



	<b>DYNamic Analysis. Simulation and Test</b> applied to the Energy and Environment performance of buildings	
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<ul> <li>NOTES:</li> <li>The webinar will be recorded and published at a couple of weeks, along with the presentation</li> <li>In case your questions have not been answered Jose Jimenez (mjose.jimenez@psa.es) or Aitor E (aitor.erkoreka@ehu.eus);</li> <li>All remaining questions will be answered durin September 30<sup>th</sup></li> </ul>	https://dynaster slides. I please send the Erkoreka g the last webina	e.info/within m to Maria ır of
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4 – BUILDING ENVELOPE HEAT LOSS COEFFICIENT (HLC)  

$$\sum_{i=1}^{z} m_{i}c_{i}(T_{i}(t_{2}) - T_{i}(t_{1})) + \sum_{k=1}^{N} Q_{k}\Delta t + \sum_{k=1}^{N} K_{k}\Delta t = HLC \sum_{k=1}^{N} (T_{in,k} - T_{out,k})\Delta t - \sum_{k=1}^{N} (S_{a}V_{sol})_{k})\Delta t$$

$$HLC = (UA + C_{v}) [kW/^{o}C]$$
Thus, if the thermal level is not equal at the start and end of the analysis period [kW/^{o}C]  

$$HLC = \frac{\sum_{i=1}^{z} m_{i}c_{i}(T_{i}(t_{2}) - T_{i}(t_{1})) + \sum_{k=1}^{N} (Q_{k} + K_{k} + (S_{a}V_{sol})_{k})\Delta t}{\sum_{k=1}^{N} (T_{in,k} - T_{out,k})\Delta t}$$
Thus, if the thermal level is equal at the start and end of the analysis period [kW/^{o}C]  

$$HLC = \frac{\sum_{k=1}^{N} (Q_{k} + K_{k} + (S_{a}V_{sol})_{k})}{\sum_{k=1}^{N} (T_{in,k} - T_{out,k})}$$

**DETAILED INFO IN REFERENCE [2]** 

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5 – INTRODUCTION TO MEASUREMENTS FOR BUILDING ENERGY PERFORMANCE ASSESSMENT



- Dynamic testing of building components requires a very well controlled and positioned **set of sensors** with a correct measuring and control system that will provide high quality data sets.
- The quality requirements developed during the different **PASSYS and PASLINK projects** have been found to perform an optimal full scale testing of a building component.
- These results are also valid for any building component or building in its whole that wants to be monitored since the focus is done in optimising the measuring and monitoring systems

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## 8 – REFERENCES [1] ÇENGEL, Y. A., HEAT AND MASS TRANSFER, A Practical Approach. McGraw-Hill. 3rd Edition 2007 [2] Irati Uriarte, Aitor Erkoreka. Catalina Giraldo-Soto, Koldo Martin, Amaia Uriarte, Pablo Eguia, Mathematical development of an average method for estimating the reduction of the Heat Loss Coefficient of an energetically retrofitted occupied office building, Energy and Building, 2019, DOI: <a href="https://doi.org/10.1016/j.enbuild.2019.03.006">https://doi.org/10.1016/j.enbuild.2019.03.006</a> [3] Giraldo-Soto, C.; Erkoreka, A.; Mora, L.; Uriarte, I.; Del Portillo, L.A. Monitoring System Analysis for Evaluating a Building's Envelope Energy Performance through Estimation of Its Heat Loss Coefficient. Sensors 2018, 18, 2360, DOI: <a href="https://doi.org/10.3390/s18072360">https://doi.org/10.3390/s18072360</a>

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