

exact
Excellence in Applied Electronics and Technologies

The Interessen-Gemeinschaft exact

- IG exact has been founded in 1967 as an OECD initiative. Today it represents an association as well as a trademark, registered in Switzerland.
- IG exact is headed by a management committee
- Four working groups deal with specific issues.

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Members of IG exact

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Organization

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Tasks and activities of IG exact:

Exchange of information about:

- Components engineering & -technology AGE
- procurement AGB
- production processes & -technology ZEP
- Environmental questions AGU

quarterly meetings with:
 Presentations by members and external experts at,
 progress reports on projects (cooperation of companies)
 Information's on conferences, publications.
 Discussions about actual problems.
 News on homepage: www.igexact.org

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ITG-exact seminar 2 „Bleifreie Elektronik“ (29.9.04)

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IG exact AG special Workshop RoHS & WEEE (29.10.04)



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Lifecycle Assessment (LCA) in Electronics

Simplified LCA for components

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Simplified LCA in Electronics

- Method „simplified – LCA“ for easy and cost saving assessment of substances and processes
- Results on different technologies
- Conclusions

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Simplified LCA

- include the whole lifecycle (from cradle to gate)
- select **Screening-indicators**
- highlight “hot spots”
- Best suited for industrial application

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Screening-Indicators

- **Energy consumption** (input indicator)
e.g. Production of Integrated Circuits (IC) (global warming, acidification)
- **Resource depletion** (input indicator)
- **Human-/ecotoxicity** (output indicators)
toxic heavy metals (v.a. lead, chromium-6 cadmium, mercury) and halogenated hydrocarbons (flame retardants)

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Advantages of sf-LCA

- **scale and scope**
smaller (data collection)
- **time**
less time consuming (method)
- **costs**
less expensive (time)
- **results**
ca. 80% of impacts

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Application

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Example: Table Chemical Content

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International Exchange of Electronic Component Technology and Test Data
Arbeitsgruppe Umweltfragen

Material Deklaration

Hersteller: X Werkbest.Nr.: 02000, V=1000 Component Tel.: 0041 9000 0000 Datum: 20.Nov. 95
 Bauteil: Y Bauteilnr.: U.C. 804 Fax: 0041 9000 0003 Version:

Komponente: Fabrikat, Typ, Charakteristik Kunde: GP, 8572000, General Purpose, radial, 133 x 12mm

Teil	Komponente	Kurzbezeichnung	Menge (kg)	Gewicht (%)	UW-Wert (GWP) (gewichtete Mittelwert)
Kondensatorleiste	Aluminium / Papier	Al	0,186 0,043	14,4 3,4	
Verschlussstopfen	Athylen Propylen Terephthalat	EPT	0,207	23,28	
Isolierrückführung	Polyvinylchlorid	PVC	0,049	5,51	823,35
Elektronen	Methylformamid (DMF)	HCONH ₂ CH	0,120	13,50	106,81 / 836,37, 53
Lötenschlüsse	Eisen / Kupfer (>1000:1) Zinn / Blei (60/40)	Fe/Cu Sn/Pb	0,021 0,002	2,36 0,23	8,49
Übrige:	Polycarbonat / Polypropylen	UP/PP	0,028 0,028	3,24 3,24	820
Total:			0,889	100,0	

Notiz: 20.11.95 Seriennummer: exact Schweiz c/o Hans J. T. Müller, Celeris AG, Postfach 600, CH-4603 Schwarzenbach, Schweiz

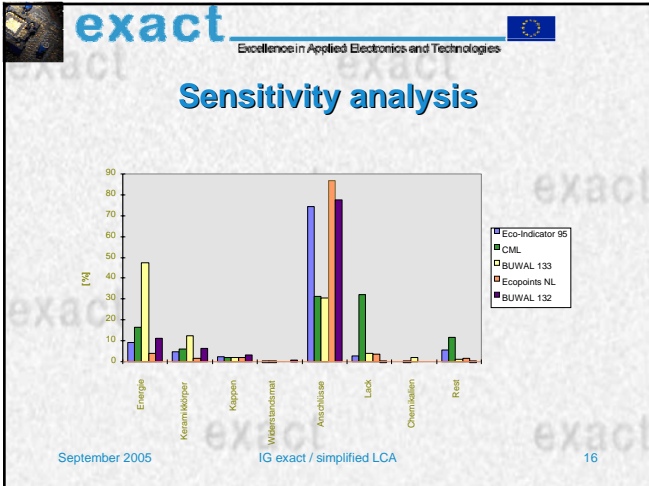
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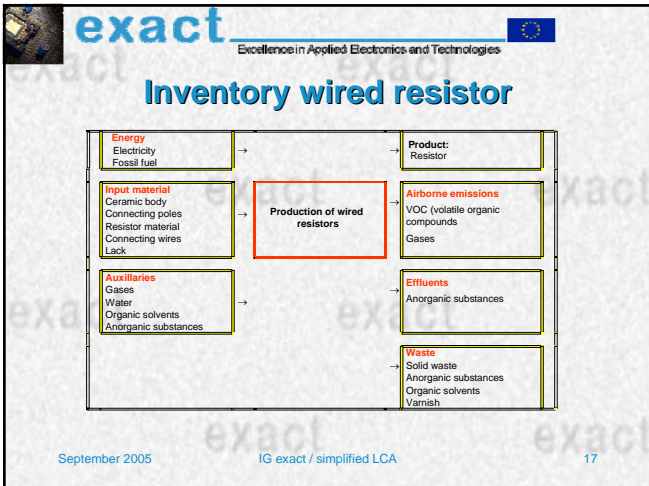
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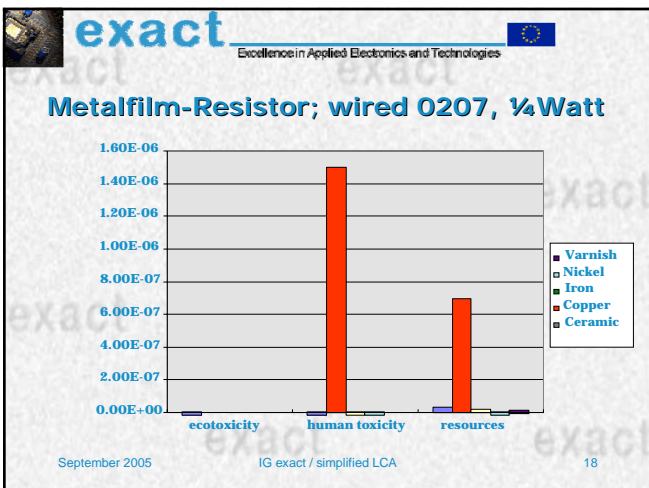
Example

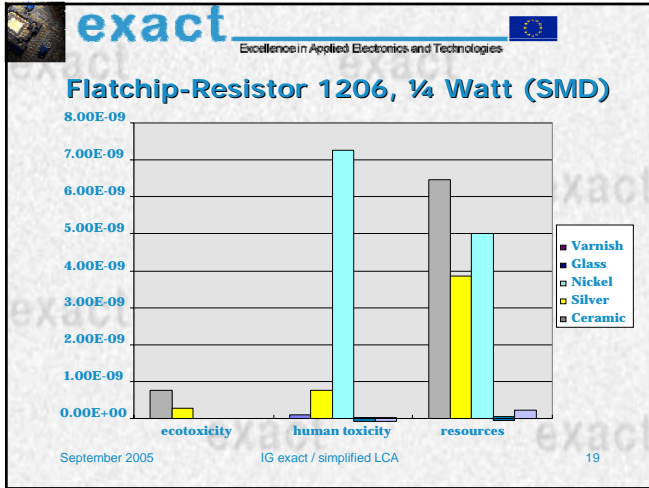
- Metallfilm-Resistor wired (¼ Watt)
- Flatchip-Resistor 1206, (¼ Watt)
- Al-Electrolytic Capacitor (Æ5x12mm)
- IC SO-8 (in Epoxy Case, SMD)

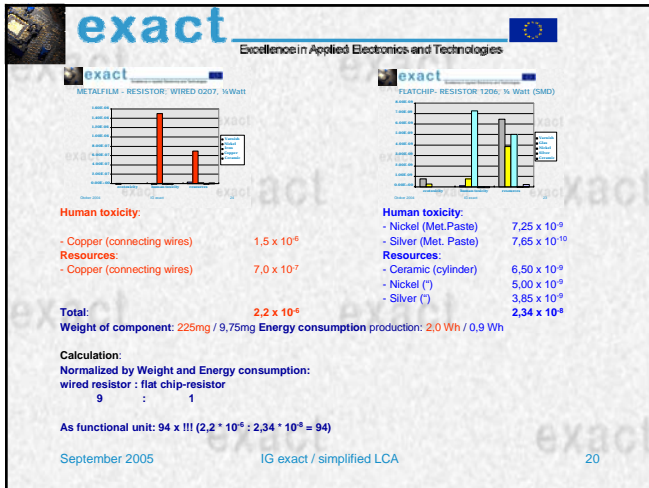
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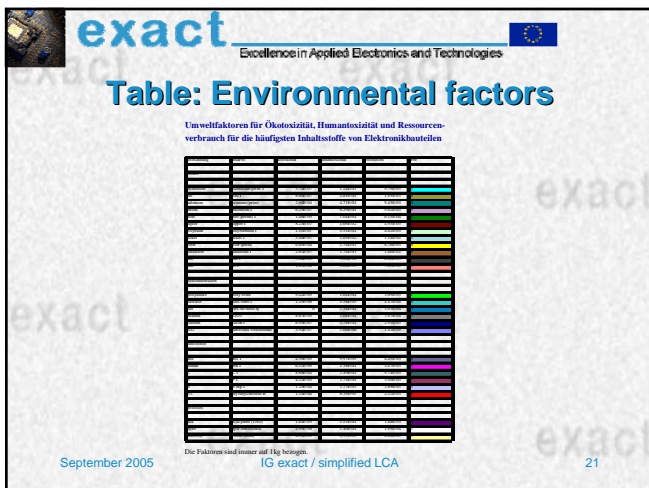














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Direct application in:

- **Design for Environment:**
*Data transfer to Softwaretool
"EcoDesign"*
- **new projects:**
*Application of SN 36350-1
"Environmental friendly products"
Impacts in waste management
"Life Cycle Costing (LCC)"*

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Conclusion:

- ✓ Industry needs a tool to separate „elephants from mice“
- ✓ LCA must be carried out by engineers for product development in the evaluation phase of new products → environmental sciences have to provide basics (factors)
- ✓ Time consuming „full LCA-studies“ are too expensive for industry.

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Sources

Publications:
"Simplified LCA in der Elektronik"
Authors: Markus T. Stutz (ETH DA)
 Hans J. Tobler (IG exact, Supporting)
Homepage of IG exact / Umweltfragen (AGU) / Publikationen:
http://www.igexact.org/agu/agu_pub.htm

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