



Federal Office  
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# Export Control in Science & Research



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# Introduction

This publication is aimed at professors, scientists and scientific staff at universities and non-university research institutions as well as representatives of these organizations<sup>1</sup> working in the field of “export control and research activities“. It deals, in particular, with the rights and obligations that apply in this area. While scientific freedom is enshrined in the Basic Law for the Federal Republic of Germany („Grundgesetz“), research activities must nevertheless comply with the provisions of export control.

The publication was created with the cooperation of organizations including the Helmholtz Zentrum Berlin für Materialien und Energie GmbH, the Fraunhofer Gesellschaft, the Leibniz Institute DSMZ, the Robert Koch Institute and the Technical University of Berlin. BAFA is grateful for their participation.

We should point out that this publication cannot cover all possible aspects of the subject matter and therefore does not claim to be exhaustive. Reading this publication does not relieve you of the responsibility of reviewing export control regulations. However, it does offer wide-ranging advice, especially with regard to finding relevant information and means of communicating with BAFA.

You should also note that the statements contained herein are not legally binding. It is possible that different assessments may be reached by prosecutors or courts in individual cases.

The publication is valid as of January 2019.

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<sup>1</sup> For the purpose of better readability, the term “research institution” below includes non-university research institutions, universities, colleges and polytechnics.

## 2 Risks of misuse

In the interests of safeguarding peace, the Federal Republic of Germany has made an international commitment to prevent the proliferation of weapons of mass destruction (WMD) and the uncontrolled accumulation of conventional armaments. The control of sensitive goods, including technology and software, is an important element of this non-proliferation strategy.

Sensitive technological expertise is found in German industry, but also in institutes, research institutions and departments of German universities and technical colleges. These areas are therefore also the target audience for the control regulations for handling potentially critical goods, including technology, software and sensitive knowledge transfer.

„The content of physics is the concern of physicists, its effect the concern of all humanity“

Friedrich Dürrenmatt, *The Physicists*





### 3 Export control and the scientific sector

Export control regulations<sup>1</sup> form part of the comprehensive national and international strategy which primarily seeks to prevent the dangers of proliferation<sup>2</sup>, uncontrolled accumulation of conventional armaments, targeted human rights violations, and the threats of international terrorism.

The control regulations equally apply to private individuals such as scientists, but also to legal entities such as research institutions or developing and manufacturing companies - regardless of the motivation and purpose of their activity. The objective potential for misuse is the sole criterion.

Knowledge of atomic, biological or chemical weapons and related missiles, as well as civil goods that are or could be intended for the use or development of such weapons, are a particular potential hazard just as well as the goods themselves. You are therefore not permitted to deliver these dual-use goods without restriction to any recipient in any country (even if these goods are used predominantly for civil purposes in everyday life).

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<sup>1</sup> There are a variety of legal bases for this strategy at European and national level; see [http://www.bafa.de/DE/Aussenwirtschaft/Ausfuhrkontrolle/Rechtsgrundlagen/rechts-grundlagen\\_node.html](http://www.bafa.de/DE/Aussenwirtschaft/Ausfuhrkontrolle/Rechtsgrundlagen/rechts-grundlagen_node.html)

<sup>2</sup> of atomic, biological and chemical weapons

For example, switching spark gaps used in medical technology can also be used in principle to ignite nuclear warheads.

Some states try to acquire such strategically relevant knowledge and pass it on to other states for financial gain. You should therefore also be aware of the risks and dangers of conscious and unconscious participation (proliferation risk).

Even civilian research and activity areas can open the door to the acquisition of proliferation-relevant information and military and/or terrorist activities based on this information.

## 4 Lists of relevant goods, including software and technology

Lists of especially critical goods are agreed at international level. Consistent control of these goods aims to ensure that they do not contribute to a WMD programme.

A licence is therefore required to export these goods („listed goods“), for example, in the context of research projects or collaborations. This licensing requirement also covers the transfer of knowledge and thus the transfer of research findings about technology if these are crucial and could potentially be used for the development, production or use of a listed good. However, not all foreign collaborations carried out by German research institutes are automatically subject to the licensing requirements. In case they are, licences can usually be granted. In general, an export licence application is only denied if critical goods are to be delivered to a critical recipient/end user.

Regardless of the motivation and direction of the research, the following applies, even if a project looks like a harmless civil application at first glance:

We share a responsibility to prevent the proliferation of WMD and the unhindered spread of conventional armaments. Everyone must contribute what they can to this goal. This responsibility cannot be delegated.

BAFA is happy to help with any questions you may have about applying for a licence.

## 5 Do you know the potential for misuse of your own research?

Do you work in one of the following areas?<sup>3</sup>:

- Biology including biotechnology and medicine
- Chemistry, biochemistry
- Physics
- Nuclear technology
- Energy and environmental technology
- Telecommunications and information technology
- Electrical engineering
- Aerospace and propulsion
- Mechanical engineering
- Materials technology
- Process engineering

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<sup>3</sup> This list does not claim to be exhaustive.

These fields of knowledge and the associated expertise are extremely relevant for export control. States may be tempted to gain knowledge that allows or at least facilitates the production or distribution of WMD or conventional armaments. The growing threat of weapons of mass destruction falling into the hands of international terrorists is also a serious concern.

All researchers and research institutions must step up and assume responsibility in relation to export control. On the one hand, this concerns the export of goods (e.g. laboratory equipment, test equipment), especially including the export of tangible technology (in e-mails, on data carriers, in clouds, etc.), and on the other hand, the intangible transfer of knowledge or „technical support“.

The more innovative your research, the more important it is to think about possible theoretical uses related to WMD.

In this regard, cooperation with guest researchers at your own institute could be affected. Scientists, students and technicians from countries that pose a proliferation risk have free access to Western universities and other scientific and technical institutions. They can therefore acquire and pass on sound basic knowledge in state-of-the-art technology. This knowledge transfer can be the potential basis for proliferating states to achieve scientific and technical independence in sensitive areas.

The most famous case of misuse of such knowledge is the Khan network: After studying at European universities, A. Q. Khan subsequently became known as the „Father of the Pakistani Atomic Bomb“ by sharing relevant knowledge and technology.

Regardless of whether goods or technology are sent abroad, so-called personal sanctions (also known as financial sanctions or, colloquially, „terrorist lists“) must be considered. These prohibit the direct or indirect provision of funds or assets of any kind („economic resources“) to persons specified in the sanction lists. For research organizations, this means ensuring that the people they work with do not appear on the sanction lists.

## 6 Scientific freedom

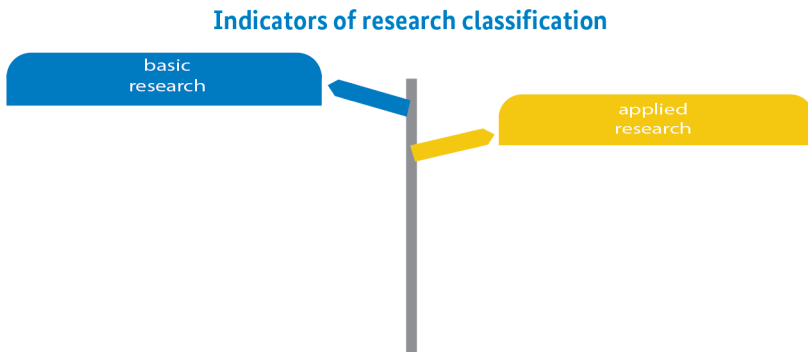
Scientific freedom may be guaranteed by the German Basic Law, but this does not provide exemption from compliance with foreign trade regulations. The aim of export control is not to censor scientific research or publications, but to prevent major security-related abuse when sensitive goods or knowledge are transferred abroad.

Scientists and research institutions must abide by the same legal regulations as manufacturing industry. When goods are exported, for example by the transport/dispatch of measuring equipment, or when information is transferred, for example, by submitting measurement results, exporters and information brokers have a duty to check whether their actions require prior regulatory approval.

### Important!

Neither civil clauses in the statutes of your research institution nor the principle of freedom of research exempt you from export control. Your personal motivation, your source of research funding and the purpose of your research are irrelevant in this respect.

However, in contrast to the export of goods, the export of technology often benefits from what is referred to as „de-control notes“: if the knowledge is already in the public domain or is basic research rather than applied research, then the export of this knowledge is usually exempted from a licensing requirement. In this context, the scientific freedom enshrined in the German Basic Law applies.



You must judge yourself whether or not your research findings can be passed on without restriction to anyone in any location. Scientific freedom does not free you from your obligation to check whether the preconditions for exemptions exist.

Bear in mind however that terminology in this area can be an issue: Your scientific classification of a research project as „basic research“ does not necessarily automatically comply with the foreign trade classification. For example, research funded by industry is not usually considered to be scientific basic research under foreign trade law. BAFA would be happy to assist you with any cases where you are in doubt.



## 7 Preventing misuse

To assess whether you need a licence or whether the above exceptions apply, you must first determine whether or not part of your research is subject to any controls. Not all goods, software and technology are controlled. Sometimes a large portion of research projects is not affected by export control licensing requirements or prohibitions:



You must be able to take responsibility for excluding the part of your research that is obviously not affected by export controls. In grey areas, such as the question of whether your goods (samples or models, for example) or technology are subject to the international control lists, feel free to contact BAFA.

Information for researchers handling export control and the goods and technologies concerned is provided in the BAFA handbook “Exportkontrolle und Academia” (*Export Control and Academia*). The BAFA publication „Exportkontrolle und das BAFA” (*Export Control and BAFA*<sup>4</sup>) also offers a general overview of export control.

<sup>4</sup> Available only in German

The above-mentioned handbook and leaflet are available on the BAFA website [www.ausfuhrkontrolle.info](http://www.ausfuhrkontrolle.info).

You should refer to these materials yourself before contacting BAFA with a specific question. Your own „impact analysis” cannot be entirely delegated to BAFA.

General information on export control, in addition to a comprehensive commentary by BAFA and all legal provisions, can be found in the „Handbook of German Export Control - HADDEX“, which is distributed by Bundesanzeiger Verlag (as is the publication „Praxis der Exportkontrolle” (*Export Control in Practice*)).

For more information on HADDEX, see the BAFA website:

[http://www.bafa.de/DE/Aussenwirtschaft/Ausfuhrkontrolle/Arbeitshilfen/arbeitshilfen\\_node.html<sup>5</sup>](http://www.bafa.de/DE/Aussenwirtschaft/Ausfuhrkontrolle/Arbeitshilfen/arbeitshilfen_node.html<sup>5</sup>).

It is part of the responsibility of scientists to engage BAFA only after completing their own preliminary checks, if there is indeed a need for a BAFA inspection.

## 8 Red flags

Effective export control can only be achieved with the active cooperation and support of all stakeholders. Research institutions should therefore be alert to any suspicions of possible (unintentional) involvement in proliferation. Particular, but not exclusive, attention should be given to countries that are known or suspected to be seeking technical expertise relating to proliferation.

Requests or orders for the supply of goods or the provision of technical support services, as well as applications or requests for participation in certain events should be subject to a detailed examination if the person making the request raises any suspicions with regard to possible misuse.

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<sup>5</sup> Available only in German



Furthermore, you should conduct a thorough review if you notice suspicious patterns of behaviour, especially relating to business contact initiation and the specific nature of business transactions. This also applies to unusual “friendly turns“.

BAFA’s goal is not to block the scientific exchange of technology, but to provide information about possible licensing requirements and offer assistance in this complex area of legislation. Unfortunately, some countries persist in their efforts to gain knowledge by abusing scientific collaborations and put this knowledge to use in the development and production of WMD or other arms projects.

For guidance and examples of possible suspicions raised by a person making a request and/or „unusual“ patterns of behaviour, see module 1 in the handbook „Export Control and Academia“.

The handbook is available on the BAFA website:  
[www.ausfuhrkontrolle.info](http://www.ausfuhrkontrolle.info).

Preventing proliferation is a duty we share. As scientists, you are responsible for complying with export control regulations relating to your work. You must therefore check if your projects are subject to licensing. BAFA’s publications provide guidance in this area.

If you have any questions, first contact the internal export control office at your institution. Contact BAFA if you require further specific support and your project is considered to require a licence following an internal review.

## 9 Competitive advantages of export control

Are there particular advantages to operating an efficient export control policy?

Yes, there are many reasons in favour of a responsible approach to export control in the scientific and research communities. This is true whether you are an individual researcher or a research institution.

Advantages of effective export control in your research institution:

- Excellence in your field cannot be achieved without complying with legal obligations. Nowadays, export control is an obligatory compliance standard.
- You can avoid legal violations and reputational damage in the long term. Any doubts about reliability in relation to export control should be avoided. You are thus better prepared for possible regulatory reviews by third parties.
- Responsibilities are made transparent, while behavioural safety and protection against criminal liability issues can be improved.
- International cooperation is also enhanced by effective internal export controls.
- Questions of ethical responsibility (such as in the framework of Horizon 2020 EU projects) on the consequences of your actions can be assessed more reliably, once the legal limits are clearer.



Some of the world's most prestigious universities, such as Harvard, MIT, the University of Tokyo or ETH Zurich have developed internal export control programmes<sup>1</sup>.

<sup>1</sup> <https://vpr.harvard.edu/pages/export-controls-policies-and-procedures>  
<https://osp.mit.edu/compliance/export-control>

## 10 What next?

Internal export control in research institutions is essential. For guidance, BAFA has compiled an introductory handbook to the complex topic of „Export Control and Academia“. Use this handbook to establish and optimize export control in your research institution and also to tackle substantive issues.

Inform yourself using BAFA's publications and events, in particular those aimed at academia, and talk to the export control officers in your own research institution.

**Contact us:**

In your own university/research institute, you can obtain information from:

At BAFA, you can contact the project forum "Outreach to Academia" at:

E-Mail: [academia@bafa.bund.de](mailto:academia@bafa.bund.de)  
Telephone: +49 (0)6196 908 0

**BAFA information**

All BAFA publications, legal and regulatory texts, current and additional information are available on [www.bafa.de](http://www.bafa.de).

Special tips for researchers on how to handle export control, internal organization, affected areas of activity/technologies etc. can be found in the BAFA handbook „Exportkontrolle und Academia“ (*Export Control and Academia*) on the BAFA website [www.ausfuhrkontrolle.info](http://www.ausfuhrkontrolle.info).

**The scientific community has already issued recommendations for this responsibility, which goes beyond legal obligations, including the following:**

Joint committee for the handling of security-related research (*Gemeinsamer Ausschuss zum Umgang mit sicherheitsrelevanter Forschung*):

<https://www.leopoldina.org/ueber-uns/kooperationen-gemeinsamer-ausschuss-dual-use/>

German Research Association (DFG) on scientific freedom and scientific responsibility:

[http://www.dfg.de/dfg\\_magazin/forschungspolitik/wissenschaftsfreiheit\\_wissenschaftsverantwortung/index.html](http://www.dfg.de/dfg_magazin/forschungspolitik/wissenschaftsfreiheit_wissenschaftsverantwortung/index.html)

European Research Council: “Ethics self-assessment“ for projects funded under Horizon 2020<sup>6</sup>:

<https://erc.europa.eu/sites/default/files/document/file/EthicsSelfAssessment-StepByStep.pdf>

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6 European Research Council: “Ethics self-assessment“ for projects funded under Horizon 2020:

<https://erc.europa.eu/sites/default/files/document/file/EthicsSelfAssessmentStepByStep.pdf>





