

EuP – Lot 24: Professional washing machines, dryers and dishwashers

**Task 6 and 7: Additional questionnaire,
December 23th 2010**

Final Stakeholder Meeting on Washing machines and dryers
Brussels, 12 January 2011

(Öko-Institut e.V. / Bio Intelligence Service)



Relevance of improvement options per washing machine base case

Design Option		WM 1	WM 2	WM 3	WM 4	WM 5	WM 6	WM 7
T 1.3	Integrated automatic weighting system	X	X	X	X	X	X	
T 1.5	Wash process with lower temperature	X	X					
T 1.6	Alternative water phase optimisation	X	X	X	X	X	X	X
T 1.7	Drum construction	X	X	X	X	X	X	
T 1.10	User friendly control systems	X	X					
T 1.11	Heat exchanger				X			X
T 1.12	Water recovery and waste water heat recovery				X			X

Capacities, prices and consumption values of base cases

Parameters	Base case						
	1	2	3	4	5	6	7
	Semi-profess. washer extractor	Profess. washer extractor <15 kg	Profess. washer extractor 15-40 kg	Profess. washer extractor >40 kg	Profess. wash dryer	Profess. barrier washer	Washing tunnel machines
Purchase price (€)	3°250	20°000	20°000	110°000	15°000	67°500	390°000
Continuous operation							
Specific energy consumption (kWh/kg laundry)	0,14	0,17	0,17	0,18	0,80	0,25	0,35
Specific water consumption (l/kg laundry)	9	12	12	12	10	14	6
Specific detergent consumption (g/kg laundry)	17	20	20-22	20-22	15	20-22	9

Estimated and average costs and savings potential of selected design options compared to values for Base Case 1

Base Case 1: Semi-professional washer extractor					
Improvement options	T 1.3 Integrated automatic weighing system / automatic load control	T 1.5 Wash process with lower temperature / trend to cold water	T 1.6 Alternative water (rinsing) phase optimisation	T 1.7 Drum construction	T 1.10 User friendly control systems
Purchase price	108%	100%	100%	109%	100%
Continuous operation					
Specific energy consumption (kWh/kg laundry)	65%	40%	95%	90%	97%
Specific water consumption (l/kg laundry)	65%	100%	95%	95%	97%
Specific detergent consumption (g/kg laundry)	n.a.	n.a.	n.a.	n.a.	n.a.

→ Stakeholders are strongly asked to provide further information.

Professional washer extractor, < 15 kg

Estimated and average costs and savings potential of selected design options compared to values for Base Case 2

Base Case 2: Professional washer extractor, < 15 kg					
Improvement options	T 1.3 Integrated automatic weighing system / automatic load control	T 1.5 Wash process with lower temperature / trend to cold water	T 1.6 Alternative water (rinsing) phase optimisation	T 1.7 Drum construction	T 1.10 User friendly control systems
Purchase price	101%	100%	100%	102%	100%
Continuous operation					
Specific energy consumption (kWh/kg laundry)	65%	40%	95%	90%	97%
Specific water consumption (l/kg laundry)	65%	100%	95%	95%	97%
Specific detergent consumption (g/kg laundry)	n.a.	n.a.	n.a.	n.a.	n.a.

→ Stakeholders are strongly asked to provide further information.

Professional washer extractor, 15-40 kg

Estimated and average costs and savings potential of selected design options compared to values for Base Case 3

Base Case 3: Professional washer extractor, 15-40 kg			
Improvement options	T 1.3 Integrated automatic weighing system / automatic load control	T 1.6 Alternative water (rinsing) phase optimisation	T 1.7 Drum construction
Purchase price	101%	n.a.	102%
Continuous operation			
Specific energy consumption (kWh/kg laundry)	65%	95%	90%
Specific water consumption (l/kg laundry)	65%	95%	95%
Specific detergent consumption (g/kg laundry)	n.a.	n.a.	n.a.

→ Stakeholders are strongly asked to provide further information.

Professional washer extractor, > 40 kg

Estimated and average costs and savings potential of selected design options compared to values for Base Case 4

Base Case 4: Professional washer extractor, > 40 kg					
Improvement options	T 1.3 Integrated automatic weighing system / automatic load control	T 1.6 Alternative water (rinsing) phase optimisation	T 1.7 Drum construction	T 1.11 Heat exchanger	T 1.12 Water recovery
Purchase price	100%	100%	100%	106%	102%
Specific energy consumption (kWh/kg laundry)	65%	95%	90%	65%	75%
Specific water consumption (l/kg laundry)	65%	95%	95%	100%	70%
Specific detergent consumption (g/kg laundry)	n.a.	n.a.	n.a.	n.a.	n.a.

→ Stakeholders are strongly asked to provide further information.

Estimated and average costs and savings potential of selected design options compared to values for Base Case 5

Professional wash dryer			
Improvement options	T 1.3 Integrated automatic weighing system / automatic load control	T 1.6 Alternative water (rinsing) phase optimisation	T 1.7 Drum constructions
Purchase price	102%	100%	102%
Continuous operation			
Specific energy consumption (kWh/kg laundry)	65%	95%	90%
Specific water consumption (l/kg laundry)	65%	95%	95%
Specific detergent consumption (g/kg laundry)	n.a.	n.a.	n.a.

→ Stakeholders are strongly asked to provide further information.

Estimated and average costs and savings potential of selected design options compared to values for Base Case 6

Base Case 6: Professional Barrier washer			
Improvement options	T 1.3 Integrated automatic weighing system / automatic load control	T 1.6 Alternative water (rinsing) phase optimisation	T 1.7 Drum construction
Purchase price	100%	100%	100%
Continuous operation			
Specific energy consumption (kWh/kg laundry)	65%	95%	90%
Specific water consumption (l/kg laundry)	65%	95%	95%
Specific detergent consumption (g/kg laundry)	n.a.	n.a.	n.a.

→ Stakeholders are strongly asked to provide further information.

Estimated and average costs and savings potential of selected design options compared to values for Base Case 7

Base Case 7: Washing tunnel machines			
Improvement options	T 1.6 Alternative water (rinsing) phase optimisation	T 1.11 Heat exchanger	T 1.12 Water recovery
Purchase price	negligible	102%	101%
Continuous operation			
Specific energy consumption (kWh/kg laundry)	95%	65%	75%
Specific water consumption (l/kg laundry)	95%	100%	70%
Specific detergent consumption (g/kg laundry)	n.a.	n.a.	n.a.

→ Stakeholders are strongly asked to provide further information.

Relevance of improvement options per dryer base case

Design Option		D 1	D 2	D 3	D 4	D 5	D 6	D 7
T 2.1	Increased motor concept	X	X	X	X	X	X	X
T 2.2	Heat pump	X	X	X	X	X	X	X
T 2.3	Heat recovery from exhaust air		X	X	X	X	X	X
T 2.4	Improved condensing units	X						
T 2.5	Improved air flow system		X	X	X	X	X	X
T 2.6	Air control system		X	X	X	X	X	X
T 2.8	Integrated automatic weighting system	X	X		X	X	X	
T 2.9	Voice control systems	X	X					
T 2.10	Control system	X	X	X	X	X	X	X
I 2.1	Gas-operated heating				X	X	X	

Capacities, prices and consumption values of dryer bases cases

	Base case						
	1	2	3	4	5	6	7
Parameters	Semi-professional dryer, condenser	Semi-professional dryer, air vented	Professional Cabinet dryer	Professional tumble dryer, < 15 kg	Professional tumble dryer, 15-40 kg	Professional tumble dryer, > 40 kg	Heavy duty pass-through (transfer) tumble dryer
Purchase price (€)^[1]	2°150	2°150	11°750	11°750	11°750	26°500	75°000
Continuous operation							
Specific energy consumption (kWh/kg laundry) ^[2]	0,60	0,56	0,70	0,55	0,65	0,85	0,6

^[1] Weighted purchase price from Task 2

^[2] Energy consumption from Task 3

Estimated and average costs and savings potential of selected design options compared to values for Base Case 1

Base Case 1: Semi-professional dryer, condenser						
Improvement options	T 2.1 Increased motor concept	T 2.2 Heat pump	T 2.4 Improved condensing units	T 2.8 Integrated automatic weighting system / automatic load control	T 2.9 voice control systems	T 2.10 Control system
Purchase price	103%	200%	103%	106%	100%	101%
Continuous operation						
Specific energy consumption (kWh/kg laundry)	95%	50%	90%	95%	95%	87%

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Semi-professional dryer, air vented

Estimated and average costs and savings potential of selected design options compared to values for Base Case 2

Base Case 2: Semi-professional dryer, air vented								
Improvement options	T 2.1 Increased motor concept	T 2.2 Heat pump	T 2.3 Heat recovery from exhaust air	T 2.5 Improved air flow system	T 2.6 Air control system	T 2.8 Integrated automatic weighing system	T 2.9 voice control systems	T 2.10 Control system
Purchase price	103%	200%	186%	103%	101%	106%	100%	101%
Continuous operation								
Specific energy consumption (kWh/kg laundry)	95%	50%	72%	82%	87%	95%	95%	87%

→ Stakeholders are strongly asked to provide further information.

Estimated and average costs and savings potential of selected design options compared to values for Base Case 3

Base Case 3: Professional Cabinet dryer						
Improvement options	T 2.1 Increased motor concept	T 2.2 Heat pump	T 2.3 Heat recovery from exhaust air	T 2.5 Improved air flow system	T 2.6 Air control system	T 2.10 Control system
Purchase price	101%	200%	186%	101%	100%	101%
Control system						
Specific energy consumption (kWh/kg laundry)	95%	50%	72%	82%	87%	87%

→ Stakeholders are strongly asked to provide further information.

Professional tumble dryer, < 15 kg

Estimated and average costs and savings potential of selected design options compared to values for Base Case 4

Base Case 4: Professional tumble dryer, < 15 kg								
Improvement options	T 2.1 Increase d motor concept	T 2.2 Heat pump	T 2.3 Heat recover y from exhaust air	T 2.5 Improve d air flow system	T 2.6 Air control system	T 2.8 Integrat ed automat ic weighin g system	T 2.10 Control system	I 2.1 Gas- operate d heating ^[1]
Purchase price	101%	200%	186%	101%	100%	101%	100%	110%
Control system								
Specific energy consumption (kWh/kg laundry)	95%	50%	72%	82%	87%	95%	87%	60%

[1] www.enwag.de/media/downloads/.../Gastrockner.pdf

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Professional tumble dryer, 15-40 kg

Estimated and average costs and savings potential of selected design options compared to values for Base Case 5

Base Case 5: Professional tumble dryer, 15-40 kg								
Improvement options	T 2.1 Increased motor concept	T 2.2 Heat pump	T 2.3 Heat recovery from exhaust air	T 2.5 Improved air flow system	T 2.6 Air control system	T 2.8 Integrated automatic weighing system	T 2.10 Control system	I 2.1 Gas-operated heating
Purchase price	101%	200%	186%	101%	100%	101%	100%	110%
Control system								
Specific energy consumption (kWh/kg laundry)	95%	50%	72%	82%	87%	95%	87%	60%

→ Stakeholders are strongly asked to provide further information.

Estimated and average costs and savings potential of selected design options compared to values for Base Case 6

Base Case 6: Professional tumble dryer, > 40 kg								
Improvement options	T 2.1 Increased motor concept	T 2.2 Heat pump	T 2.3 Heat recovery from exhaust air	T 2.5 Improved air flow system	T 2.6 Air control system	T 2.8 Integrated automatic weighing system	T 2.10 Control system	I 2.1 Gas-operated heating
Purchase price	100%	???	186%	100%	100%	100%	100%	106%
Control system								
Specific energy consumption (kWh/kg laundry)	95%	50%	82%	72%	87%	95%	87%	60%

→ Stakeholders are strongly asked to provide further information.

Heavy duty pass through (transfer) tumble dryer

Estimated and average costs and savings potential of selected design options compared to values for Base Case 7

Base Case 7: Heavy duty pass through (transfer) tumble dryer						
Improvement options	T 2.1 Increased motor concept	T 2.3 Heat recovery from exhaust air	T 2.5 Improved air flow system	T 2.6 Air control system	T 2.10 Control systems (infrared)	I 2.1 Gas-operated heating
Purchase price	100%	186%	100%	105%	105%	106%
Continuous operation						
Specific energy consumption (kWh/kg laundry)	95%	72%	82%	87%	90%	80%

→ Stakeholders are strongly asked to provide further information.

Thanks for your attention!

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