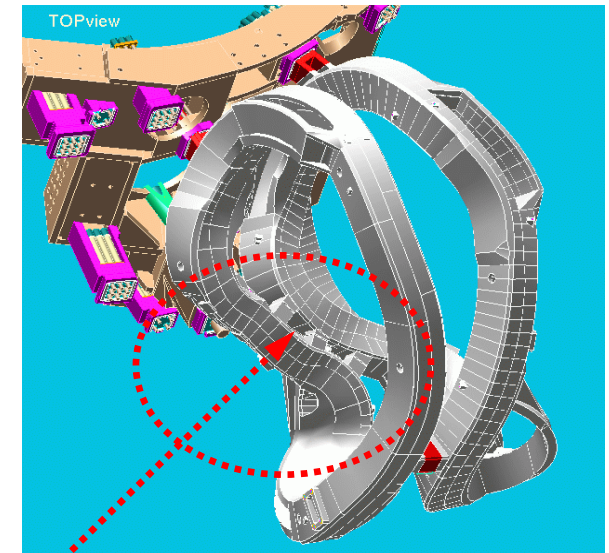
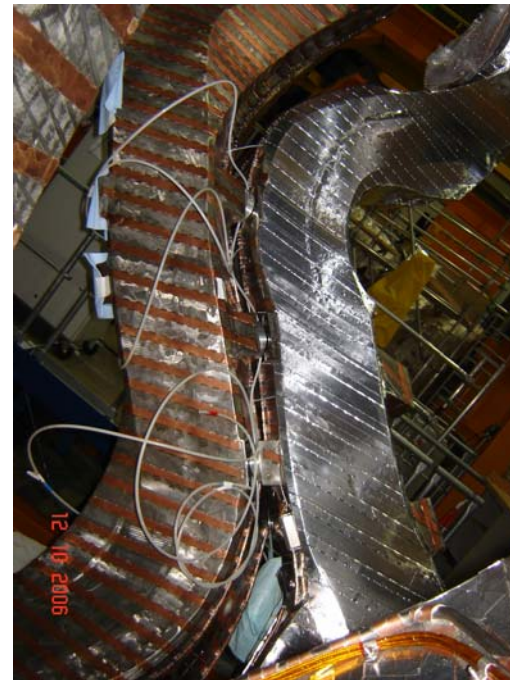


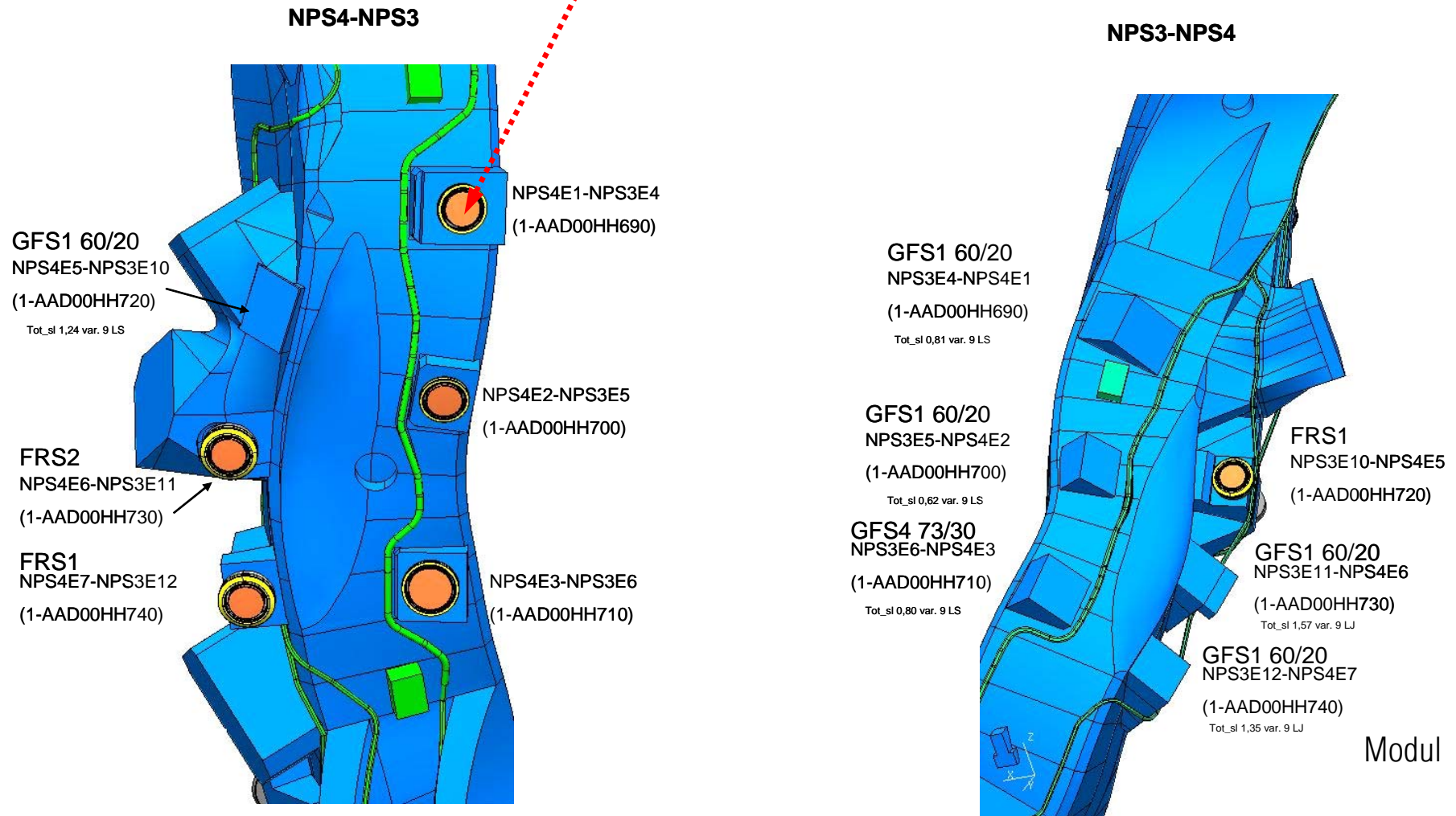
STEPS FOR IMPLEMENTATION OF THE NSE-CASTING TECHNOLOGY

NSE- ASSEMBLY TECHNOLOGIE FOR THE MECHANICAL COIL- STRUCTURE REGARDING EXPENDITURE OF TIME:



NARROW SUPPORT (NSE) BETWEEN THE NON PLANAR COILS.

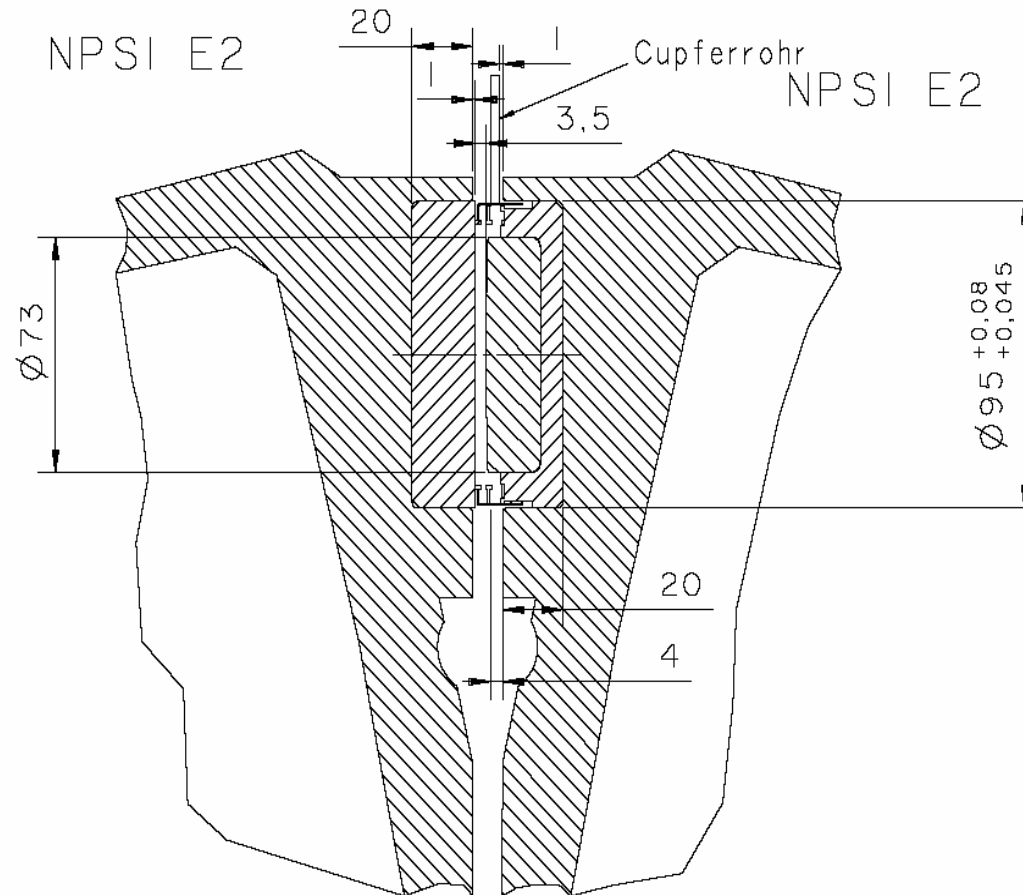
STEP 1: NSE- LOCATIONS FOR THE COIL- Couples (NPC4- NPC5)



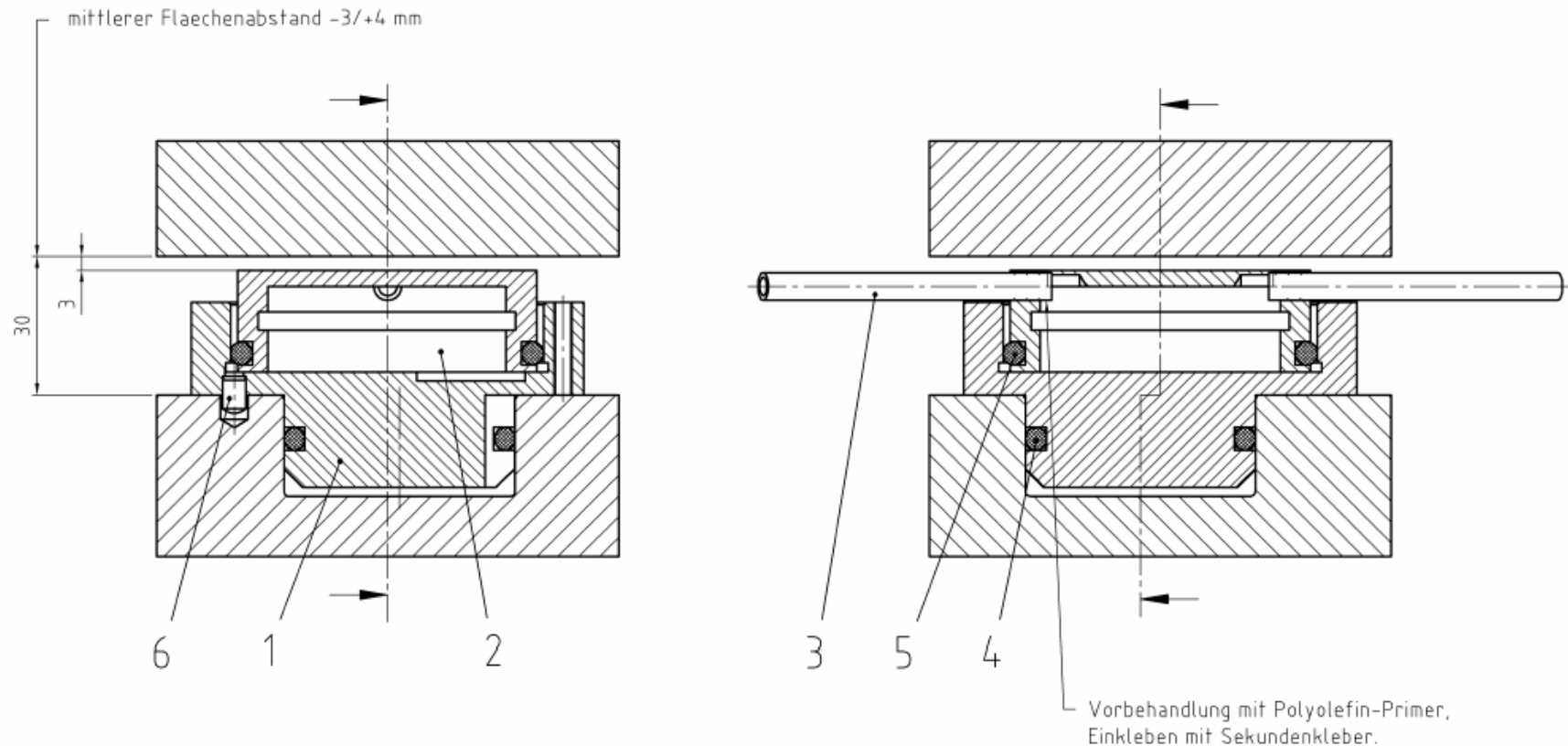
Step 1.1: Allocation for Sliding Surfaces and the place of NSE-Padframes per Coil- Couple



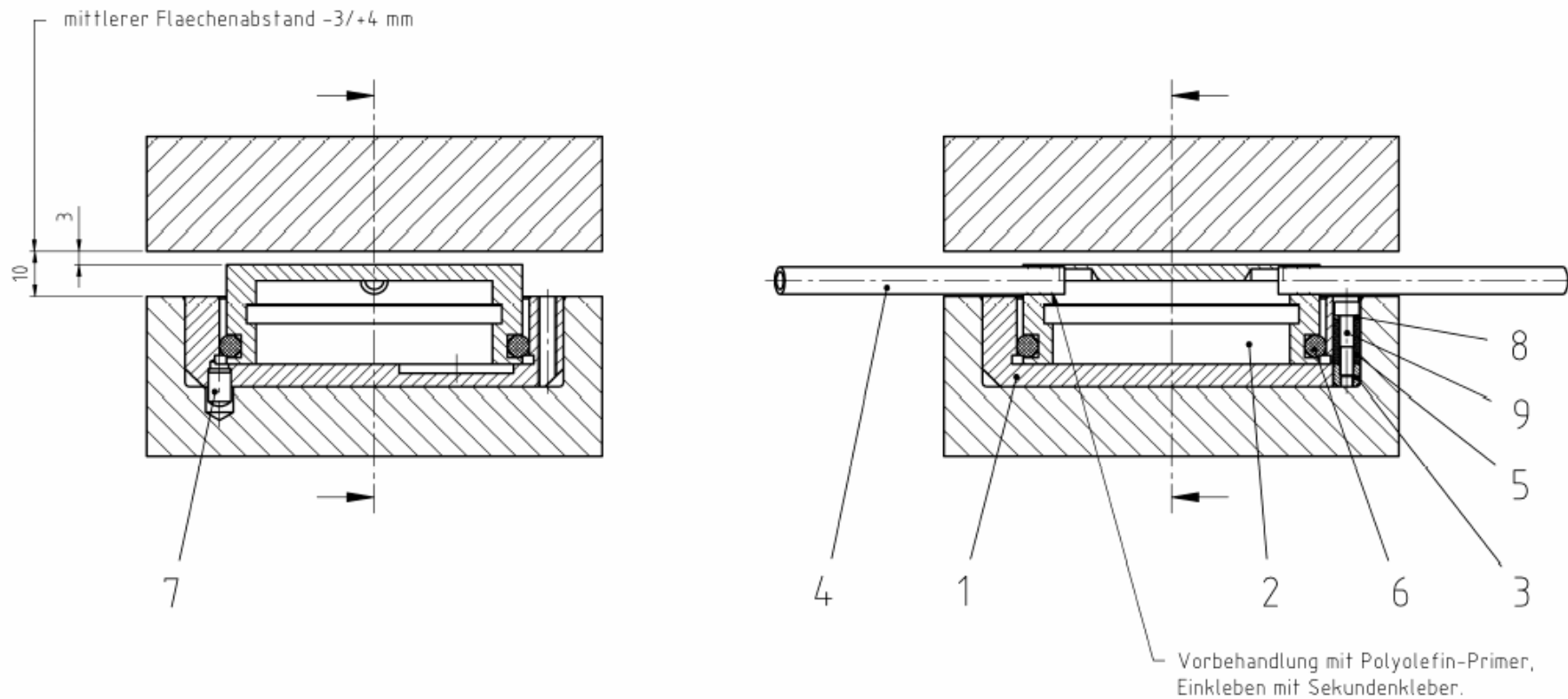
STEP 2: CONSTRUCTION OF THE CASTING BODY



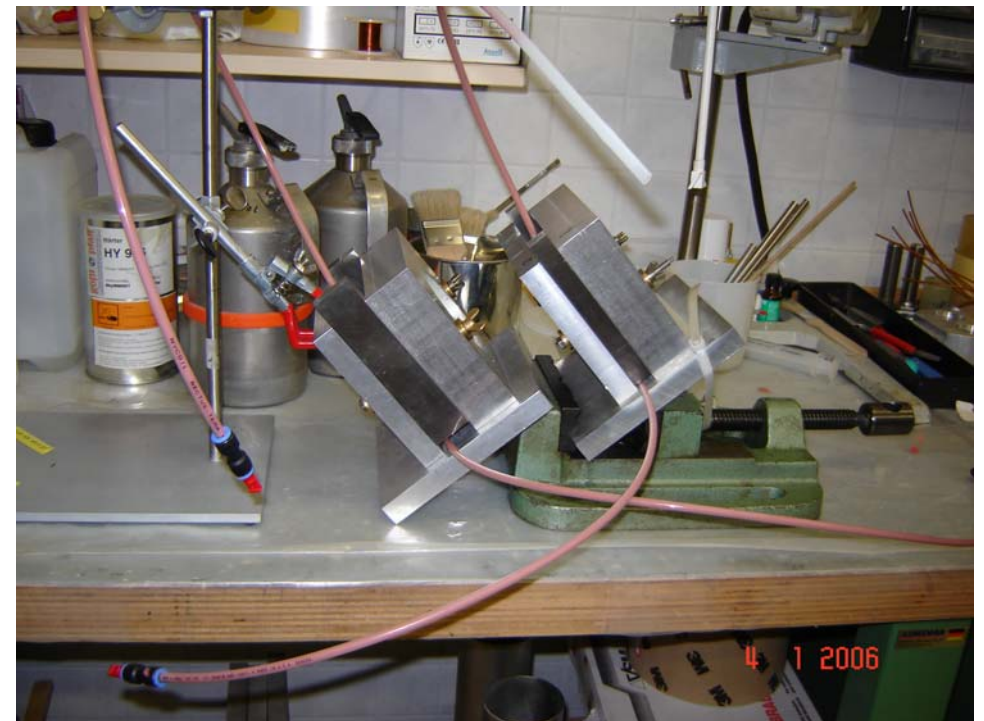
STEP 2.1: SUBASSEMBLY DRAWINGS FROM THE NSE CASTING BODY WITH A PLUG (DESIGN 1)



STEP 2.2: SUBASSEMBLY DRAWINGS FROM THE NSE CASTING BODY WITH A PLUG (DESIGN 2)



STEP 3: NSE- HANDLINGTEST WITH THE CASTING BODYS IN THE LAB



STEP 4: IMPROVEMENT OF THE NSE- CASTING RECIPES

BASIC MATERIAL: SILICON RUBBER CASTING COMPOUND:

Elastosil M 4670 A (800 g) and M 4670 B (80 g)

Characteristics:

Pourable, additional-curing, two compound silicone rubber that vulcanize at room temperature and features:

- Very good Flow and very good handling on the W7X- components.
- Fast and non-shrink cure at room temperature.
- Shore hardness (approx. 48).
- Excellent long-term stability of the mechanical properties of the vulcanizate.
- Storage Stability: 12 Months.
- The NSE- Casting is a serial assembly process (3 NSE- Castings per Silicone- Compound batch)
- Producer: Wacker Chemie GmbH/ Germany.

STEP 5: THE SPECIFICATION OF THE PROCESS DATA

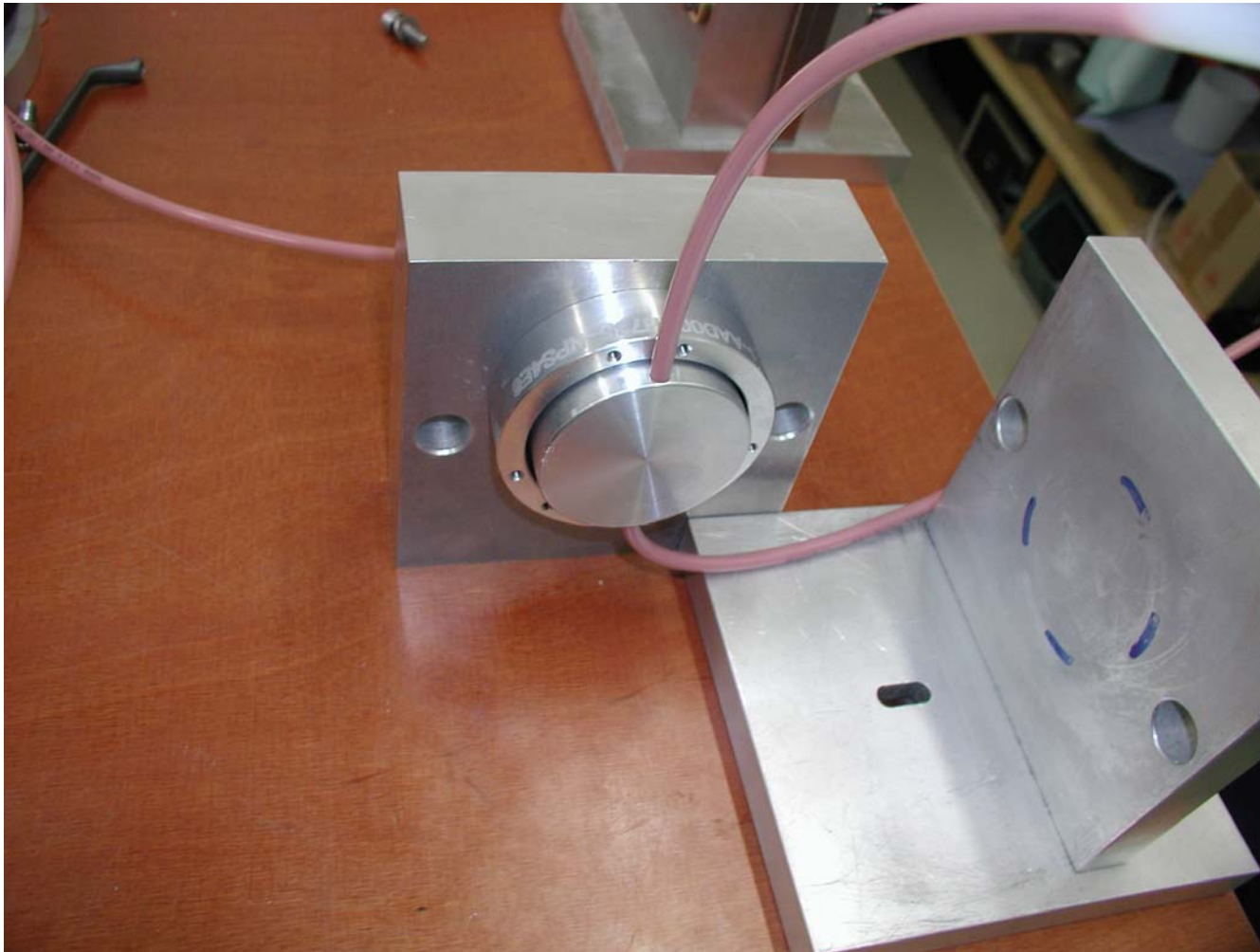
DURING THE CASTING PROCESS:

- PRESSURE FOR PNEUMATIC CARTRIDGE SQUEEZING MACHINE: $p=3,5$ bar.
- MASS OF SILICON PER CASTING- BODY: $m=$ ca. 75 g
- SIZE OF THE CATRIDGE: 1000 ml.
- TUBE LENGTH: APPROX.: 1m; MATERAIL: PA; NOMINAL DIAMETER 4 mm
- TIME TO FILL SILICON IN THE CASTING-BODY: $t=$ 10 -12 min.

PREPARATION OF CASTING BODY:

- USING O-SEALRING INSIDE OF THE CASTING BODY (Material: Viton, Producer: Westring Dichtungstechnik).

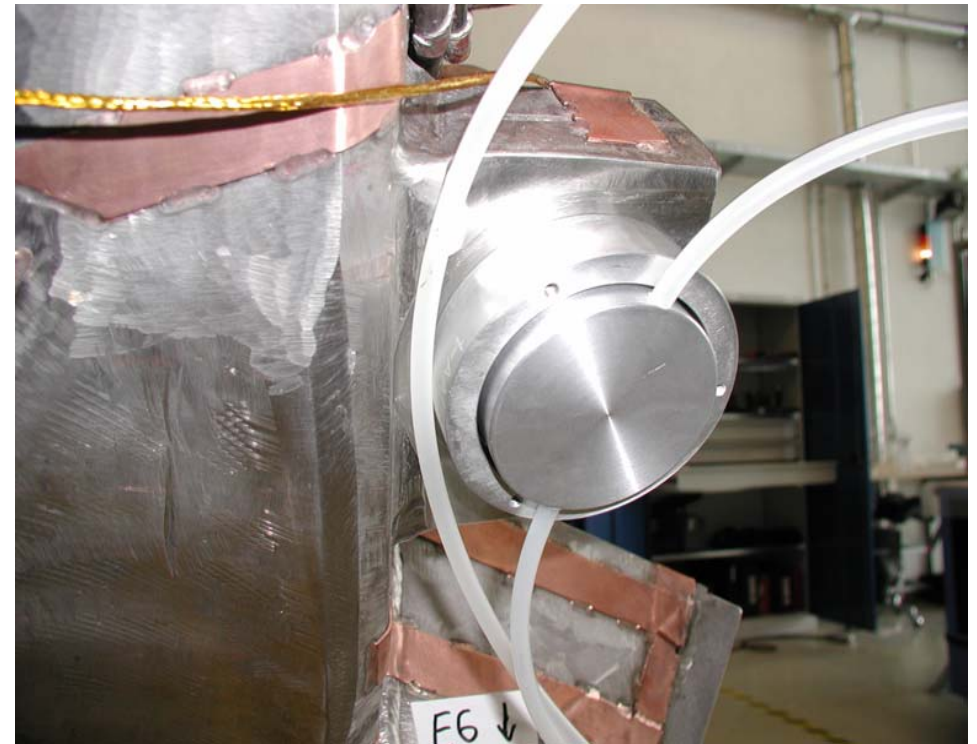
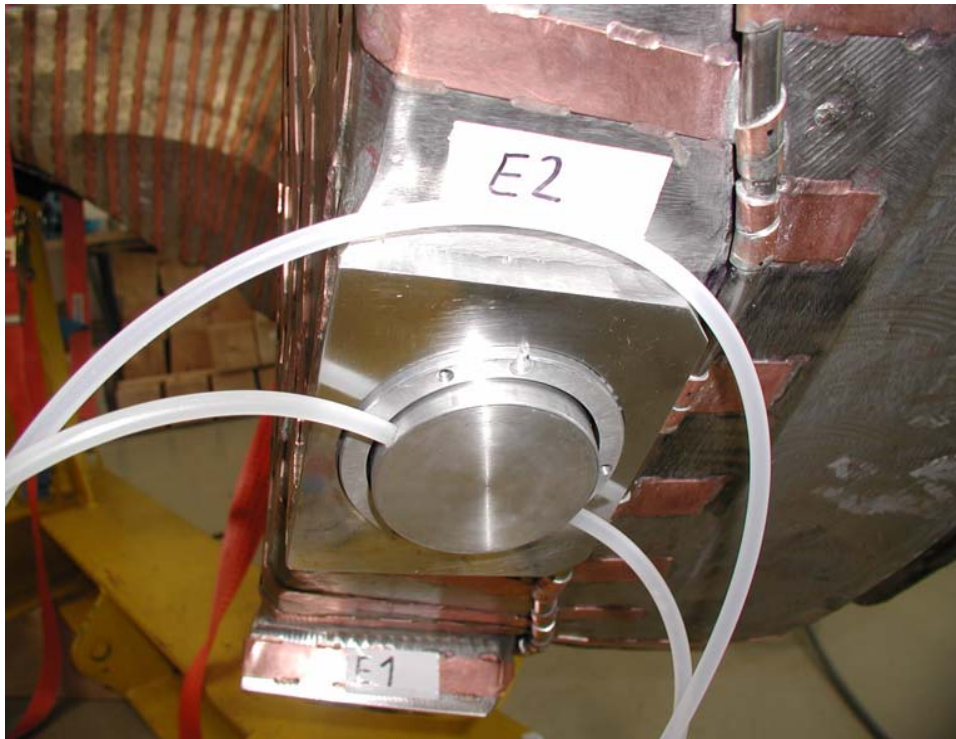
STEP 6: THE LEAK TEST IN THE LAB



STEP 7: INSTALLATION OF THE CASTING BODY IN THE BLIND HOLE FROM THE COIL –CASING.



STEP 8: CLAMPED CONNECTION OF THE CASTING BODY IN THE COIL-CASE.



STEP 9: ADJUSTMENT OF THE COMPRESSED AIR



THE PRESSURE REGULATOR ($p= 3,5$ bar) FOR THE PNEUMATIC CARTRIDGE SQUEEZING MACHINE

STEP 10: FIXATION OF THE COILCOUPLE FOR CASTING WITH BRACKETS AND THE BARSYSTEM.



STEP 11: SETTING UP OF THE SILICON COMPOSITION AND OUTGASSING IN THE EXSICCATOR (APPROX. 5 MIN)



STEP 12: NSE- CASTING (IN SITU) IN THE MOUNTINGSTAND I

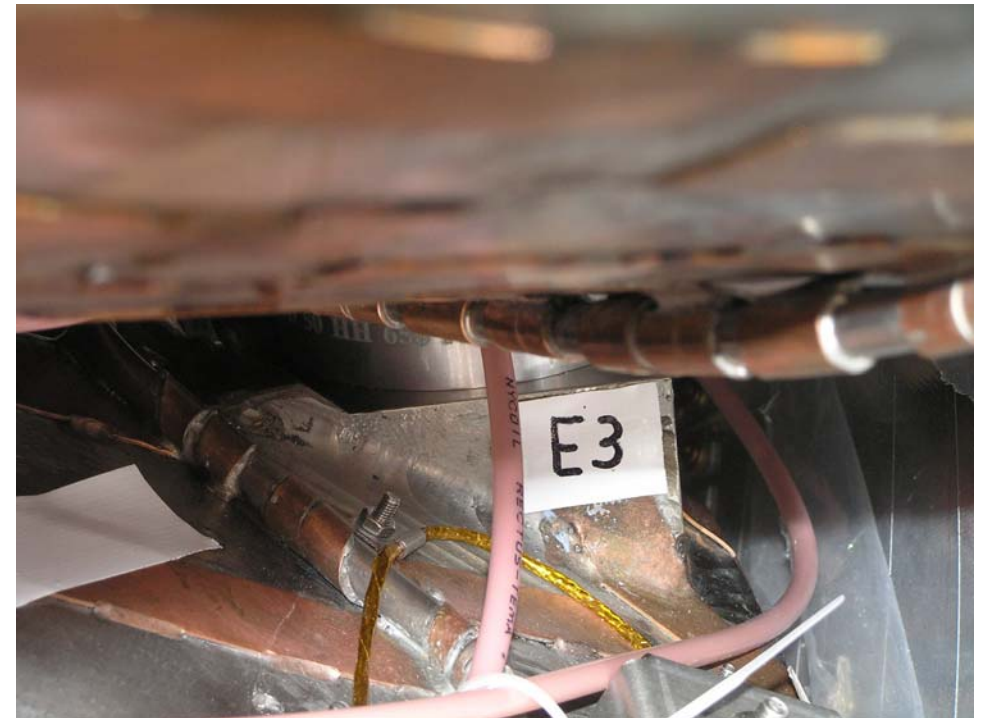


PNEUMATIC CARTRIDGE SQUEEZING MACHINE



MONITORING WITH THE VIDEOSKOP.

STEP 13: THE HARDENING OF THE SILICONE IN THE CASTINGBODY (APPROX: 20 HOURS)



STEP 14: REMOVAL OF THE NSE- CASTINGBODY



AIM: ASSEMBLY OF THE NSE- PADFRAME IN THE COILCASE (SHRINKAGE- PROCESS)

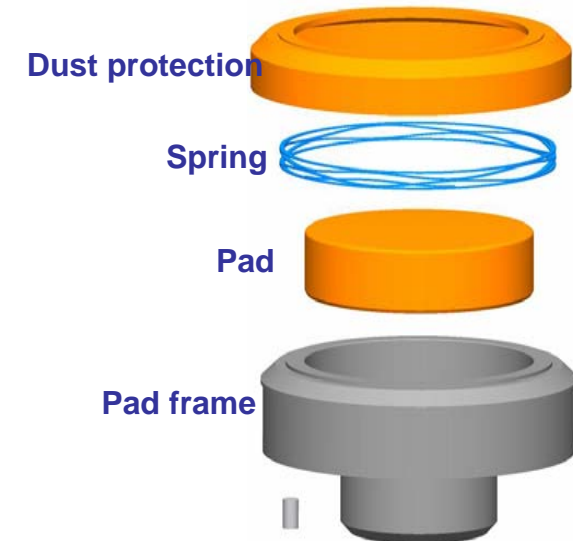
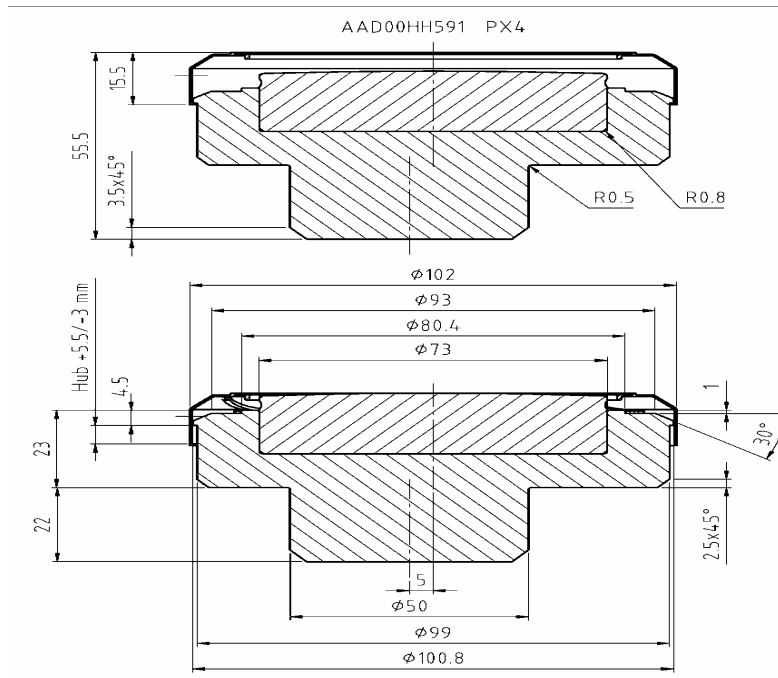


FIG.: EXPLODED VIEW