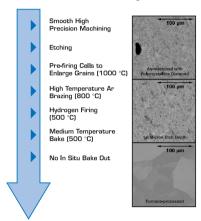
# Structure Processing

Careful surface treatment during fabrication is the key for fast processing and good performance

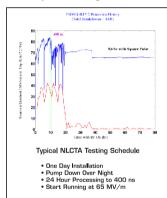
Fast turn-around of accelerating structures

Potential for higher gradients at shorter pulse length

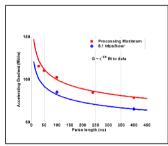
# Surface Treatment at FNAL During Production



### Extremely Fast Processing of New Structures



# Potential for Higher Gradient at Shorter Pulses



Pulse Length Dependence of Accelerating Gradient

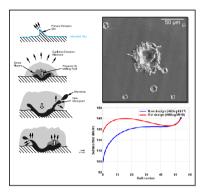
# RF-breakdown in a Nutshell

Very fast dissipation of stored RF energy

High electric surface fields leads to explosive electron emission

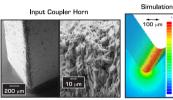
High magnetic surface fields leads to RF pulse heating Material and machining defects

#### Explosive Electron Emission



Optimized RF-design to Lower Surface Fields Clean and Smooth Surfaces

## RF Pulse Heating



Temperature Rise During 400 ns RF Pulse: 130 K Consequence:

All Components Since 2002 are Designed for a Temperature Rise < 50 K

### Localized Defects and Particles





H90vg5R, Cell 13

H90va3N, Cell 35

Quality Control and Careful Handling Needed