



VIPP VALUES CREATED IN
FIBRE-BASED PROCESSES
AND PRODUCTS



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LICENTIATE THESIS NOVEMBER 4 2014

INCREASING THE VALUE OF HOUSEHOLD APPLIANCES BY ADDING A HEAT PUMP SYSTEM

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BIOGRAPHY

Peder Bengtsson is employed at ASKO Appliances AB, Lidköping since 2000. His work incorporates knowledge how to decrease the electricity usage of household products by adding a heat pump system. Peder Bengtsson obtained a Master of Science in Engineering Design at KTH in 1998.



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ABSTRACT

The competition in the household appliances industry is strong. Manufacturers are continuously trying to develop, produce and sell product functions and features with good profit. To continually develop new features that the customer chain is willing to pay for is a key factor for a manufacturer to survive.

To introduce a new feature the manufacturer must be sure that the customer chain is willing to pay for it from one to five years in the future. In this study has a heat pump system been added as a new feature to the tumble dryer and the dishwasher. The willingness from the customer chain to pay extra for this feature is because of the decreases electricity usage by 64% for the tumble dryer and 37% for the dishwasher. However, the added heat pump system is increasing the price for the machine.

The first heat pump tumble dryer was introduced on the market in 2000 and is currently one of the state-of-the-art variants. This success was mainly because of the money saved from the lower electricity usage. The first heat pump dishwasher was introduced on the market in 2014, but only time will tell if the heat pump variant will dominate in the future.

ISBN nr: 978-91-7063-582-3

Webb: <http://kau.diva-portal.org/smash/get/diva2:744927/FULLTEXT01.pdf>



LIST OF PUBLICATIONS

Publications Included in the Licentiate Thesis

I. Bengtsson, P.; Berghel, J.; Renström, R. Performance Study of a Closed-Type Heat Pump Tumble Dryer Using a Simulation Model and an Experimental Set-Up. *Drying Technology*, 2014, 32, 891–901.

II. Bengtsson, P.; Berghel, J.; Renström, R. A Household Dishwasher Heated by a Heat Pump System using an Energy Storage Unit with Water as the Heat Source. Submitted to *International Journal of Refrigeration*, June 2014.

Other publications

Berghel, J.; Brunzell, L.; Bengtsson, P. Performance Analysis of a Tumble Dryer. *Proceedings of the 14th International Drying Symposium, Sao Paulo Brazil 22–25 August 2004, Vol. B, pp. 821–827.*

Brunzell, L.; Beiron, J.; Bengtsson, P. Temperature as an Indicator of Moisture Content and Drying Rate: A Control Strategy for an Air-Vented Tumble Dryer. *Proceedings of the 15th International Drying Symposium, Budapest Hungary 20–23 August 2006, Vol. B, pp. 761–764.*

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