



**INNOVHUB**  
STAZIONI SPERIMENTALI  
PER L'INDUSTRIA

Innovazione e ricerca



STAZIONE SPERIMENTALE  
CARTA, CARTONI  
E PASTE PER CARTA

SEDE OPERATIVA:  
Via Giuseppe Colombo, 83  
20133 Milano  
Tel +39 02.239553.1  
Fax +39 02.2365039  
sales.innovhub@mi.camcom.it  
www.innovhub-ssi.it  
P.IVA 05121060965 - C.F. 97425580152



LAB N° 0082

TEST REPORT N. 839

P. 1 / 4

Spett.  
QUIMARI SRL  
Via Artigiani 3/a - Loc. Prado  
27010 CURA CARPIGNANO PV

Milan, 30/07/2015

**CUSTOMER ORDER:**

Request order received: 21/01/2015

Laboratory stop: 29/07/15

**SAMPLE IDENTIFICATION:**

Sample signed: "pallini softair Bio Elite made in Italy".

Sampling, transport and delivery due to Customer.

Description customer request:

Your letter dated 19/01/2015

**TEST METHOD:**

00.03 \* PREPARATION OF THE SAMPLE FOR BIODEGRADABILITY TESTS

00.73 \*TOC determination (Total Organic Carbon). (Analytic method UNI 13137/02)

32.10 BIODEGRADABILITY IN MATURE COMPOST UNI-EN 14046/2003, ISO 14855-1/2005.

S.D.



INNOVHUB  
STAZIONI SPERIMENTALI  
PER L'INDUSTRIA

Innovazione e ricerca

**SSCCP**  
THE ITALIAN PULP AND PAPER RESEARCH INSTITUTE  
STAZIONE SPERIMENTALE  
CARTA, CARTONI  
E PASTE PER CARTA

SEDE OPERATIVA:  
Via Giuseppe Colombo, 83  
20133 Milano  
Tel +39 02.239553.1  
Fax +39 02.2365039  
sales.innovhub@mi.camcom.it  
www.innovhub-ssi.it  
P.IVA 05121060965 - C.F. 97425580152



LAB N° 0082

TEST REPORT N. 839

P. 2 / 4

00.03 \*PREPARATION OF THE SAMPLE FOR BIODEGRADABILITY TESTS

Data of test start: 22/01/15 Data of test end: 26/01/15

The sample was ground in liquid nitrogen until obtaining particle size <1 mm.

00.73 \*TOC determination (Total Organic Carbon). (Analytic method UNI 13137/02)

Data of test start: 26/01/15 Data of test end: 28/01/15

% Total organic carbon "pallini softair Bio Elite made in Italy"= 17,40%.

32.10 BIODEGRADABILITY IN MATURE COMPOST UNI-EN 14046/2003, ISO 14855-1/2005.

Data of test start: 26/01/15 Data of test end: 29/07/15

**Experimental conditions**

**Determination of the ultimate aerobic biodegradability under controlled composting conditions.**

**Reactors employed:** (3 litres capacity jars).

3 reactors for the blank.

3 reactors for the reference sample.

3 reactors for the sample.

**Reference sample:** Avicel cellulose (Merck) about 20 g for each reactor.

**Analysed sample:** milled sample, about 20 g for each reactor.

**Temperature during the test:** 58 ±2 °C.

**Testing mixture:** mature compost from a composting plant mixed with an inert support (vermiculite, Sigma – Aldrich). For each reactor: 300 g compost + 100 g vermiculite (dry weight).

**Water content of the testing mixture:** about 40 % during the test.

**Validation of the test:**

	YES	NO
Was the degree of biodegradability of the reference material (Avicel) > than 70% after 45 days? (Mean obtained value: 92,4%)	X	
Is the difference among the percentage of biodegradability of the reference material (Avicel) in the different reactors < than 20% at the end of the test?	X	
Is the CO <sub>2</sub> production of the compost after 10 days of test comprised between 50 and 150 mg CO <sub>2</sub> / g of volatile solids? (Mean obtained value: 87,3 mg CO <sub>2</sub> /g)	X	
<b>Validation of the test:</b>	X	

S.O.



**INNOVHUB**  
STAZIONI SPERIMENTALI  
PER L'INDUSTRIA

Innovazione e ricerca

**SSCCP**  
THE ITALIAN PULP AND PAPER RESEARCH INSTITUTE  
STAZIONE SPERIMENTALE  
CARTA, CARTONI  
E PASTE PER CARTA

SEDE OPERATIVA:  
Via Giuseppe Colombo, 83  
20133 Milano  
Tel +39 02.239553.1  
Fax +39 02.2365039  
sales.innovhub@mi.camcom.it  
www.innovhub-ssi.it  
P.IVA 05121060965 - C.F. 97425580152



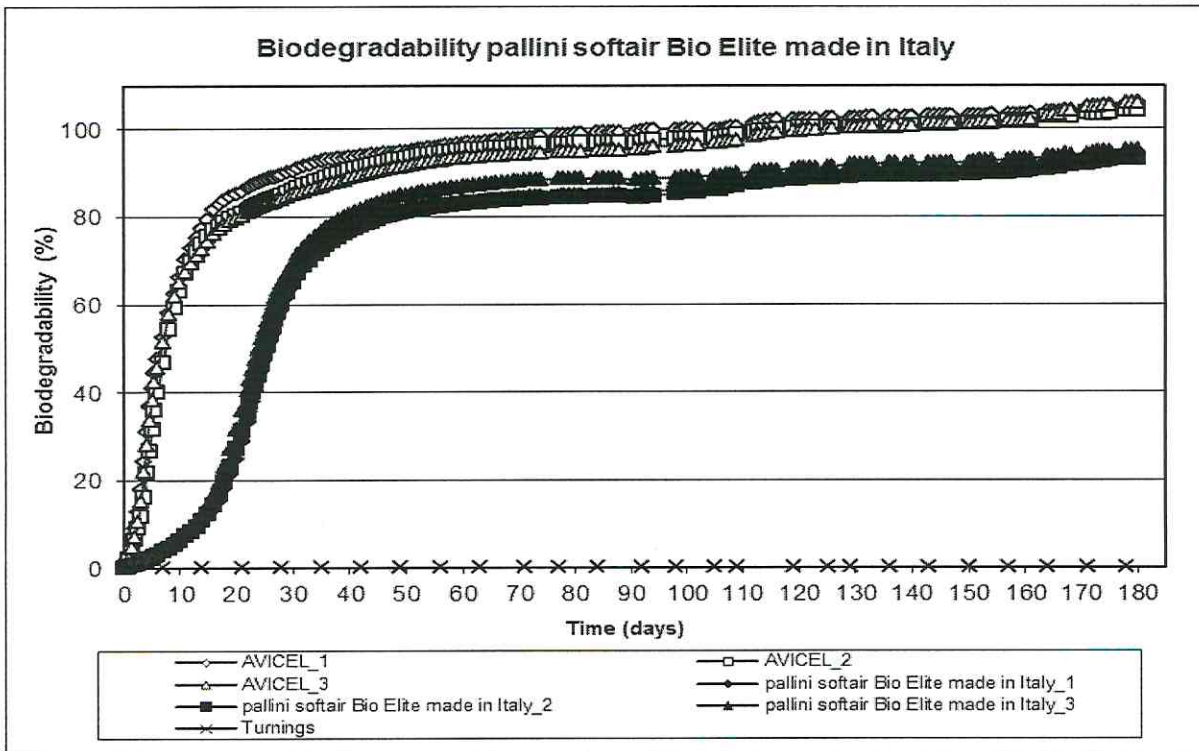
**ACCREDIA**  
L'ENTE ITALIANO DI ACCREDITAMENTO

LAB N° 0082

TEST REPORT N. 839

P. 3 / 4

**Determination of the ultimate aerobic biodegradability under controlled composting conditions.**



% biodegradability = Calculated respect the quantity of the total organic carbon initially contained in the sample.

S.D.



**INNOVHUB**  
STAZIONI SPERIMENTALI  
PER L'INDUSTRIA

Innovazione e ricerca



STAZIONE SPERIMENTALE  
CARTA, CARTONI  
E PASTE PER CARTA

SEDE OPERATIVA:  
Via Giuseppe Colombo, 83  
20133 Milano  
Tel +39 02.239553.1  
Fax +39 02.2365039  
sales.innovhub@mi.camcom.it  
www.innovhub-ssi.it  
P.IVA 05121060965 - C.F. 97425580152



LAB N° 0082

TEST REPORT N. 839

P. 4 / 4

Sample	% Biodegradation				
	replicate 1	replicate 2	replicate 3	Average	Standard Deviation
Reference, Avicel Cellulose	105,9	104,1	105,9	105,3	1,1
Pallini softair Bio Elite made in Italy	94,6	93,1	95,2	94,3	1,1

Annex 1 and Annex 2 report cumulative CO<sub>2</sub> and Biodegradability data collected during the 180 days of test.

N.B.- The results of the present report solely refer to the received samples. The reproduction of individual parts of this report without our prior written approval, is prohibited.  
The residual sample is stored for three months.

DESIGNATED TECHNICAL RESPONSIBLE

(Dr. Sara Daina)

*Sara Daina*

THE DIVISION MANAGER

(Dr. Patrizia Sadocco)

*P. Sadocco*





INNOVHUB  
STAZIONI SPERIMENTALI  
PER L'INDUSTRIA



Innovazione e ricerca

TEST REPORT N. 839- Annex 2  
Laboratory start: 26/01/2015

### % Biodegradability (pag. 1/4)

Date	26-gen	27-gen	27-gen	27-gen	28-gen	28-gen	28-gen	29-gen	29-gen	30-gen	30-gen	31-gen	31-gen	1-feb	1-feb	2-feb	3-feb	4-feb	5-feb	6-feb	7-feb	8-feb
<b>Days</b>	0	0,5	1	1,5	2	2,5	3	3,5	4	4,5	5	5,5	6	7	8	9	10	11	12	13		
AVICEL_1	0	0,98	3,25	6,06	9,12	12,79	17,83	24,24	31,10	36,68	40,93	44,34	47,61	52,52	58,05	62,55	66,41	70,28	73,12	75,43		
AVICEL_2	0	0,72	2,08	4,30	6,48	9,06	11,69	16,07	21,52	26,70	31,65	36,04	40,03	46,66	54,37	59,18	63,14	67,01	69,81	72,08		
AVICEL_3	0	0,72	2,22	4,70	7,19	10,54	15,32	21,88	28,08	33,53	38,20	42,24	45,60	51,29	57,93	61,92	65,05	67,54	69,48	71,22		
Pallini softair Bio Elite made in Italy_1	0	0,17	0,54	0,92	1,15	1,38	1,57	1,78	2,04	2,33	2,60	2,91	3,23	3,92	4,66	5,46	6,22	7,06	8,00	9,09		
Pallini softair Bio Elite made in Italy_2	0	-0,03	0,23	0,55	0,74	0,96	1,15	1,40	1,67	1,99	2,30	2,66	3,01	3,76	4,52	5,40	6,28	7,22	8,26	9,46		
Pallini softair Bio Elite made in Italy_3	0	0,10	0,46	0,77	1,06	1,30	1,50	1,76	2,06	2,38	2,73	3,11	3,49	4,35	5,19	6,10	7,06	8,12	9,32	10,69		
Turnings														0,000								

Date	9-feb	10-feb	11-feb	12-feb	13-feb	14-feb	15-feb	16-feb	17-feb	18-feb	19-feb	19-feb	20-feb	20-feb	21-feb	21-feb	22-feb	22-feb
<b>Days</b>	14	15	16	17	18	19	20	21	22	23	24	24,5	25	25,5	26	26,5	27	27,5
AVICEL_1	77,34	79,48	81,81	82,93	83,81	84,51	85,22	85,79	86,61	87,07	87,39	87,67	88,19	88,42	88,69	88,88	89,08	89,14
AVICEL_2	73,97	75,68	77,09	78,07	78,85	79,58	80,21	80,77	81,48	81,82	82,18	82,52	83,16	83,44	83,71	83,96	84,21	84,45
AVICEL_3	72,70	74,55	76,25	77,42	78,32	79,07	79,71	80,27	81,03	81,37	81,73	82,05	82,34	82,88	83,12	83,34	83,55	83,76
Pallini softair Bio Elite made in Italy_1	10,35	11,78	13,46	15,51	18,02	21,23	24,98	28,97	33,38	35,66	37,96	40,32	42,71	45,01	47,33	49,46	51,56	53,44
Pallini softair Bio Elite made in Italy_2	10,84	12,40	14,28	16,61	19,55	23,04	27,06	31,25	35,46	37,72	39,99	42,33	44,58	46,78	48,93	51,03	53,07	55,04
Pallini softair Bio Elite made in Italy_3	12,36	14,22	16,70	19,64	23,23	27,24	31,46	35,86	40,56	42,91	45,29	47,61	49,96	52,19	54,28	56,32	58,25	60,03
Turnings	0							0,000										

End of test: 29/07/2015

Signature: *Seema Dine*



Riferimento: rapporto di Prova 839- Allegato 2  
DATA INIZIO PROVA: 26/01/2015

**% Biodegradability (pag. 2/4)**

Date	23-feb	24-feb	25-feb	26-feb	27-feb	28-feb	1-mar	2-mar	3-mar	4-mar	5-mar	6-mar	7-mar	8-mar	9-mar	10-mar	11-mar	12-mar	13-mar	14-mar
<b>Days</b>	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
AVICEL_1	89,50	90,16	90,60	91,16	91,54	92,02	92,46	92,86	93,01	93,15	93,29	93,44	93,59	93,72	93,90	94,05	94,16	94,30	94,45	94,57
AVICEL_2	84,94	85,56	86,23	86,82	87,27	87,71	88,14	88,54	89,02	89,52	89,94	90,33	90,67	90,95	91,37	91,74	92,09	92,37	92,62	92,85
AVICEL_3	84,14	84,63	85,12	85,53	85,92	86,31	86,70	87,06	87,50	87,90	88,26	88,59	88,93	89,21	89,48	89,86	90,21	90,52	90,78	91,03
Pallini softair Bio Elite made in Italy_1	58,58	61,68	64,21	66,39	68,22	69,74	71,14	72,28	73,45	74,47	75,36	76,17	76,83	77,46	78,04	78,55	78,99	79,40	80,17	80,51
Pallini softair Bio Elite made in Italy_2	60,22	62,92	65,19	67,15	68,78	70,16	71,47	72,52	73,56	74,51	75,34	76,10	76,73	77,38	77,95	78,44	78,89	79,29	80,05	80,35
Pallini softair Bio Elite made in Italy_3	64,70	67,22	69,44	71,39	73,02	74,42	75,70	76,75	77,72	78,57	79,35	80,07	80,68	81,28	81,82	82,29	82,72	83,09	83,79	84,14
Turnings	0,00							0,00							0,00					

Date	15-mar	16-mar	17-mar	18-mar	19-mar	20-mar	21-mar	22-mar	23-mar	24-mar	25-mar	26-mar	27-mar	28-mar	29-mar	30-mar	31-mar	1-apr	2-apr	3-apr
<b>Days</b>	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67
AVICEL_1	94,71	94,84	94,99	95,18	95,33	95,49	95,67	95,82	96,01	96,19	96,34	96,51	96,66	96,83	96,91	97,00	97,18	97,32	97,45	97,58
AVICEL_2	93,05	93,25	93,50	93,74	93,96	94,15	94,34	94,50	94,67	94,85	95,00	95,13	95,24	95,32	95,40	95,48	95,57	95,66	95,74	95,81
AVICEL_3	91,27	91,46	91,73	92,00	92,21	92,42	92,59	92,77	92,92	93,11	93,26	93,41	93,54	93,63	93,72	93,83	93,90	93,98	94,05	94,11
Pallini softair Bio Elite made in Italy_1	80,84	81,15	81,40	81,66	81,88	82,07	82,27	82,46	82,65	82,78	82,88	82,99	83,13	83,26	83,40	83,52	83,65	83,76	83,88	83,99
Pallini softair Bio Elite made in Italy_2	80,70	81,00	81,25	81,50	81,70	81,85	82,02	82,21	82,40	82,56	82,70	82,82	82,94	83,05	83,17	83,30	83,42	83,53	83,63	83,72
Pallini softair Bio Elite made in Italy_3	84,49	84,82	85,06	85,27	85,49	85,68	85,88	86,07	86,29	86,46	86,62	86,78	86,93	87,08	87,24	87,39	87,51	87,63	87,75	87,86
Turnings		0,00							0,00							0,00				

End of test: 29/07/2015

Signature: *Sara Deime*





INNOVHUB  
STAZIONI SPERIMENTALI  
PER L'INDUSTRIA



SSCCP  
SISTEMI SPERIMENTALI  
CARTA, SOSTINE E PASTE PER CARTA

Innovazione e ricerca

TEST REPORT N. 839- Annex 2

Laboratory start: 26/01/2015

### % Biodegradability (pag. 3/4)

Date	4-apr	5-apr	6-apr	7-apr	8-apr	9-apr	10-apr	13-apr	14-apr	15-apr	16-apr	17-apr	20-apr	21-apr	22-apr	23-apr	24-apr	27-apr	28-apr	29-apr
<b>Days</b>	68	69	70	71	72	73	74	77	78	79	80	81	84	85	86	87	88	91	92	93
AVICEL_1	97,68	97,78	97,90	97,99	98,17	98,26	98,32	98,67	98,70	98,77	98,81	98,82	99,12	99,17	99,24	99,28	99,31	99,38	99,41	99,76
AVICEL_2	95,87	95,96	96,08	96,21	96,39	96,46	96,48	96,68	96,72	96,75	96,76	96,78	96,81	96,83	96,84	96,85	96,87	96,89	96,99	97,36
AVICEL_3	94,14	94,18	94,24	94,29	94,47	94,63	94,69	94,95	94,95	94,96	94,98	94,99	95,12	95,14	95,14	95,16	95,20	95,31	95,42	95,78
Pallini softair Bio Elite made in Italy_1	84,07	84,17	84,31	84,46	84,51	84,54	84,58	84,77	84,81	84,81	84,82	84,87	85,01	85,06	85,03	85,11	85,12	85,06	85,09	85,43
Pallini softair Bio Elite made in Italy_2	83,77	83,87	83,99	84,11	84,15	84,16	84,17	84,30	84,37	84,36	84,35	84,41	84,58	84,60	84,53	84,58	84,54	84,31	84,29	84,58
Pallini softair Bio Elite made in Italy_3	87,96	88,07	88,21	88,35	88,39	88,42	88,43	88,59	88,61	88,59	88,59	88,62	88,73	88,75	88,66	88,73	88,68	88,35	88,33	88,59
Turnings				0,00				0,00					0,00						0,00	

Date	30-apr	4-mag	5-mag	6-mag	7-mag	8-mag	11-mag	12-mag	13-mag	14-mag	15-mag	18-mag	19-mag	20-mag	21-mag	22-mag	25-mag	26-mag	27-mag	28-mag
<b>Days</b>	94	98	99	100	101	102	105	106	107	108	109	112	113	114	115	116	119	120	121	122
AVICEL_1	99,91	99,89	99,86	100,02	99,93	99,82	99,85	99,91	100,11	100,29	100,48	101,31	101,58	101,76	101,94	102,16	102,16	102,28	102,27	102,23
AVICEL_2	97,56	97,79	97,83	97,91	97,89	97,80	98,01	98,09	98,26	98,44	98,57	99,19	99,39	99,54	99,61	99,76	100,15	100,30	100,34	100,34
AVICEL_3	96,01	96,16	96,22	96,37	96,40	96,38	96,77	96,88	97,09	97,32	97,47	98,37	98,68	98,85	99,01	99,16	99,52	99,66	99,77	99,85
Pallini softair Bio Elite made in Italy_1	85,64	86,24	86,41	86,59	86,75	86,86	87,26	87,36	87,68	87,99	88,15	88,84	89,03	89,15	89,27	89,40	89,86	89,95	90,03	90,10
Pallini softair Bio Elite made in Italy_2	84,74	85,28	85,40	85,50	85,55	85,65	86,06	86,20	86,55	86,87	87,01	87,62	87,83	87,92	88,03	88,14	88,48	88,56	88,60	88,64
Pallini softair Bio Elite made in Italy_3	88,72	88,87	88,93	88,99	89,09	89,11	89,36	89,39	89,57	89,73	89,79	90,20	90,35	90,40	90,49	90,58	90,88	90,94	91,00	91,06
Turnings		0,00					0,00					0,00						0,00		

End of test: 29/07/2015.

Signature: *Sara Oame*



INNOVHUB  
STAZIONI SPERIMENTALI  
PER L'INDUSTRIA



SSCCP  
STAZIONI SPERIMENTALI  
PER L'INDUSTRIA  
CARTA, CARTONI E RASTE PER CARTA

Innovazione e ricerca

Riferimento: rapporto di Prova 839- Allegato 2  
DATA INIZIO PROVA: 26/01/2015

### % Biodegradability (pag. 4/4)

Date	29-mag	4-giu	5-giu	8-giu	9-giu	10-giu	11-giu	12-giu	15-giu	16-giu	18-giu	19-giu	22-giu	23-giu	24-giu	25-giu	26-giu	29-giu	30-giu	1-lug
<b>Days</b>	123	125	126	129	130	131	132	133	136	137	139	140	143	144	145	146	147	150	151	152
AVICEL_1	102,29	102,38	102,42	102,55	102,56	102,57	102,72	102,72	102,73	102,75	102,81	102,81	102,93	102,94	102,98	102,98	102,99	103,06	103,11	103,12
AVICEL_2	100,41	100,42	100,43	100,45	100,45	100,46	100,47	100,50	100,53	100,53	100,55	100,55	101,06	101,06	101,09	101,10	101,06	101,20	101,23	101,25
AVICEL_3	99,96	100,04	100,10	100,36	100,39	100,42	100,56	100,59	100,65	100,69	100,70	100,71	101,22	101,24	101,29	101,30	101,33	101,31	101,36	101,52
Pallini softair Bio Elite made in Italy_1	90,13	90,19	90,27	90,74	90,78	90,79	90,88	90,91	91,03	91,07	90,97	90,96	91,34	91,37	91,34	91,29	91,28	91,37	91,48	91,73
Pallini softair Bio Elite made in Italy_2	88,64	88,71	88,75	89,15	89,20	89,22	89,25	89,26	89,45	89,45	89,28	89,24	89,34	89,36	89,31	89,26	89,28	89,54	89,64	89,85
Pallini softair Bio Elite made in Italy_3	91,10	91,28	91,34	91,92	91,96	91,97	92,03	92,07	92,13	92,14	92,02	92,13	92,27	92,29	92,25	92,20	92,19	92,36	92,46	92,73
Turnings		0,00		0,00					0,00				0,00					0,00		

Date	2-lug	3-lug	6-lug	7-lug	8-lug	9-lug	10-lug	13-lug	14-lug	15-lug	16-lug	17-lug	20-lug	21-lug	22-lug	23-lug	24-lug	27-lug	28-lug	29-lug
<b>Days</b>	153	154	157	158	159	160	161	164	165	166	167	168	171	172	173	174	175	178	179	180
AVICEL_1	103,13	103,22	103,28	103,37	103,41	103,42	103,51	103,83	103,87	103,88	104,13	104,12	104,82	104,96	105,09	105,17	105,29	105,69	105,81	105,94
AVICEL_2	101,27	101,30	101,85	101,88	101,89	101,89	101,93	102,68	102,68	102,70	102,85	102,82	103,48	103,45	103,42	103,45	103,49	104,06	104,06	104,06
AVICEL_3	101,54	101,57	101,90	101,90	101,98	101,98	102,07	103,04	103,18	103,32	104,15	104,14	105,02	105,03	105,17	105,28	105,38	105,86	105,90	105,94
Pallini softair Bio Elite made in Italy_1	91,75	91,76	91,97	92,05	92,12	92,13	92,23	92,73	92,95	93,00	93,44	93,39	93,72	93,89	94,10	94,22	94,30	94,56	94,56	94,59
Pallini softair Bio Elite made in Italy_2	89,83	89,85	90,02	90,08	90,17	90,20	90,37	90,84	91,08	91,16	91,63	91,61	91,92	92,18	92,46	92,61	92,76	93,11	93,08	93,12
Pallini softair Bio Elite made in Italy_3	92,75	92,73	92,96	92,99	93,05	93,09	93,22	93,58	93,72	93,76	94,13	94,05	94,20	94,45	94,75	94,87	94,96	95,14	95,16	95,18
Turnings			0,00					0,00					0,00					0,00		

End of test: 29/07/2015

Signature: *Sara Daino*





INNOVHUB  
STAZIONI SPERIMENTALI  
PER L'INDUSTRIA



SSCOP  
LA STAZIONE SPERIMENTALE  
PER LA CARTA  
CARTA, CARTONI E PASTE PER CARTA

Innovazione e ricerca

TEST REPORT N. 839- Annex 1

Laboratory start: 26/01/2015

### cumulative CO2 (\*) (pag. 1/4)

(\*) = values of CO2 reported in the table for Avicel and the samples are subtracted by the average value of CO2 produced by the 3 blanks.

Date	26-gen	27-gen	27-gen	28-gen	28-gen	28-gen	29-gen	29-gen	29-gen	30-gen	30-gen	30-gen	31-gen	31-gen	1-feb	1-feb	2-feb	3-feb	4-feb	5-feb	6-feb	7-feb	8-feb
<b>Days</b>	0	0,5	1	1,5	2	2,5	3	3,5	4	4,5	5	5,5	6	7	8	9	10	11	12	13			
BLANK_1	0	0,836	1,457	2,001	2,546	2,995	3,438	3,814	4,170	4,515	4,845	5,164	5,483	6,087	6,766	7,372	7,947	8,489	9,030	9,528			
BLANK_2	0	0,845	1,487	2,059	2,619	3,088	3,538	3,926	4,287	4,633	4,974	5,292	5,607	6,212	6,892	7,481	8,057	8,594	9,115	9,595			
BLANK_3	0	0,828	1,464	2,038	2,603	3,084	3,542	3,938	4,303	4,658	5,011	5,338	5,662	6,283	6,969	7,578	8,177	8,738	9,289	9,798			
AVICEL_1	0	0,298	0,989	1,845	2,779	3,896	5,432	7,382	9,471	11,172	12,466	13,506	14,501	15,994	17,681	19,049	20,225	21,404	22,270	22,974			
AVICEL_2	0	0,218	0,631	1,308	1,971	2,755	3,555	4,887	6,543	8,119	9,624	10,962	12,175	14,189	16,536	17,999	19,201	20,378	21,230	21,920			
AVICEL_3	0	0,220	0,680	1,437	2,199	3,224	4,685	6,693	8,590	10,255	11,683	12,920	13,948	15,688	17,717	18,939	19,895	20,658	21,251	21,781			
Pallini soffair Bio Elite made in Italy_1	0	0,064	0,205	0,351	0,439	0,530	0,600	0,683	0,781	0,890	0,996	1,116	1,237	1,501	1,785	2,092	2,382	2,702	3,062	3,481			
Pallini soffair Bio Elite made in Italy_2	0	-0,011	0,087	0,211	0,282	0,369	0,440	0,536	0,639	0,761	0,884	1,021	1,152	1,441	1,732	2,072	2,408	2,767	3,166	3,625			
Pallini soffair Bio Elite made in Italy_3	0	0,039	0,178	0,296	0,407	0,497	0,576	0,675	0,789	0,912	1,046	1,190	1,335	1,666	1,988	2,339	2,706	3,111	3,569	4,096			

Date	9-feb	10-feb	11-feb	12-feb	13-feb	14-feb	15-feb	16-feb	17-feb	17-feb	18-feb	18-feb	19-feb	19-feb	20-feb	20-feb	21-feb	21-feb	22-feb	22-feb
<b>Days</b>	14	15	16	17	18	19	20	21	22	22,5	23	23,5	24	24,5	25	25,5	26	26,5	27	27,5
BLANK_1	10,019	10,563	11,075	11,545	12,005	12,449	12,852	13,251	13,702	13,897	14,096	14,302	14,493	14,681	14,857	15,026	15,200	15,367	15,533	15,694
BLANK_2	10,047	10,568	11,061	11,520	11,967	12,403	12,801	13,182	13,632	13,822	14,021	14,225	14,411	14,598	14,776	14,945	15,121	15,289	15,449	15,604
BLANK_3	10,292	10,830	11,342	11,830	12,307	12,783	13,216	13,634	14,105	14,311	14,526	14,743	14,943	15,143	15,330	15,509	15,695	15,873	16,043	16,207
AVICEL_1	23,556	24,206	24,917	25,259	25,525	25,740	25,954	26,128	26,379	26,518	26,615	26,702	26,782	26,859	26,930	27,011	27,071	27,129	27,149	27,210
AVICEL_2	22,494	23,015	23,444	23,742	23,981	24,200	24,393	24,563	24,780	24,884	24,994	25,097	25,198	25,292	25,375	25,457	25,535	25,609	25,683	25,760
AVICEL_3	22,234	22,801	23,321	23,678	23,955	24,182	24,378	24,550	24,784	24,887	24,998	25,095	25,182	25,270	25,349	25,421	25,488	25,555	25,618	25,680
Pallini soffair Bio Elite made in Italy_1	3,9629	4,509	5,153	5,940	6,900	8,131	9,566	11,092	12,782	13,655	14,535	15,436	16,353	17,235	18,121	18,940	19,741	20,460	21,146	21,812
Pallini soffair Bio Elite made in Italy_2	4,1561	4,756	5,475	6,369	7,495	8,833	10,373	11,982	13,595	14,461	15,332	16,230	17,093	17,936	18,759	19,565	20,348	21,101	21,801	22,457
Pallini soffair Bio Elite made in Italy_3	4,7354	5,450	6,399	7,526	8,902	10,438	12,055	13,740	15,542	16,439	17,353	18,241	19,142	19,997	20,798	21,577	22,320	23,002	23,639	24,224

End of test: 29/07/2015

Signature:

*Sava Daina*





INNOVHUB  
STAZIONI SPERIMENTALI  
PER L'INDUSTRIA



SSOCP  
STAZIONE Sperimentale  
CARTA, CARTONI E PASTE PER CARTA

Innovazione e ricerca

TEST REPORT N. 839- Annex 1

Laboratory start: 26/01/2015

### cumulative CO2 (\*) (pag. 2/4)

(\*) = values of CO2 reported in the table for Avicel and the samples are subtracted by the average value of CO2 produced by the 3 blanks.

Date	23-feb	24-feb	25-feb	26-feb	27-feb	28-feb	1-mar	2-mar	3-mar	4-mar	5-mar	6-mar	7-mar	8-mar	9-mar	10-mar	11-mar	12-mar	13-mar	14-mar
<b>Days</b>	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
BLANK_1	15,84	16,166	16,503	16,828	17,143	17,447	17,698	17,980	18,295	18,580	18,862	19,130	19,435	19,685	19,931	20,230	20,498	20,777	21,038	21,298
BLANK_2	15,739	16,069	16,405	16,732	17,044	17,337	17,582	17,842	18,159	18,447	18,724	18,996	19,283	19,524	19,757	20,049	20,304	20,559	20,809	21,053
BLANK_3	16,353	16,683	17,022	17,351	17,679	17,982	18,237	18,514	18,803	19,063	19,327	19,587	19,877	20,115	20,342	20,605	20,850	21,112	21,363	21,608
AVICEL_1	27,258	27,460	27,595	27,764	27,880	28,028	28,160	28,283	28,328	28,370	28,413	28,459	28,504	28,543	28,599	28,645	28,678	28,720	28,765	28,804
AVICEL_2	25,833	26,019	26,224	26,404	26,540	26,673	26,805	26,927	27,073	27,223	27,352	27,470	27,574	27,660	27,787	27,900	28,006	28,091	28,168	28,236
AVICEL_3	25,735	25,885	26,033	26,161	26,279	26,397	26,516	26,627	26,761	26,884	26,993	27,094	27,198	27,285	27,368	27,483	27,589	27,684	27,766	27,841
Pallini soffair Bio																				
Elite made in Italy_1	22,432	23,615	24,586	25,420	26,121	26,702	27,240	27,677	28,125	28,515	28,856	29,165	29,419	29,661	29,880	30,075	30,247	30,402	30,695	30,826
Pallini soffair Bio																				
Elite made in Italy_2	23,09	24,122	24,993	25,743	26,371	26,899	27,400	27,806	28,203	28,567	28,884	29,176	29,418	29,666	29,887	30,075	30,247	30,400	30,690	30,807
Pallini soffair Bio																				
Elite made in Italy_3	24,79	25,756	26,607	27,352	27,976	28,513	29,005	29,406	29,779	30,103	30,402	30,680	30,911	31,141	31,347	31,528	31,693	31,835	32,103	32,239

Date	15-mar	16-mar	17-mar	18-mar	19-mar	20-mar	21-mar	22-mar	23-mar	24-mar	25-mar	26-mar	27-mar	28-mar	29-mar	30-mar	31-mar	1-apr	2-apr	3-apr
<b>Days</b>	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67
BLANK_1	21,545	21,779	22,055	22,304	22,540	22,789	23,037	23,259	23,447	23,688	23,930	24,162	24,387	24,591	24,795	24,997	25,230	25,455	25,670	25,892
BLANK_2	21,283	21,494	21,759	22,003	22,247	22,497	22,735	22,959	23,147	23,386	23,625	23,851	24,077	24,285	24,493	24,690	24,918	25,129	25,348	25,565
BLANK_3	21,844	22,058	22,314	22,551	22,789	23,030	23,267	23,496	23,675	23,910	24,151	24,375	24,603	24,815	25,033	25,241	25,467	25,691	25,910	26,132
AVICEL_1	28,846	28,884	28,932	28,989	29,035	29,083	29,137	29,184	29,242	29,297	29,343	29,393	29,439	29,490	29,516	29,544	29,596	29,639	29,679	29,719
AVICEL_2	28,299	28,358	28,434	28,508	28,575	28,633	28,691	28,740	28,792	28,844	28,893	28,931	28,965	28,990	29,013	29,037	29,065	29,092	29,116	29,138
AVICEL_3	27,914	27,974	28,055	28,138	28,201	28,267	28,319	28,374	28,419	28,476	28,525	28,569	28,609	28,635	28,666	28,697	28,720	28,744	28,764	28,784
Pallini soffair Bio																				
Elite made in Italy_1	30,952	31,071	31,169	31,269	31,353	31,425	31,499	31,574	31,648	31,698	31,735	31,777	31,828	31,878	31,932	31,979	32,028	32,071	32,119	32,159
Pallini soffair Bio																				
Elite made in Italy_2	30,939	31,057	31,150	31,246	31,322	31,382	31,448	31,518	31,594	31,654	31,707	31,755	31,800	31,843	31,888	31,939	31,983	32,025	32,064	32,099
Pallini soffair Bio																				
Elite made in Italy_3	32,373	32,497	32,592	32,671	32,754	32,830	32,903	32,978	33,051	33,128	33,186	33,248	33,307	33,364	33,426	33,484	33,529	33,574	33,622	33,662

End of test: 29/07/2015

Signature: *Sara Osimo*





INNOVHUB  
STAZIONI SPERIMENTALI  
PER L'INDUSTRIA



SSCCP  
SISTEMI SPERIMENTALI PER LA  
STABILIZZAZIONE E LA  
STABILITÀ DELLE PASTE PER CARTA

Innovazione e ricerca

TEST REPORT N. 839- Annex 1

Laboratory start: 26/01/2015

### cumulative CO2 (\*) (pag. 3/4)

(\*) = values of CO2 reported in the table for Avicel and the samples are subtracted by the average value of CO2 produced by the 3 blanks.

Date	4-apr	5-apr	6-apr	7-apr	8-apr	9-apr	10-apr	13-apr	14-apr	15-apr	16-apr	17-apr	20-apr	21-apr	22-apr	23-apr	24-apr	27-apr	28-apr	29-apr
<b>Days</b>	68	69	70	71	72	73	74	77	78	79	80	81	84	85	86	87	88	91	92	93
BLANK_1	26,117	26,319	26,519	26,729	26,893	27,164	27,399	28,110	28,382	28,604	28,826	29,076	29,708	29,926	30,121	30,337	30,562	31,200	31,415	31,788
BLANK_2	25,778	25,971	26,148	26,315	26,595	26,874	27,100	27,789	28,057	28,270	28,478	28,708	29,287	29,498	29,694	29,911	30,134	30,775	30,979	31,324
BLANK_3	26,349	26,558	26,741	26,919	27,234	27,539	27,783	28,574	28,866	29,102	29,343	29,610	30,276	30,522	30,728	30,977	31,212	31,915	32,147	32,505
AVICEL_1	29,751	29,780	29,818	29,845	29,898	29,928	29,945	30,053	30,059	30,081	30,095	30,098	30,188	30,205	30,224	30,237	30,246	30,268	30,278	30,382
AVICEL_2	29,157	29,182	29,219	29,260	29,313	29,335	29,343	29,404	29,413	29,424	29,427	29,432	29,442	29,448	29,449	29,453	29,460	29,465	29,496	29,610
AVICEL_3	28,793	28,804	28,824	28,839	28,893	28,941	28,959	29,039	29,039	29,042	29,042	29,048	29,053	29,093	29,097	29,103	29,116	29,149	29,183	29,295
Pallini softair Bio Elite made in Italy_1	32,19	32,228	32,281	32,339	32,359	32,371	32,384	32,460	32,474	32,473	32,477	32,497	32,550	32,570	32,558	32,588	32,593	32,571	32,581	32,711
Pallini softair Bio Elite made in Italy_2	32,118	32,154	32,201	32,250	32,265	32,267	32,272	32,320	32,348	32,344	32,339	32,364	32,428	32,436	32,410	32,428	32,412	32,323	32,319	32,428
Pallini softair Bio Elite made in Italy_3	33,7	33,742	33,798	33,850	33,866	33,877	33,883	33,943	33,951	33,944	33,943	33,953	33,998	34,003	33,971	33,995	33,978	33,849	33,841	33,944

Date	30-apr	4-mag	5-mag	6-mag	7-mag	8-mag	11-mag	12-mag	13-mag	14-mag	15-mag	18-mag	19-mag	20-mag	21-mag	22-mag	25-mag	26-mag	27-mag	28-mag
<b>Days</b>	94	98	99	100	101	102	105	106	107	108	109	112	113	114	115	116	119	120	121	122
BLANK_1	32,161	33,304	33,578	33,810	34,072	34,321	34,998	35,243	35,474	35,705	35,929	36,560	36,808	37,050	37,279	37,503	38,068	38,280	38,486	38,683
BLANK_2	31,681	32,840	33,111	33,384	33,660	33,904	34,667	34,898	35,150	35,395	35,633	36,322	36,581	36,836	37,072	37,310	37,962	38,207	38,438	38,643
BLANK_3	32,887	34,140	34,415	34,667	34,946	35,186	35,933	36,176	36,455	36,724	36,983	37,649	37,892	38,131	38,369	38,577	39,090	39,305	39,515	39,709
AVICEL_1	30,428	30,424	30,413	30,461	30,436	30,401	30,412	30,430	30,489	30,546	30,601	30,854	30,938	30,993	31,048	31,115	31,116	31,151	31,147	31,134
AVICEL_2	29,67	29,741	29,752	29,776	29,771	29,742	29,806	29,832	29,883	29,938	29,976	30,165	30,226	30,271	30,293	30,339	30,458	30,502	30,514	30,515
AVICEL_3	29,365	29,409	29,428	29,473	29,484	29,478	29,597	29,629	29,696	29,766	29,811	30,088	30,181	30,234	30,283	30,329	30,436	30,481	30,514	30,538
Pallini softair Bio Elite made in Italy_1	32,79	33,021	33,086	33,156	33,217	33,259	33,410	33,451	33,574	33,692	33,753	34,015	34,089	34,135	34,183	34,232	34,409	34,443	34,474	34,500
Pallini softair Bio Elite made in Italy_2	32,491	32,695	32,742	32,782	32,798	32,839	32,994	33,049	33,185	33,305	33,358	33,593	33,673	33,707	33,749	33,792	33,924	33,955	33,969	33,984
Pallini softair Bio Elite made in Italy_3	33,994	34,049	34,073	34,096	34,133	34,141	34,237	34,250	34,320	34,380	34,404	34,558	34,615	34,637	34,669	34,704	34,820	34,842	34,865	34,891

End of test: 29/07/2015

Signature: *Sara Casine*





### cumulative CO2 (\*) (pag. 4/4)

(\*) = values of CO2 reported in the table for Avicel and the samples are subtracted by the average value of CO2 produced by the 3 blanks.

Date	29-mag	4-giu	5-giu	8-giu	9-giu	10-giu	11-giu	12-giu	15-giu	16-giu	18-giu	19-giu	22-giu	23-giu	24-giu	25-giu	26-giu	29-giu	30-giu	1-lug
<b>Days</b>	123	125	126	129	130	131	132	133	136	137	139	140	143	144	145	146	147	150	151	152
BLANK_1	38,9104	39,469	39,736	40,533	40,799	41,072	41,345	41,584	42,270	42,510	42,993	43,205	43,964	44,171	44,360	44,512	44,714	45,290	45,469	45,658
BLANK_2	38,8684	39,366	39,609	40,312	40,548	40,786	41,017	41,217	41,802	42,007	42,421	42,608	43,287	43,455	43,618	43,749	43,923	44,414	44,563	44,727
BLANK_3	39,9097	40,459	40,714	41,434	41,678	41,930	42,212	42,421	43,039	43,297	43,797	44,022	44,902	45,115	45,298	45,446	45,641	46,213	46,389	46,589
AVICEL_1	31,1526	31,180	31,193	31,232	31,237	31,240	31,284	31,284	31,288	31,295	31,311	31,312	31,350	31,351	31,363	31,365	31,366	31,388	31,403	31,408
AVICEL_2	30,5372	30,540	30,542	30,549	30,550	30,553	30,556	30,564	30,573	30,574	30,579	30,579	30,736	30,736	30,744	30,745	30,733	30,778	30,787	30,793
AVICEL_3	30,5726	30,596	30,616	30,694	30,703	30,712	30,755	30,764	30,783	30,796	30,799	30,802	30,959	30,982	30,980	30,982	30,990	30,986	31,000	31,049
Pallini soffair Bio Elite made in Italy_1	34,5089	34,535	34,564	34,744	34,760	34,762	34,797	34,808	34,856	34,869	34,830	34,830	34,974	34,985	34,973	34,956	34,952	34,987	35,028	35,124
Pallini soffair Bio Elite made in Italy_2	33,9864	34,010	34,027	34,178	34,199	34,207	34,220	34,223	34,294	34,295	34,230	34,215	34,255	34,259	34,243	34,222	34,229	34,331	34,367	34,448
Pallini soffair Bio Elite made in Italy_3	34,9039	34,973	34,997	35,218	35,233	35,237	35,260	35,274	35,298	35,305	35,259	35,301	35,352	35,361	35,345	35,327	35,321	35,389	35,427	35,529

Date	2-lug	3-lug	6-lug	7-lug	8-lug	9-lug	10-lug	13-lug	14-lug	15-lug	16-lug	17-lug	20-lug	21-lug	22-lug	23-lug	24-lug	27-lug	28-lug	29-lug
<b>Days</b>	153	154	157	158	159	160	161	164	165	166	167	168	171	172	173	174	175	178	179	180
BLANK_1	45,8526	46,043	46,765	46,954	47,140	47,315	47,503	48,058	48,236	48,419	48,662	48,844	49,484	49,664	49,839	50,025	50,204	50,765	50,942	51,106
BLANK_2	44,8939	45,056	45,635	45,810	45,977	46,124	46,291	46,768	46,907	47,060	47,241	47,402	47,914	48,069	48,216	48,369	48,519	48,985	49,140	49,279
BLANK_3	46,7782	46,963	47,670	47,904	48,093	48,269	48,467	49,056	49,234	49,415	49,693	49,865	50,499	50,670	50,833	51,008	51,189	51,754	51,934	52,097
AVICEL_1	31,4083	31,438	31,454	31,482	31,495	31,498	31,525	31,623	31,634	31,637	31,714	31,712	31,925	31,967	32,005	32,032	32,069	32,191	32,227	32,264
AVICEL_2	30,7976	30,809	30,975	30,983	30,985	30,987	31,000	31,226	31,226	31,226	31,277	31,271	31,470	31,460	31,452	31,461	31,474	31,647	31,646	31,645
AVICEL_3	31,0567	31,065	31,166	31,166	31,191	31,191	31,218	31,516	31,557	31,600	31,855	31,851	32,121	32,123	32,165	32,200	32,232	32,376	32,390	32,402
Pallini soffair Bio Elite made in Italy_1	35,1307	35,133	35,213	35,244	35,274	35,277	35,313	35,507	35,588	35,610	35,777	35,760	35,886	35,949	36,029	36,075	36,107	36,205	36,207	36,217
Pallini soffair Bio Elite made in Italy_2	34,4412	34,449	34,512	34,536	34,570	34,582	34,647	34,828	34,920	34,950	35,133	35,124	35,241	35,341	35,449	35,505	35,566	35,697	35,685	35,703
Pallini soffair Bio Elite made in Italy_3	35,5365	35,530	35,617	35,631	35,653	35,665	35,715	35,853	35,907	35,925	36,066	36,037	36,091	36,190	36,304	36,351	36,382	36,454	36,459	36,467

End of test: 29/07/2015

Signature: *Sara Daine*