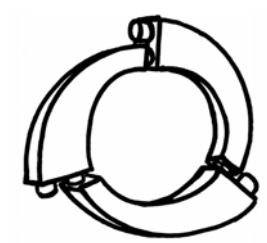




KTH Machine Design

KTH EcoDesign



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This material contains 7 modules for education. They are intended for different lengths of EcoDesign Education.

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The modules:

- KTHecodesign_1 An introduction for a 20 min presentation
- KTHecodesign_2 An orientation for a 2 hour presentation
- KTHecodesign_3 A-E A ppt material useful for a 2 day course

Modules 3B, C and D are parts of a PhD made by Jessica Lagerstedt. The rest is part of educational material that have been developed under the period 1996-2004

In module KTHecodesign_2 and _3E the concept of the 10 Golden Rules is presented and the following is a text introduction to this concept.

10 Golden Rules of EcoDesign

First it must be stated that these 10 golden rules are not an invention made by the authors. It is a pedagogic summary of many of the guidelines that can be found in company guidelines and in handbooks of different origins. The Golden Rules, as presented in this chapter, are very generic and must be transformed and customised to be at real use in product development work. Guidelines in a company must be company and product specific and must be implemented by the product developers. The Golden Rules are NOT listed in any preference order.

- GR 1. Don't use TOXIC substances and arrange closed loops for necessary but toxic ones.
- GR 2. Minimise energy and resource consumption in production phase and transport through HOUSEKEEPING.
- GR 3. Use structural features and high quality materials to minimise WEIGHT ..in products...if not interfering with necessary flexibility, impact strength or functional priorities.
- GR 4. MINIMISE energy and resource consumption in the usage phase, especially for products with most significant aspects in the usage ph
- GR 5. Promote repair and upgrading, especially for SYSTEM dependent products

- GR 6. Promote LONG LIFE for products..... especially for products with most significant environmental aspects OUT of usage phase.
- GR 7. Invest in better materials, surface treatments or structural arrangements to PROTECT products for dirt, corrosion and wear, giving long life and minimised maintenance.
- GR 8. PREARRANGE upgrading, repair and recycling trough access ability, labelling, modules, breaking points, manuals.
- GR 9. Promote upgrading, repair and recycling by using few, SIMPLE, recycled, not blended materials and no alloys.
- GR 10. Use as FEW joining elements as possible and use screws, adhesives, welding, snap fits, geometric locking etc. according to the life cycle scenario.

Some designers have specific use for just a few of the rules. In these cases, on the other hand, they usually have a strong need for more product and activity focused design guidelines!

As stated earlier these 10 Golden Rules are generic rules. They are hardly intended for direct use in design work. For example the first rule "Don't use toxic.....". The customized set of rules can be:

- Identify which are the toxic substances inside your responsibility!
- Try to find a nontoxic substitute available not jeopardizing functionality and economy!
- Consider if closed loops be arranged or are there any established collecting-recycling systems for actual substance!

A connection to rule number 8 in this case can be:

- Label material A and try to make it as an easy accessible module!

Another connection can be to rule nr 9 and 10 the substitute of a toxic substance might be lead to a more complicated structure in order to achieve the modules and labels asked for.

- Provide instructions for the disassembly of the toxic and scarce substances in the product

This customization of the rules can preferably be made together with environmental expert as well as managers and market expertise.

A parallel can be made to living rules present in many cultures and religions, like "Thou shall not steal!"

This is easy to say but not very useful as guidance to someone who is a thief! For a kleptomaniac who would like to stop this habit, you have to give him customized rules like:

- Sew together your pockets
- Carry bags that can be seen thru
- Leave your overcoat at the shop entrance.
- Ask someone from the shop to accompany you during your stay in the shop

Some of these good advices in the 10 golden rules are contradictory to a certain extent. In most cases one cannot assign a winner. The best solution to be found to such a conflict is to implement a good guidance for compromises and to communicate the resulting view, e.g. in the dialogue between environmental experts, product developers, sales organisations and customers.

Precious materials can be an energy saver like gold plated connectors, making a conflict between GR 2, 3 7 and 9.

In-moulds in plastic parts can keep the weight down but at the same time by using precious metals, the product structure is getting more complex, making a conflict between GR 2, 6 and 9.

Saving energy often means lowering the weight of products but these savings must not jeopardise the functionality of the product. For example telephone receivers often have an inset of metal to give a more stable and solid impression. The same thing goes for razors, which often have an inlet of metal to lower vibrations and improve performance.

Lightweight cars, can be motivated by fuel consumption, but might denote danger at car accidents. Products, which have their most significant environmental aspect OUT of usage phase, like chairs, tables, stairs, bridges can benefit from more weight in order to lengthen life and lower the risk for damage and human injuries.