Surfactant Catalogs, SUNJIN

2018 Nov.

ESTER Quaternary for Fabric Softener

Ester Quarts

Grade	Solid(%)	Solvent	Melting Point	Source	Remark NF*	ECO*	COLD*	NE*	Price*
Non Flammable & Cold Process									
SUNQAT-CEQ90TPG	90±1	TPG*	23°C	Palm Fatty Acid	√		√		5
SUNQAT-CTN85G	85±1	DEG* DPG*	21°C	Cotton	√		√	√	5
Cold Process									
SUNQAT-CEQ90	90±1	IPA	18°C	Palm Fatty Acid			√		2
SUNQAT-CTN90	90±1	EtOH	14°C	Cotton		√	√	√	4
SUNQAT-SEQ90	90±1	EtOH	24°C	Soybean		√	√		1
Regular									
SUNQAT-PEQ90	90±1	IPA	33°C	Palm Oil					1
SUNQAT-TEQ90	90±1	IPA	33°C	Palm Oil					2
SUNQAT-TE90	90±1	IPA	32°C	Palm Fatty Acid					3
SUNQAT-TE90H	90±1	IPA	33°C	Palm Fatty Acid					3

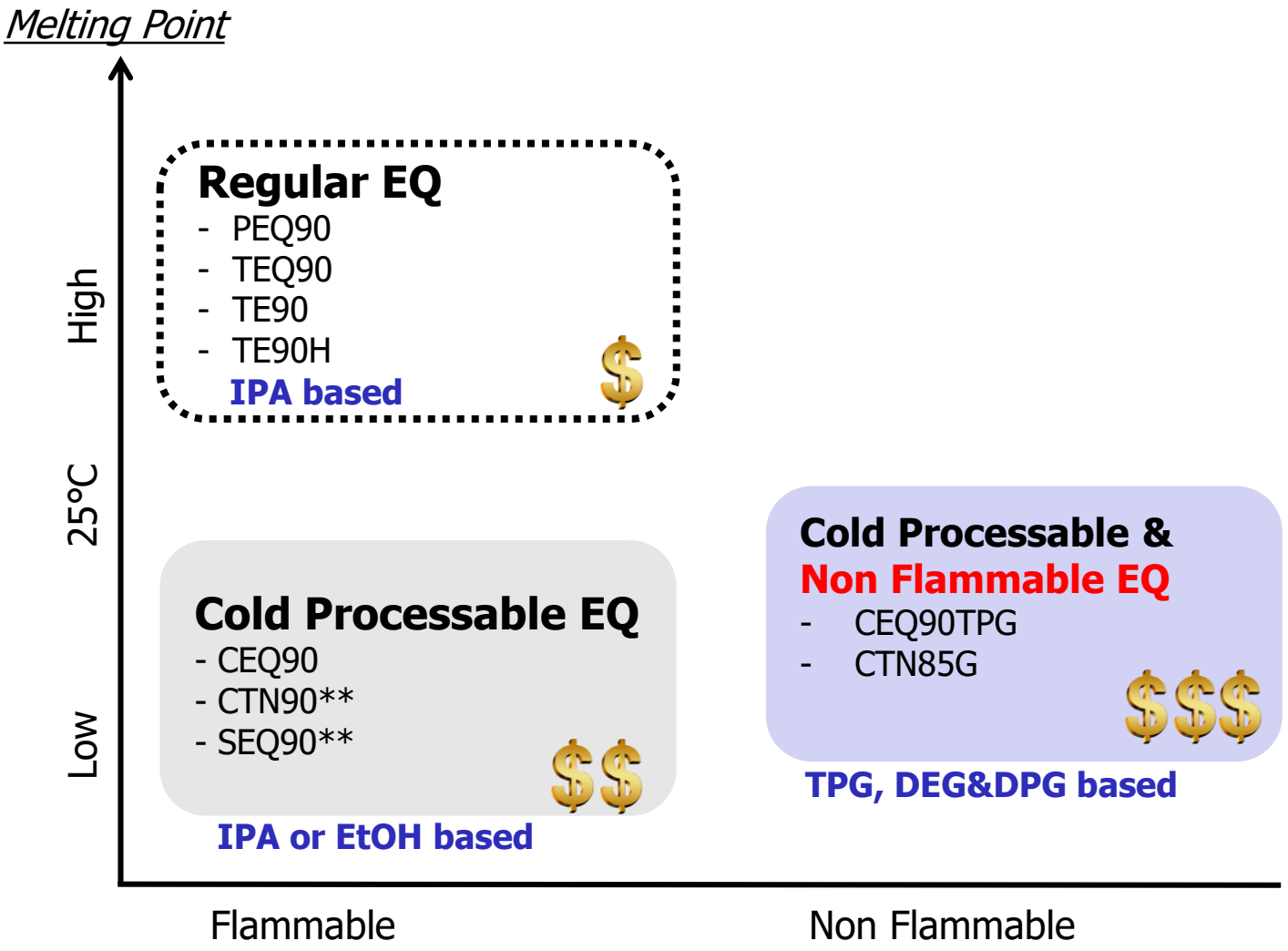
Remarks*

NF: Non Flammable ECO: Eco Friendly COLD: Cold Processable

NE: Non Edible Source Price: 1(Low) / 3(Average) / 5(High)

TPG*: Tripropylene glycol / DEG*: Diethylene glycol / DPG*: Dipropylene glycol

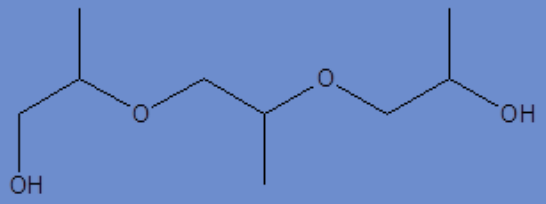
Ester Quarts



Remarks**
CTN: Cotton Seed based
SEQ: Soybean based

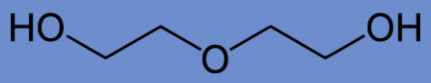
Non Flammable EQ

TPG



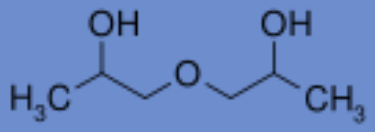
- Chemical Name: Tripropylene Glycol
- Formula: $C_9H_{20}O_4$
- Cas No.: 24800-44-0
- Molecular Weight: 192.3 g/mol
- Boiling Point: 265.1℃

DEG



- Chemical Name: Diethylene glycol
- Formula: $C_4H_{10}O_3$
- Cas No.: 111-46-6
- Molecular Weight: 106.1 g/mol
- Boiling Point: 244℃

DPG



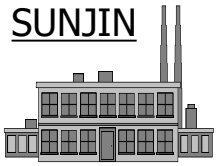
- Chemical Name: Dipropylene glycol
- Formula: $C_6H_{14}O_3$
- Cas No.: 25265-71-8
- Molecular Weight: 134.1 g/mol
- Boiling Point: 230.5℃

- ***Patent Pending***

EsterQuat

Non Flammable vs. Flammable (From EQ maker to Container Loading)

SUNJIN



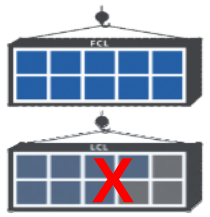
Packaging

Inspection

Container Loading

- Certified drum only
- Open head plastic drum not allowed
- Used drum not allowed
- Hazard pictogram should be properly attached

- Expert Inspection mandatory
- If rejected, rescheduling at least 1 week



- FCL only
- LCL cargo not allowed

* FCL: Full Container Load
** LCL: Less then Container Load

NON-FLAMMABLE

- Various Packages available including Open head PE drum
- Used drum(2nd hand drum) OK

- Inspection not required

- FCL OK
- LCL OK

Non Flammable vs. Flammable (From Shipping To Customer)

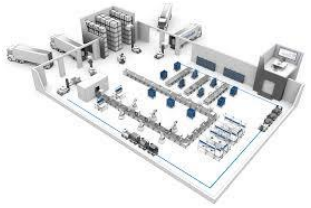
Ocean Shipping

Landing @CY

Storage & usage

- Inland trucking more expensive
- Limited shipping schedule
- Limited shipping route

- Dangerous Goods, limited CY(container yard) space
- Inland trucking to customer site more costly due to handling of dangerous goods



- Strict facility & factory regulation

NON-FLAMMABLE

- Inland trucking less expensive
- More flexible shipping schedule
- More flexible shipping route

- More spacious CY

- Safer to use
- Less regulation

Non Flammable EQ

Grade	Solid(%)	Solvent	Melting Point	Source	Remark NF*	ECO*	COLD*	NE*	Price*
Non Flammable & Cold Process									
SUNQAT-CEQ90TPG	90±1	TPG*	23°C	Palm Fatty Acid	√		√		5
SUNQAT-CTN85G	85±1	DEG* DPG*	21°C	Cotton	√		√	√	5
Cold Process									
SUNQAT-CEQ90	90±1	IPA	18°C	Palm Fatty Acid			√		2
SUNQAT-CTN90	90±1	EtOH	14°C	Cotton		√	√	√	4
SUNQAT-SEQ90	90±1	EtOH	24°C	Soybean		√	√		1
Regular									
SUNQAT-PEQ90	90±1	IPA	33°C	Palm Oil					1
SUNQAT-TEQ90	90±1	IPA	33°C	Palm Oil					2
SUNQAT-TE90	90±1	IPA	32°C	Palm Fatty Acid					3
SUNQAT-TE90H	90±1	IPA	33°C	Palm Fatty Acid					3

Remarks*

NF: Non Flammable ECO: Eco Friendly COLD: Cold Processable

NE: Non Edible Source Price: 1(Low) / 3(Average) / 5(High)

TPG*: Tripropylene glycol / DEG*: Diethylene glycol / DPG*: Dipropylene glycol

Improved Color Stability

Tested Recipe
- Water 81.7%
- EQ 18.0%
- CaCl2 0.3%
- Dye q.s

Test Condition
- at 25℃
- under the sunlight
- 1 week

Water Dispersibility

Tested sample
- CTN85G
- CEQ90TPG
- TE90
- Company "E"
- Company "K"

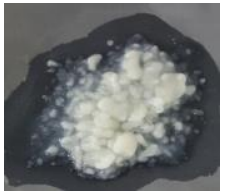
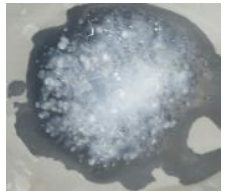
Formula Recipe
- Water 95%
- EQ 5%

SUNJIN suggests below test procedure for water-dispersibility

1) Heating to EQ(40°C)
2) Heating to D.I Water (10°C,18°C, 25°C 40°C)
3) Input EQ in each temperature water
4) Stirring (500rpm, Keep the temperature of D.I water)
   - Stirring Time: 10min & 20min & 30min & 60min
5) Filter the solution by 200 mesh
6) Check whether lump appear on the mesh or not.

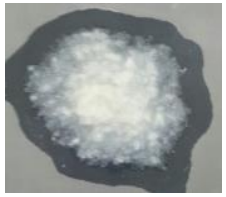
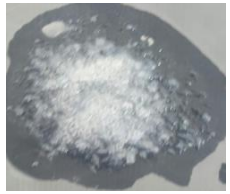
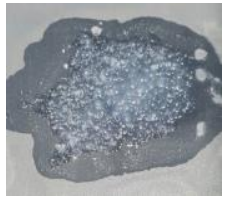
If you see lump on the sieve, the water dispersibility is no good

Water Dispersibility at 18°C

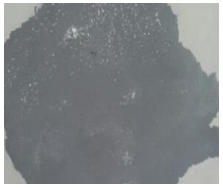
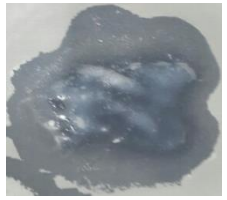
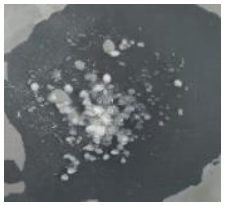
	10min	20min	30min	60min
CEQ90TPG				
CTN85G				
TE90				
Company "E"				
Company "K"				

Improved Water Dispersibility

Water Dispersibility at 25℃

	10min	20min	30min	60min
CEQ90TPG				
CTN85G				
TE90				
Company “E”				
Company “K”				

Water Dispersibility at 40°C

	10min	20min	30min	60min
CEQ90TPG				
CTN85G				
TE90				
Company “E”				
Company “K”				

Eco-Environmental EQ

Save the Environment

Humans Are Destroying the Last Place on Earth Where Orangutans, Tigers, Rhinos and Elephants Still Live Together in the Wild

An ancient ecosystem is being decimated by corporate interests.

By *Dr. Ian Singleton* / AlterNet | April 10, 2017

There are some places in the world that are so vital to the survival of wildlife and so important to surrounding people and their livelihoods that even if we will never visit them in person, we know we must cherish them.
The Leuser Ecosystem pulses with life. It is the last place on earth where orangutans, tigers, rhinos and elephants still live side by side in the wild. To step into Leuser's steamy rainforests is to experience a serenade of biodiversity, a cacophony of buzzing insects, singing birds, croaking frogs and loud-calling primates.

But today, Leuser's forests are under constant and escalating threat. Despite being protected by Indonesian law, the Leuser Ecosystem is under siege for short-term profits. Corporate interests such as industrial pulp and palm oil plantations, mining and logging operations, energy projects, and all the roads and infrastructure that are built to support them, are eating away at every corner of the Ecosystem.
As the last remaining intact lowland forests and peatlands are being cleared, drained, burned and carved up into smaller and smaller fragments, all of the region's threatened and endangered species are being pushed closer to the brink of extinction.
…
If we lose Leuser, we will lose these species and countless others, forever.

Palm Deforestation

Orangutan Conservancy

Cotton Seed EQ, CTN90

- Non edible oil source
- Melting point 14°C

Soybean EQ, SEQ90

- Natural Plant oil source
- Melting point 24℃

Cold Processable EQ

Cold Processable Ester Quarts

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SUNQAT-CTN90	90±1	EtOH	14°C	Cotton		√	√	√	4
SUNQAT-SEQ90	90±1	EtOH	24°C	Soybean		√	√		1
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SUNQAT-TEQ90	90±1	IPA	33°C	Palm Oil					2
SUNQAT-TE90	90±1	IPA	32°C	Palm Fatty Acid					3
SUNQAT-TE90H	90±1	IPA	33°C	Palm Fatty Acid					3

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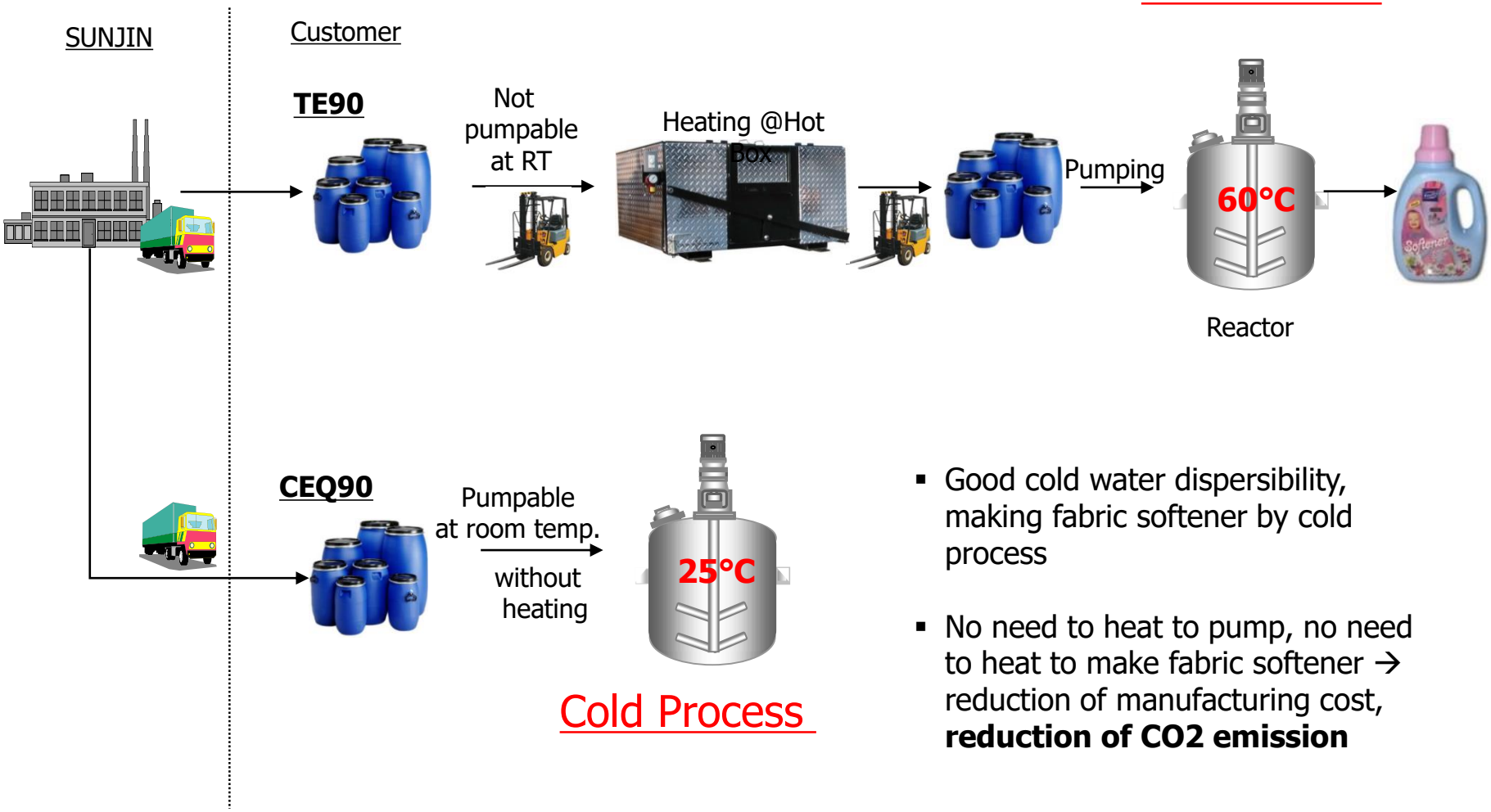
Cold Process vs. Hot Process

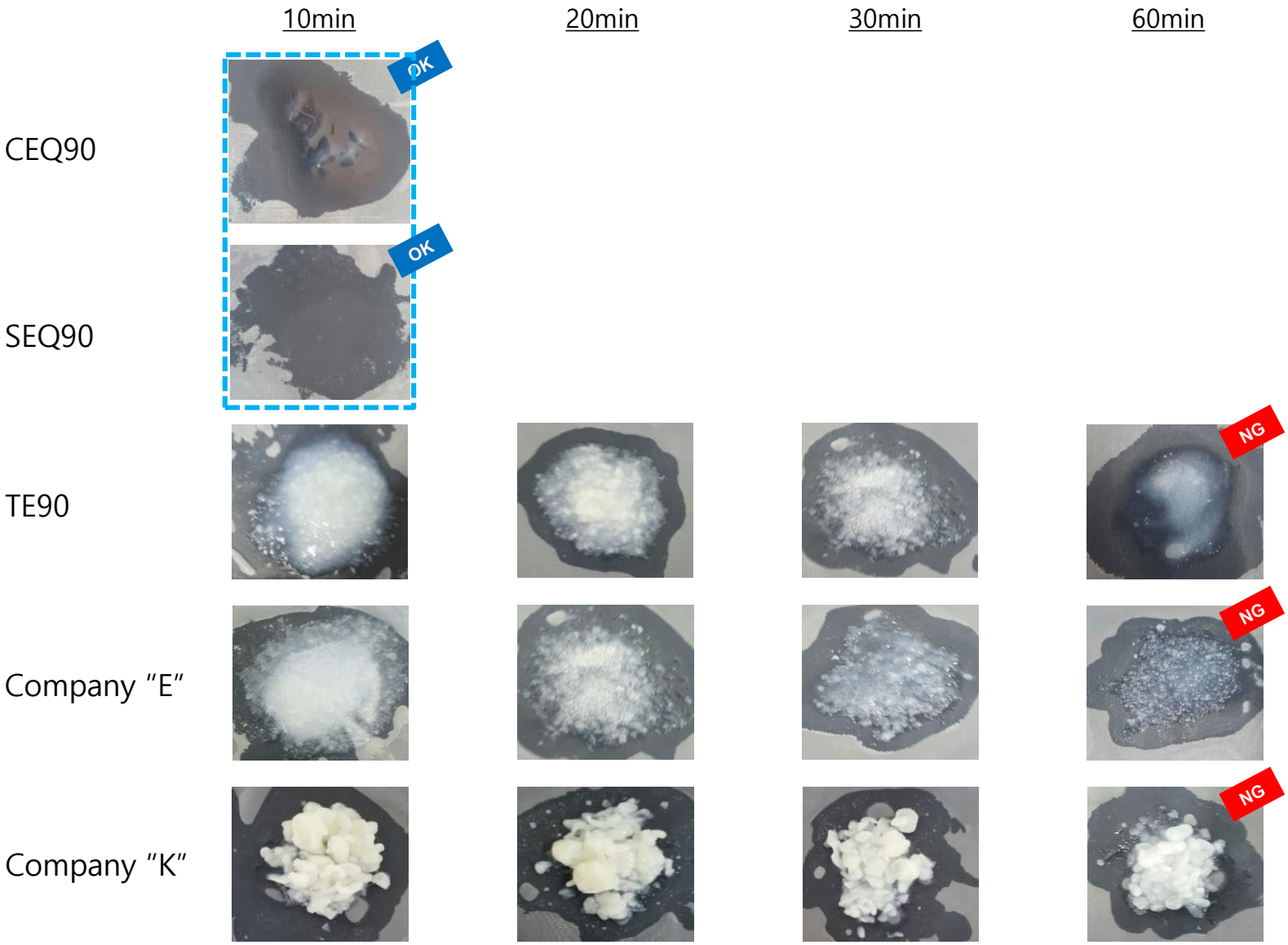
Hot Process



Cold Process

- Good cold water dispersibility, making fabric softener by cold process
- No need to heat to pump, no need to heat to make fabric softener → reduction of manufacturing cost, **reduction of CO2 emission**

Water Dispersibility at 25℃



Regular EQ

Regular Ester Quarts

Grade	Solid(%)	Solvent	Melting Point	Source	Remark NF*	ECO*	COLD*	NE*	Price*
Non Flammable & Cold Process									
SUNQAT-CEQ90TPG	90±1	TPG*	23°C	Palm Fatty Acid	√		√		5
SUNQAT-CTN85G	85±1	DEG* DPG*	21°C	Cotton	√		√	√	5
Cold Process									
SUNQAT-CEQ90	90±1	IPA	18°C	Palm Fatty Acid			√		2
SUNQAT-CTN90	90±1	EtOH	14°C	Cotton		√	√	√	4
SUNQAT-SEQ90	90±1	EtOH	24°C	Soybean		√	√		1
Regular									
SUNQAT-PEQ90	90±1	IPA	33°C	Palm Oil					1
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SUNQAT-TE90	90±1	IPA	32°C	Palm Fatty Acid					3
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Remarks*

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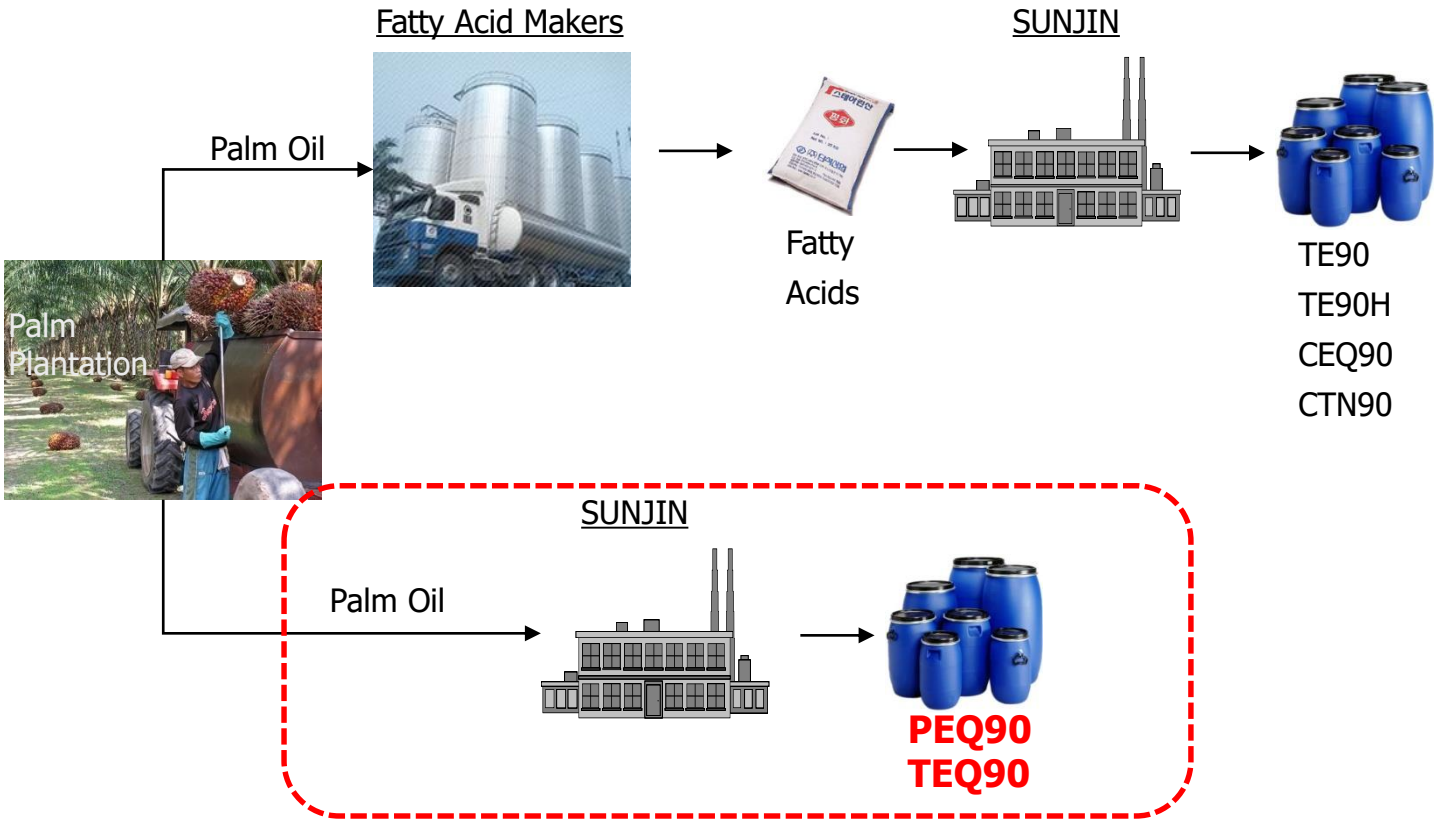
EQ from Fatty Acid vs. EQ directly from palm oil



"Palm oil is always cheaper than Fatty Acids"

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