

OUR DATE 2018-02-06
DEPARTMENT Global RD, AD&T
FROM Anette Johansson

REG NO TL-5630/18
EDITION
REPLACEMENT
PROJECT NO
PAGE 1 (21)

SUBJECT Washing performance test of ultra-pure water at
MKB ,Malmö.

TO
CC

1. Background /Introduction

A new alternative washing process has been installed in a house property in Malmö. The new process washes without detergent, with cold or hot water, as good as with detergent, according to the company Swatab.

Swatab also said that the load will dry quicker, depending on lower residual moisture after extraction, 20% less, with ultra-pure water. The explanation was that detergent will attach or hold water and without detergent the residual moisture will be lower after extraction.

This is a performance test of this new process, from Swatab, with ultra-pure water at MKB in Malmö.

The purpose was to verify the washing performance and also the residual moisture after extraction.

The machines used, were Electrolux W575HLE.

Two different cold programs with ultra-pure water were tested.

Duration for program 1 was around 28 minutes and for program 2, around 35 minutes.

Local reference tests were done with water only, liquid detergent and IEC detergent.

The tested program was "Normal 60 color" (N60 color), this program lasted for 48-50 minutes.

Washing performance and residual water were evaluated.

2. Summary of results / Conclusion

The best washing performance was achieved with liquid detergent (N60 color) and IEC detergent.

The liquid detergent (N60 color) was best on sebum, soot and blood.

The IEC detergent was best on chocolate and wine.

Water was better than the ultra-pure water, both programs, on all five soils.

The ratio, q (the average sum of reflectance of the test process and the standard reference machine (Electrolux FOM71CLS.)) was 0.95 for the both processes with liquid detergent and IEC detergent. This is class D.

Water, achieved $q=0.76$, class J and ultra-pure water, 0.69 and 0.66, class N and M.

A q-value higher than 0.85 considered as a good washing result according to my experience and also to the old Swedish board of consumers. (They had a five degrees scale in washing performance, where $q=0.85$ means degree 3.) Today this mean class G according to the scale of CENELEC (European Committee for Electrotechnical Standardization)

Water, $q=0.76$, was 3-4 classes better than ultra-pure water.
(In CENELEC a range of $q=0.03$ is one class.)

The conclusion of this test is that detergent is required to obtain better washing performance than $q=0.85$, class G.

Best washing performance shows the liquid detergent (N60color) and the IEC detergent
The two processes with ultra-pure water show lower washing performance,
than water only shows in the N60 program.

The test shows that the residual moisture is quite the same for all processes.
The lowest residual moisture evaluated with liquid detergent + softener (47.6%).
The highest with only water (51.6 %). My explanation why the process with softener gives a lower residual moisture is that softener decrease the surface tension of water and then the textile releases more water.

Sammanfattning

En anläggning med ultra-rent vatten har testats på Malmö Kommunala Bostadsbolag i Malmö. Två maskiner Electrolux W575HLE testades med program 1 och 2.

Programmen tog 28 respektive 35 minuter.

I referensanläggningen testades två W575HLE med program N60 kulör.

Detta program tog ca 48-50 minuter.

Programmet testades med enbart vatten, flytande automatisk dosering och IEC tvättmedel.

Bäst sammanlagt tvättresultat erhöll flytande tvättmedel samt IEC tvättmedlet. Flytande tvättmedlet var bäst på smutserna, sebum, sot och blod. IEC tvättmedlet var bäst på choklad och vin. Vanligt vatten var bättre än ultra-rent vatten på samtliga fem smutsar.

Förhållandet, q , summan av reflektansen av den testade processen och standard referensen (FOM71CLS), var 0.95 för båda de bästa processerna med flytande och IEC tvättmedel, motsvarar klass D .

Vatten erhöll $q=0.76$, vilket motsvarar klass J och ultra-rent vatten processerna erhöll $q=0.69$ resp. $q=0.66$, motsvarande klass N och M.

Högre än 0.85 är ett godkänt tvättresultat, enligt min erfarenhet och även enligt den gamla skalan på Konsumentverket i Sverige. Konsumentverket hade en 5 gradig skala, där $q=0.85$ motsvarade tvättbetyg 3, som var godkänt. Idag motsvarar det klass G enligt CENELECs skala.

Vanligt vatten i N60 kulör var 3-4 klasser bättre än program 1 och 2 med ultra-rent vatten. I CENELEC motsvarar en klass 0.03 i reflektans.

Testet visar att tvättmedel behövs för att erhålla ett godkänt tvättresultat. De två processerna med ultra rent vatten visade sämre resultat än vanligt vatten i N60 kulör programmet.

Testerna visade att restfuktigheten skilde väldigt lite mellan de olika testerna, vilket kan förklaras av att det är samma slutcentrifugering i alla testerna.

Lägst restfuktighet erhöll testen med flytande tvättmedel och sköljmedel 47.6%.

Högst hade vanligt vatten med 51.6%. Testerna med ultrarent vatten erhöll 50%.

Min förklaring till detta är att sköljmedel sänker ytspänningen på vattnet och därmed släpper vattnet lättare från textilierna.

Contents

1. Background /Introduction	1
2. Summary of results / Conclusion	1
Sammanfattning	3
3.Method	5
3.1 Washing process.....	5
3.2 Washing performance.....	6
3.3 Re soiling	7
3.4 Residual moisture.....	7
Result	8
Washing Performance	8
Table 1	9
Diagram 1	9
Diagram 2.	10
Diagram 3.	10
Diagram 4.	11
Diagram 5	11
Re-soil	12
.....	12
Residual moisture.....	12
Table 2	12
Diagram 6	13
Discussion	13
Appendix	14
Program description	14
Program 1 Ultra-pure.....	14
Program 2 Ultra-pure)	17
Program Normal 60 Colour	21

3.Method

3.1 Washing process

3.1.1 Standard reference

Complete process according to standard IEC EN 60456.

Machine: FOM71 CLS

Program: Cotton 60

Tap water: 4°dH

Detergent: IEC detergent

Dosage: 74 g (soft water)

3.1.2.1. Local reference liquid detergent N60 color

Machines: W575HLE

Program: Normal 60 color (see description in appendix)

Duration around 48 min

Tap water: 7°dH

Detergent: Liquid Henkel Eco-Lab

Dosage: Turbo emulsion future 6 ml/kg

Turbo oxysan 1 ml/kg

Softenit dual excellence 3 ml/kg

3.1.2.2. Local reference liquid detergent N60 white

Machines: W575HLE

Program: Normal 60 white (see description in appendix)

Duration around 48 min

Tap water: 7°dH

Detergent: Liquid Henkel Eco-Lab

Dosage: Turbo emulsion future 7 ml/kg

Turbo oxysan 2.5 ml/kg

Softenit dual excellence 3 ml/kg

3.1.2.3. Local reference IEC detergent

Machines: W575HLE

Program: Normal 60 color

Duration around 48 min

Tap water: 7°dH

Detergent: IEC according standard IEC EN 60456

Dosage: 34g+ 10g/kg (7°dH)

3.1.2.4. Local reference water

Machines: W575HLE

Program: Normal 60 color (see description in appendix)

Duration around 48 min

Tap water: 7°dH

Detergent: No

Dosage: No



3.1.3.1 Tested process with ultra-pure water Pr.1

Machines: W575HLE

Program: Program 1 (see description in appendix)

Cold program duration around 28 min

Tap water: *Ultra-pure water

Detergent: No

Dosage: No

3.1.3.2 Tested process with ultra-pure water Pr.2

Machines: W575HLE

Program: Program 2 (see description in appendix)

Cold program duration around 35 min

Tap water: *Ultra-pure water

Detergent: No

Dosage: No

*The water was purified in an equipment from Swatab. The equipment consists of a pre filter, reverse osmosis and ion exchangers. The water has a conductivity of 0.1-0.3 uS/cm, according to Swatab.



3.2 Washing performance

The washing tests were performed according to IEC60456 Ed5.

Minolta spectrophotometer CM-3610d, used for the reflectance measuring.

The load was 5 kg of standard cotton.

Test pieces from EMPA were used, serie 129.

Five test pieces were used in each wash.

The washing performance evaluated by measure the reflectance of the EMPA test pieces.

There are five different soils and one unsoiled, called white. The five soils are sebum, soot, blood, chocolate and wine.

The higher the reflectance on the test pieces (i.e. the whiter after washing), the better washing performance.

The sum and mean values of the reflectance for the five soils, are calculated for each process.

The ratio, q is calculated as the average sum of reflectance of the tested process (Ctest) and for the standard reference (Cref). $q = C_{test}/C_{ref}$

CENELEC (European Committee for Electrotechnical Standardization) has defined a scale with classes from A-G, where A is best.

A difference of 0.03 in reflectance means one class in the scale.

Ratio, q, above 1.03 means an A.

A q-value higher than 0.85 considered as a good washing result according to my experience and also to the old Swedish boarder of consumers. (They had a five degrees scale in washing performance, where $q=0.85$ means degree 3.) Today this mean class G according to the scale of CENELEC.

3.3 Re soiling

Re soil means when the soils are solved in the water and then reattach to the textiles.

There are not enough with force to keep the soil in solution.

The effect can be observed as greying after many washes or as here when the white ballast gets dirty.

3.4 Residual moisture

This means the water that was left in the textiles after extraction, divide with the dry load that was used.

The load was weighed bone-dry (which mean it was dried until no water was left in the textiles) and then it was calculated to dry weight. The standard cotton hold 8 % moisture at 20 °C and 65 %RH.

Four standard loads 1-4 were weighed for the testes.

All loads weighed after each test and the residual moisture was calculated for each test.

Result

Washing Performance

Best washing performance has the two processes, liquid detergent N60 color and IEC detergent, with a mean reflectance of 62.2 (See diagram 1). The two processes with Ultra-pure water cleaned worse, than water.

The diagram 1 shows the result for the mean value for all 5 stains, diagram 2 shows the blood stain and diagram 3 shows the wine stain.

Table 1 shows all reflectance values for all stains and processes.

Water cleaned better than ultra-pure water for all the five stains.

Liquid detergent was best on sebum, soot and blood.

IEC detergent was best on chocolate and wine.

Best washing result shows the processes with liquid detergent color and IEC detergent 0.95, class D. Water, 0.76, class J and ultra-pure water, 0.69 and 0.66, class N and M.

Water only with a $q=0.76$, was 0.07-0.10 better than ultra-pure water Pr.1 and 2.

In CENELEC 0.03 is one class. This will mean that water only was 3-4 classes better than the ultra-pure water.

Diagram 5 shows the line for the scale.

Figure 1.

Shows the EMPA test pieces. Processes from the left.

Liquid detergent N60color (D1) and liquid detergent N60 white (D6), IEC detergent (I11), water (V1), ultra-pure water Pr.1 (U9) and ultra-pure water Pr.2 (U16).

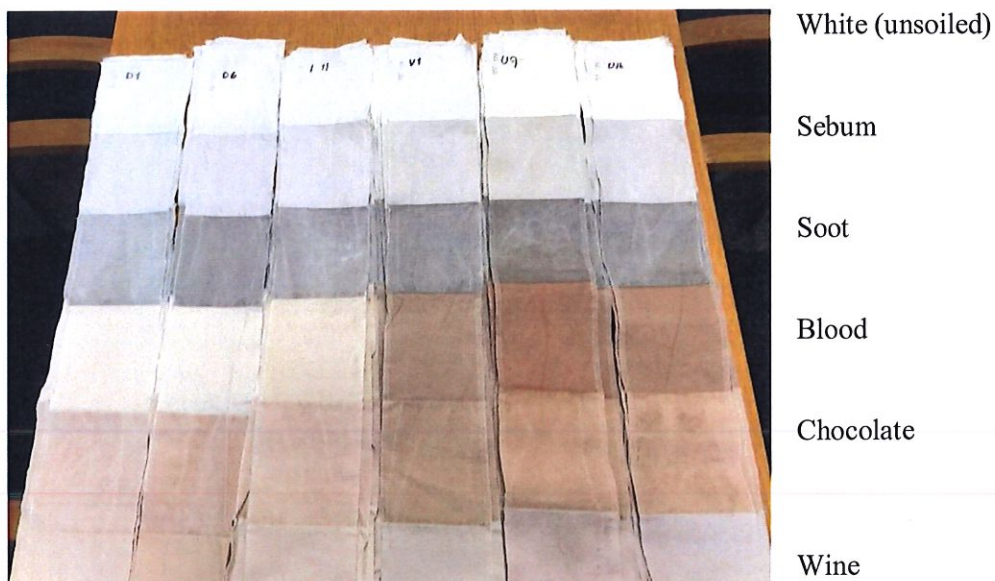


Table 1

Shows the reflectance for all soils.

Machine	q=Ctest/Cref	White	Sebum	Soot	Blood	Chocolate	Wine	Sum	x
Reference Cotton 60	1,0	88,7	71,0	47,3	74,6	64,6	70,3	327,8	65,6
Det liq.N60 color	0,95	87,1	71,3	50,0	71,4	56,2	62,1	310,9	62,2
Det liq. N60 White	0,85	85,4	66,2	37,8	69,3	49,9	56,9	280,1	56,0
IEC N60	0,95	87,7	68,1	45,0	66,5	59,1	72,1	310,8	62,2
Ultra pure Pr 1	0,66	87,6	58,2	31,3	27,9	42,4	56,8	216,6	43,3
Ultrapure Pr 2	0,69	88,4	59,4	33,8	28,6	44,4	59,3	225,6	45,1
Water N60	0,76	85,9	63,9	38,0	37,7	45,7	65,1	250,3	50,1

Diagram 1

Shows the Mean values for the five different soils.

Liquid detergent N60 color and IEC detergent, with reflectance of 62.2, show best result.

Water cleans better than both the two processes with ultra-pure water.

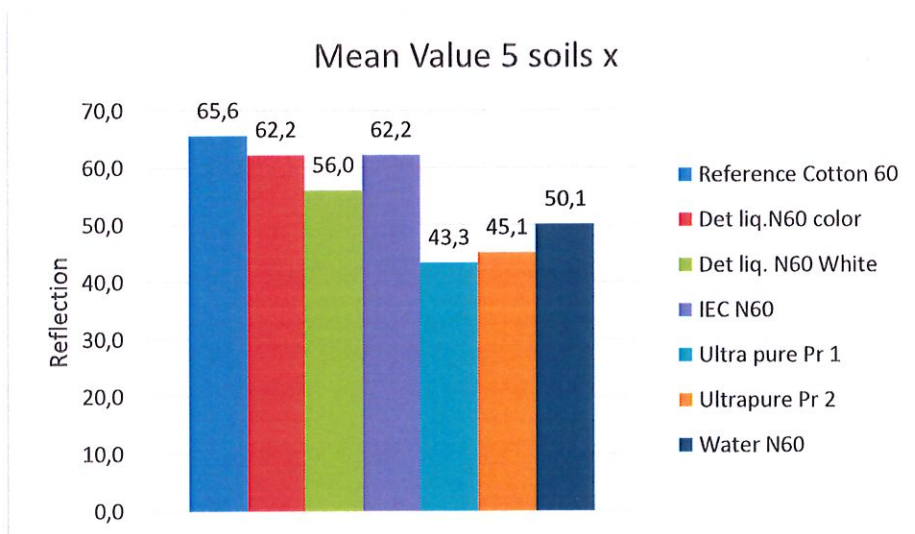


Diagram 2.

Shows the reflectance for the blood soil.

All the washes with detergent were much better than the processes without detergent.

Water cleans better than both the two processes with ultra-pure water.

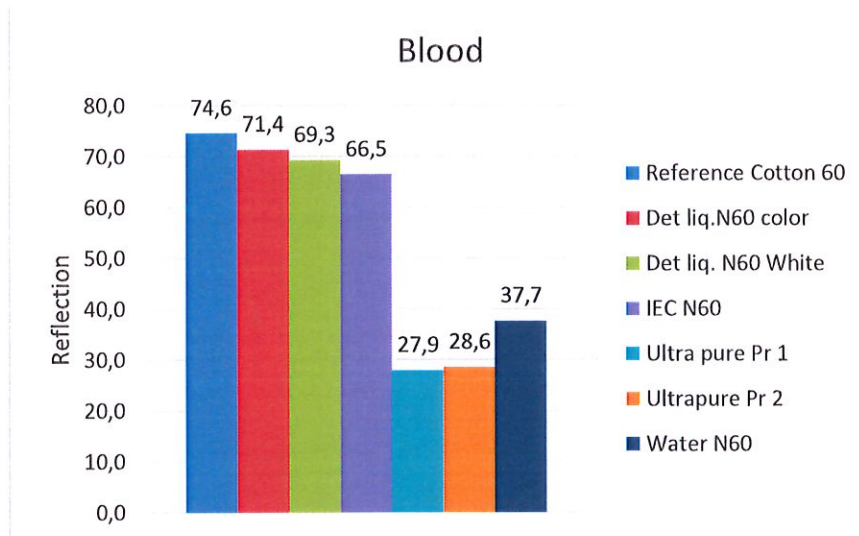


Diagram 3.

Shows the reflectance for the wine soil.

IEC detergent has the best bleaching effect on wine.

Ultra-pure water gave the lowest reflectance.

Noteworthy is that water is better than both the processes with liquid detergent.

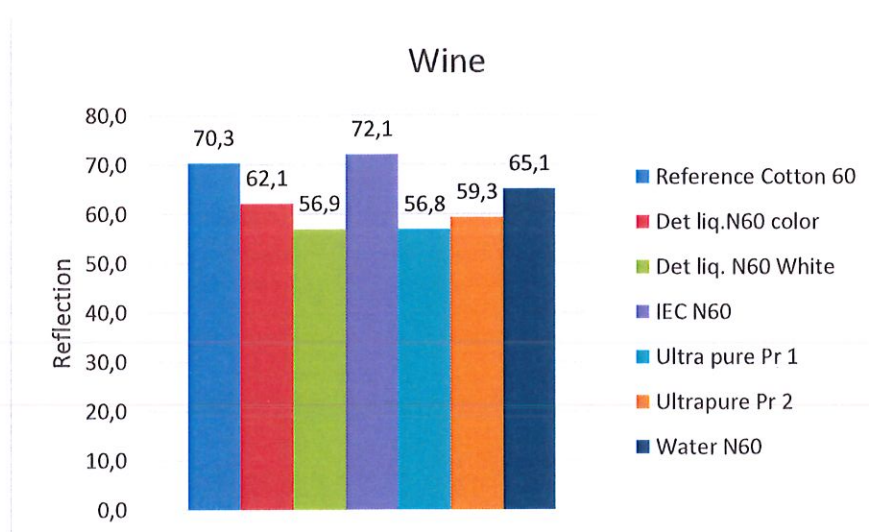


Diagram 4.

Shows the ratio q ($q=C_{test}/C_{ref}$) for the different processes.

Best washing result shows the processes with liquid detergent color and IEC detergent 0.95, means class D, in the scale of CENELEC.

Water, $q=0.76$, class J and ultra-pure water Pr.2, $q= 0.69$ and Pr.1 $q=0.66$, class N and M.

A q -value higher than 0.85 considered as a good washing result.

Tap water, 0.76, was 0.07-0.10 better than ultra-pure water.
In CENELEC 0.03 is one class.

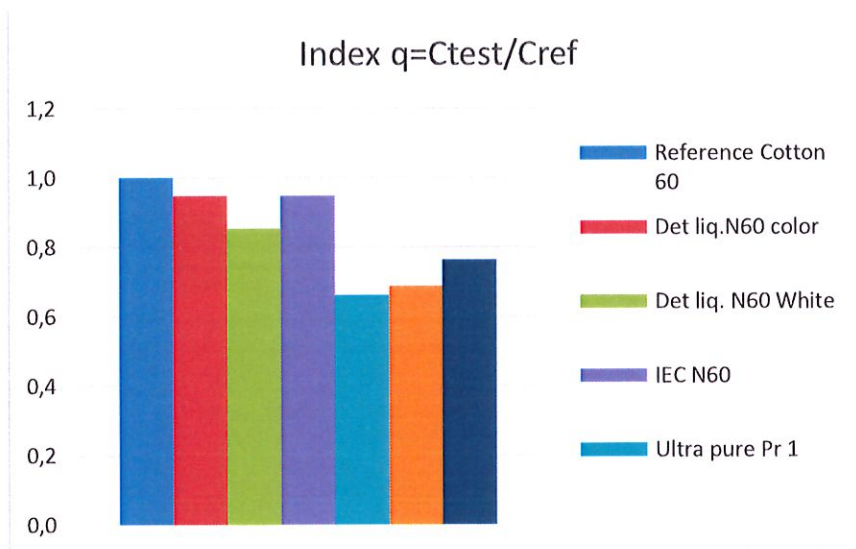


Diagram 5

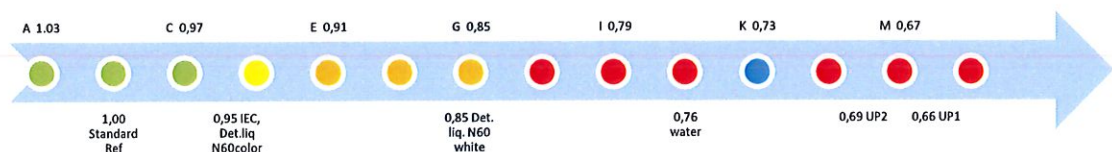
Shows the performance classes A-N in the scale of CENELEC.

Best washing result shows the processes with liquid detergent color and IEC detergent 0.95, means class D, in the scale of CENELEC.

Water, $q=0.76$, class J and ultra-pure water Pr.2, $q= 0.69$ and Pr.1 $q=0.66$, class N and M.

A q -value higher than 0.85 considered as a good washing result.

Tap water, 0.76, was 0.07-0.10 better than ultra-pure water.
In CENELEC 0.03 is one class.



Re-soil

Figure 2. to the left shows the ballast from the process with detergent. The textiles is still white.

Figure 3. to the right shows the ballast from the process with ultra-pure water. The stains have been solved in the water and then reattached to the textiles. Detergent is needed to keep the soils in the water.



2. Shows clean ballast



3. Shows re-soiled ballast

Residual moisture

Four different cotton loads, 1-4, were used.

The residual moisture are quite the same in all tests. Lowest residual moisture was achieved with liquid detergent that also contained softener in last rinse. Detergent and softener decrease the surface tension of water and then the textiles released more water.

The tests with liquid detergent shows the least water retention, 47.6 %. The test with only water holds most water 51.6 %. See table 2 and diagram 6.

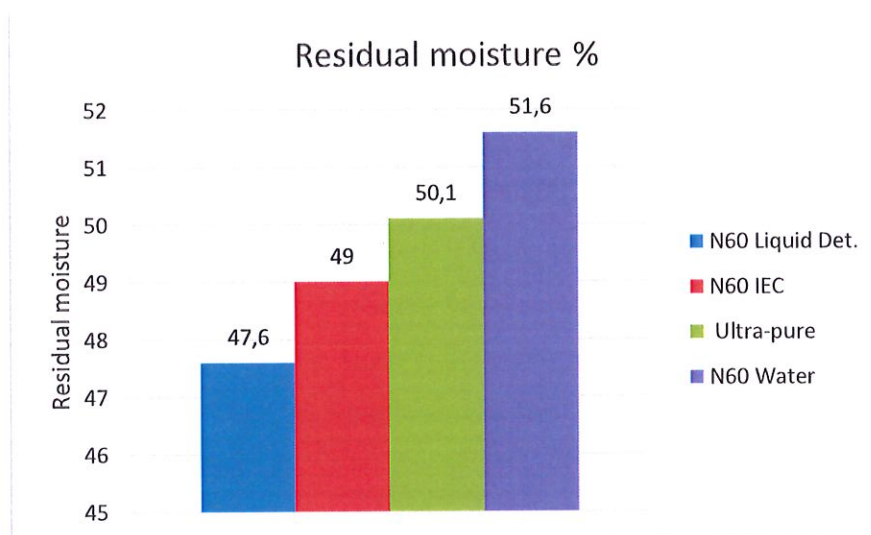
Table 2

Shows the residual moisture for the different processes.

Program	Load	Bone-dry	Dry weight	Wet weight	Water retention	Mean x
		kg	kg	kg	%	%
Pr 1 Ultra-pure	4	4,58	4,95	7,51	51,7	
Pr 1 Ultra-pure	1	4,59	4,96	7,38	48,8	
Pr 2 Ultra-pure	4	4,58	4,95	7,43	50,1	
Pr 2 Ultra-pure	1	4,59	4,96	7,43	49,8	50,1
N60 Water	2	4,53	4,89	7,41	51,5	
	3	4,57	4,94	7,49	51,6	51,6
N60 Liquid Det.	3	4,57	4,94	7,37	49,2	
	2	4,53	4,89	7,14	46,0	47,6
N60 IEC	4	4,58	4,95	7,34	48,3	
	3	4,57	4,94	7,4	49,8	49,0

Diagram 6

Shows the residual moisture for the different processes.



Discussion

The conclusion of this test is that detergent is required to obtain better washing performance than $q=0.85$, class G.

Best washing performance shows the liquid detergent (N60color) and the IEC detergent.

The two processes with ultra-pure water show lower washing performance, than water only shows in the N60 program.

In the ultra-pure processes some of the stains have been solved and then re soiled the textiles. Detergent is needed to keep the soils in the water.

The lowest residual moisture achieved with liquid detergent, as also has softener added in last rinse. Detergent and softener decrease the surface tension of water and then the textiles released more water.

The process with liquid detergent N60 white seems to achieved too low values regarding washing performance. The dosage here is little higher both for detergent and bleach compared with N60 color. A possible reason is that the automatic dosing system did not provide the programmed doses of detergent during that run.

Appendix

Program description

Program 1 Ultra-pure

PROGRAM 1

Free text	NORMALTVÄTT	
Machine	W575H	
Modules	17	
0	Huvuddata	
	Buzzer at Program end	On
	Powder, flush valve from wash program	On
	Program option changes allowed	On
	Motor action 1 on time, CW	00:06
	Motor action 1 on time, CCW	00:06
	Motor action 1 off time	00:18
	Motor action 2 on time, CW	00:15
	Motor action 2 on time, CCW	00:15
	Motor action 2 off time	00:04
	Motor action 3 on time, CW	00:08
	Motor action 3 on time, CCW	00:08
	Motor action 3 off time	00:07
	Motor action 4 off time	00:03
	Motor action 5 off time	00:03
1	Huvudtvätt(1)	
	Reheat	On
	Module heated	On
	Wash Time (Min:Sec)	00:30
	Temperature	0°C
	Temperature Hystereses	4°C
	Max Temp. Increase per min	38°C
	First Fill Level (Set mm)	25
	Second Fill Level (Set mm)	25
	Level Hystereses (Scale Units)	10
	Cold Water	On
	Motor Speed During Filling (Rpm)	30
	Motor Speed During Heating (Rpm)	49
	Motor Speed During Wash (Rpm)	49
	Motor acceleration (RPM/sec) during filling	25
	Motor acceleration (RPM/sec) during heating	25
	Motor acceleration (RPM/sec) during wash	25
	Detergent Compartment 4	00:20
2	Huvudtvätt(2)	
	Reheat	On
	Module heated	On
	Wash Time (Min:Sec)	00:30
	Temperature	0°C
	Temperature Hystereses	4°C
	Max Temp. Increase per min	38°C
	Level Hystereses (Scale Units)	10
	Motor action fill	2
	Motor action heat	2
	Motor action wash	2
	Motor Speed During Filling (Rpm)	30
	Motor Speed During Heating (Rpm)	49
	Motor Speed During Wash (Rpm)	49
	Motor acceleration (RPM/sec) during filling	25
	Motor acceleration (RPM/sec) during heating	25
	Motor acceleration (RPM/sec) during wash	25
	Detergent Compartment 4	00:10
	Detergent Compartment 5	00:10
	Detergent Signal 2	00:10
3	Huvudtvätt(3)	
	Wash Time (Min:Sec)	02:30
	Temperature	0°C
	Temperature Hystereses	4°C
	Max Temp. Increase per min	38°C
	First Fill Level (Set mm)	61
	Second Fill Level (Set mm)	70
	Level Hystereses (Scale Units)	10
	Motor action fill	2
	Motor action heat	2
	Motor action wash	2
	Motor Speed During Filling (Rpm)	30
	Motor Speed During Heating (Rpm)	49
	Motor Speed During Wash (Rpm)	49
	Motor acceleration (RPM/sec) during filling	25
	Motor acceleration (RPM/sec) during heating	25
	Motor acceleration (RPM/sec) during wash	25
	Detergent Compartment 5	Level refill

2018-02-08

W575H

1

PROGRAM 1

4	Huvudtvätt(4)	
	Module heated	On
	Wash Time (Min:Sec)	01:00
	Temperature	0°C
	Temperature Hystereses	4°C
	Max Temp. Increase per min	38°C
	Second Fill Level (Set mm)	73
	Level Hystereses (Scale Units)	21
	Motor action fill	2
	Motor action heat	2
	Motor action wash	2
	Motor Speed During Filling (Rpm)	30
	Motor Speed During Heating (Rpm)	49
	Motor Speed During Wash (Rpm)	49
	Motor acceleration (RPM/sec) during filling	25
	Motor acceleration (RPM/sec) during heating	25
	Motor acceleration (RPM/sec) during wash	25
	Detergent Compartment 5	Level refill
5	Avlopp(1)	
	Drain Normal	On
	Motor Action	2
	Drain Time (min:sec)	00:10
	Distribution Time (min:sec)	00:01
	Motor Speed During Drain Time (Rpm)	49
	Motor Acceleration During Drain (Rpm/sec)	25
6	Centrifugering(1)	
	Drain Normal	On
	Program option changes allowed	On
	Extract Time (Min:Sec)	00:30
	Extract Speed in Rpm	1015
7	Sköljning(1)	
	Reheat	On
	Module heated	On
	Program option changes allowed	On
	Wash Time (Min:Sec)	04:00
	Temperature	0°C
	Temperature Hystereses	4°C
	Max Temp. Increase per min	38°C
	First Fill Level (Set mm)	61
	Second Fill Level (Set mm)	102
	Level Hystereses (Scale Units)	50
	Cold Water	On
	Motor action fill	2
	Motor action heat	2
	Motor action wash	2
	Motor Speed During Filling (Rpm)	30
	Motor Speed During Heating (Rpm)	49
	Motor Speed During Wash (Rpm)	49
	Motor acceleration (RPM/sec) during filling	25
	Motor acceleration (RPM/sec) during heating	25
	Motor acceleration (RPM/sec) during wash	25
8	Avlopp(2)	
	Drain Normal	On
	Motor Action	2
	Drain Time (min:sec)	00:10
	Distribution Time (min:sec)	00:01
	Motor Speed During Drain Time (Rpm)	49
	Motor Acceleration During Drain (Rpm/sec)	25
9	Centrifugering(2)	
	Drain Normal	On
	Program option changes allowed	On
	Extract Time (Min:Sec)	00:30
	Extract Speed in Rpm	1015
10	Sköljning(2)	
	Reheat	On
	Module heated	On
	Program option changes allowed	On
	Wash Time (Min:Sec)	04:00
	Temperature	0°C
	Temperature Hystereses	4°C
	Max Temp. Increase per min	38°C
	First Fill Level (Set mm)	61
	Second Fill Level (Set mm)	102
	Level Hystereses (Scale Units)	50
	Cold Water	On
	Motor action fill	2
	Motor action heat	2
	Motor action wash	2
	Motor Speed During Filling (Rpm)	30
	Motor Speed During Heating (Rpm)	49

PROGRAM 1

	Motor Speed During Wash (Rpm)	49
	Motor acceleration (RPM/sec) during filling	25
	Motor acceleration (RPM/sec) during heating	25
	Motor acceleration (RPM/sec) during wash	25
11	Avlopp(3)	
	Drain Normal	On
	Motor Action	2
	Drain Time (min:sec)	00:10
	Distribution Time (min:sec)	00:01
	Motor Speed During Drain Time (Rpm)	49
	Motor Acceleration During Drain (Rpm/sec)	25
12	Centrifugering(3)	
	Drain Normal	On
	Program option changes allowed	On
	Extract Time (Min:Sec)	00:30
	Extract Speed in Rpm	1015
13	Sköljning(3)	
	Reheat	On
	Module heated	On
	Program option changes allowed	On
	Wash Time (Min:Sec)	04:00
	Temperature	0°C
	Temperature Hystereses	4°C
	Max Temp. Increase per min	38°C
	First Fill Level (Set mm)	61
	Second Fill Level (Set mm)	102
	Level Hystereses (Scale Units)	50
	Cold Water	On
	Hot water flush	On
	Motor action fill	2
	Motor action heat	2
	Motor action wash	2
	Motor Speed During Filling (Rpm)	30
	Motor Speed During Heating (Rpm)	49
	Motor Speed During Wash (Rpm)	49
	Motor acceleration (RPM/sec) during filling	25
	Motor acceleration (RPM/sec) during heating	25
	Motor acceleration (RPM/sec) during wash	25
	Detergent Compartment 3	Level no refill
	Detergent Signal 3	00:10
14	Avlopp(4)	
	Drain Normal	On
	Motor Action	2
	Drain Time (min:sec)	00:10
	Distribution Time (min:sec)	00:01
	Motor Speed During Drain Time (Rpm)	49
	Motor Acceleration During Drain (Rpm/sec)	25
15	Centrifugering(4)	
	Drain Normal	On
	Program option changes allowed	On
	Extract Time (Min:Sec)	05:10
	Extract Speed in Rpm	1245
16	Slut	

Program 2 Ultra-pure)

PROGRAM 2

Free text Hårt smutsat
Machine W575H
Modules 22

0	Huvuddata	
	Buzzer at Program end	On
	Powder, flush valve from wash program	On
	Program option changes allowed	On
	Motor action 1 on time, CW	00:06
	Motor action 1 on time, CCW	00:06
	Motor action 1 off time	00:18
	Motor action 2 on time, CW	00:15
	Motor action 2 on time, CCW	00:15
	Motor action 2 off time	00:04
	Motor action 3 on time, CW	00:08
	Motor action 3 on time, CCW	00:07
	Motor action 3 off time	00:03
	Motor action 4 off time	00:03
	Motor action 5 off time	00:03
1	Förtvätt(1)	
	Module heated	On
	Wash Time (Min:Sec)	00:30
	Temperature	0°C
	Temperature Hystereses	4°C
	Max Temp. Increase per min	40°C
	First Fill Level (Set mm)	25
	Second Fill Level (Set mm)	25
	Level Hystereses (Scale Units)	10
	Cold Water	On
	Motor action fill	2
	Motor action heat	2
	Motor action wash	2
	Motor Speed During Filling (Rpm)	30
	Motor Speed During Heating (Rpm)	49
	Motor Speed During Wash (Rpm)	49
	Motor acceleration (RPM/sec) during filling	25
	Motor acceleration (RPM/sec) during heating	25
	Motor acceleration (RPM/sec) during wash	25
2	Förtvätt(2)	
	Module heated	On
	Wash Time (Min:Sec)	00:30
	Temperature	0°C
	Temperature Hystereses	4°C
	Max Temp. Increase per min	40°C
	Level Hystereses (Scale Units)	10
	Cold Water	On
	Motor action fill	2
	Motor action heat	2
	Motor action wash	2
	Motor Speed During Filling (Rpm)	30
	Motor Speed During Heating (Rpm)	49
	Motor Speed During Wash (Rpm)	49
	Motor acceleration (RPM/sec) during filling	25
	Motor acceleration (RPM/sec) during heating	25
	Motor acceleration (RPM/sec) during wash	25
3	Förtvätt(3)	
	Module heated	On
	Wash Time (Min:Sec)	02:30
	Temperature	0°C
	Temperature Hystereses	4°C
	Max Temp. Increase per min	40°C
	First Fill Level (Set mm)	61
	Second Fill Level (Set mm)	70
	Level Hystereses (Scale Units)	10
	Cold Water	On
	Motor action fill	2
	Motor action heat	2
	Motor action wash	2
	Motor Speed During Filling (Rpm)	30
	Motor Speed During Heating (Rpm)	49
	Motor Speed During Wash (Rpm)	49
	Motor acceleration (RPM/sec) during filling	25
	Motor acceleration (RPM/sec) during heating	25
	Motor acceleration (RPM/sec) during wash	25
4	Förtvätt(4)	

2018-02-09

W575H

1

PROGRAM 2

	Module heated	On
	Wash Time (Min:Sec)	00:30
	Temperature	0°C
	Temperature Hystereses	4°C
	Max Temp. Increase per min	40°C
	Second Fill Level (Set mm)	73
	Level Hystereses (Scale Units)	21
	Cold Water	On
	Motor action fill	2
	Motor action heat	2
	Motor action wash	2
	Motor Speed During Filling (Rpm)	30
	Motor Speed During Heating (Rpm)	49
	Motor Speed During Wash (Rpm)	49
	Motor acceleration (RPM/sec) during filling	25
	Motor acceleration (RPM/sec) during heating	25
	Motor acceleration (RPM/sec) during wash	25
5	Avlopp(1)	
	Drain Normal	On
	Motor Action	2
	Drain Time (min:sec)	00:10
	Distribution Time (min:sec)	00:01
	Motor Speed During Drain Time (Rpm)	49
	Motor Acceleration During Drain (Rpm/sec)	25
6	Huvudtvätt(1)	
	Reheat	On
	Module heated	On
	Wash Time (Min:Sec)	00:30
	Temperature	0°C
	Temperature Hystereses	4°C
	Max Temp. Increase per min	38°C
	First Fill Level (Set mm)	25
	Second Fill Level (Set mm)	25
	Level Hystereses (Scale Units)	10
	Cold Water	On
	Motor Speed During Filling (Rpm)	30
	Motor Speed During Heating (Rpm)	49
	Motor Speed During Wash (Rpm)	49
	Motor acceleration (RPM/sec) during filling	25
	Motor acceleration (RPM/sec) during heating	25
	Motor acceleration (RPM/sec) during wash	25
	Detergent Compartment 4	00:20
7	Huvudtvätt(2)	
	Reheat	On
	Module heated	On
	Wash Time (Min:Sec)	00:30
	Temperature	0°C
	Temperature Hystereses	4°C
	Max Temp. Increase per min	38°C
	Level Hystereses (Scale Units)	10
	Motor action fill	2
	Motor action heat	2
	Motor action wash	2
	Motor Speed During Filling (Rpm)	30
	Motor Speed During Heating (Rpm)	49
	Motor Speed During Wash (Rpm)	49
	Motor acceleration (RPM/sec) during filling	25
	Motor acceleration (RPM/sec) during heating	25
	Motor acceleration (RPM/sec) during wash	25
	Detergent Compartment 4	00:10
	Detergent Compartment 5	00:10
	Detergent Signal 2	00:10
8	Huvudtvätt(3)	
	Wash Time (Min:Sec)	02:30
	Temperature	0°C
	Temperature Hystereses	4°C
	Max Temp. Increase per min	38°C
	First Fill Level (Set mm)	61
	Second Fill Level (Set mm)	70
	Level Hystereses (Scale Units)	10
	Motor action fill	2
	Motor action heat	2
	Motor action wash	2
	Motor Speed During Filling (Rpm)	30
	Motor Speed During Heating (Rpm)	49
	Motor Speed During Wash (Rpm)	49
	Motor acceleration (RPM/sec) during filling	25
	Motor acceleration (RPM/sec) during heating	25
	Motor acceleration (RPM/sec) during wash	25
	Detergent Compartment 5	Level refill
9	Huvudtvätt(4)	

2018-02-09

W575H

2

PROGRAM 2

Module heated	On
Wash Time (Min:Sec)	00:30
Temperature	0°C
Temperature Hystereses	4°C
Max Temp. Increase per min	38°C
Second Fill Level (Set mm)	73
Level Hystereses (Scale Units)	21
Motor action fill	2
Motor action heat	2
Motor action wash	2
Motor Speed During Filling (Rpm)	30
Motor Speed During Heating (Rpm)	49
Motor Speed During Wash (Rpm)	49
Motor acceleration (RPM/sec) during filling	25
Motor acceleration (RPM/sec) during heating	25
Motor acceleration (RPM/sec) during wash	25
Detergent Compartment 5	Level refill
10 Avlopp(2)	
Drain Normal	On
Motor Action	2
Drain Time (min:sec)	00:10
Distribution Time (min:sec)	00:01
Motor Speed During Drain Time (Rpm)	49
Motor Acceleration During Drain (Rpm/sec)	25
11 Centrifugering(1)	
Drain Normal	On
Program option changes allowed	On
Extract Time (Min:Sec)	00:30
Extract Speed in Rpm	1015
12 Sköljning(1)	
Reheat	On
Module heated	On
Program option changes allowed	On
Wash Time (Min:Sec)	04:00
Temperature	0°C
Temperature Hystereses	4°C
Max Temp. Increase per min	38°C
First Fill Level (Set mm)	61
Second Fill Level (Set mm)	102
Level Hystereses (Scale Units)	50
Cold Water	On
Motor action fill	2
Motor action heat	2
Motor action wash	2
Motor Speed During Filling (Rpm)	30
Motor Speed During Heating (Rpm)	49
Motor Speed During Wash (Rpm)	49
Motor acceleration (RPM/sec) during filling	25
Motor acceleration (RPM/sec) during heating	25
Motor acceleration (RPM/sec) during wash	25
13 Avlopp(3)	
Drain Normal	On
Motor Action	2
Drain Time (min:sec)	00:10
Distribution Time (min:sec)	00:01
Motor Speed During Drain Time (Rpm)	49
Motor Acceleration During Drain (Rpm/sec)	25
14 Centrifugering(2)	
Drain Normal	On
Program option changes allowed	On
Extract Time (Min:Sec)	00:30
Extract Speed in Rpm	1015
15 Sköljning(2)	
Reheat	On
Module heated	On
Program option changes allowed	On
Wash Time (Min:Sec)	04:00
Temperature	0°C
Temperature Hystereses	4°C
Max Temp. Increase per min	38°C
First Fill Level (Set mm)	61
Second Fill Level (Set mm)	102
Level Hystereses (Scale Units)	50
Cold Water	On
Motor action fill	2
Motor action heat	2
Motor action wash	2
Motor Speed During Filling (Rpm)	30
Motor Speed During Heating (Rpm)	49
Motor Speed During Wash (Rpm)	49

PROGRAM 2

	Motor acceleration (RPM/sec) during filling	25
	Motor acceleration (RPM/sec) during heating	25
	Motor acceleration (RPM/sec) during wash	25
16	Avlopp(4)	
	Drain Normal	On
	Motor Action	2
	Drain Time (min:sec)	00:10
	Distribution Time (min:sec)	00:01
	Motor Speed During Drain Time (Rpm)	49
	Motor Acceleration During Drain (Rpm/sec)	25
17	Centrifugering(3)	
	Drain Normal	On
	Program option changes allowed	On
	Extract Time (Min:Sec)	00:30
	Extract Speed in Rpm	1015
18	Sköjning(3)	
	Reheat	On
	Module heated	On
	Program option changes allowed	On
	Wash Time (Min:Sec)	04:00
	Temperature	0°C
	Temperature Hystereses	4°C
	Max Temp. Increase per min	38°C
	First Fill Level (Set mm)	61
	Second Fill Level (Set mm)	102
	Level Hystereses (Scale Units)	50
	Cold Water	On
	Hot water flush	On
	Motor action fill	2
	Motor action heat	2
	Motor action wash	2
	Motor Speed During Filling (Rpm)	30
	Motor Speed During Heating (Rpm)	49
	Motor Speed During Wash (Rpm)	49
	Motor acceleration (RPM/sec) during filling	25
	Motor acceleration (RPM/sec) during heating	25
	Motor acceleration (RPM/sec) during wash	25
	Detergent Compartment 3	Level no refill
	Detergent Signal 3	00:10
19	Avlopp(5)	
	Drain Normal	On
	Motor Action	2
	Drain Time (min:sec)	00:10
	Distribution Time (min:sec)	00:01
	Motor Speed During Drain Time (Rpm)	49
	Motor Acceleration During Drain (Rpm/sec)	25
20	Centrifugering(4)	
	Drain Normal	On
	Program option changes allowed	On
	Extract Time (Min:Sec)	05:10
	Extract Speed in Rpm	1245
21	Slut	

Program Normal 60 Colour

Electrolux Laundry Systems

1 (1)

418776123 6A01 SE CH EL/DS W575H 1E 2F

NORMAL 60 COLOUR - (A01)

Module	Param Chd	Out Alwd.	Hot Flush	Valves	Pump	1st Lvl	2nd Lvl	Lvl Hyst	Temp	Time (s)	Fill	Heat	Wash	RPM
Weight										90 s				
Mainwash				C	2	40	40	10	0°C	30 s	2	2	2	
Pump time					10									
Mainwash				H		61	70	10	50°C	150 s	2	2	2	
Mainwash				H		68	71	52°C	60 s	2	2	2		
Mainwash	Y	Y		H		68	71	52°C	1020 s	2	2	2		
Drain	Y	Y								30 s			2	
Extract	Y	Y								60 s			1015	
Rinse	Y	Y		C		61	75	50	0°C	240 s	2	2	2	
Drain	Y	Y								30 s			2	
Extract	Y	Y								60 s			1015	
Rinse	Y	Y		C	3	61	75	50	0°C	240 s	2	2	2	
Pump time					10									
Drain	Y	Y								30 s			2	
Extract	Y	Y								350 s			1245	

NOTE: Column Valves in table indicates "Powder detergent valves", whilst the column Pump indicates "Liquid detergent". When "C" or "H" is present in column Valves, it means that the main cold or hot inlet valve is open.

Fill/Heat/Wash on/off
 Motor action 1 6/18
 Motor action 2 15/4
 Motor action 3 8/7
 Motor action 4 0/3
 Motor action 5 0/3

Baseline valve configuration

Valve	Flow	Temperature	Separate valve
Powder detergent valve 1	20 l/min	Cold	No
Powder detergent valve 2	20 l/min	Cold	No
Powder detergent valve 3	1 l/min	Cold	No
Powder detergent valve 4	20 l/min	Hot	No
Powder detergent valve 5	20 l/min	Hot	No
Powder detergent valve 6	20 l/min	Cold	No
Powder detergent valve 7	20 l/min	Cold	No

418776123 E 24.q7s

2017-03-20 13:20:24