Tools and methods

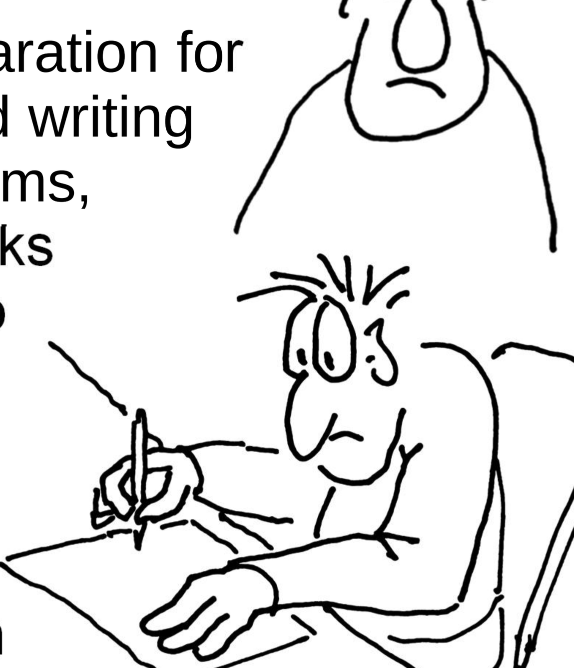
FROM SCRIBBLED CHEAT SHEETS TO HELPFUL TOOLS

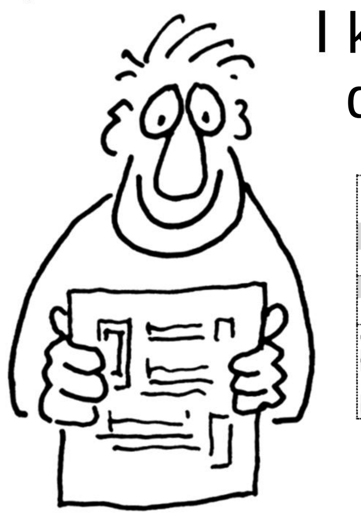
Too much information
à The Passive House Reference Sheet

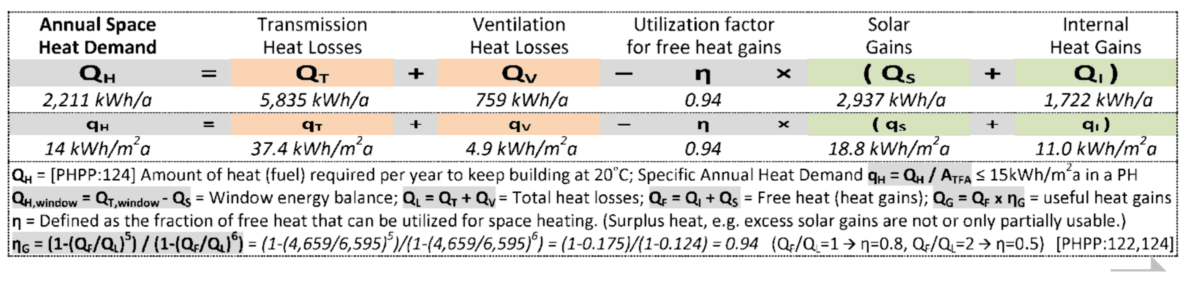
For many, entry to the professional Passive House world starts with a CEPH course and exam. Quality training and preparation for the exam as well as for first projects are important. There are many very good providers and publications available to support this.

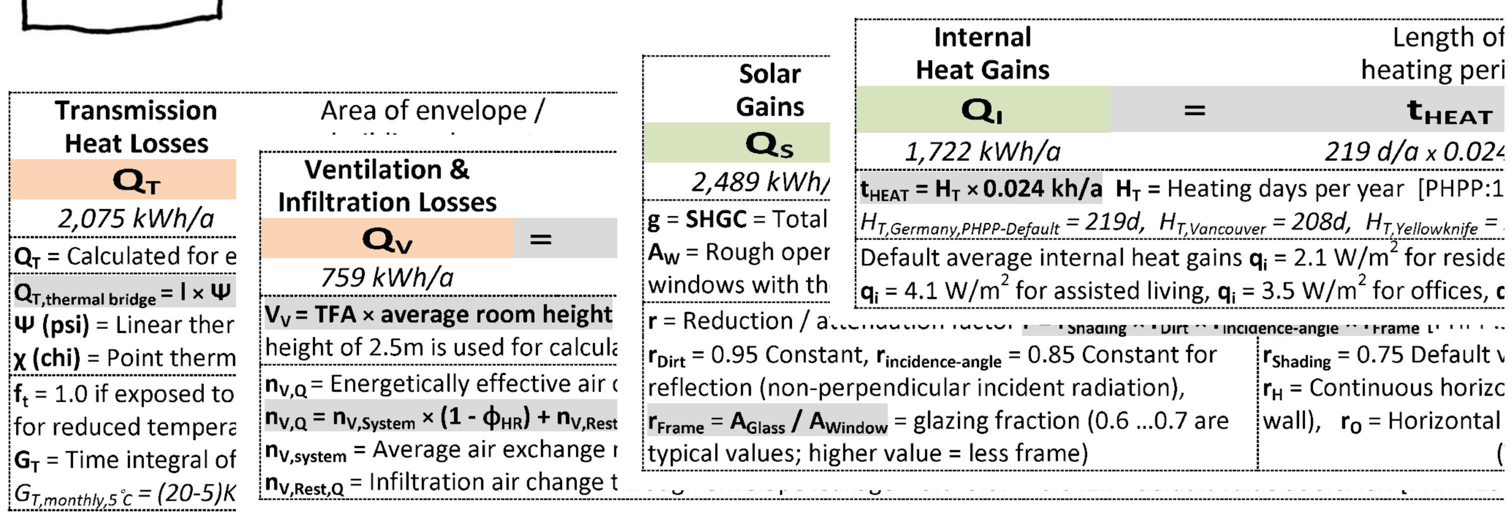
But open book exams are tricky – the Passive House exam is a battle against the clock with not much time to skim through available material.

Early during the preparation for my own test, I started writing down formulas, terminology, acronyms, symbols and all kind of notes. Thanks to bad handwriting and my desire to be well prepared for the exam, I transcribed my notes into a digital format. This allowed me to experiment with a few options to present the material. After the exam I kept on improving the document and shared it with others.

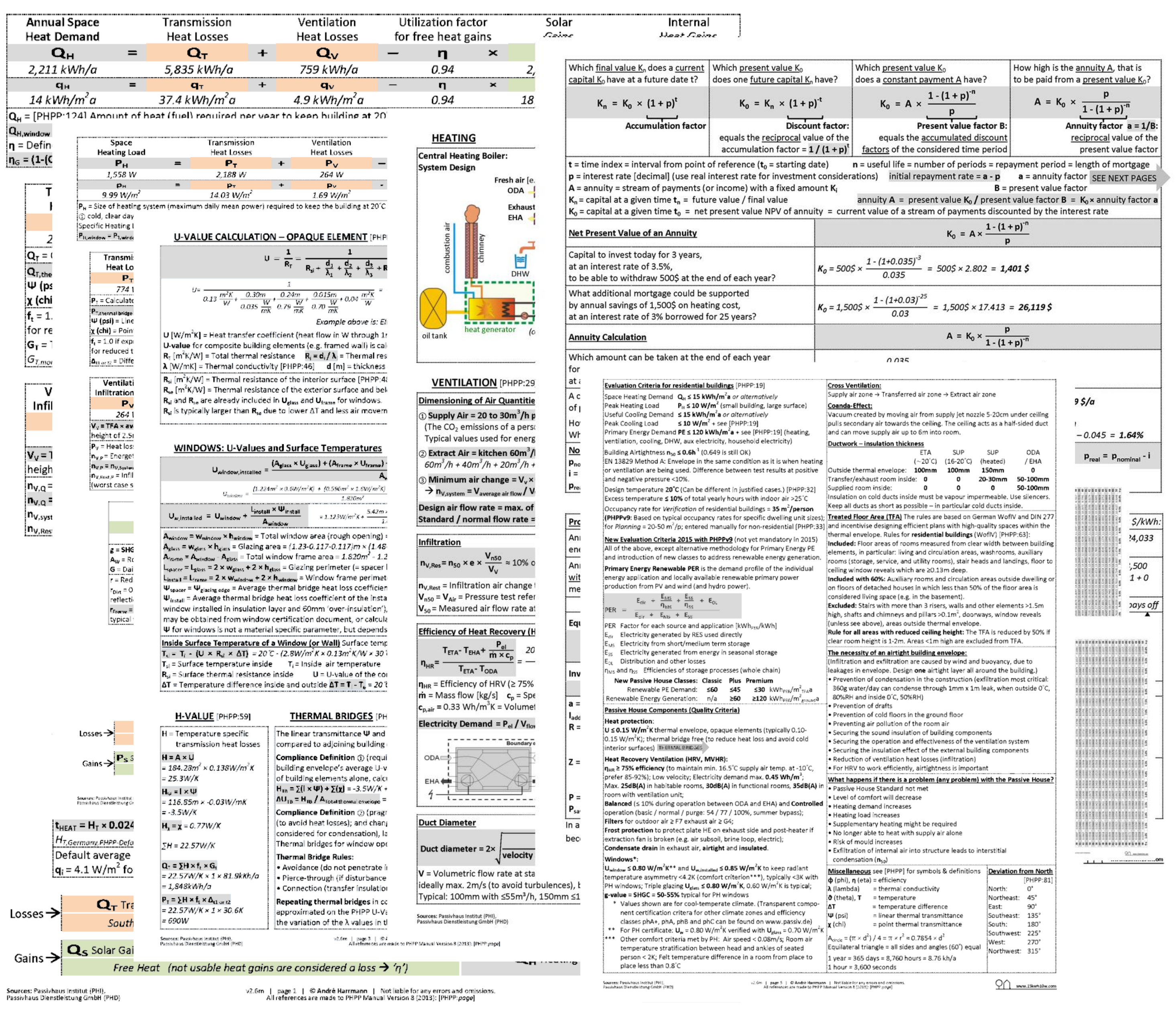






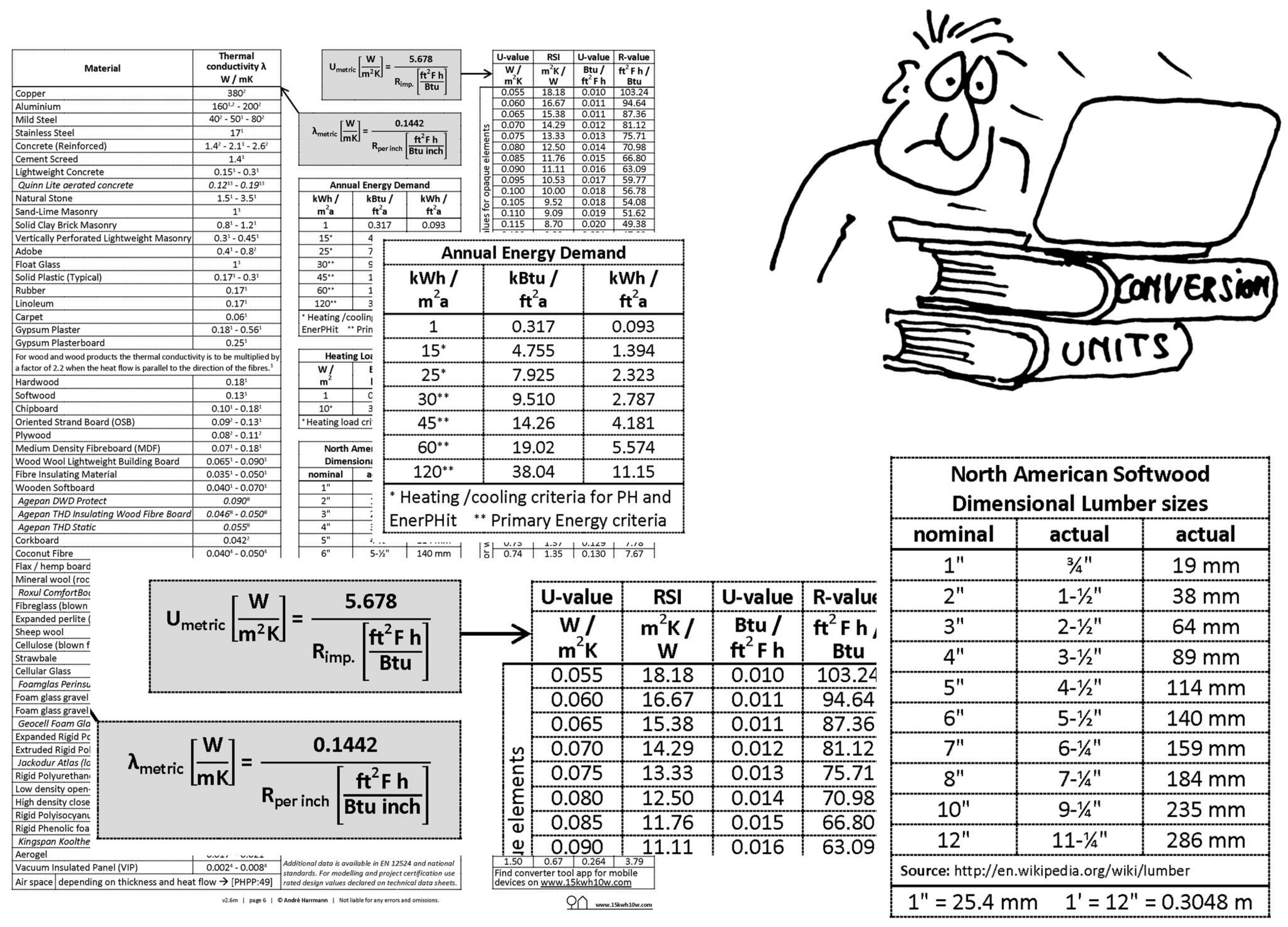


Now the **Reference Sheet** is much more than just a comforting cheat sheet for the exam. The concise guide presents the relevant terminology and information in such a way that the document can serve as the initial go-to tool to look up information when working on a project or learning about Passive House. References for further reading are included.



Too many units
à The Passive House Converter Tool

Unique to the North American construction industry is the need to work with imperial and metric units – even in Canada where metrication started back in the 1970s. The **Reference Sheet** offers conversion tables.



$$U_{metric}\left[\frac{W}{m^2K}\right] = \frac{5.678}{R_{imp.}\left[\frac{ft^2 F\,h}{Btu}\right]}$$

$$\lambda_{metric}\left[\frac{W}{mK}\right] = \frac{0.1442}{R_{per\,inch}\left[\frac{ft^2 F\,h}{Btu\,inch}\right]}$$

Annual Energy Demand		
kWh / m²a	kBtu / ft²a	kWh / ft²a
1	0.317	0.093
15*	4.755	1.394
25*	7.925	2.323
30**	9.510	2.787
45**	14.26	4.181
60**	19.02	5.574
120**	38.04	11.15

* Heating /cooling criteria for PH and EnerPHit ** Primary Energy criteria

U-value W / m²K	RSI m²K / W	U-value Btu / ft² F h	R-value ft² F h / Btu
0.055	18.18	0.010	103.24
0.060	16.67	0.011	94.64
0.065	15.38	0.011	87.36
0.070	14.29	0.012	81.12
0.075	13.33	0.013	75.71
0.080	12.50	0.014	70.98
0.085	11.76	0.015	66.80
0.090	11.11	0.016	63.09

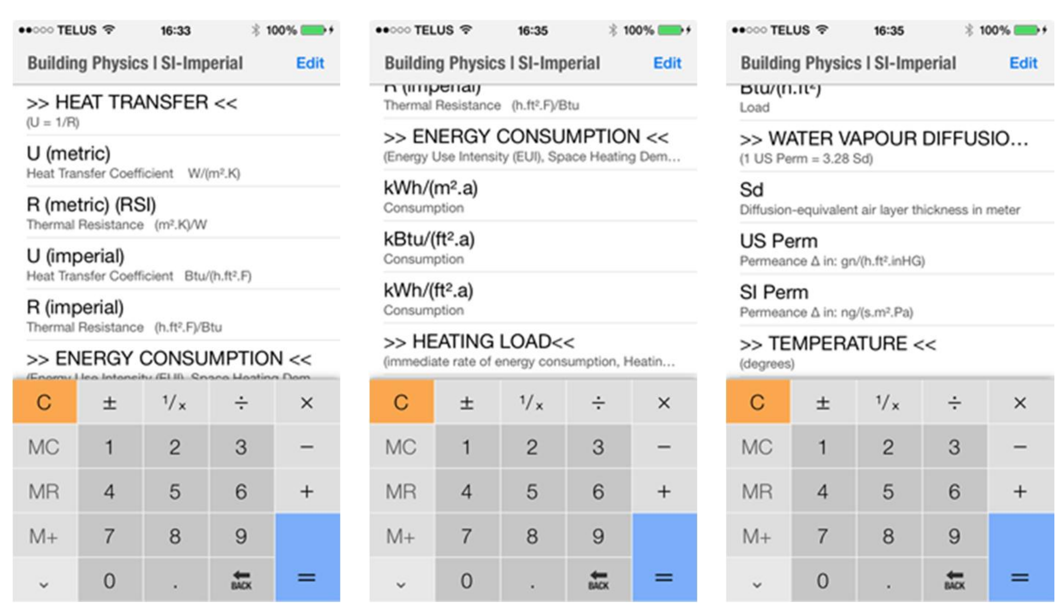
North American Softwood Dimensional Lumber sizes		
nominal	actual	actual
1"	¾"	19 mm
2"	1-½"	38 mm
3"	2-½"	64 mm
4"	3-½"	89 mm
5"	4-½"	114 mm
6"	5-½"	140 mm
7"	6-¼"	159 mm
8"	7-¼"	184 mm
10"	9-¼"	235 mm
12"	11-¼"	286 mm

Source: http://en.wikipedia.org/wiki/lumber

1" = 25.4 mm 1' = 12" = 0.3048 m

A **Unit Converter** for mobile devices was added for accurate metric-imperial conversions on the go:

U-values, R-values + Heating Demand (kWh/m2.a, kBtU/ft2.a, kWh/ft2.a) + Heat Load (W/m2, BtU/h.ft2) + Vapour Diffusion (Sd-value, metric & US-Perm) + Temperature (°C, °F, K)



Less searching
à More Passive House

The **Reference Sheet** and **Unit Converter** are currently available in English only (metric and imperial versions as downloadable PDF), with a strong focus on North American user groups.

I hope my brief introduction to the tools will initiate a productive discussion which eventually leads to further developments. The result might be cooperation with others and the development of more customized versions of both tools for specific markets, in different languages and for additional software platforms. I have already received requests to add more conversions, such as for lighting power density, cooling metrics and equipment efficiencies.

References

Harrmann, André: Tools for Passive House Exam and Daily Use. Harrmann Consulting, Canada & Germany. www.15kwh10w.com/passive-house-tools/, January 2017

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