

## A German repair registry

Possible ways of implementing a national registry to increase the availability of spare parts

### Summary

New EU eco-design regulations for dishwashers, household washing machines and dryers, refrigerators, light bulbs and displays require manufacturers to make safety-related spare parts and maintenance information available to "professionally competent repairers." The regulation is vague about how professional competence is determined and leaves it up to manufacturers to verify it. Verification of competence by an "official registration system for professionally competent repairers" is to be accepted "if such a system exists in the Member States concerned." As a prerequisite for registration, the regulation requires proof of "professional competence" and insurance coverage "covering liability related to his activities."

This paper discusses various options for the design of such a registry and takes a look at the extent to which evidence of competence and insurance can be demonstrated for repairers and the validity of such evidence.

Based on this analysis, Runder Tisch Reparatur concludes that introducing a registry in Germany would be both uneconomical and disproportionate. All stakeholders - i.e. repair initiatives, the repair trade, authorities and industry - should be involved in any further developments.

Regardless of the design of a registry, the Round Table Repair calls for improving general conditions for repair. Specifically:

- General, unconditional and inclusive access to spare parts.
- No general assumption of incompetence of repairers by manufacturers
- Reversal of the burden of proof in the event of doubts about the competence of a repairer
- Easy-to-understand, but concrete safety instructions and specification of the competence requirements for repairers for all products by the manufacturers.

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### 1. Proof of competence and insurance

#### 1.1 Perception of repairers by many manufacturers

The high demand for safety via a two-stage restriction concept through proof of competence and insurance indicates a high level of uncertainty on the part of many manufacturers in the perception of their customers. Specifically, repairers are by default perceived by manufacturers as incompetent and lacking in awareness with regards to risks and hazards.

This may be true for some repairers, but it can be assumed that there are two relevant gradients within society:

1. a competence gradient, which varies according to the repair requirements of the object being repaired
2. a risk affinity gradient that varies according to the person repairing the object and is not necessarily related to the object being repaired.

Higher competence has a securing effect on a positive repair result, higher risk affinity acts as an uncertainty factor on a positive repair result. With higher competence, a higher risk awareness can also be assumed, which reduces risks. A low skill level in combination with low risk affinity can be understood as the main reason for unattempted repairs.

The combination of high risk affinity and low capability level is unlikely to describe the majority of repairers, rather the opposite. However, this combination seems to best reflect the basic perception of repairers by many manufacturers. One can speak of a worst case perception by many manufacturers of those repairers obviously unknown to them.

This is also due to the fact that in the event of a damage during a repair, which may not have met current safety requirements, the manufacturer's "involvement" in or "contribution" to the repair might be investigated.

This means that if the manufacturer indicates that its products can be repaired and makes spare parts available, this could be interpreted as negligence in case of a damage because there is no safety assurance mechanism in place from the manufacturer's side. From this point of view, the manufacturer is, so to speak, knowingly enabling a (self-)endangerment of the assumedly unskilled and haphazard repairers.

This is why it is common practice for many manufacturers not to even want to give the impression of supporting repairs, and consequently to advise against repairs as a matter of principle, as well as not to provide any verifiable repair support in the form of spare parts.

For repairers, the current situation is regularly characterized by the fact that they try to meet the sometimes very different requirements of manufacturers (with limited success). Their ability for safe, proper and professional handling of spare parts is, however, categorically called into question.

**However, there is no sensible reason noticeable why manufacturers should not inform potential repairers of the specific risks involved in a repair, and why they should not suggest the involvement of designated specialists in each case, in order to ensure that the repair is as safe and successful as possible, irrespective of the supply of spare parts.**

## 1.2 Numbers of claims in German repair initiatives

It is estimated that a mid-five figure number of products is at least considered for repair each year in the repair initiatives and repair cafés organized by volunteers in Germany. It is estimated that at least two-thirds of these are successfully repaired.

While the figures above are estimates, the following exact figures are available on insurance claims in repair initiatives: In 2014, anstiftung, a charitable foundation in Germany, initially introduced an association liability insurance (Verbandshaftpflichtversicherung) for registered repair initiatives. In 2020, this was converted into a subsidiary form of insurance that no longer requires registration. The latter was most likely enabled by the insurance company due to the nature and number of insurance claims in the 2014-2020 period:

A total of 30 insurance claims occurred in six years, about half of which can be attributed to damage to property. The other half of the insured events apparently occurred during the operation of the

repair cafe at or in connection with the facility (e.g. "loss of keys"). It should be emphasized that the only case of possible bodily injury here is not directly related to a repair ("fall from stairs") – it might as well be a case of damage to property caused by the fall. The damage is quantified with EUR 0.

All 30 insured events add up to a total amount of EUR 6474.66 over six years, the average per insured event is thus EUR 215.82. Half of the insured events did not trigger any costs for the insurance company, the median value was therefore just 0 (nil), the smallest amount EUR 40. This results in an annual average of EUR 1079.11 for claim compensation and an average monthly amount of EUR 89.93 for repair claims nationwide. The concrete costs result in an average "claim share" of about 2 cents per repair for the 50,000 repairs p.a. in Germany estimated above.

**This value shows that the risk of damage is significantly lower than the savings potential that can be tapped economically through the systematic, safe and manufacturer-independent repair of products.**

If the above estimates of the repair volume are now compared with the 30 insurance claims that actually occurred, the probability of damage to property is around 0.01-0.02%. It should be noted here that no probability of bodily injury can be derived from the available figures, as such an injury has not occurred in connection with a repair to date. This does not mean that such a case cannot occur. The circumstance rather indicates that in practice the likelihood of bodily injury is lower than the verifiable likelihood of damage to property.

A higher availability of spare parts will presumably not change this probability of a damage, since the connection of the former with technical characteristics of a to be repaired device is hardly recognizable.

**In contrast, it is reasonable to expect that the general availability of repair instructions with safety information will reduce the probability of damages, both to property and bodily, since such information makes hazards transparent, draws attention on how to avoid them and thus makes them expectably avoidable.**

**As soon as a new ecodesign directive that will require repair-friendly appliance designs and corresponding appliances has entered the market, a decrease in the probability of damages can be expected in the long term, since the possibility of opening appliances without lowering their structural integrity should reduce the risk of damage to property. This development is expected to lead to fewer insurance claims in the area of "damage to property due to attempted repair".**

### **1.3 Role of the proof of competence from the point of view of many manufacturers**

The main function of the proof of competence is an extended quality assurance or quality claim on the part of the manufacturer with regard to the repair process and/or the repair result; extended because after the transfer of perils, at the latest after the transfer of ownership, it is officially outside the manufacturer's sphere of influence and therefore beyond the manufacturer's sphere of decision-making.

Brand value and public perception of the products thus play a significant role.

More specifically, negative headlines due to failed repairs and resulting property damage or personal injury are to be avoided, which is supposedly achieved by avoiding repairs. It should be noted that in the context of the strong increase in repair activities in repair initiatives (see above), which are now ubiquitous, there has been no corresponding increase in negative headlines within the last few years.

One can also assume that many manufacturers insist on existing business models that do not allow for manufacturer-independent repair. Many manufacturers thus cultivate, consciously or not, a culture of mistrust among their environmentally conscious customers. This circumstance, if true, cannot be part of any serious corporate sustainability strategy.

Manufacturers' arguments often focus on safety concerns for the sake of the repairer, i.e. the repair subject, or the product, i.e. the repair object, which, however, do not seem to have any basis in empirical data (see above). If manufacturers do have data to the contrary, these should be made available to the debate on this topic in a suitable manner in order to ensure clarity in the debate and to enable spurious arguments to be recognized as such.

## 2. Type of register

A repair register can be implemented in different forms. It is essential to clarify the terminology in order to describe the differences between the approaches:

### Direct entry

A direct entry is an entry in the register by the repairer. Any entry in an existing register that is person-related and can be unambiguously assigned to a repairer is also referred to here as a direct entry, even if the entry itself was not necessarily made by the repairer himself, but by the body operating the register, for example a Chamber of Crafts.

### Exhaustive register

An exhaustive register is understood here as a closed database in which all repairers are uniquely represented by a record filed directly in the database. Examples of existing exhaustive registers in other contexts are trade registers or a roll of craftsmen.

### Meta register

A meta register is understood herein as a virtual database in which no direct entries are provided. Direct entries of repairers are listed in various exhaustive registers, which are logically connected to the meta register and thus can be virtually queried in one place and centrally by manufacturers. The meta register consists of and depends on the exhaustive registers that are logically connected to it. For details, see the description of how a meta register works below.

### Hybrid register

A hybrid register combines the properties of an exhaustive register with those of a meta register. This means that both, direct entries can be made and queried by repairers, as well as direct entries in exhaustive registers which are virtually connected to the hybrid register can be queried by

manufacturers via the hybrid register. This two-tier system allows repairers who have not previously been registered elsewhere to obtain an entry because, for example, they would otherwise not be eligible for an entry in an exhaustive register.

### Trivial register

A trivial register is a theoretical concept and realizes inclusive access to spare parts by not holding direct entries (there is no possibility of entry by repairers that would result in a record), it is not linked to exhaustive registries, and it positively confirms all requests to it. It is expected to be the most economically cost-effective registry solution, second only to a solution that does not use any registries at all.

## **3. Usage scenarios for registers**

In case of a exhaustive register each repairer registers once. This entry is then checked for validity by the manufacturer when the repairer orders spare parts. If the register provides a positive response, the order for the spare part proceeds.

In a meta register, no entries are made by the repairers. The direct entries of the repairers are located in the exhaustive registers logically connected to the meta register and are initially entered there. The meta register acts as a central point of contact and processes the requests from manufacturers regarding the entries in the connected registers.

When ordering a spare part, the manufacturer will query the meta register for the existence of an entry. The meta register passes the query on to the associated exhaustive registers and then receives a simple yes/no answer (binary) from each of them. If at least one positive response is recorded at the meta register, this is returned to the requesting manufacturer, which then proceeds with the ordering process. Example: A valid direct entry could be found in a handicraft register, which is detected by the meta register as the existence of a valid entry and thus passed on to the manufacturer.

In the case of a hybrid register, repairers can register themselves there directly, while anyone who is already registered in an exhaustive register that is linked to the hybrid register (e.g., the register of craftsmen) does not have to make an additional direct entry of this kind. When ordering a spare part, the manufacturer queries the hybrid register for the existence of an entry. The hybrid register first checks whether a direct entry exists in its own database; if not, it sends the query to the exhaustive registers connected to it. If there is an entry found in one of the databases queried in this way, the hybrid register reports this fact back to the requesting manufacturer, who then proceeds with the order.

In the case of a trivial register, repairers cannot make direct entries; the register does not contain any data records. Since all contents of the direct entries would be identical, there is no need to distinguish between data sets. Furthermore, it is not logically connected to exhaustive registers. This is not necessary because the purpose of the trivial register is merely to positively confirm incoming requests from manufacturers. This is an extremely simplified register concept, intended to realize and illustrate the minimum technical effort with maximum spare part accessibility, while still meeting the requirement for the existence of a register.

A repair platform, as outlined by Umwelttechnik BW, unites consumers, professional repairers, manufacturers and market surveillance in a concept that can also be called a multi register. The four-part concept contains at least three sub-registers, namely for professional repairers, manufacturers and consumers, each obviously designed as an exhaustive register. The interaction of the different platform parts was described in a project description. This concept represents the most comprehensive and elaborate concept presented in this paper.

#### 4. Unambiguity of direct entries in manufacturer registers

Before discussing the prospective data set contents in a repair registry, the contents in existing manufacturers' registries must be addressed in terms of their distinctiveness.

Commercial establishments are typically represented in manufacturers' and wholesalers' registries as a legal person ("firm") by the authorized representative (natural person) or a person responsible for orders (natural person).

This means that professional repairers usually do not have to undergo a registration process individually and personally in order to obtain spare parts and thereby perform repairs as a part of their professional activity. The responsibility for the repair (supervision), the ordering of spare parts and the execution of repairs can be understood as activities carried out by different persons collaboratively within repairing companies.

Even in authorized repair shops, it is possible that at certain times or in certain cases, repairs are carried out by trainees who have not yet acquired formal skills. However, it can be assumed that "the company" has at least one person with demonstrable competence, and all participants in such a company are subject to insurance coverage.

Thus, the presence of a person with demonstrable competence can obviously be transferred to the legal person, i.e., the enterprise, thereby making it eligible to receive spare parts. This possibility eliminates the need for all repairers in this company to obtain spare parts for their respective repairs individually from the manufacturers, which is a common, obvious and economically reasonable.

**We can summarize that common direct entries in existing exhaustive registers or customer databases held by retailers or manufacturers do regularly not allow for a precise identification of the repairing person and his or her skill level. This results in an imprecise assumption of competence with regard to the performing repairers on the part of all parties involved, which up to now has obviously been sufficient in these areas.**

#### 5. Content of direct entries

The essential requirements for repairers are competence and insurance coverage.

When selecting the contents of the register, the principles of data minimisation should be applied, also for economic reasons (see below). The more extensive the data records, the more extensive will be the technical effort and any verification and maintenance processes of those records, also see below.

Direct entries must always allow for a concrete personal reference so that repairers can be personally assigned. Registering a repair initiative as a legal person would be comparable to repairing companies where a natural person is also responsible for certain activities in the company, even if they are not necessarily carried out by this person. It has become common practice in repair initiatives, too, for repairs to be supervised by skilled persons and, as shown above, for repairs not to be carried out in case of lack of skilled supervision. In addition, training programs for electrical repairs are now established to qualify volunteers in performing and documenting industry level safety checks.

A persons name can be considered the most essential characteristic. The extent to which a persons address, which is less of a constant over time than the name (especially surnames in the case of natural persons), constitutes a necessary data record would have to be discussed further. Addresses are only necessary data sets in the case of deliveries of spare parts, but these are foreseeably not carried out by the registry or its operator(s).

It should also be discussed to what extent pseudonymization would be sufficient, whereby the queries would not contain any personal data. For example, the direct entry could take the form of a register identification number that would be submitted by the repairer when ordering a spare part from the manufacturer.

## **5.1 Proof of competence**

The proof of competence of repairers can occur in different ways. The minimum effort (based on the inclusive method of the trivial register) would be a binary query of the repairer's competence as a yes/no question, with the answer being stored in the direct entry. Between this minimum effort and a time-consuming verification of diplomas, master craftsman's certificates or vocational and advanced training, the direct entry for the proof of competence can be defined according to the necessary verification requirement.

This verification requirement is difficult to define in the case of repairs.

On the one hand, repairs can be understood as "non-essential activities" (nicht-wesentliche Aktivitäten) according to the German Crafts and Trade Code (Handwerksordnung, HwO). A repair activity therefore does not necessarily require a license according to code and therefore may not allow an entry in a register of skilled crafts ("registration-free minor craft", "eintragungsfreies Minderhandwerk"). On the other hand, there are repairs (e.g. on electrical systems) that require proof of expertise (e.g. master craftsman's certificate, Meisterbrief), which under certain conditions (e.g. advanced training) enables an entry in a register of skilled crafts.

A master craftsman's certificate is generally not a proof of repair competence though, but rather a proof of competence to safely deal with hazards that may occur during a repair (e.g. electric shock). In other words: A master craftsman's certificate may possibly result in a causal link to safe repairs, but not in a causal link to economic repairs. The latter depend on actual repair skills and a degree of routine therein.



An entry in a register of craftsmen can therefore neither be regarded as sufficient a competence for repairs, nor necessary. The latter is proven by successful repairs - tens of thousands p.a. - of persons without an entry in a register of craftsmen.

Voluntary repair initiatives do not meet any legal requirement for a trade and consequently there is no entry in a trade register for such repairers in the foreseeable future (cf. Register Austria). Again, it depends on the individual case to what extent the qualification reflecting in a valid business registration coincides with the qualification required for a repair. An entry in a trade register can therefore neither be considered sufficient proof of competence for repairs, nor be necessary for them. It is important to note here that a repair initiative does not have any profitability requirements for repairs, which is why in some cases repairs are realized that cannot be economically performed by commercial repairers. This aspect is a distinctive feature of repair initiatives and important in terms of material efficiency and resource conservation.

Private and voluntary repairs are in principle not to be regarded as equivalent to commercial repairs, even if the usual requirements of care and quality in the commercial sector are likely to be imposed on the execution of a repair in the case of dispute. Although, the classifications "employee" and "employer" or "entrepreneur" and "insured person" are generally not applicable in the private and voluntary sector.

In addition, the temporally sporadic character of voluntary repair organizations must be taken into account, which, in contrast to commercial or craft enterprises, do not (want to/are not able to) exhibit operational continuity and, for example, only "exist" on one day per month.

Repair activities will be even more irregular in time in the case of private individuals, which, for example, will entail an even more sporadic spare parts requirement of about a few spare parts per year maybe.

For voluntary repair initiatives, it is obvious that a direct entry is made by a specialist who is active in the initiative, or that this specialist is at least consulted and named in the direct entry.

At this point, it is important to refer to the implementation directive for regulation 3 of the German Social Accident Insurance in connection with repairs of electrical products (shortened): "As a rule, professional qualification is proven by the successful completion of an apprenticeship. It can also be demonstrated by several years of activity." Furthermore, a successful training or educational qualification is not even sufficient for a professional qualification according to the German Social Accident Insurance (DGUV) if, for example, the related activity is no longer performed and dates back a long time, although corresponding educational qualifications or valid trade entries can still be produced. A professional qualification can therefore neither be considered sufficient proof of competence for repairs, nor be necessary for them - since they are still verifiable, but have possibly not been exercised for some time or have never been exercised with regard to special requirements of a given repair at all.

In contrast to clearly defined tasks in the commercial or craft sector, the competence requirements for repairs are less absolute in the sense of a specialist area and more relative in the sense of experience with repairs of specific products or product groups.

**Strict requirements for repair competence whose need is unclear and which are likely to be fulfilled by very few in practice, contrast with the high repair success rates and the associated low incidence of damages in the professionally diverse voluntary sector.**

**The question arises as to the justification of any competence requirements, especially when repair information with safety instructions is provided by the manufacturers which clearly identifies hazards even for laypersons and thus makes them avoidable by everyone.**

## 5.2 Proof of insurance

Similar questions arise for the insurance obligation of repairers. Yet, in this case, these are purely academic, since every repair in a volunteer repair initiative in Germany now enjoys insurance coverage through the charitable foundation anstiftung, and thus this requirement is met, in the same way that equivalent protection is mandated by law in all commercial strata.

If all eligible repairers are insured in different ways and at least by one insurance, the need for recording details of such insurance coverage in a repair registry is also eliminated. If everyone is insured, the proof of individual insurance is trivial.

For the sake of completeness: direct entries of the repairers could also be implemented here, from a simple binary query (insurance coverage: yes/no) to the specification of insurance numbers and insurance company, and the uploading of documents.

However, due to the aforementioned insurance situation and the probability of damage, the question of the plausibility of such additional effort arises even more clearly in this point than in the case of proof of competence.

**In conclusion, it can be said that the proof of insurance coverage, although seeming less necessary, can be provided more clearly than the proof of a repair competence which is not clearly defined. With regard to the subsidiary insurance existing for repair initiatives in Germany in particular, this can be checked for validity at one point, or rather it has a very low probability of invalidity due to the financing situation via a foundation.**

## 5.3 Validity and scope of documentation

Regardless of the content of direct entries, the question arises as to how validity can be assessed over time. For example, the status of an insurance coverage can only be proven with legal certainty at the time of the register query by additional effort. Moreover, as stated above, questions exist even in the case of demonstrably valid proofs of competence with regard to the relevance and applicability for the repair to be carried out in each case.

In other words, it is questionable to what extent even valid direct entries are suitable to prove the safety of repairs as a result, because their correspondence to the respective repair cannot be prove. Specifically, competence profiles would have to be requested from manufacturers for each different spare part, which would then have to be compared with the competence profiles stored in the direct entries before a spare part release could be granted by the registry. For example, a direct entry in the

repair registry shows a valid training certificate as a medical-technical assistant, dated a few months ago, and proof of insurance from a private liability insurance company. On this basis, is suitability proven for the installation of an electronic control system in a mains-powered washing machine? Which suitability profile characteristics are to be defined here, i.e. both in the register for repairers and with the manufacturer for the spare parts? Who has this information and can provide it? Even exhaustive registers that can be connected to a meta register, such as a register of craftsmen, do not yet contain competence profiles. Depending on the exhaustive register, these would have to be recognized and added by the meta register.

As already explained above in relation to the unambiguousness of direct entries in manufacturers' registers, a presumption of suitability of purchasers has long been made in the commercial sector, and de facto, on the basis of rather imprecise criteria. The interpretation of these presumptions of suitability differ greatly in some cases (freedom of contract) and therefore do not provide a clear template to be transferred to a newly designed repair register.

With regard to the scope of documentation of direct entries, the fundamental question is whether the informative value of direct entries can be improved by a higher scope of documentation (proportionality).

## **6. Register management and expense**

Operating the registry has a technical and an organizational side. Technical operation includes the operation of the database and website. The latter is used for interaction with repairers and manufacturers of spare parts, while the former is used to store direct entries in the case of an exhaustive or a hybrid register. In the case of a meta register or a hybrid register, it is necessary to maintain the connection and communication with the connected exhaustive registers instead of using a separate database.

Depending on the scope of documentation, a respective amount of data maintenance and correspondence is to be expected for exhaustive and hybrid registers. Data protection and IT security measures will also increase with the amount and volume of data. In concrete terms, the direct entries and associated verification documents must be screened, evaluated, and, if necessary, checked with the issuing bodies. All of this must be done on a regular basis, depending on the validity requirements. Thus, personnel is required for the administration, maintenance and protection of the data.

The effort described last does not apply to a meta registry, or is significantly less; the administration and maintenance of the data is already established in the connected exhaustive registries. However, the interfaces to these registries must be maintained and protected.

In the case of a hybrid register, there is the possibility that direct entries exist in the hybrid register and additionally in a logically connected exhaustive register for the same repairer. These cases might require a validity check and prioritization of the entries (consistency).

The effort to operate a register can be put in the following order reflecting increasing effort:

(0. no register, see below)

1. trivial register
2. meta register
3. exhaustive register
4. hybrid register
5. repair platform (multiple registers)

A key requirement of spare part availability is to minimize the cost of procuring a spare part. At this point, the question arises how the expenses of the operation of a register should be financed. Distributing the operating costs among the users of the register on the basis of pro rata amounts in particular could, even in the case of mass participation in the register, be so high that it could call into question the economic viability of procuring spare parts. From a repairer's point of view, the costs of using the register must be added to the price of the spare part. Repairs thus become more expensive – and unlikely.

The maximum number of repairs is made possible if no additional costs are incurred by the repairer as a result of using a register. In this case, a register would have to be financed either by the manufacturers or by public or government funds.

It is important to note here that the spare part pricing strategy of manufacturers would not be affected by a registry solution, regardless of its design. Even if a repair register increases the availability of spare parts, which by virtue of a trivial register already relieves manufacturers of their previous interpretative sovereignty with regard to the suitability of repairers, the manufacturer can continue to moderate the repair process via spare parts prices. The register strategy is therefore itself subject to a certain risk of being neutralized by manufacturers through spare parts price increases. In particular, there is then a risk that the operating costs for a registry could turn out to be a pointless burden on the public purse or the taxpayer. This risk could be significantly reduced by an alternative approach, see below.

The extent to which manufacturers could be persuaded to (co-)finance a registry is unclear. If it were possible to turn the operation of a registry at least partly into the interest of the manufacturers, they would also be interested in the economic efficiency of the registry operation (identity principle).

## **7. Need for a register among professional repairers**

The professional repairers interviewed for this paper see no need for a repair register. Their procurement of spare parts is by and large guaranteed. Where procurement of spare parts is made difficult or prevented by manufacturers (e.g. Apple), repairs are sometimes no longer offered. Major market players are structuring the market on their own in this case, which is in fact tantamount to regulation. See also the antitrust complaint of the Round Table Repair on the advertising ban for independent repairers by and at Google.

## 8. Alternative approach without a register

An alternative approach could be to legally separate the disadvantages of independent repair for manufacturers, i.e. their potential liability in case of damage, from these manufacturers. In this way, the manufacturers' demand for safety could be addressed, free access to spare parts would no longer be an obstacle, and a repair register and the resulting costs and risks could be spared and avoided.

Due to the low probability of occurrence of an insured claim (see above) on the one hand, and the promising potentials in terms of resource savings, as well as the associated long-term positive effects on the environment and human health on the other hand, the result of such a balancing of interests in the form of public/state liability for non-commercial, manufacturer-independent repair claims could be of interest to the national economy. A similar balancing is already known from other areas that appear comparable.

Therefore, an alternative approach could be formulated as follows:

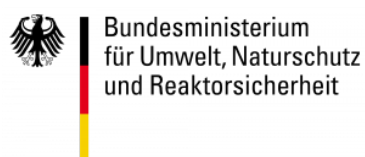
**All manufacturers of repairable products are exempted from liability in the case of repair damage, which is compensated via the Federal Supply Act (Bundesversorgungsgesetz), analogous to the already established practice for vaccine manufacturers. Similar to the case of public health, there is an overall societal interest in environmental protection and resource conservation, which is realized through repairs. An analogous rationale and implementation seems feasible, if not obvious. In return, manufacturers commit to inclusive access to spare parts.**

### Reversal of burden of proof

An obligation on the part of manufacturers to make spare parts available on an inclusive basis, especially against the background of public liability for damage claims, should be secured by a reversal of the burden of proof. This means that if a manufacturer has doubts about the suitability of a repairer, he must justify and prove them. This is because a general suspicion of manufacturers, as described in "Perception of repairers by many manufacturers" above, is empirically refuted by the above-mentioned cases of claims that actually occurred.

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This project was funded by the German Environment Agency and the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety. The funding was provided by resolution of the German Bundestag.



The responsibility for the content of this publication lies with the authors.