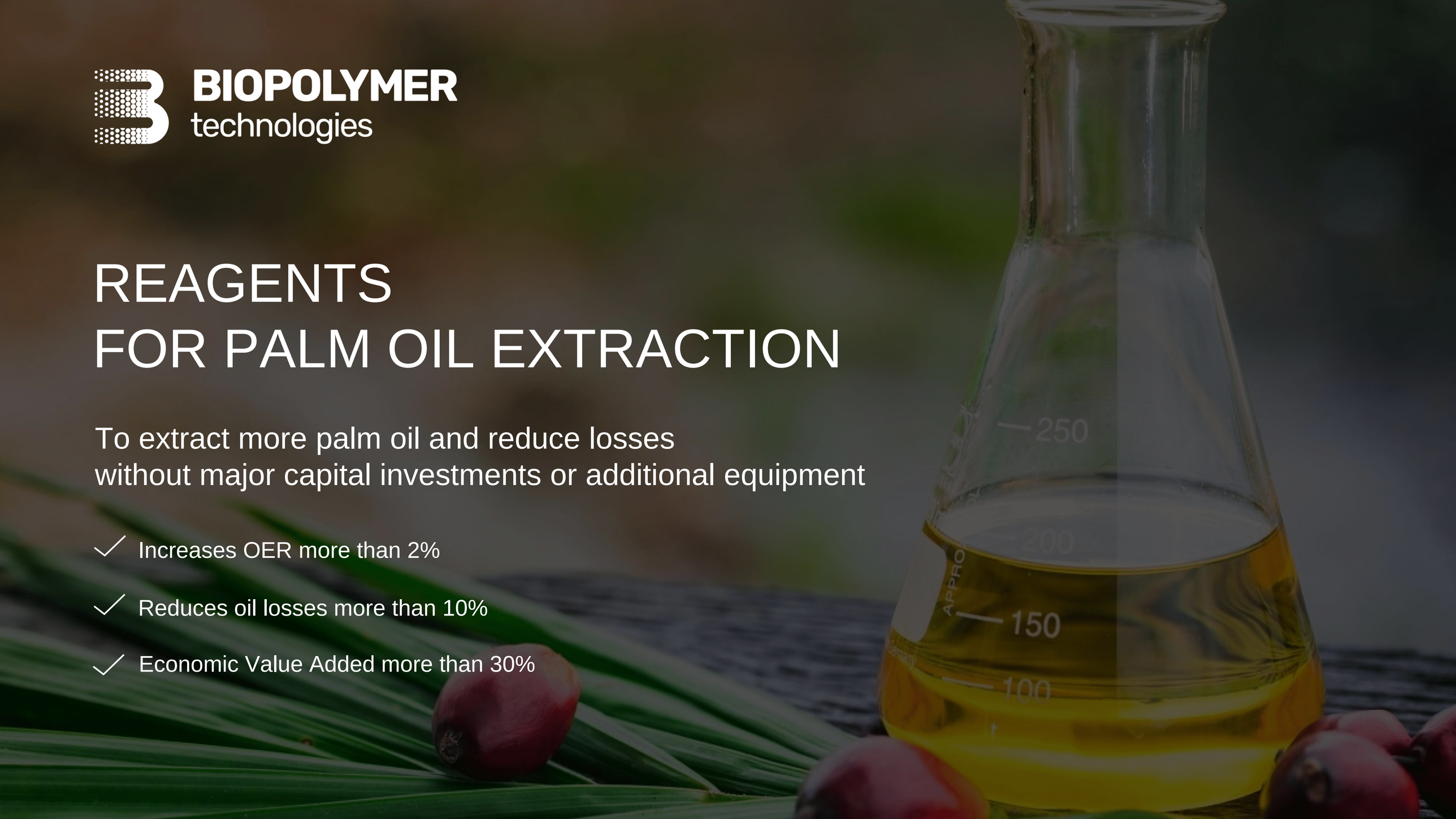
BIOPOLYMER
technologies

REAGENTS
FOR PALM OIL EXTRACTION

To extract more palm oil and reduce losses
without major capital investments or additional equipment

- ✓ Increases OER more than 2%
- ✓ Reduces oil losses more than 10%
- ✓ Economic Value Added more than 30%



BIOPOLYMER TECHNOLOGIES: ABOUT THE COMPANY

Biopolymer Technologies develops innovative technology and products to boost palm oil extraction, with patents in Indonesia, Malaysia, the Philippines, Thailand, Colombia, India, China, and Europe

For five years in Southeast Asia we:

- Cooperate with **15+** palm oil producers, conducted tech audits in over **40 mills**
- Completed over **50 successful lab tests**
- Launching our **own production** in Thailand
- Signed contracts with **3 distributors** for container shipments

MALAYSIA

CERTIFICATE OF GRANT OF A PATENT

In accordance with Section 31 (2) of the Patents Act 1983 a patent for an invention having grant number MY-187201-A has been granted to OBSCHESTVO S OGRANICHENNOI OTVETSTVENNOSTYU (NPO BIOMIKROGELI), in respect of an invention having the following particulars:

TITLE	:	APPLICATION OF POLYSACCHARIDE MICROGELS IN PRODUCTION OF VEGETABLE OILS, POLYSACCHARIDE MICROGEL-BASED REAGENTS AND VEGETABLE OIL PRODUCTION METHOD, USING THESE REAGENTS
FILING DATE	:	21 SEPTEMBER 2018
PRIORITY DATE	:	26 JUNE 2018
NAME OF INVENTOR	:	ELAGIN ANDREI ALEKSANDROVICH MIRONOV MAKSIM ANATOLIEVICH
PATENT OWNER	:	OBSCHESTVO S OGRANICHENNOI OTVETSTVENNOSTYU (NPO BIOMIKROGELI) UL. KONSTRUKTOROV, D. 5, KV. 431, EKATERINBURG, 620010 RUSSIAN FEDERATION
DATE OF GRANT	:	10 SEPTEMBER 2021
DURATION OF PATENT	:	21 SEPTEMBER 2018 UNTIL 21 SEPTEMBER 2038
END OF PROTECTION	:	09 SEPTEMBER 2022 (SUBSEQUENT ANNUAL FEE SHALL FOLLOW AS STATED IN THE SCHEDULE OF FEES AT THE BACK OF THIS PAGE)

Dated this 10 day of SEPTEMBER 2021

(ZULKARNAIN MUHAMMAD)
Deputy Registrar of Patents
MALAYSIA

Recognized as a game changer by the Palm Oil leading experts:

BUSINESS BERNAMA.com

BIOMICROGELS GROUP INTRODUCES PRODUCTS TO OPTIMISE PALM OIL PRODUCTION IN MALAYSIA

Warta Ekonomi .co.id

Biomicrogels Group Perkenalkan BMG-C4 dan Biomicrogel BMG-SPO, Solusi Meningkatkan Produksi Minyak Sawit, Efisien dan Berkelanjutan

2023

We were named most promising in green chemistry at the BRICS Innovation Technology Competition

BIOPOLYMER TECHNOLOGIES: ABOUT THE COMPANY

Manufacture in Thailand

- 1200 m^2 production and warehouse area
- 3500 tons products per year
- Modern laboratory for palm oil products

Product development for customer needs

- Own research and development center
- 5 modern laboratories
- Experienced palm oil mill managers, 5 PhD on staff

REAGENTS FOR PALM OIL EXTRACTION: HOW IT WORKS

We use a new technology for production of biopolymers from agricultural waste

These biopolymers makes oil extraction more efficient, cost-effective and sustainable

Watch how our reagents
increase oil level

Watch full video
on our YouTube channel

Food Grade
CELLULOSE

Food Grade
BEET PECTIN

Food Grade
APPLE PECTIN

REAGENTS FOR PALM OIL EXTRACTION: SAFE MATERIALS

- Raw material cellulose from agriculture by-products - used in pharmaceuticals, food additives, personal care and as viscosity modifiers in oil drilling

- Sodium carboxymethyl cellulose, (CAS-No.) 9004-32-4, (EC-No.) 618-378-6

- Food grade, Non-toxic, not classified, not dangerous for environment according to EC No.1272/2008

SGS TEST – HEAVY METALS AND AFLATOXINS

SGS

TEST REPORT: HNSA/230396298-AG12237 **REPORTED DATE:** 30-March-2023

CUSTOMER : [redacted]

SAMPLE ID : AG12237 - REAGENT FOR OIL EXTRACTION BIOMICROGEL® BMG-C4

TEST RESULTS :

TEST PARAMETER	TEST METHOD	RESULT	UNIT
Arsenic (As)	In-house Method, SGS-SOP-LAB-028 based on AOAC 986.15, 975.03 & 922.02, APHA 3120B and APHA 3125B (ICP-OES)	N.D.(<0.5)	mg/kg
Lead (Pb)	In-house Method, SGS-SOP-LAB-028 based on AOAC 986.15, 975.03 & 922.02, APHA 3120B and APHA 3125B (ICP-OES)	N.D.(<0.5)	mg/kg
Cadmium (Cd)	In-house Method, SGS-SOP-LAB-028 based on AOAC 986.15, 975.03 & 922.02, APHA 3120B and APHA 3125B (ICP-OES)	N.D.(<0.5)	mg/kg
Antimony (Sb)	In-house Method, SGS-SOP-LAB-028 based on AOAC 986.15, 975.03 & 922.02, APHA 3120B and APHA 3125B (ICP-OES)	N.D.(<0.5)	mg/kg
Mercury (Hg)	In-house method, CL-TM-01-044 based on US EPA SW-846 Method 7473, 2007 (Mercury Analyzer)	N.D.(<0.02)	mg/kg
Aflatoxin B1	In-house method SGS-TM-AGRI-037 based on AOAC 2003.02 (HPLC- FLD)	N.D.(<1)	µg/kg
Aflatoxin B2	In-house method SGS-TM-AGRI-037 based on AOAC 2003.02 (HPLC- FLD)	N.D.(<1)	µg/kg
Aflatoxin G1	In-house method SGS-TM-AGRI-037 based on AOAC 2003.02 (HPLC- FLD)	N.D.(<1)	µg/kg
Aflatoxin G2	In-house method SGS-TM-AGRI-037 based on AOAC 2003.02 (HPLC- FLD)	N.D.(<1)	µg/kg
Total Aflatoxin	In-house method SGS-TM-AGRI-037 based on AOAC 2003.02 (HPLC- FLD)	N.D.(<1)	µg/kg

3RD PARTY TEST – EFFECTS ON MILL STREAMS

SAMPLE DATE										
SAMPLE ID	CPO I(RN)	CPO II(RN)	CPO III(RN)	CPO IV(RN)	CPO V(RN)	RBDPO I(RN)	RBDPO II(RN)	RBDPO III(RN)	RBDPO IV(RN)	RBDPO V(RN)
FFA%	1.39	1.25	1.16	1.31	1.16	0.03	0.03	0.03	0.03	0.03
PV (meq/kg)	na	na	na	na	na	0.00	0.00	0.00	0.00	0.00
IV-FAC	56.58	56.11	56.40	55.41	55.14	56.00	56.97	57.63	58.00	55.70
Color (51/4" cell) Red	na	na	na	na	na	1.00	1.20	1.00	1.00	1.00
Color (51/4" cell) Yellow	na	na	na	na	na	14.00	13.00	20.00	20.00	15.60
Color (51/4" cell) ~~White~~ blue	na	na	na	na	na	0.00	0.00	0.00	0.00	0.00
AnV	6.91	5.46	6.85	3.37	3.91	1.42	1.21	1.24	2.18	1.96
UV by TOTOX (E233 +E269)	1.85	1.89	1.88	1.87	2.01	1.79	2.02	1.95	2.18	1.96
Smoke Point (°C)	na	na	na	na	na	218.00	220.00	220.00	220.00	222.00
Rancimat IP (120°C)	na	na	na	na	na	12.26	13.18	12.68	13.82	13.32
Moisture (%)	0.09	0.11	0.07	0.14	0.08	0.05	0.05	0.05	0.04	0.05
Impurities (%)	0.03	0.02	0.02	0.02	0.03	0.01	0.00	0.01	0.02	0.01
Total tocols (ppm)	1157.00	1088.00	1146.00	1135.00	1145.00	171.00	270.00	284.00	318.00	221.00

SAMPLE DATE										
SAMPLE ID	CPO I(RN)	CPO II(RN)	CPO III(RN)	CPO IV(RN)	CPO V(RN)	RBDPO I(RN)	RBDPO II(RN)	RBDPO III(RN)	RBDPO IV(RN)	RBDPO V(RN)
3-MCPD (ppm)	nd	nd	nd	nd	nd	0.53	0.62	0.41	1.23	0.75
TG by GC (%)	96.43	96.27	96.39	96.10	96.02	95.29	97.05	97.18	96.97	97.11
DG by GC (%)	2.64	2.62	2.66	2.89	2.67	4.70	2.89	2.81	3.04	2.89
MG by GC (%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FFA by GC (%)	0.83	0.98	0.86	0.92	1.17	0.00	0.00	0.00	0.00	0.00
PTG by HPLC (%)	0.00	0.00	0.00	0.00	0.00	0.15	0.19	0.07	0.23	0.06
TG by HPLC (%)	95.58	95.57	95.53	95.33	95.61	95.56	95.55	95.86	95.41	95.84
DG by HPLC (%)	3.45	3.56	3.57	3.58	3.42	4.29	4.25	4.07	4.30	4.10
MG by HPLC (%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FFA by HPLC (%)	0.97	0.87	0.89	1.09	0.97	0.00	0.00	0.00	0.00	0.00
TPC by HPCL (%)	4.42	4.43	4.47	4.67	4.39	4.44	4.45	4.14	4.59	4.16
Total Chlorine (ppm)	na	na	na	na	na	na	na	na	na	na
Corotene (ppm)	635.00	631.00	625.00	642.00	632.00	na	na	na	na	na
DOBI	3.34	3.33	3.21	3.06	3.11	na	na	na	na	na
Fatty Acid Composition %										
C8	-	-	-	-	-				-	-
C10	-	-	-	-	-				-	-

3RD PARTY TEST – EFFECTS ON MILL STREAMS

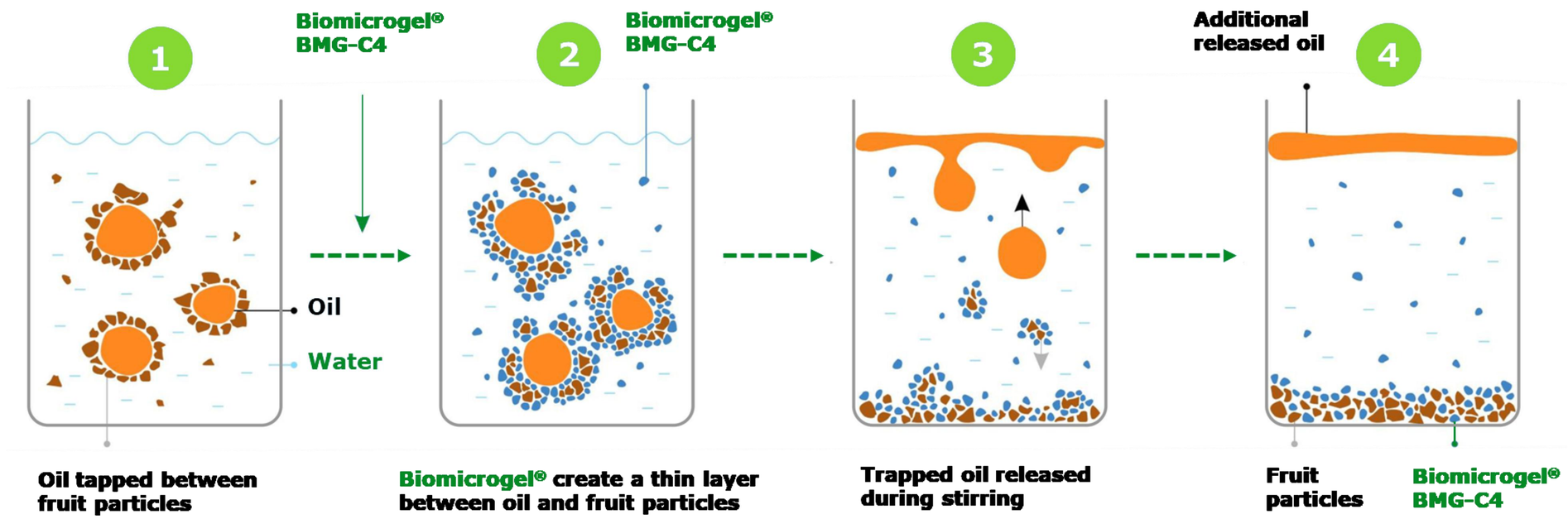
SAMPLE DATE										
SAMPLE ID	CPO I(RN)	CPO II(RN)	CPO III(RN)	CPO IV(RN)	CPO V(RN)	RBDPO I(RN)	RBDPO II(RN)	RBDPO III(RN)	RBDPO IV(RN)	RBDPO V(RN)
C12	0.29	0.28	0.29	0.32	0.32	0.28	0.28	0.28	0.27	0.30
C14	0.94	0.91	0.93	0.98	0.97	0.96	0.93	0.93	0.92	1.00
C16	39.11	39.38	39.22	40.12	40.51	39.70	38.77	38.85	38.71	40.83
C16-1	0.14	0.13	0.14	0.15	0.14	0.14	0.14	0.14	0.14	0.15
C18	4.77	4.88	4.82	4.69	4.68	4.68	4.75	4.75	4.76	4.55
C18:1	43.29	43.09	43.23	42.49	42.25	42.84	43.52	43.52	43.49	41.99
C18:2T	0.00	0.00	0.00	0.00	0.00	0.33	0.26	0.30	0.35	0.30
C18:2	10.64	10.49	10.51	10.45	10.34	10.37	10.63	10.52	10.59	10.20
C18:3	0.30	0.29	0.34	0.24	0.29	0.19	0.21	0.51	0.58	0.48
C20	0.53	0.54	0.53	0.51	0.51	0.51	0.51	0.51	0.58	0.48
IV-FAC	56.58	56.11	56.40	55.41	55.14	56.00	56.97	57.63	58.00	55.70
Glyceride Composition by GC %										
FFA1	0.42	0.49	0.43	0.46	0.60	0.00	0.00	0.00	0.00	0.00
FFA2	0.41	0.49	0.43	0.46	0.57	0.00	0.00	0.00	0.00	0.00
MG1	0.02	0.02	0.02	0.02	0.02	0.00	0.00	0.00	0.00	0.00
MG2	0.09	0.11	0.09	0.08	0.12	0.00	0.00	0.00	0.00	0.00
C34-D1	0.35	0.23	0.36	0.42	0.37	0.72	0.39	0.38	0.44	0.38
C36-D2	1.44	1.45	1.42	1.57	1.42	2.68	1.54	1.50	1.62	1.54
C38-D3	0.85	0.94	0.88	0.90	0.88	1.30	0.96	0.93	0.98	0.97
C46	0.94	0.78	0.87	0.91	0.82	1.44	0.78	0.76	0.78	0.75
C48	10.26	8.15	10.21	10.82	8.23	13.67	8.19	8.04	8.22	8.96
C50	40.65	38.10	39.55	41.27	37.53	61.38	37.81	38.38	38.16	37.88
C52	35.01	38.35	35.82	33.85	38.52	0.66	39.23	38.95	38.77	38.55
C54	9.00	10.27	9.35	8.69	10.31	17.14	10.41	10.42	10.42	10.35
C56	0.57	0.62	0.59	0.56	0.61	1.00	0.63	0.63	0.62	0.62
TG by GC (%)	96.43	96.27	96.39	96.10	96.02	95.29	97.05	97.18	96.97	97.11
DG by GC (%)	2.64	2.62	2.66	2.89	2.67	4.70	2.89	2.81	3.04	2.89
MG by GC (%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FFA by GC (%)	0.83	0.98	0.86	0.92	1.17	0.00	0.00	0.00	0.00	0.00

HEAT STABILITY TEST

Sample ID	Date	Day	FFA (%)	PV (meq/kg)	AnV	Color		UV Totox	Rancimat 120 C (hr)
						Red	Yellow		
RBDPO I (RN)	15/10	0	0.025	0	1.42	1	14	1.79	13.26
	18/10	3	0.713	9.58	2.22	2.2	23	2.6	6.31
	20/10	5	0.926	15.07	5.68	2.9	28	3.12	2.9
RBDPO II (RN)	15/10	0	0.028	0	1.21	1.2	13	2.02	13.18
	18/10	3	0.653	8.88	3.95	2.5	38	2.7	8.71
	20/10	5	0.918	15.43	6.78	3	20	3.3	4.7
RBDPO III (RN)	15/10	0	0.025	0	1.24	1	20	1.95	12.68
	18/10	3	0.586	9.17	3.72	2.1	20	2.58	7.77
	20/10	5	0.853	15.37	5.63	2.9	20	3.13	4.1
RBDPO IV (RN)	15/10	0	0.03	0	1.653	1	20	2.18	13.82
	18/10	3	0.759	10.15	3.116	2.4	29	2.64	7.71
	20/10	5	0.961	13.66	6.366	3.1	29	3.04	3.86
RBDPO V (RN)	15/10	0	0.027	0	1.82	1	16	1.96	13.32
	18/10	3	0.753	9.37	3.58	2	25	2.73	9.44
	20/10	5	1.019	13.95	6.27	3.1	37	3.34	5.62

REAGENTS FOR PALM OIL EXTRACTION: HOW IT WORKS

Our reagents help to release oil trapped between fruits residue, boosting oil extraction



Added to DCO they form a biopolymer nanolayer on the surface of suspended solids in the sludge, speed up oil extraction in the clarifier

REAGENTS FOR PALM OIL EXTRACTION: ADVANTAGES

Reagent Effect presents significant advantages for Palm Oil Mills to increase productivity without CAPEX investments and provides attractive Economic Value Added effect

- Increases OER extraction by minimum 2% for CPO
- No changes needed in Mills operating procedures, low implementation and running costs
- Can be dissolved in hot or cold water: works with temperatures up to 100°C
- Reduces water consumption in COT tank up to 50%
- Positive effect on FFA and moisture content in CPO
- Reduces emulsion and oil content in Heavy Phase, Cake
- Does not effect the quality of the palm oil or its characteristics
- Reduces extraction time in Clarifier

REAGENTS FOR PALM OIL EXTRACTION: QUALITIVE TESTS TO SHOW BMG EFFECT

Task

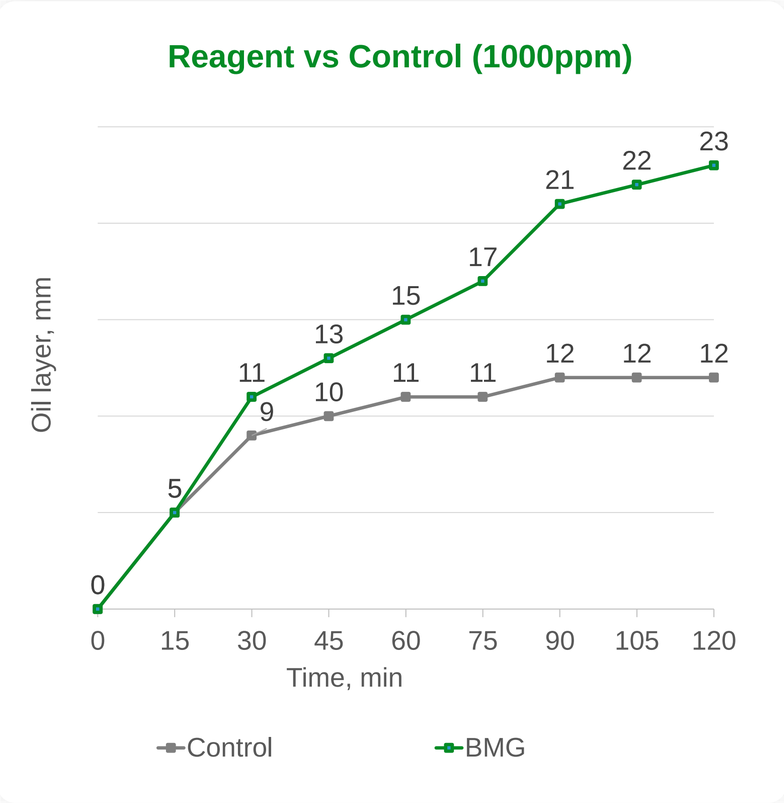
Demonstrate reagent effect in qualitive lab tests

Lab test method

COT samples taken. Oil content 40%. Reagent 3% solution. Water bath heated to 80-82°C. Retention time up to 120 min, every 15 minutes checking oil level in the samples

Results

Increased oil layer in COT sample to 92% after 120 minutes



We carried out more than 50 tests at Indonesian and Malaysian Palm Oil Mills and each of them showed increase in oil extraction speed: up to average **72%** after 90 minutes

REAGENTS FOR PALM OIL EXTRACTION: IMPLEMENTATION CASE INDONESIA

Task

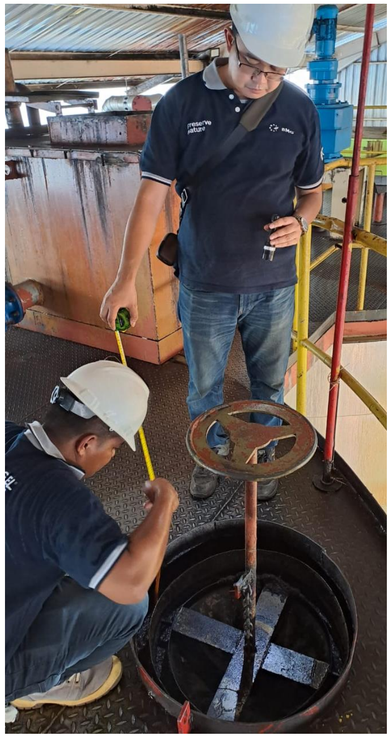
Implement our reagent and dosing station in palm oil mill in Indonesia. Get minimum target > 2% of OER increase (> 0.5 p.p. to OER)

Implementation method

Mill data were taken, dosage station prepared, installed, set up. Dosing process and process control according to SOP

Results

Minimum target > 2% achieved



REAGENTS FOR PALM OIL EXTRACTION: IMPLEMENTATION CASE MALAYSIA

Task

Implement our reagent and dosing station in palm oil mill in Malaysia. Get minimum target > 2% of OER increase (> 0.4 p.p. to OER)

Implementation method

Mill data were taken, dosage station prepared, installed, set up. Dosing process and process control according to SOP

Results

Minimum target > 2% achieved

REAGENTS FOR PALM OIL EXTRACTION:
FULL SYSTEM BMG-CPO DOSING IMPLEMENTATION CASE

Date	FFB processed, kg	CPO produced, kg	Oil in OST, kg	Process hours, h	OER sounding (include potential), %
25.09.2023	1 070 526	272 187	374 894	17,00	25,18
26.09.2023	1 113 687	284 208	659 102	18,50	24,74
27.09.2023	1 499 991	383 595	709 487	24,00	25,94
28.09.2023	PUBLIC HOLIDAY				
29.09.2023	1 213 455	310 813	455 961	18,50	25,96
30.09.2023	1 439 376	369 076	502 496	24,00	25,63
25-30.09.2023	**6 337 035**	**1 619 879**			**25,53**
03.10.2023	1 329 954	346 511	1 138 468	19,50	28,23
04.10.2023	1 431 185	372 731	1 508 686	23,00	23,80
05.10.2023	1 086 786	282 970	1 794 169	17,00	25,77
06.10.2023	1 168 837	305 326	2 099 495	19,00	26,98
07.10.2023	949 960	248 483	2 347 978	14,50	25,84
03-07.10.2023	**5 966 722**	**1 556 021**			**26,10**
10.10.2023	1 144 180	298 032	509 805	18,75	25,14
11.10.2023	1 161 005	302 424	435 029	18,75	25,37
12.10.2023	1 197 558	311 594	409 723	18,50	25,70
13.10.2023	1 048 962	272 757	397 450	17,33	25,53
14.10.2023	1 034 863	270 058	359 918	17,00	26,28
09-14.10.2023	**5 586 568**	**1 454 865**			**25,59**

Dates	OER with potential, %
25.09.23 - 30.09.23	25,53
Reagent dosing 02.10.23 - 07.10.23	**26,10**
09.10.23 - 12.10.23	25,59

Reagent effect	
Comparison with week before dosing 25.09.23 - 30.09.23	
%	2,23
p.p.	**0,57**
Comparison with week after dosing 09.10.23 - 12.10.23	
%	1,95
p.p.	**0,51**

Reagent effect average (with Potential)	
Percentage points	✅ **More than 0,50**

Both full system gives us target result
more than **0,50 p.p. OER increasing**

REAGENTS FOR PALM OIL EXTRACTION:
PARALLEL LINES BMG-CPO DOSING IMPLEMENTATION CASE

Biopolymer technologies reagent				Control		
Date	FFB proccessed	CPO produce	OER	FFB proccessed	CPO produce	OER
02.09.2024	369 888	87 458	23,64	436 828	101 916	23,33
03.09.2024	369 621	83 497	22,59	405 561	89 962	22,18
04.09.2024	321 281	80 492	25,05	303 360	71 768	23,66
06.09.2024	568 387	139 505	24,54	571 407	141 322	24,73
07.09.2024	295 104	70 996	24,06	322 101	82 017	25,46
11.09.2024	401 193	93 650	23,34	391 990	89 261	22,77
12.09.2024	432 953	100 762	23,27	511 661	114 085	22,30
13.09.2024	431 599	101 334	23,48	458 660	109 985	23,98
14.09.2024	466 898	116 669	24,99	466 490	106 012	22,73
17.09.2024	439 519	117 993	26,85	491 340	119 327	24,29
07.10.2024	521 305	109 992	21,10	570 743	136 867	23,98
08.10.2024	492 548	109 427	22,22	525 668	126 495	24,06
09.10.2024	470 194	96 178	20,45	565 493	137 977	24,40
10.10.2024	589 729	135 653	23,00	359 296	92 391	25,71
11.10.2024	487 632	112 503	23,07	419 460	101 153	24,12
12.10.2024	611 537	139 728	22,85	367 629	83 465	22,70
15.10.2024	511 656	120 406	23,53	1 000 276	227 636	22,76
16.10.2024	457 549	116 710	25,51	703 355	161 740	23,00
17.10.2024	387 409	111 579	28,80	585 381	118 549	20,25
18.10.2024	292 229	87 328	29,88	468 582	95 343	20,35
21.10.2024	295 051	75 267	25,51	594 076	140 085	23,58
24.10.2024	507 344	126 508	24,94	530 214	126 533	23,86
02.11.2024	430 246	110 088	25,59	430 633	109 852	25,51
04.11.2024	536 097	132 737	24,76	536 618	134 469	25,06
05.11.2024	567 213	141 005	24,86	567 343	143 057	25,22
06.11.2024	523 112	123 331	23,58	522 477	118 784	22,73
12.11.2024	453 951	107 993	23,79	451 150	115 071	25,51
13.11.2024	448 324	118 020	26,32	448 079	113 253	25,28
14.11.2024	610 828	131 096	21,46	610 551	141 952	23,25
15.11.2024	353 204	94 585	26,78	353 738	87 050	24,61
18.11.2024	457 836	121 251	26,48	454 837	110 666	24,33
19.11.2024	445 246	119 790	26,90	445 477	108 540	24,36
20.11.2024	526 982	125 066	23,73	526 982	129 851	24,64
21.11.2024	540 310	134 770	24,94	536 804	132 699	24,72
	Average Reagent OER — 24,29			Average Control OER — 23,73		

Reagent effect average 34 days (with Potential)	
%	2,36
Percentage points	✅ **0,56**

Dosing reagent for 34 days gives OER increasing of **0,56 p.p. — target achieved!**

REAGENT DOSING IMPLEMENTATION CASE
Reagent effect on oil loses + emulsion in UF

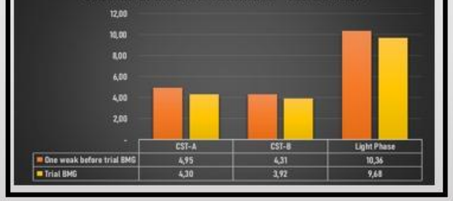
Reducing Oil losses in underflow

TANGGAL	UNDERFLOW		
	CST-A	CST-B	Light Phase
25.09.2023	4,86	4,43	9,14
26.09.2023	5,00	4,57	9,86
27.09.2023	5,00	4,33	10,78
28.09.2023			
29.09.2023	5,00	4,43	11,57
30.09.2023	4,89	3,78	10,44
AVERAGE	4,95	4,31	10,36
01.10.2023			
02.10.2023	4,43	4,00	11,29
03.10.2023	4,25	3,88	9,30
04.10.2023	4,25	4,00	9,75
05.10.2023	4,14	3,71	9,14
06.10.2023	4,88	4,00	10,00
07.10.2023	4,00	4,00	10,20
AVERAGE	4,30	3,92	9,68
08.10.2023			
09.10.2023	5,14	4,86	13,43
10.10.2023	4,75	4,00	10,38
11.10.2023	5,00	4,38	9,88
12.10.2023	4,75	4,13	9,63
AVERAGE	4,83	4,34	10,83

PENGARUH BMG TERHADAP UNDERFLOW DAN LIGHT PHASE

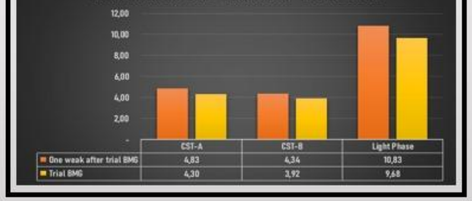
BMG EFFECT	UNDERFLOW		
	CST-A	CST-B	Light Phase
One weak before trial BMG	4,95	4,31	10,36
Trial BMG	4,30	3,92	9,68
SUMMARY	-0,65	-0,39	-0,68
	-13%	-9%	-7%

GRAFIK EFEK BMG TERHADAP OIL LOSSES



BMG EFFECT	UNDERFLOW		
	CST-A	CST-B	Light Phase
One weak after trial BMG	4,83	4,34	10,83
Trial BMG	4,30	3,92	9,68
SUMMARY	-0,53	-0,42	-1,15
	-11%	-10%	-11%

GRAFIK EFEK BMG TERHADAP OIL LOSSES



Catatan :

1. Jika dibandingkan dengan 1 minggu sebelum dan juga beberapa hari sesudah trial BMG mengalami penurunan underflow yang berhubungan dengan penurunan oil content pada light phase.

Reducing Emulsion in underflow

	Underflow CST-A	Underflow CST-B
Date	Emulsion, %	Emulsion, %
02/09/2024	21,6	25,8
03/09/2024	21,3	25,2
04/09/2024	19,8	21,8
06/09/2024	18,9	21,8
07/09/2024	20,0	22,0
11/9/2024	22	19
12/9/2024	20	20
13/9/2024	22	18
14/9/2024	24	19
17/9/2024	20	21
07/10/2024	19	26
08/10/2024	16	26
09/10/2024	17	25
10/10/2024	16	25
11/10/2024	17	28
12/10/2024	17	24
15/10/2024	27	17
16/10/2024	26	20
17/10/2024	27	22
18/10/2024	25	22
21/10/2024	31	23
24/10/2024	34	20
02/11/2024	23	23
04/11/2024	25	22
05/11/2024	22	20
06/11/2024	21	20
12/11/2024	12	19
13/11/2024	15	19
14/11/2024	16	16
15/11/2024	17	16
18/11/2024	17	22
19/11/2024	22	22
20/11/2024	20	20
Avg BMG	17,6	20,6
Avg Control	23,8	22,7
BMG effect	26%	9%

Results: Oil Losses in UF reducing by minimum 11% and Emulsion reducing in UF 18%

REAGENTS FOR PALM OIL EXTRACTION: ECONOMIC VALUE ADDED MODEL

Our reagents present significant advantages **to provide with Economic Value Added more than 30%** with low CAPEX

Parameter	Data Pabrik
Capacity FFB, TPH	60
Average FFB, tn/day	1 000
Working hours/day	17
Extraction rate, %	22,0%
CPO, tn/day	220
Oil content in COT (CST input)	35%
CST input flow, m3/day	699
CST input flow, m3/h	42
BMG dosage to UF, g/l	0,80
Concentration BMG water solution	3%
Water+Solids, m3/h	27,27
BMG, kg/h	22
CPO Density,t/m3	0,899
BMG dosage, g/tFFB	364
BMG water solution, l/min	12
BMG, kg/day	364
BMG, kg/6 days	2 181
Working days/mth	25
BMG, tn/mth	**9,1**

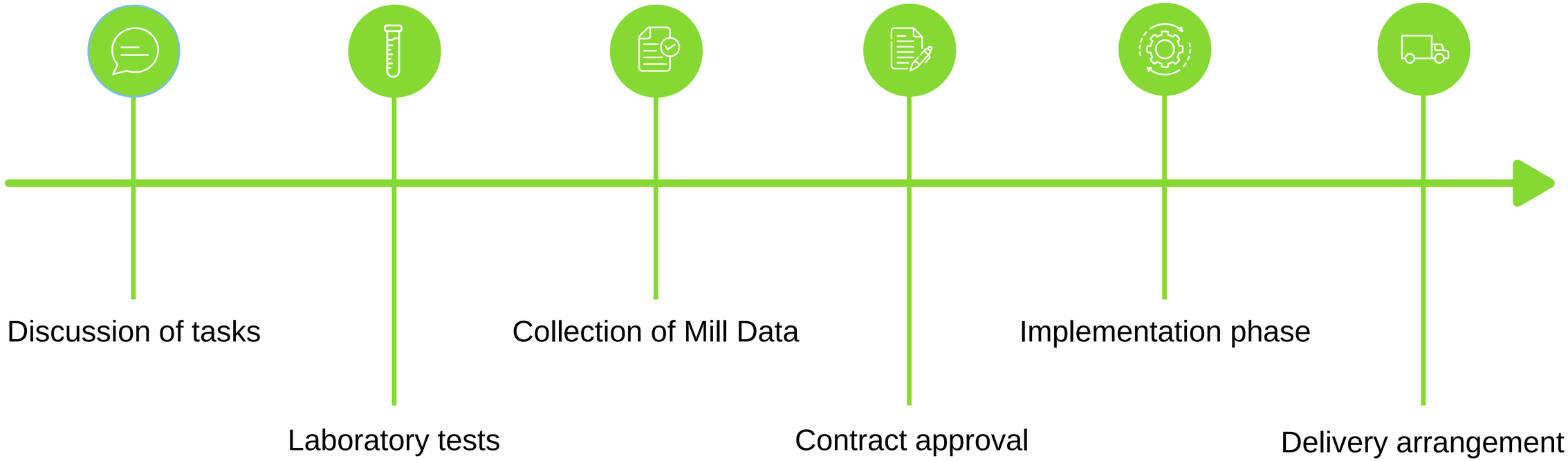
BMG price, per kg
35 MYR
129 600 IDR
$ 8,0

CPO price, per ton
4 100 MYR
14 963 504 IDR
$ 926

EVA (economic value added) model for BMG application based on OER EVA= (Additional Oil cost - BMG cost)/ BMG cost			
OER increase, %	**2**	**3**	**4**
OER increase, p.p.	**0,44**	**0,66**	**0,88**
Net Profit, per year	**5 615 889 651 IDR**	**15 491 802 060 IDR**	**25 367 714 469 IDR**
	1 546 433 MYR	**4 252 433 MYR**	**6 958 433 MYR**
	$ 349 082	**$ 959 917**	**$ 1 570 752**
EVA	**40%**	**110%**	**179%**

BIOPOLYMER TECHNOLOGIES: IMPLEMENTATION FLOW-CHART

We collect samples, conduct laboratory tests and accompany you at all stages of implementation process
Before delivery, we will prove that our product increases OER 2% minimum or provides with EVA minimum 30%



BIOPOLYMER TECHNOLOGIES: IMPLEMENTATION PHASE

Implementation equipment

For implementation phase we provide basic dosing station free of charge

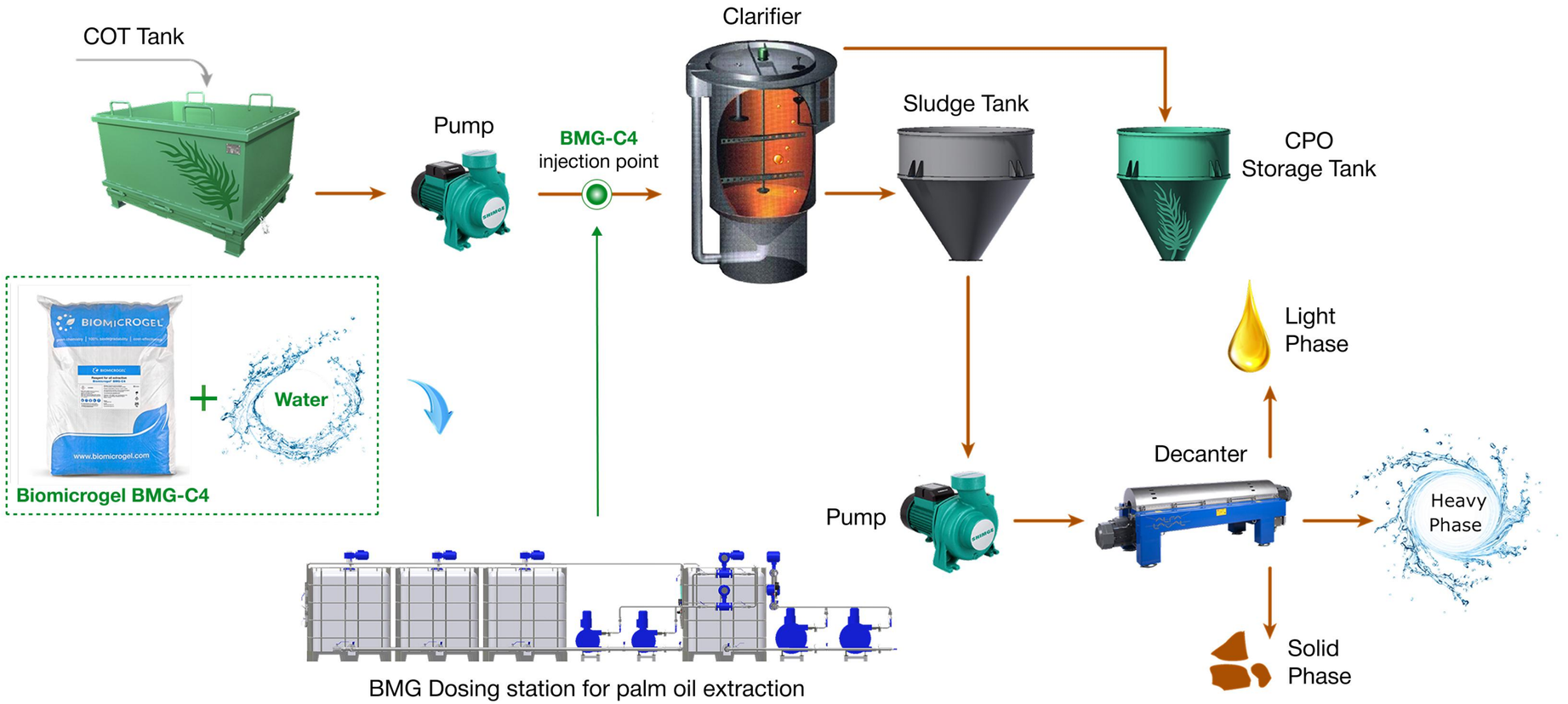
Implementation method

Before implementation we assess the palm oil mill, give recommendations about production process optimization for reagent usage, assembly and set up dosing station, adjust and agreed SOP.

Implementation is conducted within 6 operating weeks. The first 14 days to collect control data and assemble and tune equipment: Reagent dosing station and calibration flowmeter (if available) for CPO flow. The next 14 days will be used for reagent dosing. The remaining 14 days will be used for collecting control data.

REAGENTS FOR PALM OIL EXTRACTION: INTEGRATION IN PALM OIL MILL PROCESS

Mills operating procedures remain the same.
Reagent solution integrates without major costs and changes to the extraction process



THANK YOU!