**Test Superconducting Wire at CERN**

* Ic critical current
	+ at 3T, 4.5 K and 1.9K
* RRR
* cross section, to look at filaments
* electrical insulation (breakdown voltage)

**Test Superconducting Cable at Uppsala & Scanditronix**

* measure diameter
	+ 3x 0.36 mm = 1.08 to 1.09 mm diameter
* check bending,
	+ measure approximate bending radius
	+ does it come apart?
* make some photos
	+ close-up look with microscope
* measure HV insulation between strands
	+ ramp-up to breakdown voltage
	+ (put in water bucket, then measure b/w strand and water)
	+ strand to strand insulation

**Test Impregnation at Scanditronix**

**NOTE: Quality Control documentation**

**NOTE: Adapt lengths to available cable**

* dummy winding channels
	+ 4 different pieces
		- 2x straight (1 without mold release, 1 with mold release)
		- 1x bend horizontal
		- 1x bend vertical
	+ approximately 5 to 10 cm length, few channels next to each other, 0.3 mm barrier
		- 2x 1.12 x 5x 1.12 mm2 (width x height) -> 10 cables
			* cable diameter **1.08 mm**
			* add gap /tolerance about 120 microns
			* width 2.26 – 2.36 mm
		- on drawing: **channel width 2.31 x depth 5.58 mm**
		- ~~2.5\*6.25 mm2 (width x height) -> 10 cables inside channel~~
	+ with cover, Kapton sheet, glass sheet (as in the real magnet)
	+ grooves should be cleaned, sharp edges taken off
* measure channel width / depth after manufacturing
	+ e.g. every 10th channel
* anodization approximate 50 micrometer, adapt to final channel diameter
	+ up to 150 micron total thickness possible
	+ tolerance 1-2 micron,
	+ adapt to real width of the channel
		- note that ½ width grows into the channel, ½ outside
		- channel width reduces by 2 x ½ = 1 times the anodization thickness
* cable to stick out by few cm
	+ measure HV insulation between strands
	+ note that cable unwinds easily, should be restrained
	+ not enough superconducting cable
		- use superconductor in one channel
		- use copper cable in other channels
* impregnation
	+ resin options:
		- as standard used by Scanditronix (MY750)
		- ~~(paraffin wax)~~
	+ without and with mold release
	+ document the full procedure and types of resin/hardener etc used
		- put a thermo-coouple on the samples to monitor the temperature
	+ keep some of the resin that comes out at the back
		- measure shear stress on this sample
* after impregnation
	+ measure HV insulation between strands
	+ thermal shock
		- 10x: dip in liquid nitrogen for a minute to cool down, warm-up to room temperature
	+ measure HV insulation between strands
* destructive test
	+ cut and polish
	+ make photo of cross section
		- check positioning of the cables and strands
		- check for cracks in impregnation
	+ other interesting measurements
		- tension, shear, bending measurement
		- SEM microscope at LNU can have samples up to 100 x 14 mm