Annex II. Technical Resources

fabLAB Asturias is a digital fabrication lab member of the global network of Fab Labs equipped with digital fabrication machines. This machines manufacture parts and objects from digital designs. Since the birth of the first Fab Labs in 2002, the network has expanded and there are more than 200 worldwide. Many Fab Labs are based in universities: Schools of engineering, architecture, design,… others work in business environments, others basically support educational communities, and there are even some that work fully independently with no direct relationship with any other institution. Most of them also offer public access for any creator that wishes to prototype his/her projects.

LABoral's Fab Lab presents itself as a resource for all resident projects to incorporate digital fabrication to their work techniques. The easy use of machines fosters the experimentation in the framework of the creative process of the residency.

In addition to the access to the equipment, the technicians of the fabLAB provide and initial training to use the lab, and they provide technical support throughout the residency.

The milling machine can make two-dimensional cuts from vectorial designs(.dxf) in materials thicker than those cut by laser and it leaves no burns on the edges. All types of finishes can be achieved depending on the cutting tools being used and it can work a wide range of materials, from soft materials like waxes or foams, to non-ferric materials like aluminium, woods, plastics etc.

It is also possible to carry out 3D works based on mesh objects(.obj, .stl)

A disadvantage is that this is a more complex machine that needs more time to prepare and carry out the work.

CNC Milling Machine Alarsis FRH210: Large-format Milling Machine-Router, 2000x1000mm work bed and 120 mm useful axis (Z), with 1.5CV, 7000-24000 rpm brushless head, 0,005 mm resolution and vectorable vaccuum bed. Software Vectric VCarve-Pro and Cut3D.

CNC Roland Modela MDX-40A Milling Machine with rotary axis (3D): Desktop milling machine able to machine pieces of up to 300x300x100mm at bed 270x300x68mm at rotary axis, this latter can make revolution bodies.
CNC Roland iModela Milling Machine. Small desktop milling machine, able to work with soft materials, with a working surface of 8,61 cm wide times 5,51 cm long and 2,59 cm high. For small moulds or parts.

The laser cutter uses a concentrated laser beam onto a very small cutting surface using high temperature. It can cut materials up to 16mm thick (paper, cardboard, fabric, wood, plastic, acrylic, etc). Moreover, it can make superficial markings on material without cutting it. This works are based on the contours of vectors in different formats (.dxf, .dwg, .ai, .cdr, .plt, .svg and other vectorial). In addition it can engrave surfaces based on the fillings of the vectors as well as bit maps with 1 bit colour depth.

Laser cutter 160x100cm, 130W: Laser cutter with CO2 laser of 130W and 1600x1000mm of cutting surface.

3D printers are additive fabrication machines able to manufacture parts by laying down melted material in layers of increasing height to create a volume. All the 3D printers of the fabLAB are based on the project (Open Source / Open Hardware) and all designs of parts are available for manufacturing or modifications. They work mainly with plastic materials:

PLA A polymer of lactic acid chains obtained mainly from cornstarch.

ABS a plastic widely used in several industries, from the automotive industry and consumer electronics to toys and many other industries.

Plastic extrusion 3D printer LABoral 3D (RepRap). Plastic extrusion 3D printer PLA. Printing volume 200x200x160

Plastic extrusion 3D printer LABoral 3D (RepRap). Plastic extrusion 3D printer ABS. Printing volume 200x200x160

Plastic extrusion 3D printer P3Steel: Plastic extrusion 3D printer PLA. Printing volume 200x200x150

The cutting plotter functions as a printer that instead of laying down ink, moves a cutting blade onto a surface. By adjusting the force of this blade it can cut vinyl without cutting the paper support it is attached to. Its main use is cutting adhesive and textile vinyl. As explained in the "other equipment" section, a thermal plate for transferring vinyl to textile is also available.

Cutting plotter Roland CAMM-1 Servo: Vinyl cutting plotter for materials between50 and 700mm wide, up to 24 m long of material and a cutting force between 30 and 250gf.

In addition to this digital fabrication machines, the fabLAB is equipped with the common tools and machines in a shopfloor: hand drills, bench drills, table saw, compass saw, handtools (pliers, screwdrivers, files…), electric multitool, belt sander, hot glue gun, heat gun...

Hand thermal plate VT4050-1, clamshell opening
Plate dimensions: 400 x 500 mm

Plotter Epson Stylus Pro 9800: Large format plotter (40") capable of printing on sheet or roll material with eight high quality inks, with its 180 injectors, it is capable of printing with a resolution up to 2880 x 1440 dpi.

Plató
A venue linked to the production centre and equipped with technical resources to be used for research, experimentation and audiovisual development in the artistic field.

Dimensions and characteristics of Plató
- Surface: 319,70 mtrs2
- Soundproof roof
- Heights: 5,95 m- 7,95 m
- TRUSS • Self-supporting structure
- Lighting
- Electrified and dimerised.
- 7 Mb symmetric internet connection.

Streaming equipment
- MacBook (Core 2 duo), live-streaming
- Ustream account and player at LABTV

live filmmaking and experimentation
- MacPro equipped with Live, Modul8, Max/Msp/Jitter, Soundforge
- Video mixers: Edirol v-8
- Video projector
- Audio equipment
- Lights, Truss, Chroma

A/V Labs
Work space devoted to the register, production and experimentation of different audiovisual techniques. Located near Plató, it offers professional support and the following technical resources:

Video equipment
- Camera Panasonic AG-HPX171E
- Tripod Libec
- Tripod Secceed
- Camera Canon miniDV
- Handycam Sony with Tripod
- Lavalier microphone EW 100-ENG-G3 Sennheiser
- Microphone EW 135-P-G3 Sennheiser
- Short-gun microphone MKH 416-P48U3 Sennheiser
- boom-pole system Sennheiser ME-66
- Camera microphone Rode NTG-1
- Hand microphone Shure
- Recorder Tascam DR-680
- Spotlight Fresnel 650 W
- Fluorescent tubes fitting (Kinoflo)
- Video mixer V-8
- Torchlight Prolux PLX-A130
- Wide-angle adapter Convex POR Series HD o.6X

Photography equipment
- Camera Reflex EOS 5D MKII
- Tripod Manfrotto
- Digital
- Lighting kit Ellimchron Dlite 4

Editing equipment
- MacPro, 4-core 3.4 GHz, 6 GB RAM, 1 TB HD (Final Cut, After Effects, etc.)
- Mac Pro, 4- core 2.8 GHz, 4 GB RAM, 300 GB HD, equipped with the software needed (Final Cut, After Effects, etc.)
- Capture card DV and mini DV
- Capture card DV and mini DV HD
- Capture card MXO2 Matrox

Sound lab
This venue is divided into two spaces, the work/exhibition space and the control room. It has acoustical conditioning and equipment to play, capture and experiment in the sound field. It has the following resources:

Sound equipment
- Speakers Genelec 8030B
- Subwoofer Genelec 7070A
- Speaker tripods
- Pad
- Sound card Focusrite Liquid Saffire 56
- Microphones

Control and development equipment
- Computer Apple Mac Mini
- Computer Apple Mac Pro
- Ableton Live 9