IMAT Laboratory Safety Guidelines and Safety Instruction

1. General requirements for working in the lab

1. The stay in the laboratory area of the institute (see IMAT Lab user guidelines, table to 35.; page 5) is only permitted in the context of courses, internships or diploma theses or by agreement in the areas assigned to it. Specially marked areas with increased safety requirements must not be entered.
2. Pregnant women are not allowed access to the entire laboratory area.
3. Drunken persons or under the influence of drugs are not allowed in the laboratory area. In the laboratory area there is a strict ban on alcohol.
4. The use of the laboratory area is only permitted during normal working hours (Mon-Fri: 8:00 am to 4:00 pm) or after consultation with the responsible supervisor.
5. All matters relating to safety, such as accidents, even minor ones, the outbreak of a fire, even if it has already been extinguished, observations on latent hazards that exist in the area of the institute for persons or property, have to be reported as soon as possible to the institute's contact person (see p.7) to report as well as if necessary rescue alert, police or fire department.
6. Handling of open fire and light as well as the bringing of fireworks or other explosive objects is strictly prohibited. There is no smoking in the entire laboratory area.
7. Any work on a device or attempt must be carried out carefully so that no damage occurs (body, clothing, equipment, etc.). In case of damage, the supervisor must be informed immediately. It is expressly pointed out that the federal government or the university are not liable for damages. Therefore, a conclusion of a liability insurance is recommended (Note: Included in the ÖH contribution for students).
8. Facilities required for the operation of a test or test stand (infrastructure, mechanical engineering, measuring technology, etc.) may only be used after consultation with the supervisor or taken from the respective repositories. This also includes parts that are used in other pilot plants and, in particular, the metrological infrastructure of the institute.

9. IT systems are only to be used or consulted after consultation. The user undertakes to follow the rules laid down in the statutes of Graz University of Technology as well as in the IMAT IT-User Rules (EDV Nutzungsordnung).
10. In general, doors should be kept closed. In particular, fire doors must not be wedged open, adjusted or tied. Entrance doors to the laboratory area are to be blocked after office hours
11. The locations of first aid kits and fire extinguishers as well as escape routes can be found in the attached laboratory plans (see also p. 9ff).
12. The workplace must always be kept tidy and clean.

2. Lab user guidelines of the Institute of Materials Science, Joining and Forming (IMAT)

1. Each staff member of the IMAT institute is given the IMAT Laboratory Safety Guidelines, an ID card for the laboratory (lab ID) and the *Declaration of Commitment (Verpflichtungserklärung)* to their compliance after entering into service (hereinafter “VE”). The VE must be signed and returned immediately after delivery, so that it can be deposited at the IMAT secretariat.
2. Working in the laboratory is only permitted after signing the commitment (VE).
3. The lab ID card contains the instruction status and must be worn in a clearly visible manner in all lab rooms during each stay.
4. The use of any laboratory equipment without prior training by authorized laboratory personnel is not permitted.
5. For certain devices and machines safety instruction is required. This is to be documented in an instruction booklet by mutual signing of the instructed and authorized person.
6. The safety briefing may only be carried out by authorized persons. The list of devices and machines requiring instruction with the associated persons authorized to instruct can be found on page 8, table 2.
7. The lab operation time is from Mon - Fri: 8:00 am to 4:00 pm and the time, in which at least one of the lab team members works in the lab premises. In case none of the lab staff is present in the lab premises (holiday, business trip, external work, sickness), the out of lab office hours’ guidelines apply.
8. Working in the lab between 10 pm and 6 am is not permitted (see Working Hours Act).
9. The out of lab office hours’ guidelines must be strictly adhered to according to the lab safety steps (see p. 6).
10. If laboratory work has to be done overnight, e.g. due to long-term tests, the test data and the names of the persons performing the tests must be reported to the laboratory staff. Likewise, the corresponding contact and test data (name, accessibility, project, start of the test and end, etc.) are to be affixed in a clearly visible manner to the test equipment used.
11. A second person (see security steps) must be available if needed in case of an emergency as contact person for any support.
12. All lab activities must be carried out with appropriate protective equipment/gear (see the respective notice at the workplace) as well as with long trousers and closed shoes. Sandals or high heels are prohibited.
13. The storage or consumption of food is prohibited throughout the laboratory.
14. Each person must inform himself in advance by means of a safety data sheet about the dangers of the chemicals used (The safety data sheets for the chemicals available in the laboratory are available in the laboratory).
15. Chemicals must be stored without exception in the chemical boxes (security boxes) and isolated of acids and bases.
16. The transport of chemicals between laboratory premises is permitted only by authorized laboratory personnel or in consultation with the latter.
17. The preparation of etchant is only allowed on notice of authorized lab staff.
18. The transport of chemicals from the laboratory premises is not allowed.
19. Dangerous waste products must be separated as special waste and depolluted.
20. The entire IMAT staff and particularly new colleagues must, before starting working, read up on site about first aid kits and fire extinguishers and their

functionality. In addition, they must be informed about emergency exists and the general user guidelines as well as behaviour in emergency cases (see p. 7).

21. Working with chemicals is only allowed in the *fume hood etching room*, using all necessary personal protective equipment (for details, see the notice on the work station) and it is also obligatory to wear long trousers and closed shoes (sandals or high heels are prohibited).
22. Working with particularly dangerous chemicals (such as hydrofluoric acid) is only allowed in the fume hood etching room of the main laboratory, room NTEG056, on the ground floor and under simultaneously activated optical warning system.
23. During ongoing work with hydrofluoric acid, uninvolved persons are not permitted to work in the workplace at the same time.
24. The air exhaust in the lab has to be switched on permanently (24h). The air exhaust device must be checked every year.
25. The general user guidelines concerning working in the lab apply to the entire lab area and must be followed at any time (s. VE p. 17).
26. Cleanness in the workplace: According to security reasons the TU Graz cleaning staff is instructed to clean only blank work surfaces. Therefore, we kindly ask to return all working utensils in the appropriate storage boxes, so that the cleaning staff can easily clean all blank surfaces.
27. Dust cover: Especially in the microscopy we strongly recommend to cap all devices with the provided dust cover before leaving the workplace.
28. Log out of the system/computer shutdown: After finishing the work at the computer please log out of the system. The last user of the day should shut down the computer.
29. Use of the computer: All lab PCs are optimized for the use of the connected devices and are no common desktop PCs. PC activities, which are not in relation to the foreseen application, are not allowed.
30. Who works where? The teaching metallography respectively the teaching microscopy are exclusively foreseen for diploma and bachelor students, with exception of the stereo microscopy, the automatic measurement of hardness and the analytical image interpretation at the PC DIM Work. The original lab is foreseen for the doctoral students and the lab team. Separate treatments can be arranged in case of need with the lab team.
31. All users are required to fill in specified data if machine, equipment or laboratory books (electronic or paper) are present.
32. Functional devices with an obvious defect must not be put into operation.
33. Defective devices, missing utensils: If defective devices or machines are found at the beginning of the work, or if any working utensils are missing, or if defects or damage occur during the work process, this must be reported immediately to the lab team so that it can be fixed as soon as possible.
34. The trained IMAT laboratory professional staff (see item 4, table 1, laboratory staff) is excepted from compliance with security levels I-III and is subject to the corresponding general applicable guidelines and the currently valid working time law for handling the entire laboratory equipment.

35. Individual areas of the laboratory space

IMAT Proper names	TU Graz Roomnumber
Metallographie/Mikroskopie	NTEG056(+F), NTEG058(+F), NTEG054(+C,+F)
Technikum	NTEG060
Physikalisches Prüflabor/REM	NTK1034, NTK1036
Kriechlabor	NTK1070J, NTK1068J
Lehrmetallographie/Mikroskopie	NTK1112, NTK1108
EBW	NTEG128JE
Schweißlabor	RZEG100, RZEG104, RZEG106
Korrosionslabor	NTK1100
SLM Labor (AddLab)	MFEG622
Mechanische Fertigung	NTK1012, NTK1013, NTK1014, NTK1020E, NTK1022E
Pulvervorbereitung	NTK1234G
Metallographielabor LFT	FSEG086M
Mess- und Prüflabor LFT	FSEG092
Werkstatt LFT	FSEG090
Allgemeinwerkstätte LFT	FSEG100
Messraum (1. Stock) LFT	FS01086
Messraum Instron (Keller) LFT	FSK1030C

3. Security steps for lab activities

Security step I (low)

Lab activities:

- All PC-lab activities (image analysis, evaluation of measurement data, etc.)
- Microscopy (LiMi, stereo, macro), REM, MicHV
- Macro-, autom. measurement of hardness

Lab activities according to security step I are allowed to be carried out, outside of the lab operation time, only if:

A second person was informed, who is reachable by phone for this period of execution of the lab activity. This second person doesn't have to be present at the institute and doesn't have to be a member of the lab staff.

Security step II (middle)

Lab activities:

- Carrying out tests at Gleeble, Beta, FSW, EBW, RMC, dilatometer
- Residual stress measurement

Lab activities according to security step II are allowed to be carried out, outside of the lab operation time, only if:

A second person was informed, who is reachable by phone for this period of execution of the lab activity. This second person must be present at the institute but doesn't have to be a member of the lab staff.

Security step III (high)

Lab activities:

- Operating of a machine of the mechanical workshop for sample pre-separation (band saw, vertical/horizontal, wet cutting machine, grinding machine)
- heat treatment, impact tests
- all etching experiments and corrosion experiments

Lab activities according to security step II are allowed to be carried out ***only during lab operation time***, Monday - Friday 8:00 – 16:00 h if:

A second person is directly present in the same room. This second person doesn't have to be a member of the lab staff.

4. Responsibilities of the laboratory staff

EDV + applications, microscopy, others	Kurt Kerschbaumer	**DW 7687**
Metallography; scanning electron microscope	Gernot Stöfan	**DW 7189**
Metallography, creep lab, hardening, sample prep.	Thomas Friedl	**DW 7680**
Joining, sample preparation.	Leander Herbitschek	**DW 7681**
Physical testing; heat treatment	Herbert Penker	**DW 7688**
Corrosion	Wolfgang Steinbäck	**DW 7186**
Workshop LFT	Heinz Fasching	**DW 9475**
Metallography, Meas.- and Testing Lab LFT	Peter Auer	**DW 9448**

Table 1: Responsibilities

Of course all people working in the lab are available in case of queries. The above table shows the internal responsibilities. According to the query please contact right away the responsible person.

5. Behaviour in emergency cases

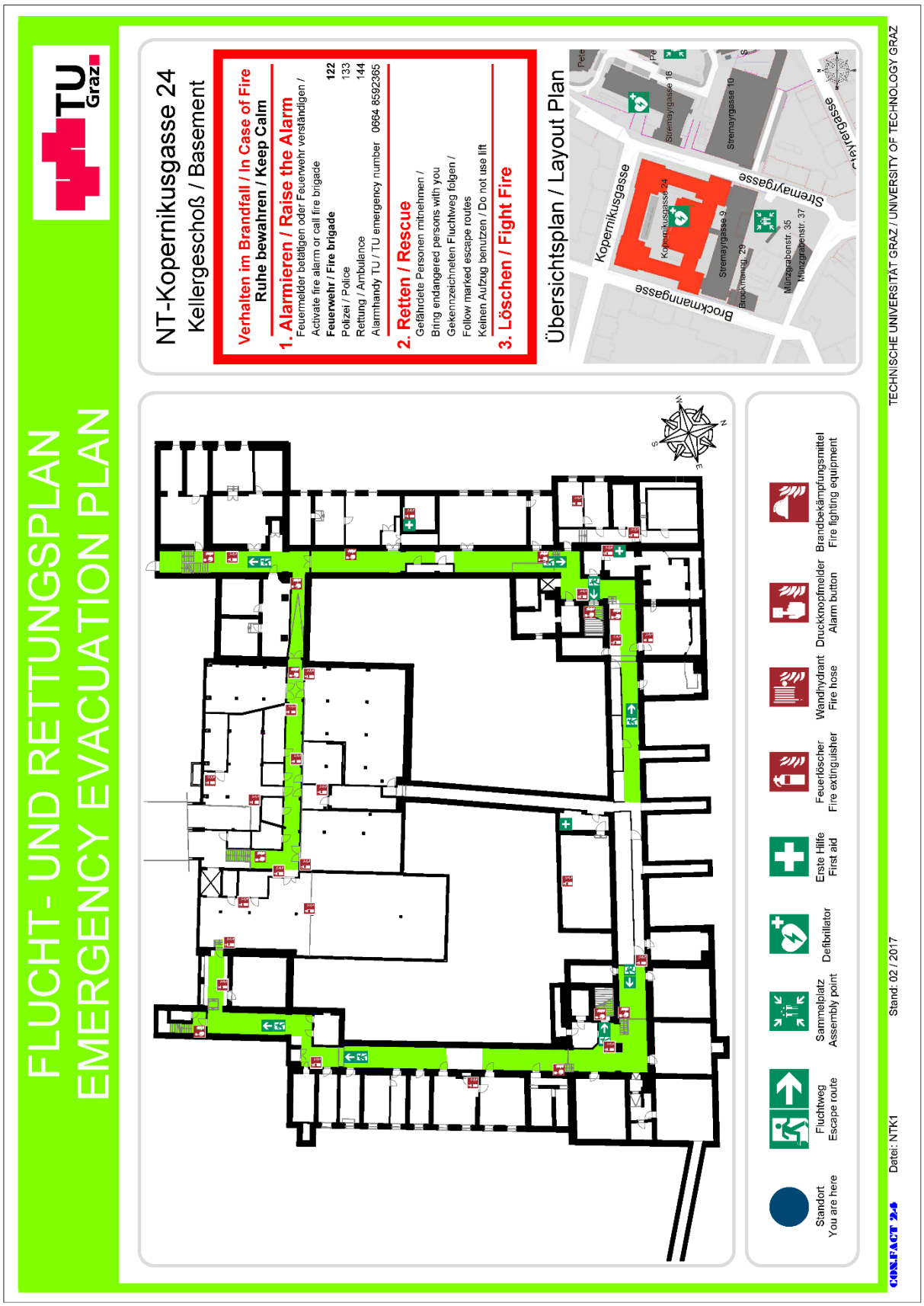
- Personal security/safety first!
- Keep calm and avoid hasty action!
- Warn people in danger, if necessary ask them to leave the rooms immediately respectively help them leaving the rooms!
- Call for help!
  - Firefighters **122**
  - Police **133**
  - Rescue **144**
  - Euro call **112**
  - Toxication/poisoning center **406**
  - Fire control TUG **4122**
- Render first aid!
- Please report each accident, without exception, to the IMAT safety officer!
- Every accident that leads to a sick leave of a person must also be reported to the preventive service (praeventivdienst@tugraz.at).

6. List of devices requiring instruction

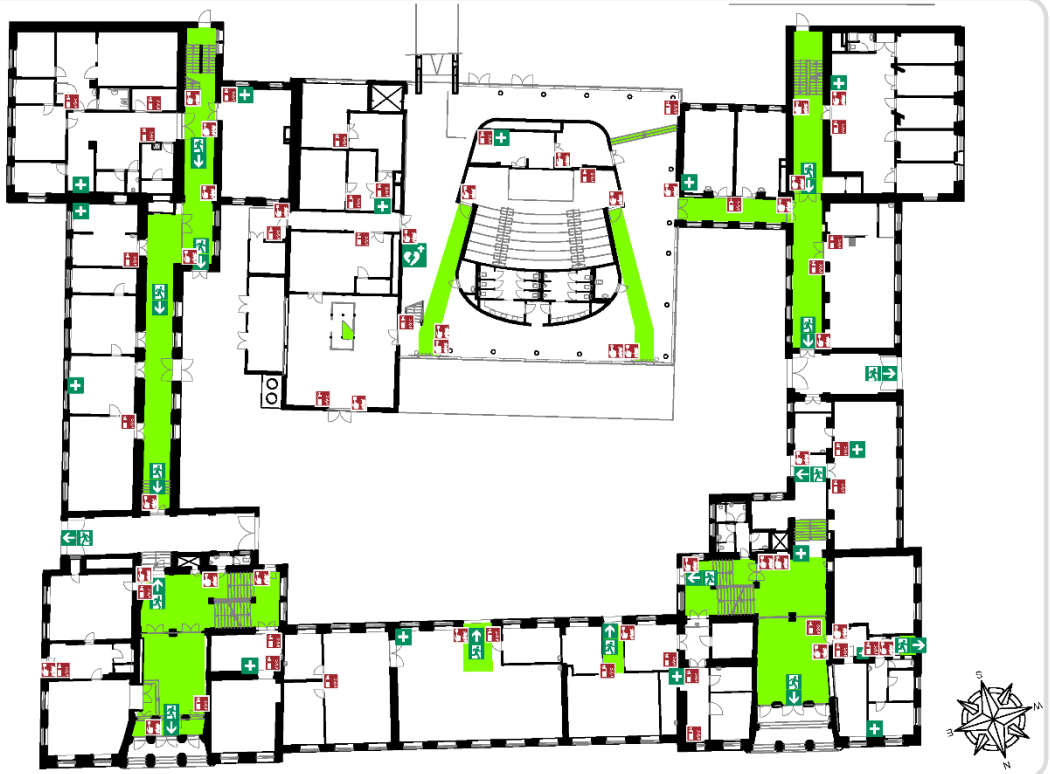
Nr.:	unterweisungspflichtiges Gerät / Maschine	unterweisungsberechtigte Person
1	Laborabzug	Wolfgang Steinbäck
2	Elektrolytisches Ätz- und Poliergerät	Wolfgang Steinbäck
3	Potentiostat	Wolfgang Steinbäck
4	Biegeprüfstand H-Versprödung	Wolfgang Steinbäck
5	ABB Roboter	Leander Herbitschek
6	Friction Stir Welding FSW Maschine	Leander Herbitschek
7	Friction Spot Welding FSP Maschine	Willian Sales de Carvalho
8	Ultraschallschweißgerät	Willian Sales de Carvalho
9	Elekronenstrahlschweißgerät EBW	Leander Herbitschek
10	Wärmebehandlungsöfen	Herbert Penker
11	Kerbschlagbiegehammer	Herbert Penker
12	Zugversuch	Herbert Penker
13	SLM-250 3D Drucker	Thomas Friedl
14	Bandsägen	Leander Herbitschek; Thomas Friedl
15	Bohrmaschine	Leander Herbitschek; Thomas Friedl
16	Klimakammer	Wolfgang Steinbäck
17	Chemie Gefahrenstoffe allgemein	Wolfgang Steinbäck
18	Chemie Flusssäure	Wolfgang Steinbäck
19	Kriechprüfmaschinen	Thomas Friedl
20	Präzisionstrennmaschine	Thomas Friedl
21	Schleif- und Poliergeräte	Gernot Stöfan,
22	Warmeinbettpresse	Gernot Stöfan; Thomas Friedl
23	Umformpresse Schuler 400t LFT	Heinz Fasching; Nino Müllner
24	Fräsmaschine SHW LFT	Heinz Fasching; Nino Müllner
25	Drehmaschine Allgem. Werkstatt LFT	Heinz Fasching; Nino Müllner
26	Fräsmaschine Allgem. Werkstatt LFT	Heinz Fasching; Nino Müllner
27	Drahterodiermaschine LFT	Heinz Fasching; Nino Müllner
28	MAG/MIG-Schweißgerät LFT	Heinz Fasching; Nino Müllner
29	WIG-Schweißgerät LFT	Heinz Fasching; Nino Müllner
30	Bandsäge LFT	Heinz Fasching; Nino Müllner
31	Blechschere LFT	Heinz Fasching; Nino Müllner
32	Trennschneider Struers LFT	Heinz Fasching; Nino Müllner
33	Bohrmaschinen und Winkelschleifer LFT	Heinz Fasching; Nino Müllner
34	Chemie Gefahrenstoffe	Heinz Fasching; Nino Müllner
35	Industrieofen LFT	Heinz Fasching; Nino Müllner
36	Rollenprüfstand ESW mit Induktionsanlage LFT	Heinz Fasching; Nino Müllner
37	Laborabzug LFT	Peter Auer
38	Zugprüfmaschine Zwick/Roell LFT	Peter Auer
39	Opt. Messsysteme Atos, Aramis, Argus LFT	Peter Auer
40	H2-Analysegerät Bruker LFT	Peter Auer
41	3D-Mikroskop Keyence LFT	Peter Auer
42	Härteprüfgerät Emco-Test LFT	Peter Auer
43	Wärmebildkamera LFT	Peter Auer
44	Präzisionstrennmaschine QATM LFT	Peter Auer
45	Schleif- und Poliergerät QATM LFT	Peter Auer
46	Warmeinbettpresse QATM LFT	Peter Auer
47	Potentiostat LFT	Peter Auer
48	M3 DP SL LFT	Matthias Moschinger
49	Instron LFT	Fernando Warchomicka; Peter Auer

Table 2: List of devices/machines subject to instruction and their authorized persons

7. Emergency Evacuation plans



FLUCHT- UND RETTUNGSPLAN
EMERGENCY EVACUATION PLAN



NT-Kopernikusgasse 24
Erdgeschoß / Ground Floor

Verhalten im Brandfall / In Case of Fire
Ruhe bewahren / Keep Calm

1. Alarmieren / Raise the Alarm

Feuermelder betätigen oder Feuerwehr verständigen /
Activate fire alarm or call fire brigade

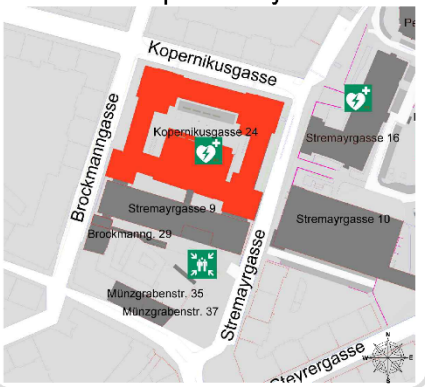
Feuerwehr / Fire brigade	**122**
Polizei / Police	133
Rettung / Ambulance	144
Alarmhandy TU / TU emergency number	0664 8592365

2. Retten / Rescue

Gefährdete Personen mitnehmen /
Bring endangered persons with you
Gekennzeichneten Fluchtweg folgen /
Follow marked escape routes
Keinen Aufzug benutzen / Do not use lift

3. Löschen / Fight Fire

Übersichtsplan / Layout Plan



Standort / You are here
Fluchtweg / Escape route
Sammelplatz / Assembly point
Defibrillator
Erste Hilfe / First aid
Feuerlöscher / Fire extinguisher
Wandhydrant / Fire hose
Druckknopfmelder / Alarm button
Brandbekämpfungsmittel / Fire fighting equipment

CON.FACT 24 Datei: NTEG Stand: 02 / 2017 TECHNISCHE UNIVERSITÄT GRAZ / UNIVERSITY OF TECHNOLOGY GRAZ

FLUCHT- UND RETTUNGSPLAN
EMERGENCY EVACUATION PLAN
TU Graz
RZ-Steyrergasse 17
Erdgeschoß / Ground Floor
Verhalten im Brandfall / In Case of Fire
Ruhe bewahren / Keep Calm
1. Alarmieren / Raise the Alarm
Feuermelder betätigen oder Feuerwehr verständigen /
Activate fire alarm or call fire brigade
Feuerwehr / Fire brigade 122
Polizei / Police 133
Rettung / Ambulance 144
Alarmhandy TU / TU emergency number 0664 8592365
2. Retten / Rescue
Gefährdete Personen mitnehmen /
Bring endangered persons with you
Gekennzeichneten Fluchtweg folgen /
Follow marked escape routes
Keinen Aufzug benutzen / Do not use lift
3. Löschen / Fight Fire
Übersichtsplan / Layout Plan
Steyrergasse 30
Steyrergasse 17
Standort
You are here
Fluchtweg
Escape route
Sammelplatz
Assembly point
Defibrillator
Erste Hilfe
First aid
Feuerlöscher
Fire extinguisher
Wandhydrant
Fire hose
Druckknopfmelder
Alarm button
Brandbekämpfungsmittel
Fire fighting equipment
COS.FACT 2.4 Datei: RZEG
Stand: 02 / 2017
TECHNISCHE UNIVERSITÄT GRAZ / UNIVERSITY OF TECHNOLOGY GRAZ

FLUCHT- UND RETTUNGSPLAN
EMERGENCY EVACUATION PLAN

TU Graz

FS-Inffeldgasse 11
Kellergeschoß / Basement

Verhalten im Brandfall / In Case of Fire
Ruhe bewahren / Keep Calm

1. Alarmieren / Raise the Alarm
Feuermelder betätigen oder Feuerwehr verständigen /
Activate fire alarm or call fire brigade

Feuerwehr / Fire brigade	**122**
Polizei / Police	133
Rettung / Ambulance	144
Alarmhandy TU / TU emergency number	0664 8592365

2. Retten / Rescue
Gefährdete Personen mitnehmen /
Bring endangered persons with you
Gekennzeichneten Fluchtweg folgen /
Follow marked escape routes
Keinen Aufzug benutzen / Do not use lift

3. Löschen / Fight Fire

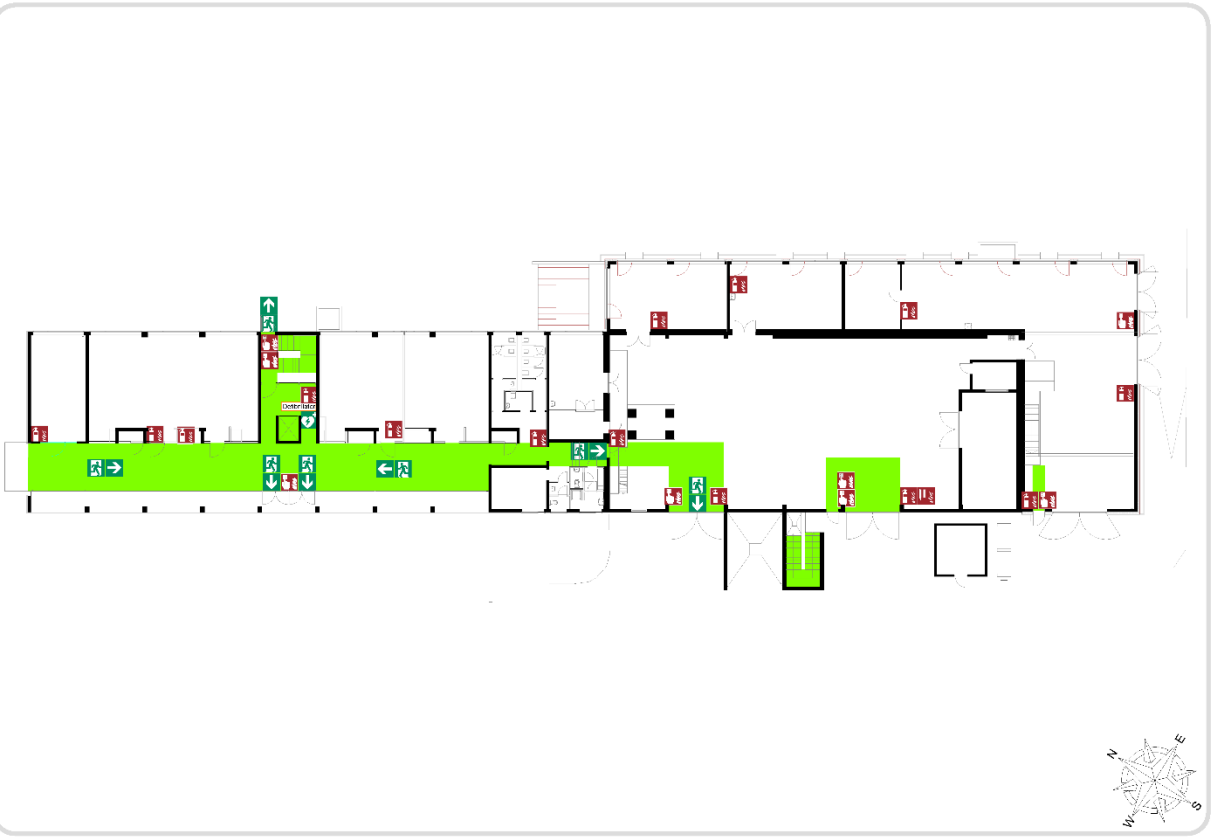
Übersichtsplan / Layout Plan

- Standort / You are here
- Fluchtweg / Escape route
- Sammelplatz / Assembly point
- Defibrillator
- Feuerlöscher / Fire extinguisher
- Wandhydrant / Fire hose
- Druckknopfmelder / Alarm button

CONFACT 2+ Datei: FSK1 Stand: 11 / 2018

TECHNISCHE UNIVERSITÄT GRAZ / UNIVERSITY OF TECHNOLOGY GRAZ

FLUCHT- UND RETTUNGSPLAN
EMERGENCY EVACUATION PLAN



FS-Inffeldgasse 11
Erdgeschoß / Ground Floor

Verhalten im Brandfall / In Case of Fire
Ruhe bewahren / Keep Calm

1. Alarmieren / Raise the Alarm

Feuermelder betätigen oder Feuerwehr verständigen /
Activate fire alarm or call fire brigade

Feuerwehr / Fire brigade	**122**
Polizei / Police	133
Rettung / Ambulance	144
Alarmhandy TU / TU emergency number	0664 8592365

2. Retten / Rescue

Gefährdete Personen mitnehmen /
Bring endangered persons with you
Gekennzeichneten Fluchtweg folgen /
Follow marked escape routes
Keinen Aufzug benutzen / Do not use lift

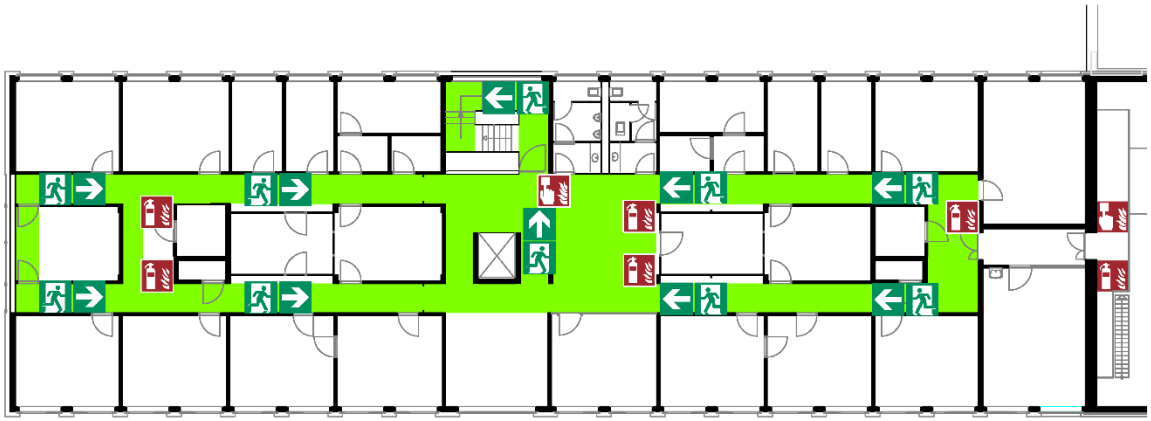
3. Löschen / Fight Fire

Übersichtsplan / Layout Plan

Standort / You are here
Fluchtweg / Escape route
Sammelplatz / Assembly point
Defibrillator
Feuerlöscher / Fire extinguisher
Wandhydrant / Fire hose
Druckknopfmelder / Alarm button

FLUCHT- UND RETTUNGSPLAN
EMERGENCY EVACUATION PLAN

TU Graz



FS-Inffeldgasse 11
1.Obergeschoß / 1st Floor

Verhalten im Brandfall / In Case of Fire
Ruhe bewahren / Keep Calm

1. Alarmieren / Raise the Alarm

Feuermelder betätigen oder Feuerwehr verständigen /
Activate fire alarm or call fire brigade

Feuerwehr / Fire brigade	**122**
Polizei / Police	133
Rettung / Ambulance	144
Alarmhandy TU / TU emergency number	0664 8592365

2. Retten / Rescue

Gefährdete Personen mitnehmen /
Bring endangered persons with you
Gekennzeichneten Fluchtweg folgen /
Follow marked escape routes
Keinen Aufzug benutzen / Do not use lift

3. Löschen / Fight Fire

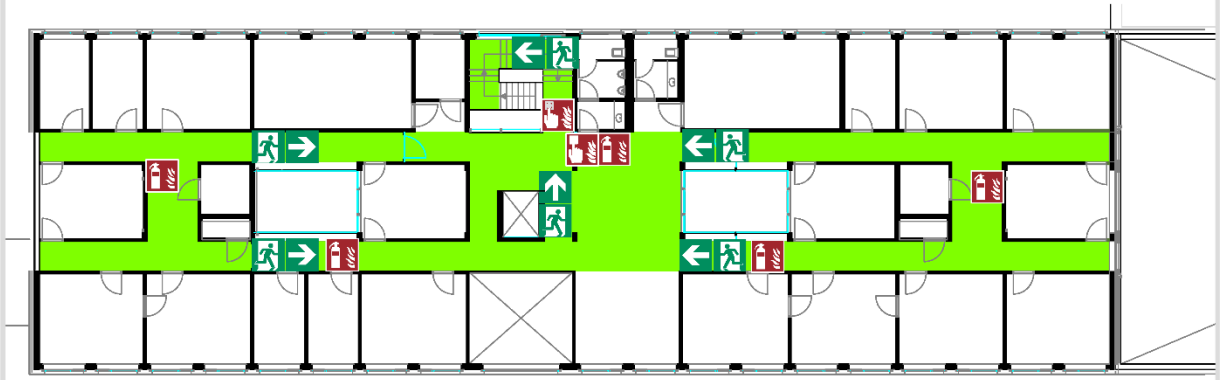
Übersichtsplan / Layout Plan

Standort / You are here
Fluchtweg / Escape route
Sammelplatz / Assembly point
Defibrillator
Feuerlöscher / Fire extinguisher
Wandhydrant / Fire hose
Druckknopfmelder / Alarm button

CON.FACT 2-4 Datei: FS01 Stand: 11 / 2018

TECHNISCHE UNIVERSITÄT GRAZ / UNIVERSITY OF TECHNOLOGY GRAZ

FLUCHT- UND RETTUNGSPLAN
EMERGENCY EVACUATION PLAN



FS-Inffeldgasse 11
2.Obergeschoß / 2nd Floor

Verhalten im Brandfall / In Case of Fire
Ruhe bewahren / Keep Calm

1. Alarmieren / Raise the Alarm

Feuermelder betätigen oder Feuerwehr verständigen /
Activate fire alarm or call fire brigade

Feuerwehr / Fire brigade	**122**
Polizei / Police	133
Rettung / Ambulance	144
Alarmhandy TU / TU emergency number	0664 8592365

2. Retten / Rescue

Gefährdete Personen mitnehmen /
Bring endangered persons with you
Gekennzeichneten Fluchtweg folgen /
Follow marked escape routes
Keinen Aufzug benutzen / Do not use lift

3. Löschen / Fight Fire

Übersichtsplan / Layout Plan

Standort / You are here
Fluchtweg / Escape route
Sammelplatz / Assembly point
Defibrillator
Feuerlöscher / Fire extinguisher
Wandhydrant / Fire hose
Druckknopfmelder / Alarm button

CON.FACT 2-4 Datei: FS02 Stand: 11 / 2018 TECHNISCHE UNIVERSITÄT GRAZ / UNIVERSITY OF TECHNOLOGY GRAZ

8. Declaration of Commitment (Verpflichtungserklärung)

I herewith confirm that I have received the laboratory safety guidelines of the institute of Materials Science, Joining and Forming in printed version. With my signature, I confirm that I have understood the security policies mentioned herein and I commit to strictly comply with these regulations.

Name in Capital letters:

Signature:

Date/Graz,