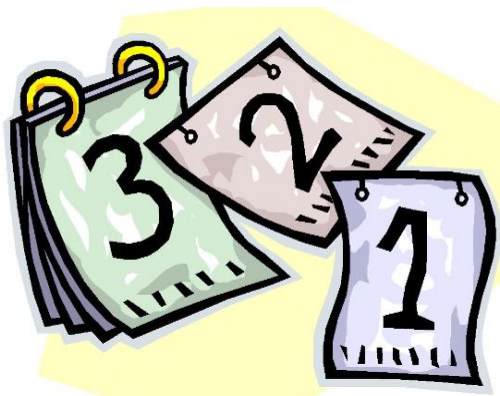


# Formula Book



# Formula stability Check



2 Year Shelf Life at Room Temperature should be examined...But it's too long!

Something faster test methods needed...

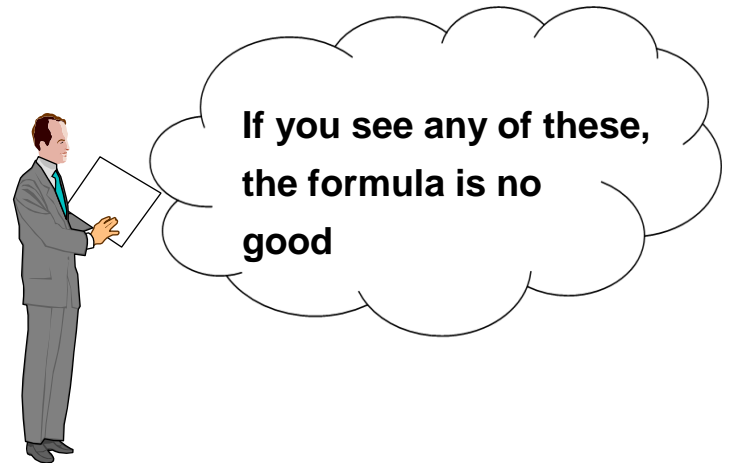
## **Acceleration Test** at Higher Temp

- **60°C 8 weeks = 25°C 2 year**
- **45°C 16 weeks = 25°C 2 year**

# How to judge whether formula is stable or not?

**SUNJIN suggests 5 criteria for the stability of Fabric Softener formulation**

- 1. Phase separation**
- 2. Sedimentation**
- 3. White Scum(=Halo effect)**
- 4. Severe change of viscosity of formula**
- 5. Severe change of color of formula**



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- 1. Phase separation**
2. Sedimentation
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4. Severe change of viscosity of formula
5. Severe change of color of formula



**<Example>**  
**Phase separation noticed**  
**: No Good**

# How to judge whether formula is stable or not?

**SUNJIN suggests 5 criteria for the stability of Fabric Softener formulation**

1. Phase separation
- 2. Sedimentation**
3. White Scum(=Halo effect)
4. Severe change of viscosity of formula
5. Severe change of color of formula



**<Example>**  
**Sedimentation at the bottom**  
**noticed : No Good**

# How to judge whether formula is stable or not?

**SUNJIN suggests 5 criteria for the stability of Fabric Softener formulation**

1. Phase separation
2. Sedimentation
- 3. White Scum(=Halo effect)**
4. Severe change of viscosity of formula
5. Severe change of color of formula



**<Example>**  
**White scum on the surface**  
**noticed : No Good**

# How to judge whether formula is stable or not?

**SUNJIN suggests 5 criteria for the stability of Fabric Softener formulation**

1. Phase separation
2. Sedimentation
3. White Scum(=Halo effect)
- 4. Severe change of viscosity of formula**
5. Severe change of color of formula



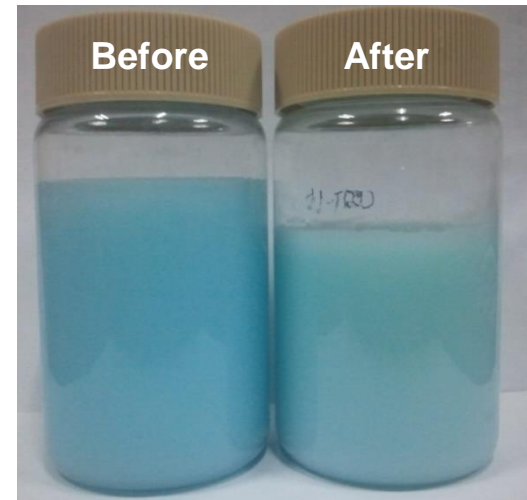
**<Example>**

**Viscosity increased significantly  
noticed : No Good**

# How to judge whether formula is stable or not?

**SUNJIN suggests 5 criteria for the stability of Fabric Softener formulation**

1. Phase separation
2. Sedimentation
3. White Scum(=Halo effect)
4. Severe change of viscosity of formula
5. **Severe change of color of formula**



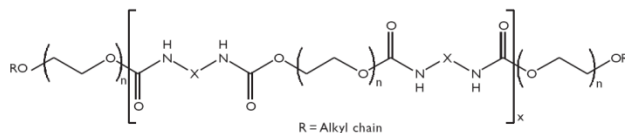
**<Example>**  
**Color faded significantly**  
**noticed : No Good**



# Regular Type Fabric Softener Formula

# Thickeners Used:

## ACUSOL882 : Nonionic Thickener



A hydrophobically modified, nonionic polyol (HEURs) thickener and stabilizer used in detergent formulations for household and industrial applications, providing outstanding rheology and excellent chemical compatibility.

## Fiosoft 222 : Polymer Thickener



Cationic acrylamide-based polymer used as a thickening agent for acidic aqueous compositions, and particularly in domestic detergents and laundry softeners.

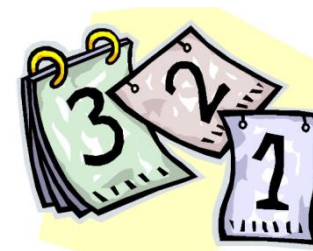
White creamy water-in-oil emulsion typically used at a concentration range between 0.1% and 5.0% in fabric softener compositions.

# 100cps

## Regular 100cps ver1.0

Step	Trade Name	REMARK	TE90	TEQ90	CEQ90	CTN90	PEQ90HV
1	D.I-Water	Aqua	93.27	94.27	94.27	94.27	
	Dye	Dye	0.5	0.5	0.5	0.5	
2	SUNQAT	Ester Quat.	5.6	5.6	5.6	5.6	
	FS-222	Thickener	0.3	0.2	0.2	0.2	
3	Fragrance	Fragrance	0.3	0.3	0.3	0.3	
	Kathone CG	Preservative	0.03	0.03	0.03	0.03	

16 weeks @45 °C, 7 weeks @60 °C stability tests passed



# 300cps

## Regular 300cps ver1.0

Step	Trade Name	REMARK	TE90	TEQ90	CEQ90	CTN90	PEQ90HV
1	D.I-Water	Aqua	93.22	94.22	94.22	94.22	
	Dye	Dye	0.5	0.5	0.5	0.5	
2	SUNQAT	Ester Quat.	5.6	5.6	5.6	5.6	
	FS-222	Thickener	0.35	0.25	0.25	0.25	
3	Fragrance	Fragrance	0.3	0.3	0.3	0.3	
	Kathone CG	Preservative	0.03	0.03	0.03	0.03	

16 weeks @45 °C, 7 weeks @60 °C stability tests passed



# 500cps

## Regular 500cps ver1.0

Step	Trade Name	REMARK	TE90	TEQ90	CEQ90	CTN90	PEQ90HV
1	D.I-Water	Aqua	93.17	94.17	94.17	94.17	93.17
	Dye	Dye	0.5	0.5	0.5	0.5	0.5
2	SUNQAT	Ester Quat.	5.6	5.6	5.6	5.6	5.6
	FS-222	Thickener	0.4	0.3	0.3	0.3	0.0
3	Fragrance	Fragrance	0.3	0.3	0.3	0.3	0.3
	Kathone CG	Preservative	0.03	0.03	0.03	0.03	0.03

16 weeks @45 °C, 7 weeks @60 °C stability tests passed



# 1000cps

## Regular 1000cps ver1.0

Step	Trade Name	REMARK	TE90	TEQ90	CEQ90	CTN90	PEQ90HV
1	D.I-Water	Aqua	92.97	92.97	93.17	93.07	92.77
	Dye	Dye	0.5	0.5	0.5	0.5	0.5
2	SUNQAT	Ester Quat.	5.6	5.6	5.6	5.6	6.0
	FS-222	Thickener	0.6	0.6	0.4	0.5	0.0
3	Fragrance	Fragrance	0.3	0.3	0.3	0.3	0.3
	Kathone CG	Preservative	0.03	0.03	0.03	0.03	0.03

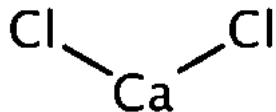
16 weeks @45 °C, 7 weeks @60 °C stability tests passed



# Concentrated Type Formula

# Viscosity control agent: CaCl<sub>2</sub>

## Calcium Chloride : Reduction of surface tension



The presence of calcium chloride reduce the surface activity to a greater extent above the critical micelle concentration region of cationic surfactant.

Ageing effects due to the salts affected the surface tension, probably by reason of the tendency of a solution to take in water by osmosis.



# 200cps

## Concentrated 200cps ver1.0

Step	Trade Name	REMARK	TE90	TEQ90	CEQ90	CTN90
1	D.I-Water	Aqua	76.97	76.95	76.97	76.97
2	Dye	Dye	0.5	0.5	0.5	0.5
3	DB-110A	Anti foam	0.05	0.05	0.05	0.05
4	LA-9N	Emulsifier	1.0	1.0	1.0	1.0
5	SUNQAT	Ester Quat.	19.8	19.8	19.8	19.8
6	CaCl <sub>2</sub>	Viscosity	0.15	0.17	0.15	0.15
7	Fragrance	Fragrance	1.5	1.5	1.5	1.5
8	Kathone CG	Preservative	0.03	0.03	0.03	0.03

8 weeks @45 °C, 4 weeks @60 °C stability tests passed



# 3500cps

## Concentrated 3500cps ver1.0

Step	Trade Name	REMARK	TE90	TEQ90	CEQ90	CTN90
1	D.I-Water	Aqua	72.29	72.29	72.27	72.27
2	Dye	Dye	0.5	0.5	0.5	0.5
3	DB-110A	Anti foam	0.05	0.05	0.05	0.05
4	LA-9N	Emulsifier	1.2	1.2	1.2	1.2
5	SUNQAT	Ester Quat.	24.4	24.4	24.4	24.4
6	CaCl2	Viscosity	0.03	0.03	0.05	0.05
7	Fragrance	Fragrance	1.5	1.5	1.5	1.5
8	Kathone CG	Preservative	0.03	0.03	0.03	0.03

8 weeks @45 °C, 4 weeks @60 °C stability tests passed

