

A.Staiano CERN 25 april 2001

# CMS-DT Field Strip Plates @ Torino

- Status report of preproduction
- Schedule update
- Material procurement

# Plate Cutting

**Device operating at nominal values.**

**Last upgrades:**

- **Revolution versus inverted to eliminate long swarfs**
- **New exhaust fan installed**

**Precision cutting:  $<300\mu\text{m}$  in length and width, actual precision in diagonals  $<1\text{mm}$ , within tech specs, but can be improved adjusting table axis perpendicularity.**

**Speed: one large plate is cut in 5 min. 10 large plates/day are a conservative estimate of the time needed during production.**



# Plate Cutting at CERN

## Few comments on advantages of plate cutting at CERN:

- **immediate check of plate quality before sending to JINR => pay only good plates and send only good plate to Dubna, react immediately with producer for bad deliveries;**
- **Simplify logistics at JINR => higher efficiency and speed in production;**
- **Easier maintenance from Torino;**
- **Manpower required at CERN for the full production is limited. 2 technicians for 100 days for the full production, which will be completed in dec 2002. Worth investigating this possibility if other institutes (JINR included) can help on this.**

# Strip Deposition

- 110 plates prepared (120 by the end of the week):

6 MB2

1 MB1

1 MB3

**Maximum speed achieved**

**14 surfaces/day (1day=12 hr)**

**= 8.75 plates/day**

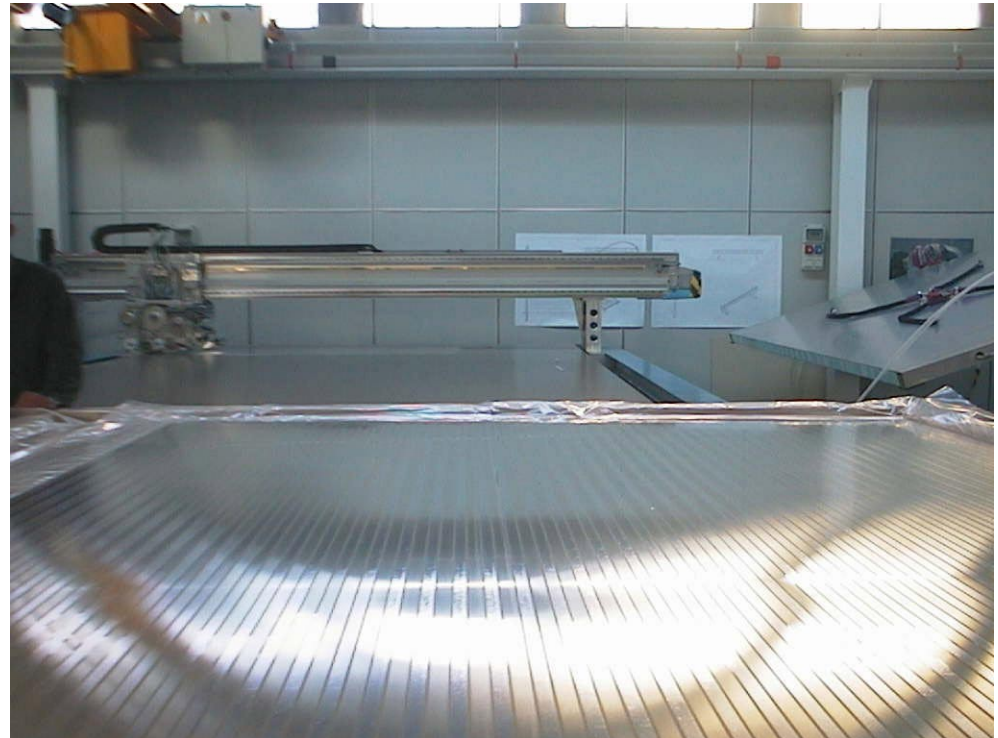
**Limiting speed factors:**

- **Plate preparation & handling**

**Now better in:**

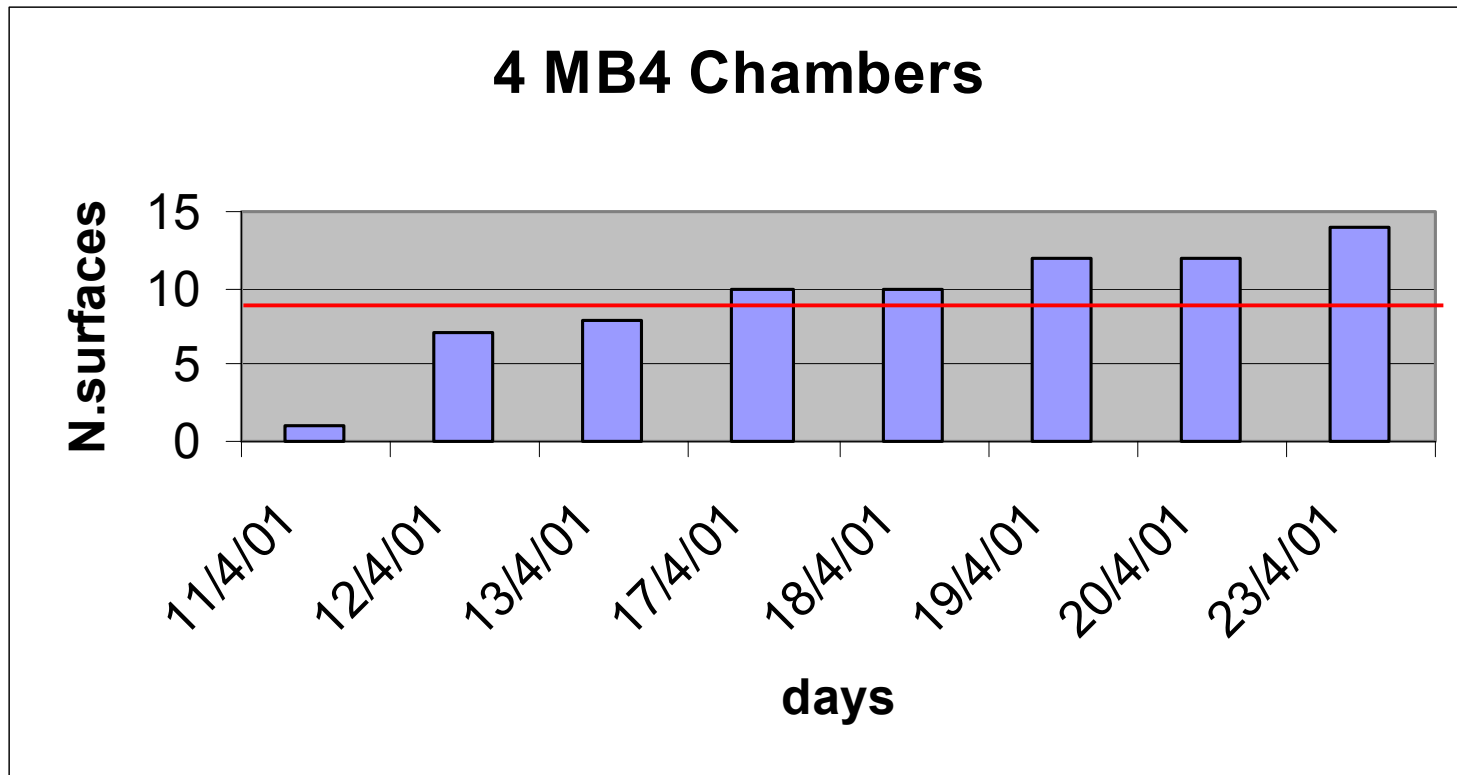
-strip failure rate in deposition and HV test

-Software development (but yet not completed)



# Strip Deposition

**Productions speed:** since 17 apr started with 9->22 shifts (3 people/shift, 3 hr overlap). Cutting, software and hardware development is done parasitically. All plates produced after 13/4 are double sided. Average production rate to complete 16 chambers before end of june is **8.4** surfaces/day.

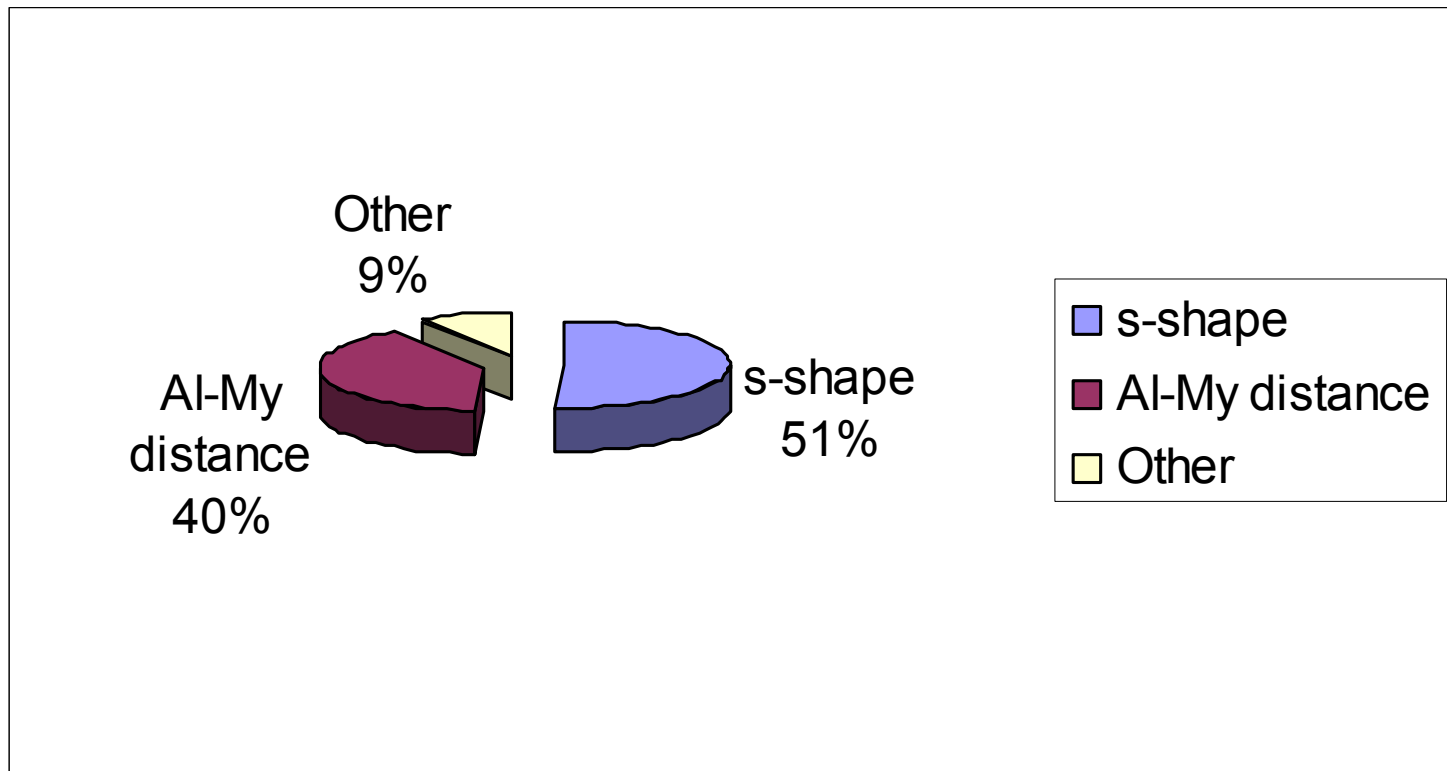


# Strip Deposition

- **Strip failure:**

**Average failure rate = 2.5%** (improved by a factor 2 in the last month), can be further improved.

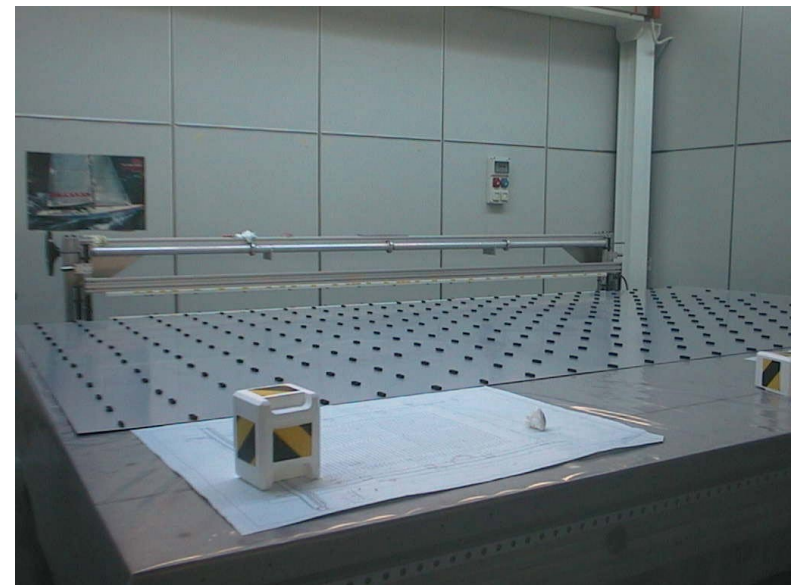
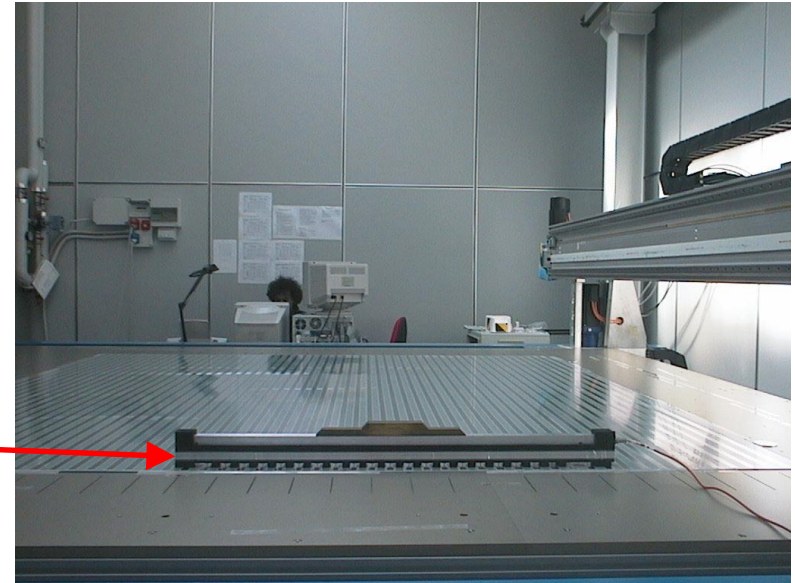
**S-shape failure depends on quality of Al pressing rolls (to be checked from time to time).**



# HV Test

HV test is now made in 2 steps:

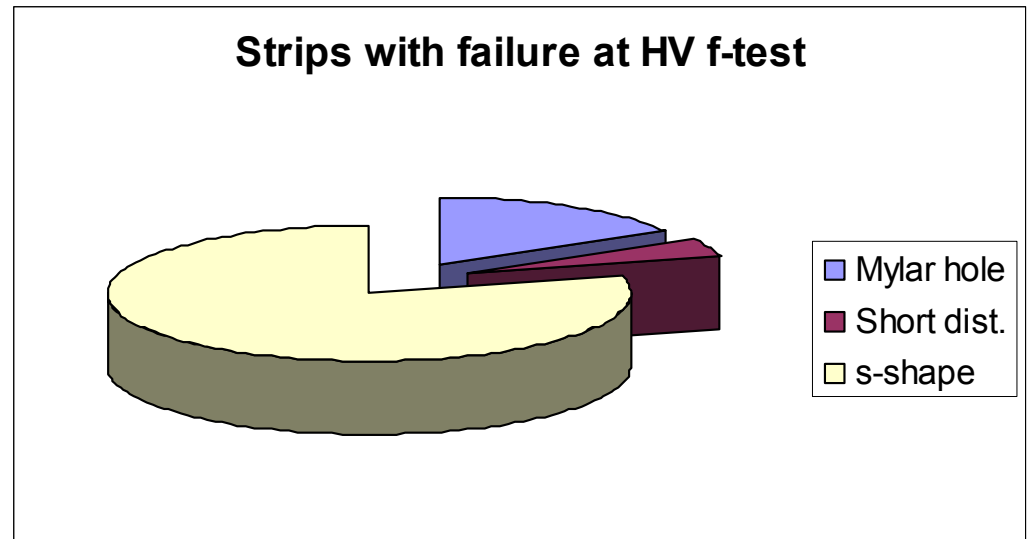
- **Fast test** (ramp up to 4.2kV and hold V for 30 secs) on the strip table (temporary short probe for testing the procedure).
- **Standard test** on HV test stand (30 secs @ 4kV). Rejected when  $I_{\text{leak}} > 10\text{nA}$ .



# HV Test

**Results:**

**0.8% fail HV f-test.**



**We had only 2 bad strips @ s-test (out of 3352). They were due to damage during handling => f-test is effective in spotting out more than 90% of bad strips.**

**Now building final f-test probe with correct dimensions.**



# Transport

**Interesting to analyze first transports:**

- **Torino-Madrid: *custom* transport, 1 week lost due to snow in Frejus.  
Madrid cannot download boxes with weight > 1t.**
- **Torino-Padova: trip ok, but Padova complains about shape of the packaging which does not allow them the use of dedicated tool.**
- **Torino-Aachen: problems in downloading the truck.  
Transporter broken and truck with fixed ceiling.**
- **Torino-Madrid: transport ok but the truck breaks the CIEMAT gate, result half a day lost in paper work for insurance reimbursement....**

**....and many more transports to do. All sites have different needs. We have to sit together and define boundary conditions for transports and boxes.**

# Material Procurement

- **Meeting with Pechiney to define last contract items on 29/3/01.**
- **Plate quality: discussion with Mr. Wusyk who recognizes that the problems we have (edge waves, and surface scratches, packaging) should be fixed and in the future avoided by their QC.**
- **We agreed that next batch (delivery in may) will be sent directly to Torino. The goal is to make immediate QC on these plates and to send plates already cut in Dubna to start production in october.**
- **Present status of plates: in the present box we do not have edge waves, but many scratches in one of the surfaces. We accept them but this require a lot of work from us.**

# What's next

- **Complete plates for 22 chambers by end of june**
- **Complete software (human interface and camera monitoring programs to be integrated)**
- **In july dismount and pack strip tooling + cut plates for Dubna production start (200)**
- **Send strip deposition tooling to Dubna beginning of august**
- **Full line installation in september**