Open Material Data

Leveraging the power of Open Data to boost the usability of material data in the construction industry
# What to expect from today’s workshop

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
</tr>
</thead>
<tbody>
<tr>
<td>10:00</td>
<td>Introduction &amp; expectations</td>
</tr>
<tr>
<td>10:05</td>
<td>Problem</td>
</tr>
<tr>
<td>10:10</td>
<td>Solution</td>
</tr>
<tr>
<td>10:15</td>
<td>Operating Model</td>
</tr>
<tr>
<td>10:20</td>
<td>Discussion along prepared questions</td>
</tr>
<tr>
<td>10:55</td>
<td>Wrap-up</td>
</tr>
</tbody>
</table>

Status Quo
Introduction

Maximilian Vomhof
Head of Products & BD
@ vyzn AG
LinkedIn

Markus Steinbrecher
CTO
@ Swiss Property AG
LinkedIn

OpenMaterialData
OpenSource.Studienauftrag

further examples from the industry
Status Quo

We got positive feedback from all stakeholders involved.

Project is nearing the end of the conception phase.

We welcome constructive feedback on technology and operating model.

Timeline

start 12/22

“best overall project”
@ AEC Hackathon in CPH 03/23

workshops tech setup and operating model Q2/23

MVP Q3/23
PROBLEM
The effort to obtain material data is too high

get location information  low
understand value potential  low
make optimised material choices  high
Search for products is highly analogue + experience driven

What (innovative) products are there?

What are their properties?

ID

physical properties

LCA

procurement

+ x
Example I: Database for LCA data, published by KBOB
**Example II: Product documentation by swisspor & Knauf**

### TP-KD 430

**GLASWOLLE**  
EN 13162 / bs 279:162  
MVEN-131624-R5-01/04-05

#### TECHNISCHE DATEN

<table>
<thead>
<tr>
<th>Eigenschaften</th>
<th>Zeichen</th>
<th>Beschreibung/Daten</th>
<th>Einheit</th>
<th>Norm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brandverhalten</td>
<td>A</td>
<td>–</td>
<td>–</td>
<td>EN 13020-1</td>
</tr>
<tr>
<td>Anwendungstemperatur</td>
<td>–</td>
<td>bis 150</td>
<td>°C</td>
<td>–</td>
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<tr>
<td>Rohdichte ca.</td>
<td>ρ</td>
<td>23</td>
<td>kg/m³</td>
<td>EN 1002</td>
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<tr>
<td>Wasserdampfdiffusions-</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>widerstandszahl</td>
<td>µ</td>
<td>–</td>
<td>–</td>
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<td>Grobabsorptionsfaktor</td>
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<td>für die Dicke</td>
<td>ε</td>
<td>0,9</td>
<td>–</td>
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<td>Wasseraufnahme bei</td>
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<td>wRB</td>
<td>kg/m²</td>
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<td>kurzzeiten, teilweis</td>
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<tr>
<td>en Entweichen</td>
<td></td>
<td>–</td>
<td></td>
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<tr>
<td>Wasseraufnahme bei</td>
<td>W</td>
<td>wRB</td>
<td>kg/m²</td>
<td>EN 12067</td>
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<td>langlebenen, teilweis</td>
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<tr>
<td>en Entweichen</td>
<td></td>
<td>–</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Specifische Wärme-</td>
<td>C_p</td>
<td>850</td>
<td>J/(kgK)</td>
<td>–</td>
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<tr>
<td>Kapazität</td>
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</tbody>
</table>

#### ANWENDUNG

### GLASS Vento 032 white

**Produktbeschreibung**
Halbsteine und formstabile Wärmedämmplatten aus Glaswolle mit auflaminiertem, hitzem Glasvlies und wasserabweisender Oberfläche.

<table>
<thead>
<tr>
<th>Format</th>
<th>1250 x 600 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dicke</td>
<td>30 - 300 mm</td>
</tr>
</tbody>
</table>

#### Technische Daten

<table>
<thead>
<tr>
<th>Merkmal</th>
<th>Symbol</th>
<th>Norm</th>
<th>Wert</th>
<th>Einheit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nennwert Wärmeleitfähigkeit</td>
<td>λ_0</td>
<td>279</td>
<td>0,032</td>
<td>W/(mK)</td>
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<tr>
<td>Brandverhalten</td>
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<td>13501-1</td>
<td>A1</td>
<td></td>
</tr>
<tr>
<td>Brandverhaltensgruppe</td>
<td></td>
<td>VKF</td>
<td>RF1</td>
<td></td>
</tr>
<tr>
<td>Dichte</td>
<td></td>
<td>–</td>
<td>~ 29 kg/m³</td>
<td></td>
</tr>
<tr>
<td>Diffusionswiderstandzahl</td>
<td>µ</td>
<td>12086</td>
<td>~ 1</td>
<td></td>
</tr>
</tbody>
</table>
Example III: EPD data by EC3

Welcome to the Embodied Carbon in Construction Calculator (EC3) Tool

You are logged into the North American servers of buildingtransparency.org as m.vornhof of vyzn AG. The EC3 tool version v-134.0.0_b-3641 is in Public Beta.

The Carbon Query Database is Online and contains:
Digitized EPDs in EC3, by Country

EPD = environmental product data
Why do we still have to copy and paste with Excel?
Problem: available data is not usable

Datasets that cover
a) mechanical properties
b) physical properties
c) sustainability indicators
d) supplier information
of construction materials
are not „digitally“ available.

Data is spread across a variety of sources:
- websites of manufacturers
- websites of suppliers
- websites of service providers that create proprietary data collections, often with a focus on LCA or procurement
- generic data from norms

Data has to be compiled manually by the individual players in a planning team, which leads to intransparency and redundant work.
Manufacturers would be the reliable source of material and product data but have difficulties to deliver

Manufacturers have difficulties for a number of internal and external reasons. Key problems with the available data are:

1. Data is published according to **varying standards**.
2. Data is **distributed across different sources** (e.g. mechanical and physical properties in a fact sheet, LCA indicators in an EPD which is stored separately).
3. Data is **incomplete** to some extent.
4. Data is usually **not accessible via API** but “hidden” in .pdf documents or tables.
Status Quo

On the one hand, there are efforts on the legislative side to further standardise the requirements for digital product data. The challenge here is speed: it takes a long time for laws to be passed and to be implemented by market participants.

On the other hand, there are private-sector initiatives that strive to build up comprehensive, cross-manufacturer material and product databases. To date, these databases, for which a registration fee is usually charged, failed to be relevant in the market (from a global perspective) and probably will have difficulties to do so in comparison to standardised, open approaches.
SOLUTION
Can open data make the difference?

**Main goals:**

**Discoverability:** cross-manufacturer search and filtering for materials and products

**Usability:** same data sets for individual materials/products can be used in different software tools
Initial situation

Data provision

1. manufacturer
2. supplier
3. collections
4. normed values

Data validation

1. local repository

Data access

1. BIM Tools (Architects)
2. LCA Tools (Sus. Experts)
3. Energy Tools (Building Systems)
4. Engineering Tools (Engineers)
5. Procurement Tools (Buyer)

Key problems:
1. not accessible via API
2. varying standards
3. distributed across diff. sources
4. incomplete
Tackling the problem at its root

Data provision

- manufacturer
- supplier
- collections
- normed values
- open repository

Data validation

1. support for "self publication"

Data access

- easy API access (no code)

open repository

- experts add data globally not locally
- mapping document

Data provision

- support for "self publication"

API

- stitching of meta data

1. support for "self publication"

BIM Tools

- (Architects)

LCA Tools

- (Sus. Experts)

Energy Tools

- (Building Systems)

Engineering Tools

- (Engineers)

Procurement Tools

- (Buyer)
OPERATING MODEL
## Core development guidelines

<table>
<thead>
<tr>
<th>Decentralisation</th>
<th>Collaboration</th>
<th>Open Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>The OMD project supports decentralised publication efforts of manufacturers instead of collecting all data in one central database.</td>
<td>Experts are empowered to validate and improve available data globally instead of maintaining individual data sets locally.</td>
<td>A “central API” will allow any data consumer to freely access data registered in the open data environment. To secure open access and create trustworthiness, core components are managed by a not-for-profit organisation.</td>
</tr>
<tr>
<td>#enablement</td>
<td>#uniting #efforts</td>
<td>#no code</td>
</tr>
</tbody>
</table>
Operating Model

Key deliverables of the association:
1. setup and maintenance of open data environment (registration of sources, stitching, commenting)
2. setup and documentation of API
3. provision of neutral webserver to enable data adding by experts

Role of commercial service providers:
1. setup of webserver & technical support for manufacturers
2. development of user specific tools & websites to interact with the data
3. …
THANK YOU!