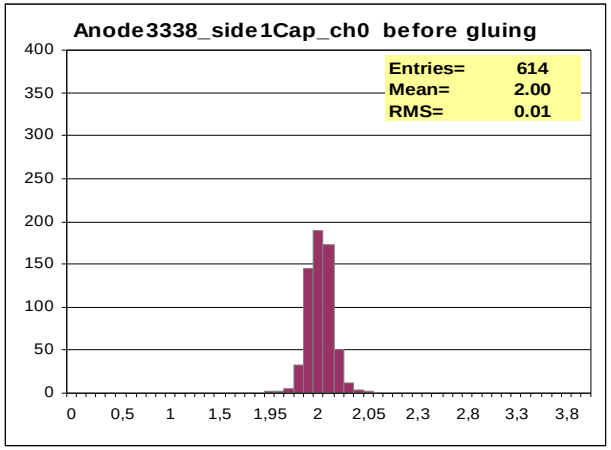
IF WIRE IS OUT OF THE TOLERANCE 100μm ITS POSITION IS CORRECTED BY HAND.

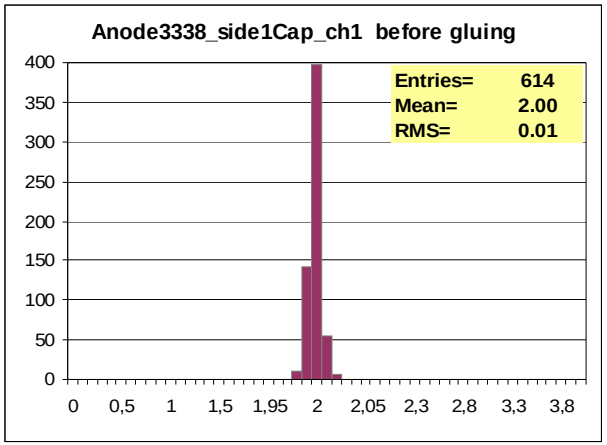
PRACTICALY THIS CORRECTION MADE ON EACH SECOND PANEL.

PRINCIPAL CAUSES OF THE WIRE PITCH VIOLATION ARE BAD POLISHING OF THE STRAIGHT COMBS AND SOMETIMES INCORRECT INSTALLATION OF THE COMBS ON THE PANELS.

Wire pitch measurement

PITCH DISTRIBUTION BEFORE GLUING





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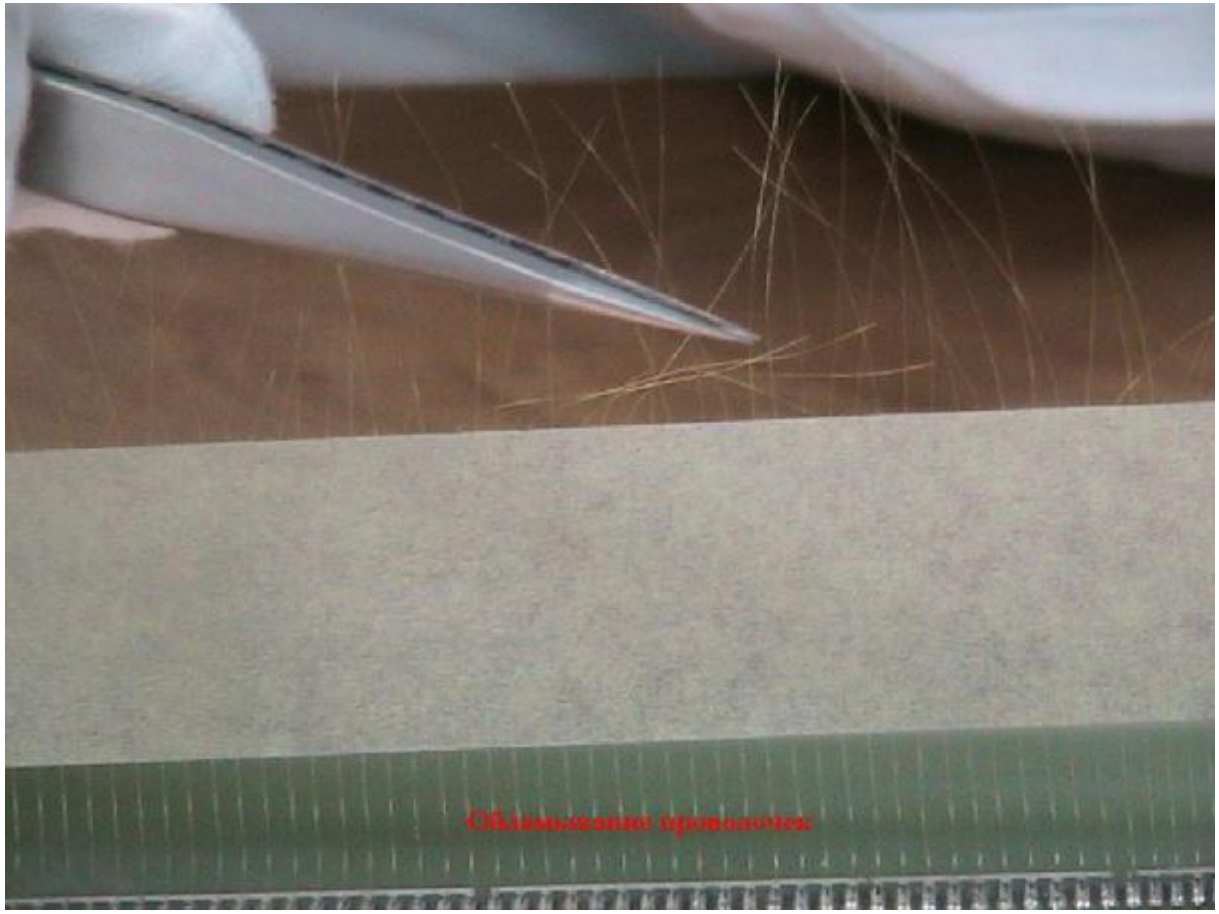
Wire soldering

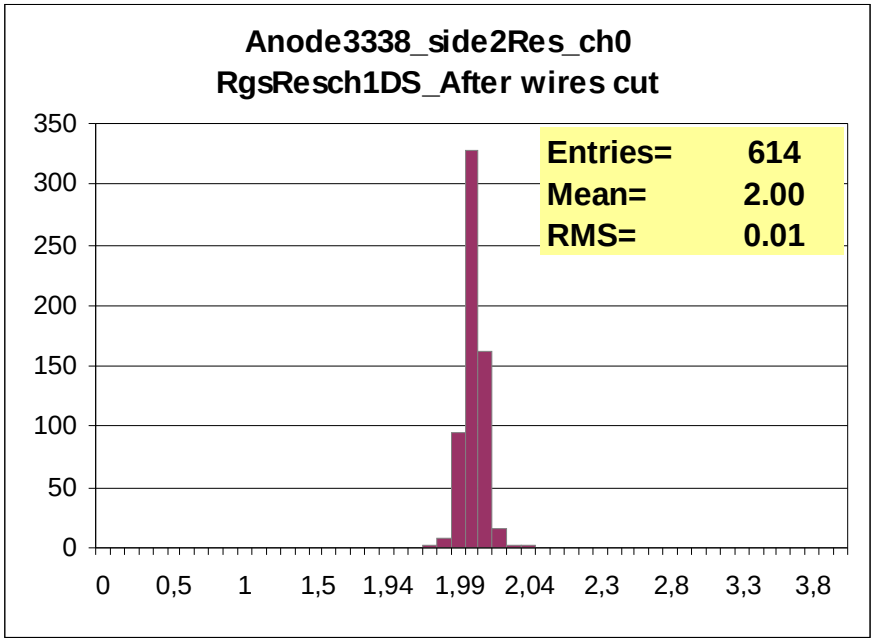
Wire cutting

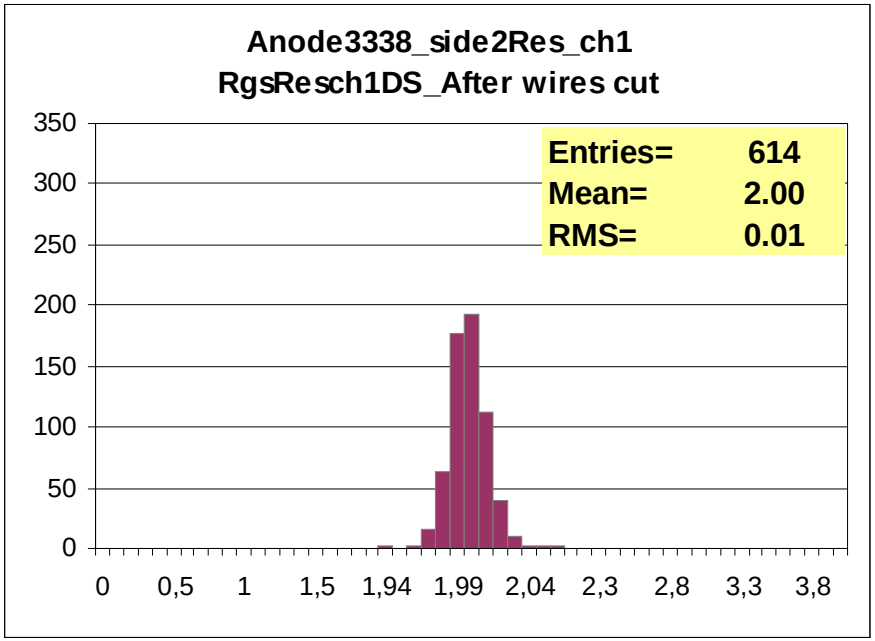


Wire pitch measurement

PITCH DISTRIBUTION

AFTER WIRE CUT





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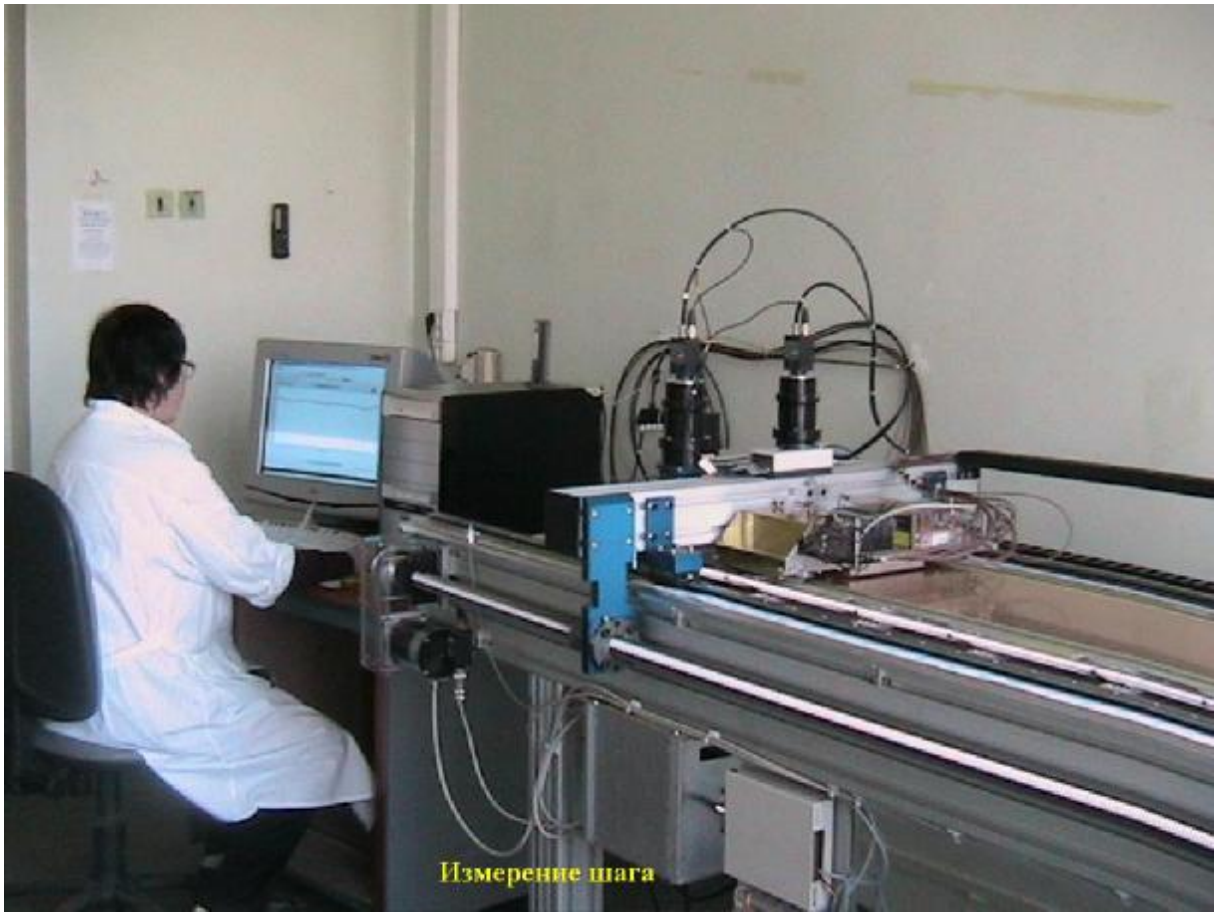
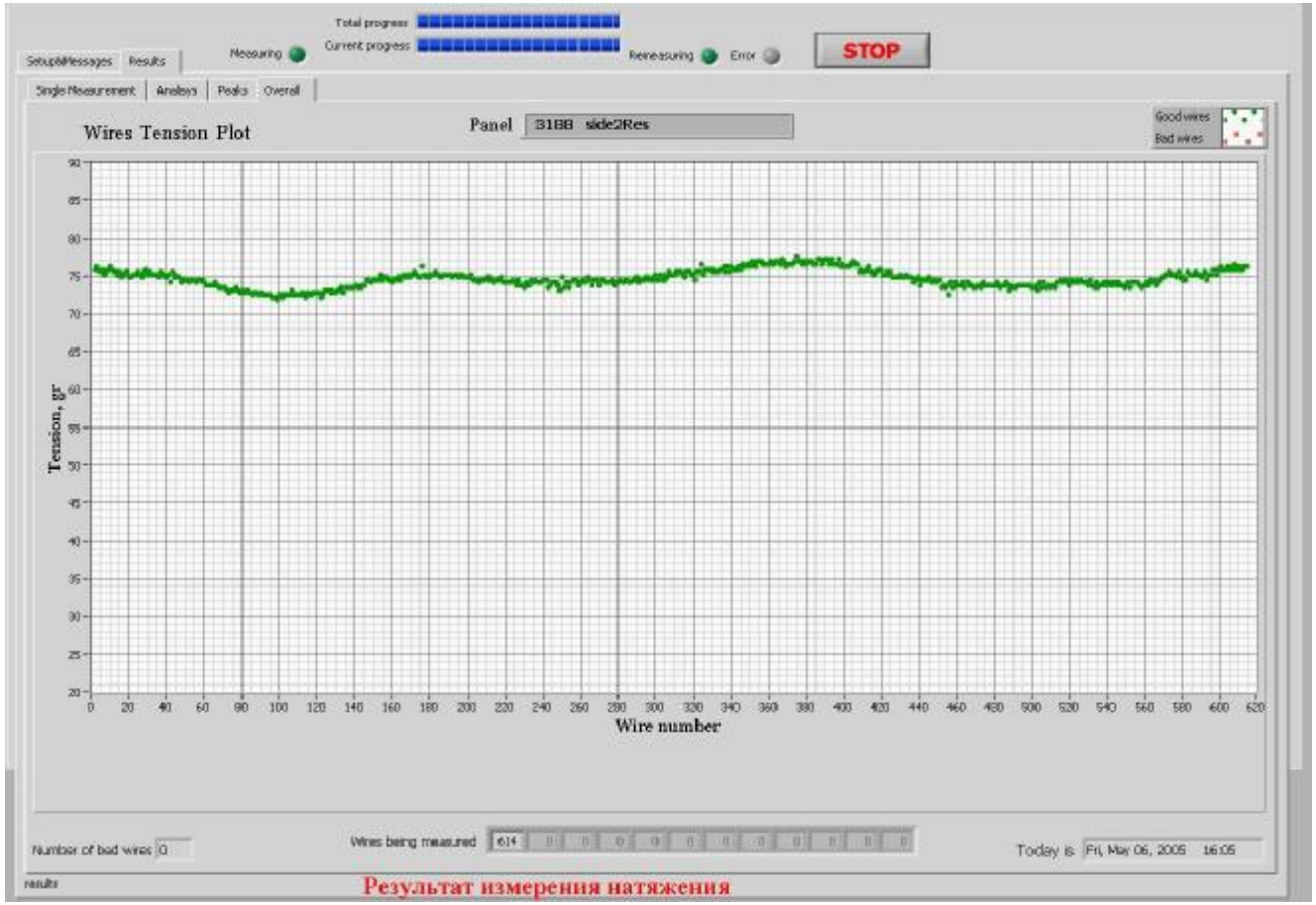
Wire tension measurement



Wire tension measurement

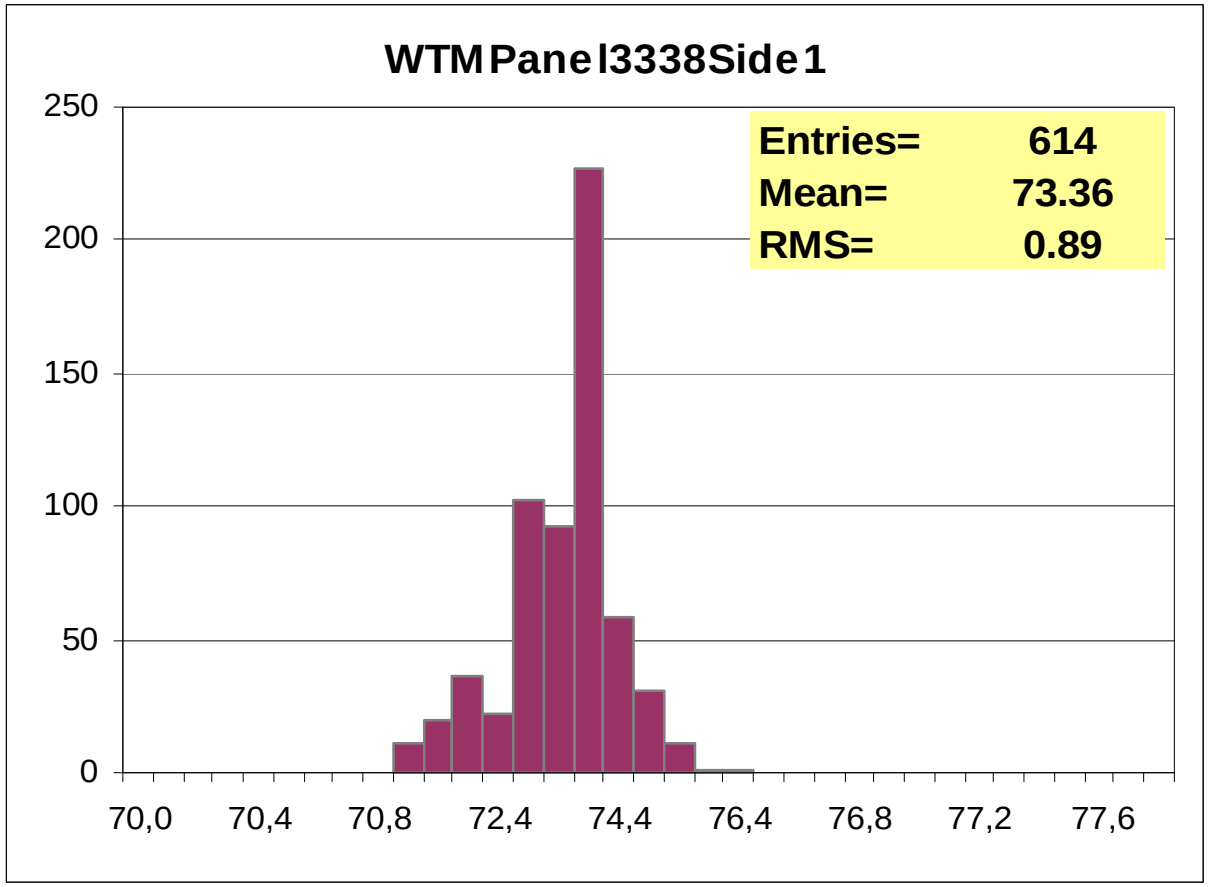
AFTER NEW WIRE TENSION CONTROL SYSTEM



WAVY CHARACTER OF THE TENSION CURVE IS A CONSEQUENCE OF COMB DEFORMATION DURING WIRE WINDING.

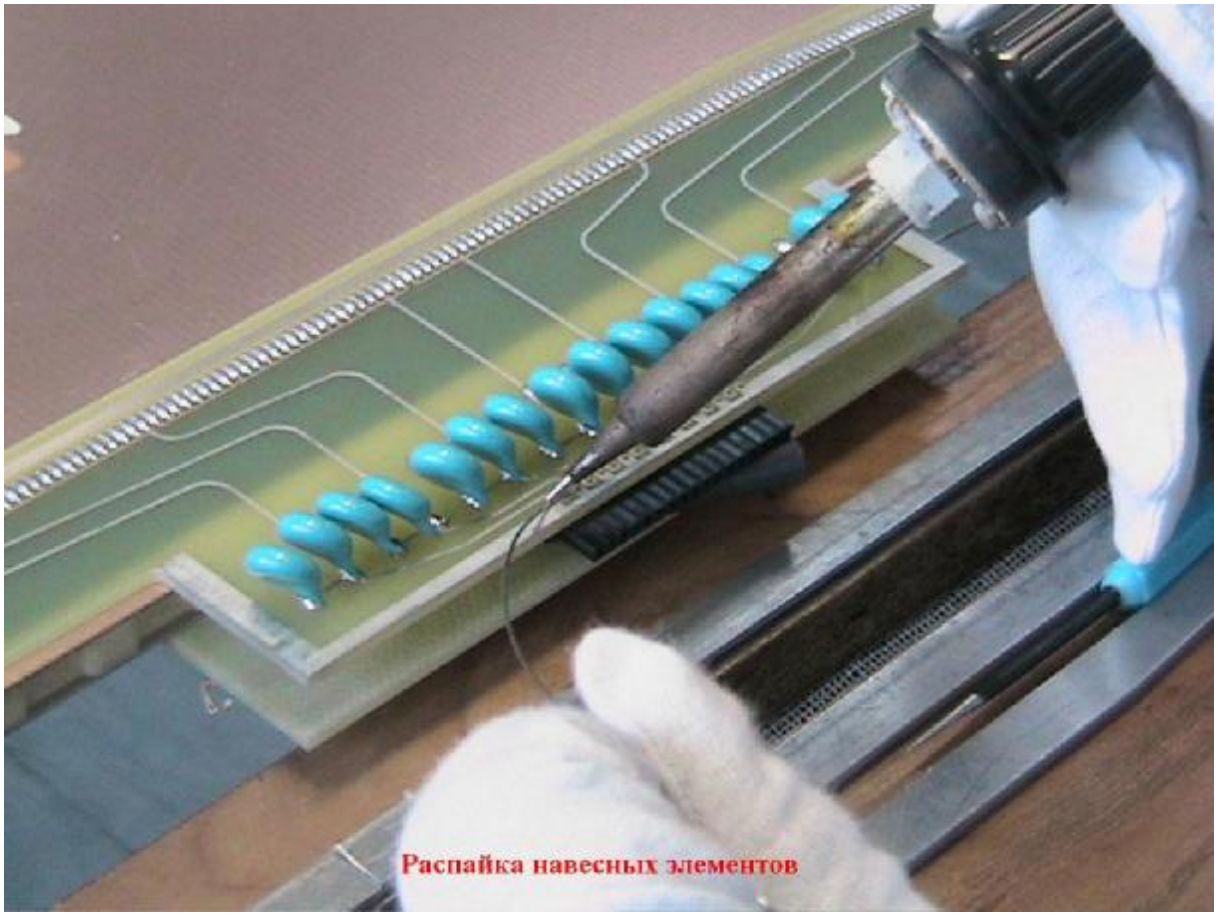
Wire tension measurement

WIRE TENSION DISTRIBUTION



Production Process

COMPONENT SOLDERING



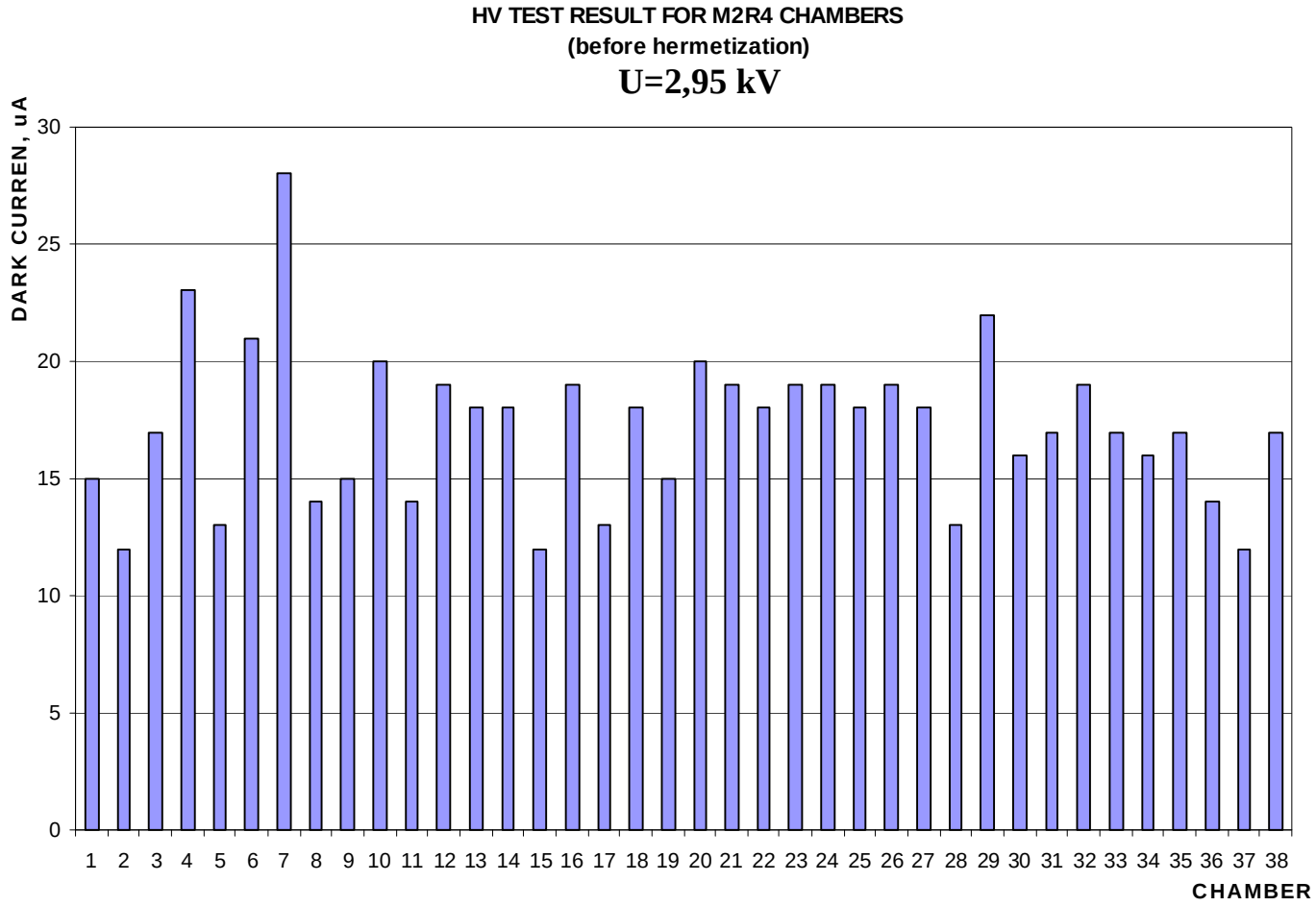
Production Process

ANODE PANEL INSPECTION AND CLEANING BEFORE ASSEMBLY

Production Process

HV TEST OF CHAMBER WITH WORKING GAS MIXTURE

Production Process



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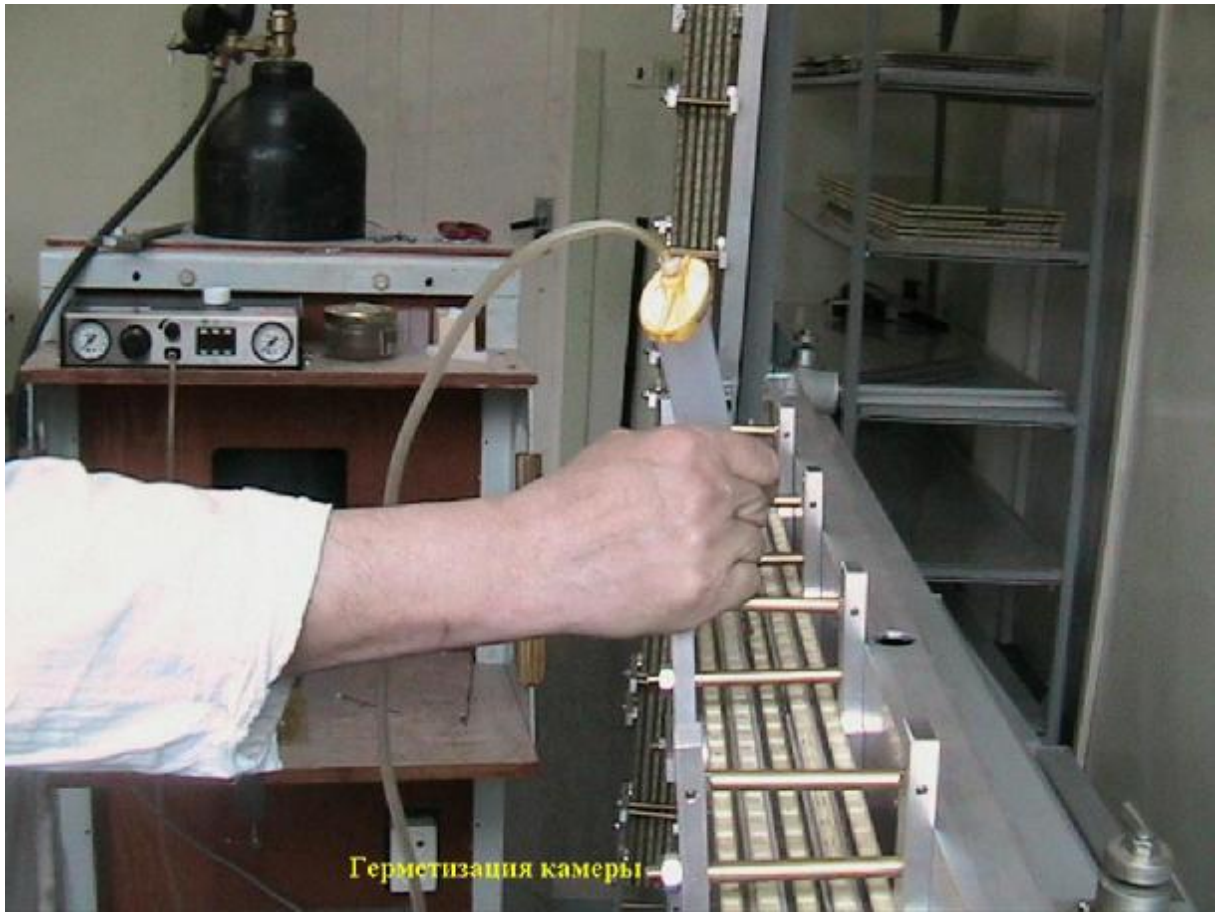
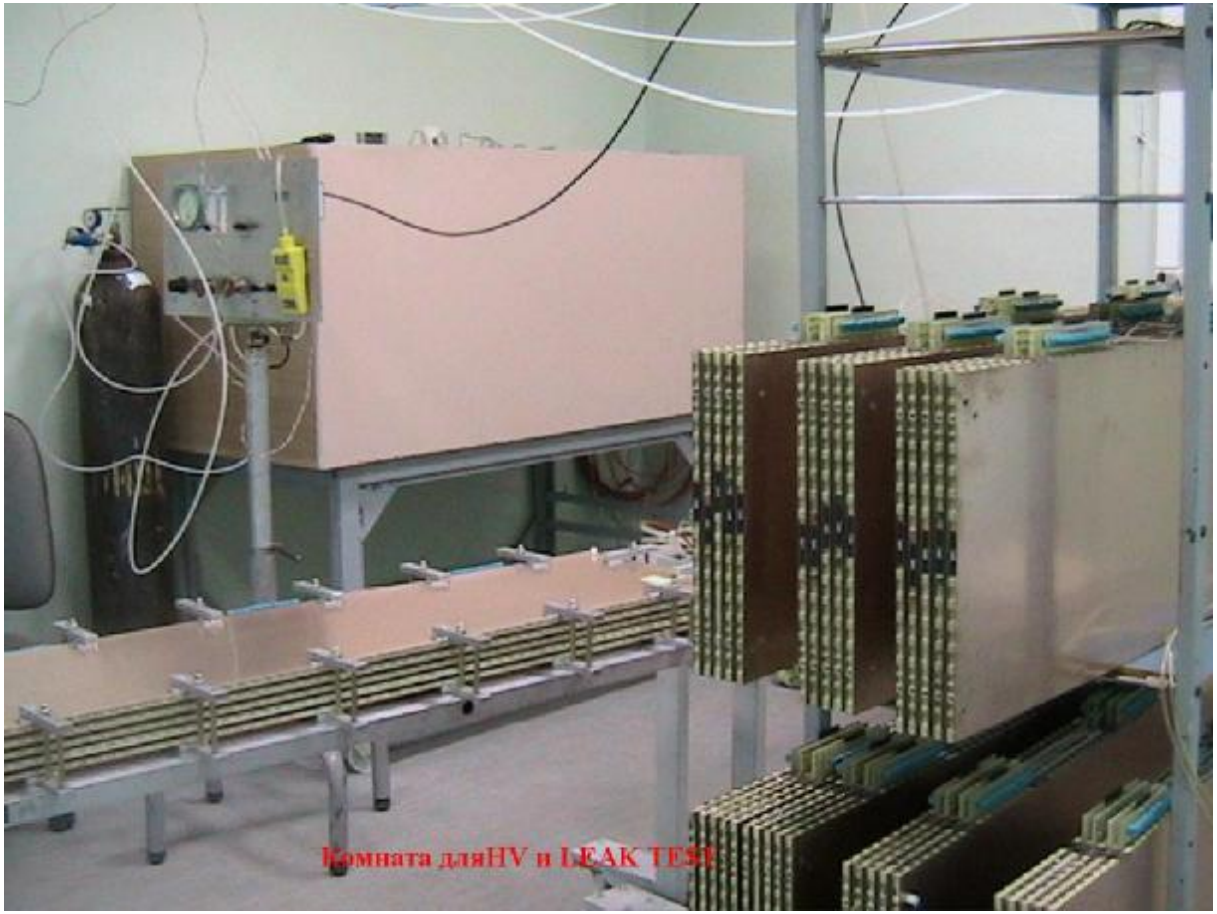
Production Process

CHAMBER SEALING

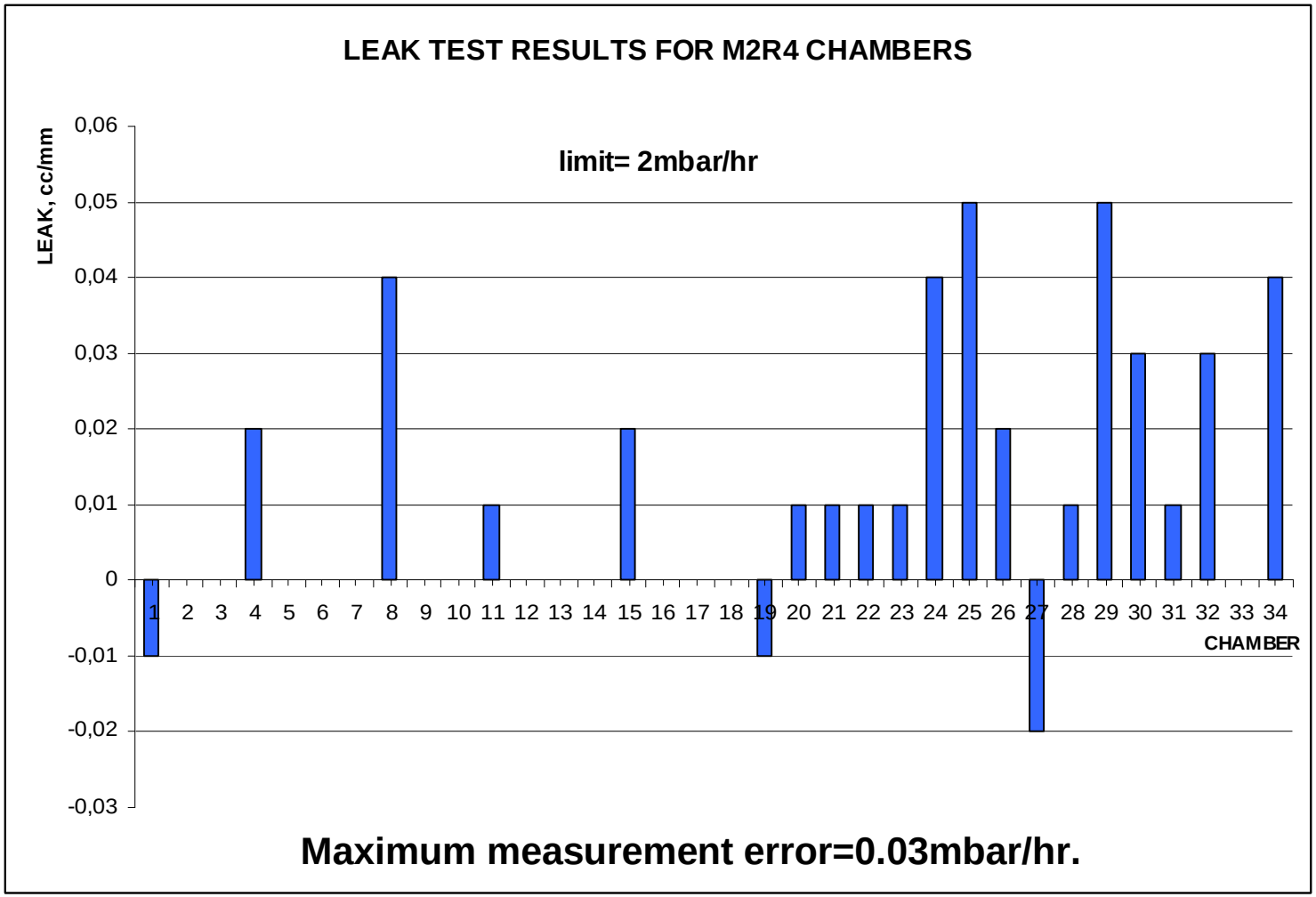


FOR SEALING WE USE HAND PNEUMATIC DISPENSER.

Gas leak tests



Gas leak tests



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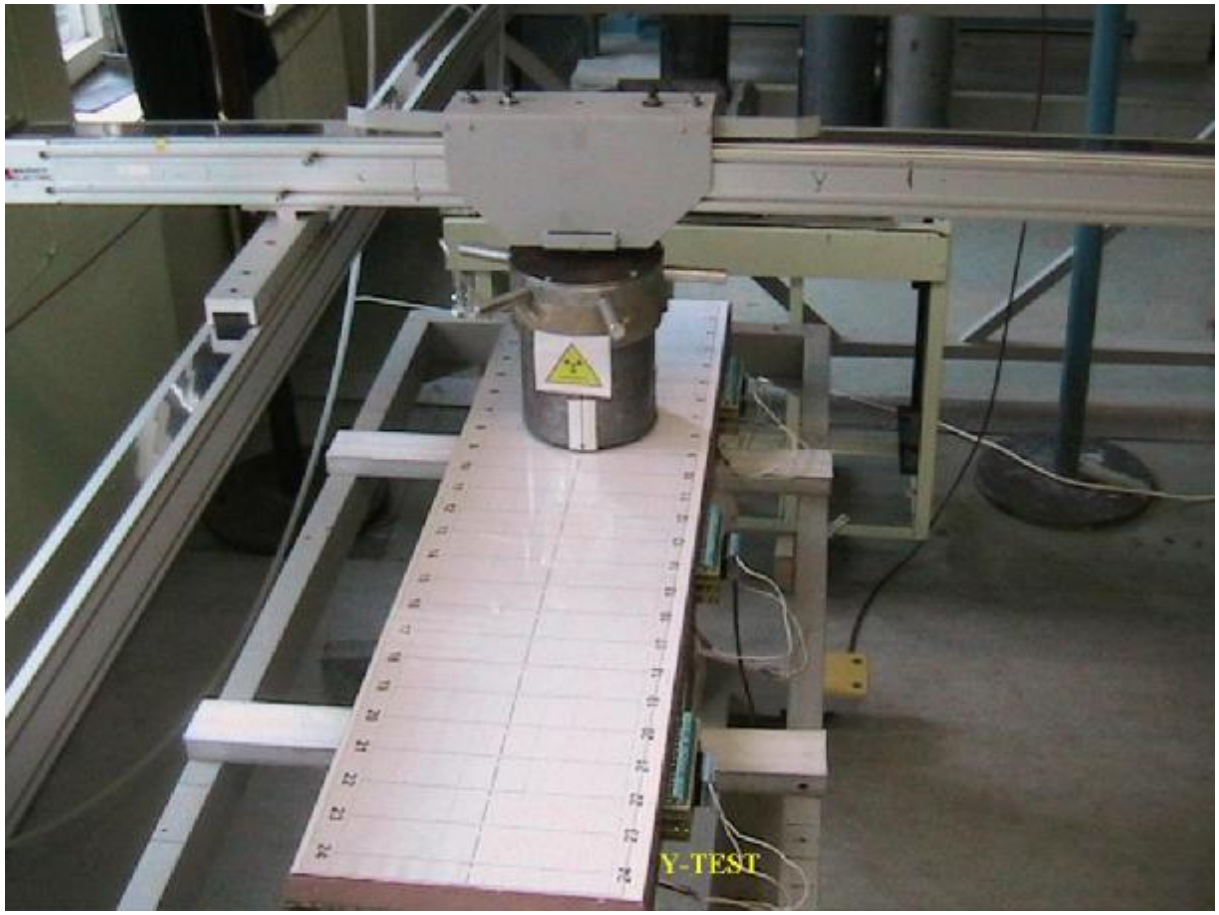
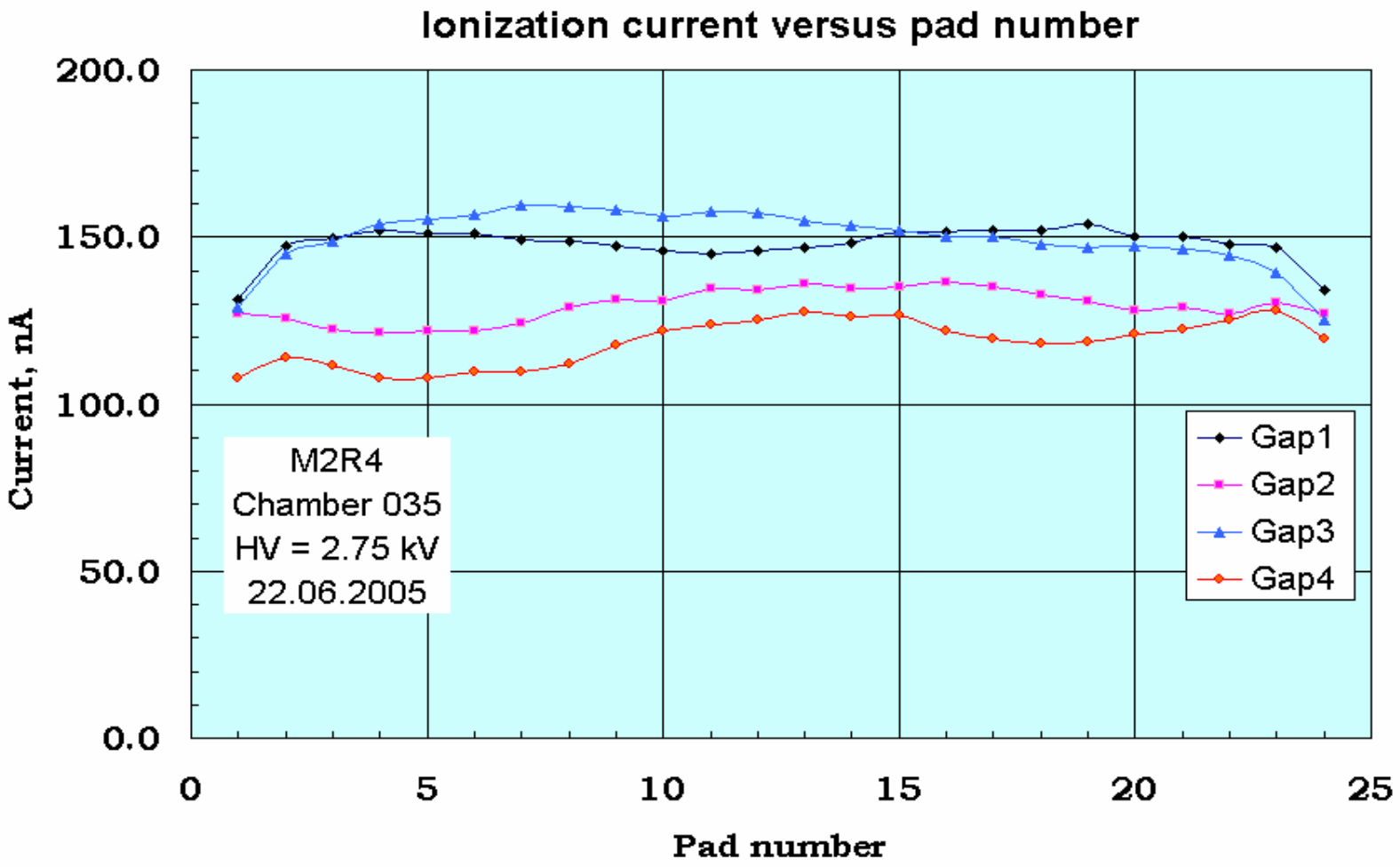
• Room for vanishings

Gamma test stand



Chamb.#35 1,2,3,4 gaps current



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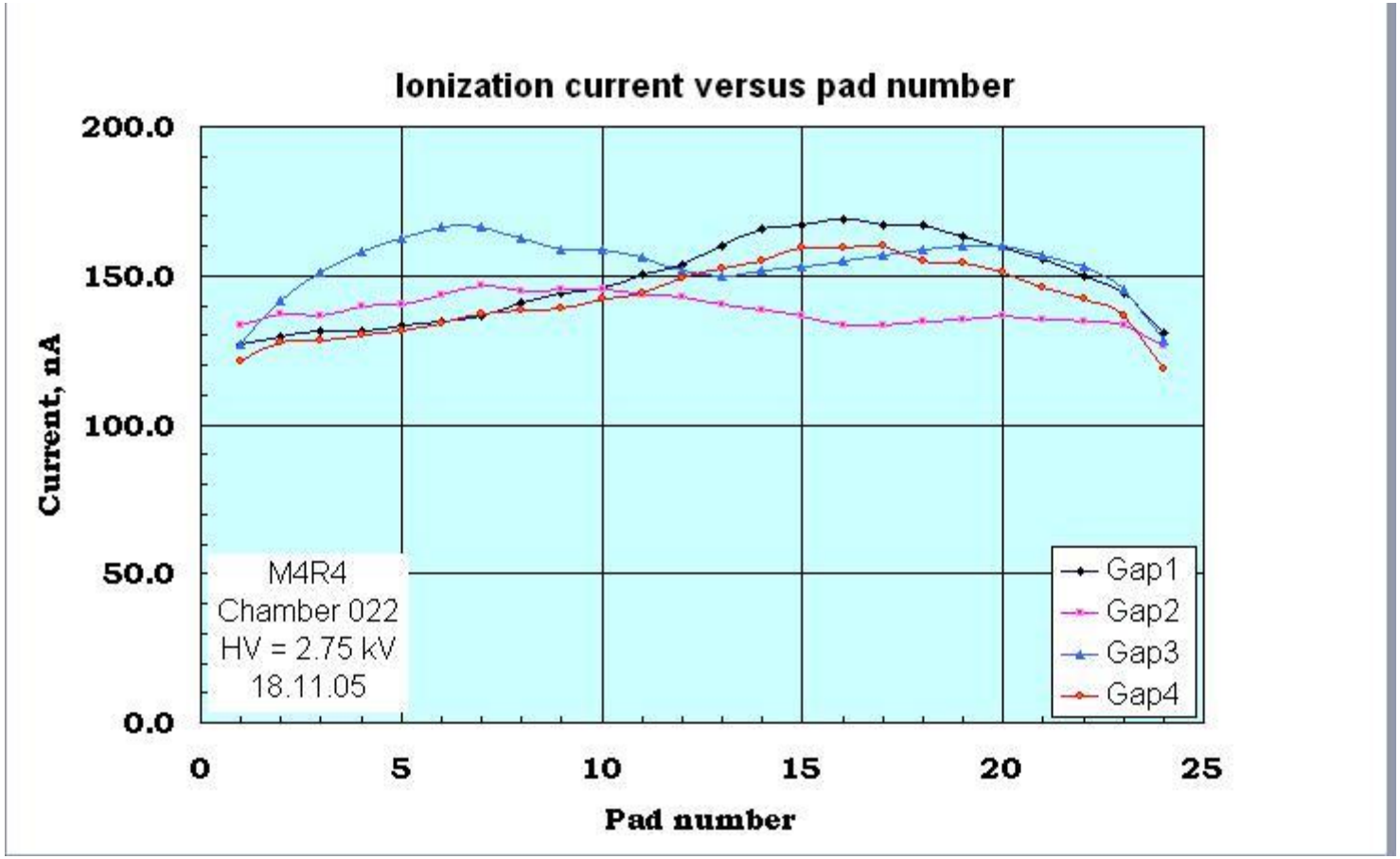
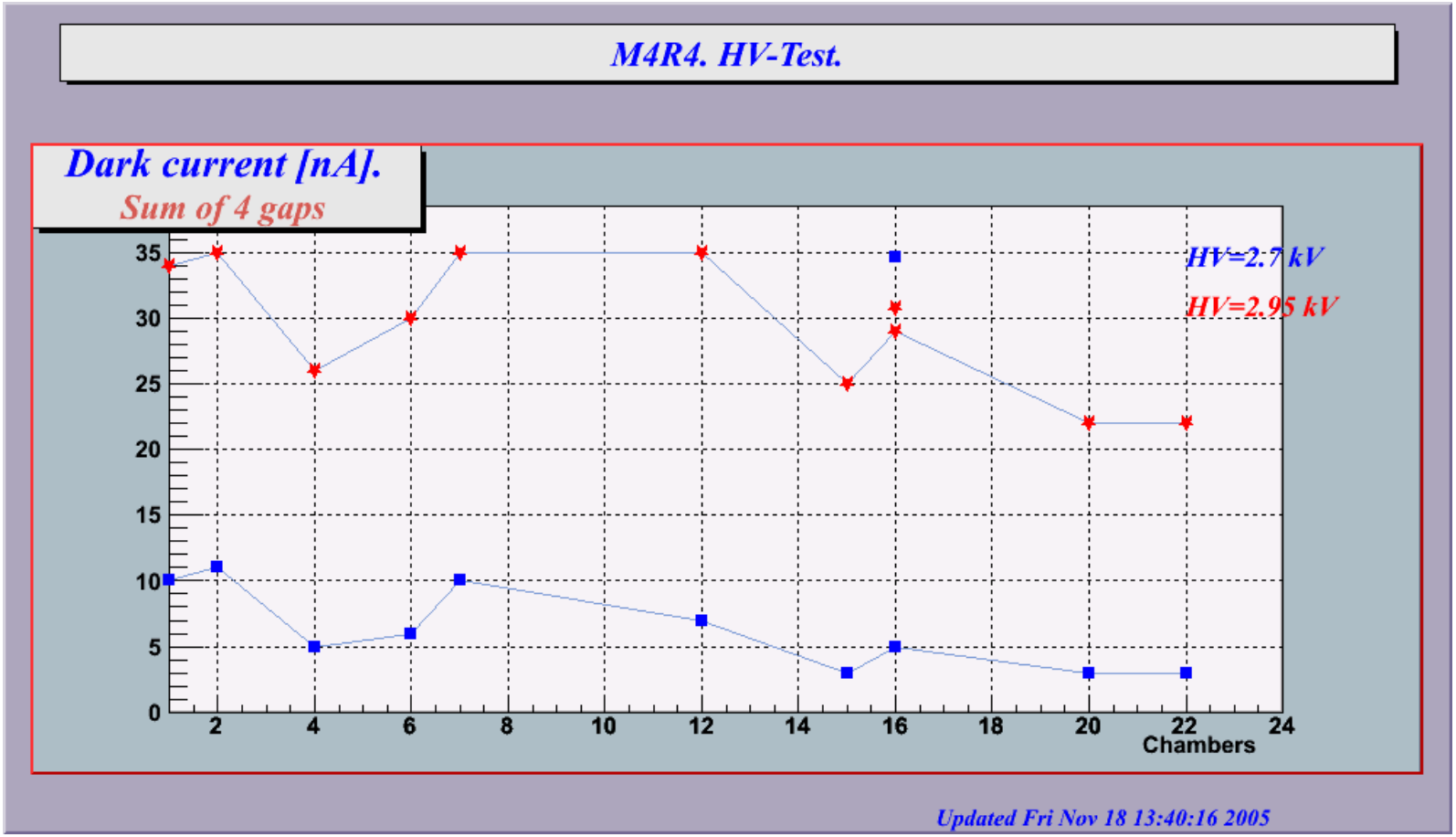
Chamber#22, 1,2, 3,4 gaps current



Dark current



Long HV test

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Technological Traveler

THESE TECHNOLOGICAL TRAVELERS WERE CREATED ON BASIS OF OUR EXPERIENCE ACQUIRED DURING WORKING AT CMS PROGRAMM. THEY ARE HELPING TO REGULATE THE TECHNOLOGICAL PROCESS AND INCREASE A PERFORMER RESPONSIBELETY.

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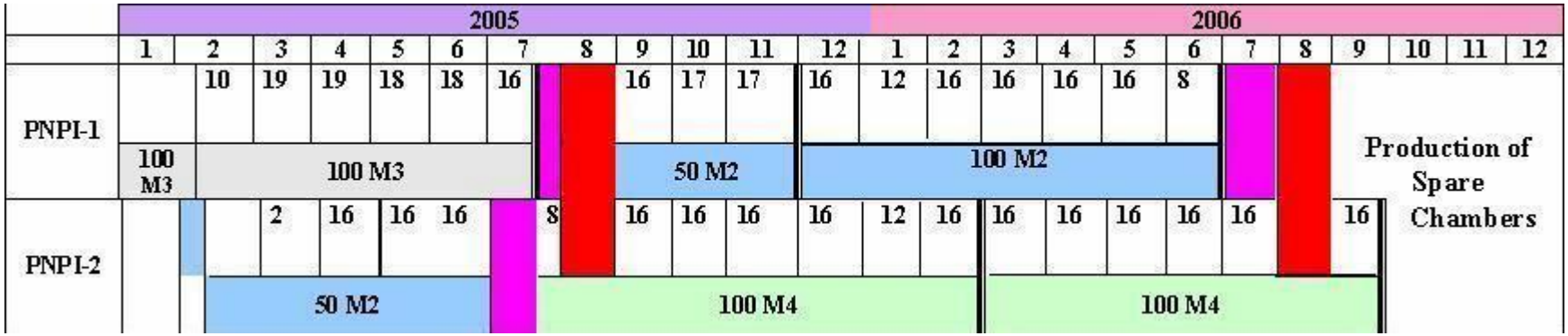
Production status and plans



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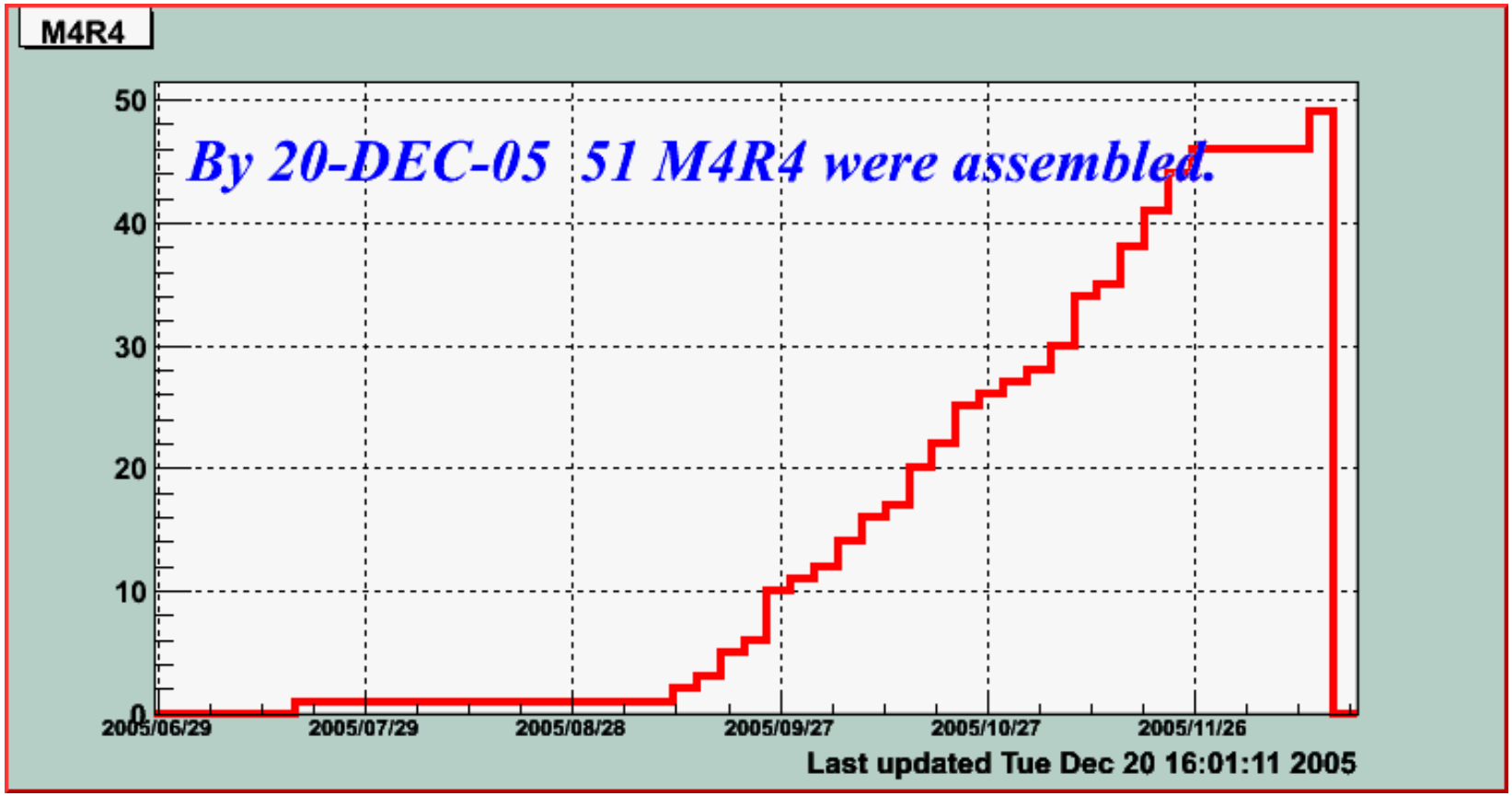
Production status



- Kozlov V.S. 29 December.2005.