



**FAN AVARAN SHIMI**  
*KNOWLEDGE-BASE*



**Manufacturer**  
**of Advanced Additives**  
**for Polymers**



# Part 1:

Introduction

## About Us:

Fan Avaran Shimi Zarin Iranian is a knowledge-base manufacturer of advanced additives for polymer.

Our company with the support of its expert and technical staff, takes steps forward to make Iran self-independent in producing high quality metallic stearates under **FLOKEM** brand name.

Among our company recent products is a coupling agent (**POLYTIVE**) which is used in stone paper industry.

Also we introduced green stabilizers (**GREENSTAB**) and phthalate-free lubricants (**LifeLub**) for PVC industry.

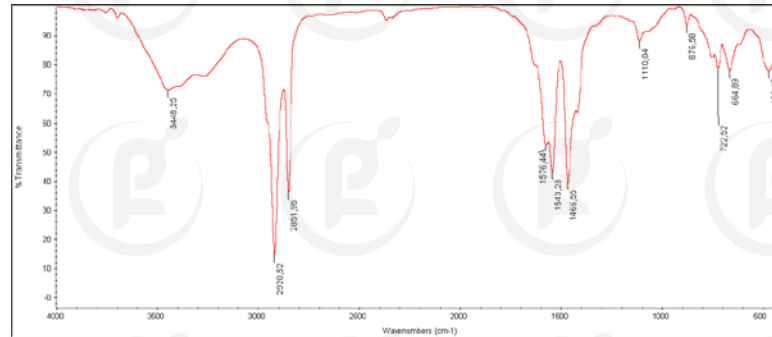
## Vision:

We want to become the largest chemical additives company in Iran by moving forward to meet the needs of customers.

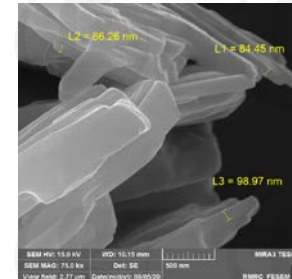
## Mission:

Producing high quality products with universal certificates and covering all required additives in petrochemical and polymer Industry.

## Membership and Certificates:



FTIR



super fine



# Our Products Overview:

## FLOKEM:



6 stearates produced by using fully automatic control system. Also different grades and testing in line is adjusted. All conditions include water content and melting point determine in line.

- Calcium Stearate • Magnesium Stearate
- Sodium Stearate • Aluminum Stearate
- Zinc Stearate • Potassium Stearate

## POLYTIVE:



We formulated a coupling agent called POLYTIVE102 for the first time in Iran for stone paper industry.

## GREENSTAB:



We offer a broad range of non-toxic Ca-Zn based stabilizers for PVC industries which are suitable for various final products.

## LIFELUB:



External and internal lubricants are one of the essential PVC additives for plastic industry. We can offer the best solution to each customer.

KNOWLEDGE-BASE

FULLY AUTOMATIC LINES

5 FACTORIES





# Part 2:

Products



## Calcium Stearate

Calcium Stearate is in a form of fine particle size powder that disperses readily during the blending or processing to provide excellent thermal stability.



Grades	Appearance	Certificates	Density	Solubility	Melting Point	Free Fatty Acid	Particle Size	Loss on drying	Packing
FSC3014	White Powder	ISIRI,USP	300 ± 30	Insoluble in water	155 ± 5	0.5 Max	90µm≥	Max 3.5	20
FSC3014SF		USP	260 ± 10		155 ± 5	0.5 Max	12µm	Max 3.5	15
KSC3020		-	175 ± 25		155 ± 5	1 Max	-	Max 5	20
Unit	-	-	gr/lit	-	°C	%	Min 90%	%	Kg



## Zinc Stearate

**Zinc stearate** developed especially for polymer, color and cosmetic industries. It has low ash for great melting clarity and outstanding heat stability and dispersing. It also functions as an acid scavenger and processing aid in certain polyolefin applications.



Grades	Appearance	Certificates	Density	Solubility	Melting Point	Free Fatty Acid	Particle Size	Loss on drying	Packing
FSZ5012	White Powder Bead	ISIRI, USP	210 ± 20	Insoluble in water	125 ± 3	0.5 Max	57µm≥	Max 0.5	20
FSZ5012SF		USP	130 ± 10		125 ± 3	0.5 Max	12µm	Max 0.5	15
Unit	-	-	gr/lit	-	°C	%	Min 90%	%	Kg



## Magnesium Stearate

**Magnesium Stearate** is used in polymer, ABS and pharmaceutical industry with a low soluble salt level that reduces discoloration during process. The low dusting particle size improves handling, blending, and dispersing.



Grades	Appearance	Certificates	Density	Solubility	Melting Point	Free Fatty Acid	Particle Size	Loss on drying	Packing
FSM4014	White Powder	ISIRI, USP	330 ± 30	Insoluble in water	140 ± 5	1 Max	45µm≥	Max 5	20
FSM4014SF		USP	160 ± 20		140 ± 5	1 Max	20µm	Max 5	15
Unit	-	-	gr/lit	-	°C	%	Min 90%	%	Kg





## Sodium Stearate

Sodium Stearate is characterized by a high melting point, making it suitable for high temperature lubricating applications. In addition, sodium stearate exhibits excellent gelling properties in polar solvents, especially short chain alcohols.



Grades	Appearance	Certificates	Assay	Solubility	Test for cations	Packing
KSN1012	White Powder	USP	Min 95	Complies by FCC	Complies by FCC	25
Unit	-	gr/lit	%			Kg



## Aluminum Stearate

Aluminum stearate is a white powder with a very high gelling property, allowing viscosity control without clouding.



Grades	Appearance	Density	Solubility	Gelling Nature	Particle Size	moisture	Packing
KSA6016	White Powder	250 ± 30	Insoluble in water	Complies	70µm≥	Max 3	20
Unit	-	gr/lit	-	-	Min 90%	%	Kg



## Potassium Stearate (E470a)

Potassium Stearate (E470a) is used as a co-emulsifier in cake gels, margarine and low-fat spreads, cleansing agent and lubricants.



Grades	Appearance	Certificates	Assay	Solubility	Test for cations	Packing
KSK2016	White Powder	USP	Min 95	Complies by FCC	Complies by FCC	25
Unit	-	-	%			Kg



## Glycerol Monostearate (GMS)

(Glyceryl Stearate, Mono and Diglycerides; Monostearin; Stearic Monoglyceride; or Stearic acid glycerol monoester)

**Glycerol Monostearate** is a pale yellow lipophilic non-ionic surfactant with **40%** and **60%** monoglycerides content.

It has effects of emulsification, dispersion, foaming, defoaming, starch anti-aging and fat agglomeration control.

It is derived from food grade and USP certified raw materials.



Grades	Appearance	Assay	Solubility	Test for cations	Packing
FSG40	Pale Yellow Bead	Min 40	Complies by FCC	Complies by FCC	25
FSG60		Min 40			25
Unit	-	%			Kg



## Polytitive 102

Alongside the increasing trends of using recyclable products, the paper industry is also moving forward to produce biodegradable and environmentally friendly paper called **stone paper** (industrial paper, mineral paper, marble paper, enriched mineral paper).

The best suggestion of **Fan Avaran Shimi Company** for **stone paper manufacturers** is using a coupling agent called **POLYTITIVE 102**, which is specifically formulated for the first time in Iran for stone paper industries.

It is worth mentioning that this product, in addition to its coupling agent properties, has great lubricating effect to increase compatibility between the polymer part and mineral part of stone paper.



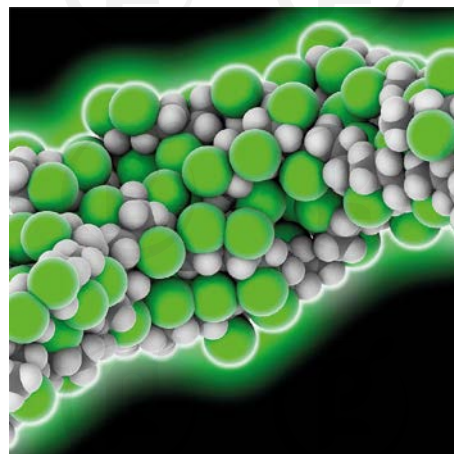
Grades	Appearance	Color	PH	Density	Heavy Metals	Lead	Sulfates	Chlorides	Particle Size	Moisture	Packing
Polytitive 102	Powder	White	7.5±0.5	160±20	30 Max	20 Max	0.6 Max	0.2 Max	Min 90%	4 Max	12
Unit	-	-	-	g / l	ppm	ppm	%	%	2.0 μm≥	%	Kg

## About GREENSTAB:

PVC processing mostly occurs at the temperature of **160°C** or more in which PVC polymer tends to be thermally unstable. Therefore, Stabilizers have a key role in PVC formulation in order to prevent PVC thermal degradation.

The use of **GREENSTAB** guarantees sufficient heat stability for PVC during processing and protects the end product from change due to heat.

Because our company policy requires us to produce healthy and eco-friendly products, **GREENSTAB** additives are free from heavy metal compounds e.g. Lead and Cadmium. Therefore, they do not have any adverse effect on the environment and human health.



Choosing the suitable stabilizer depending on processing technologies and operating conditions is tough and important.

To reach this goal, **Fan Avaran Shimi** provides various stabilizers based on processing technology and requirements of finished product which are applicable for different types of PVC products including pipe, profile, injection molded products and medical purposes.





## GREENSTAB P201

GREENSTAB P201 is suitable to improve heat stability of wide variety of extruded products particularly different pipes including wastewater pipes, drinking water pipes, irrigation pipes and etc.

### ADVANTAGES:

- Excellent heat stability
- Eco-friendly usage
- Non-volatility
- Dust-free additive



### GREENSTAB P201

Appearance	White Powder
Recommended dosage	5 phr
Heavy metal content	<20 ppm
Areas of application	Pressure pipes, sewer pipes, underground water pipes, irrigation pipes, pipe fittings



## GREENSTAB M202

The sensitivity of medical products and strict standards for producing them obligate manufactures to use high-purity, safe and healthy additives in their formulation. **GREENSTAB M202** is set for these high-standard products such as tubing, oxygen masks, medical containers, examination and surgical gloves.



### ADVANTAGES:

- Excellent heat stability
- Eco-friendly usage
- High purity with no hazardous compound
- Dust-free additive



### GREENSTAB M202

Appearance	White Powder
Recommended dosage	6 phr
Heavy metal content	<20 ppm
Areas of application	Medical product e.g. medical containers, tubes, vessel, examination and surgical gloves



## About LifeLub:

Fan Avaran Shimi offers different **internal and external lubricants** for a variety of applications including extrusion, calendaring and injection molding.

Phthalate-based compounds are common lubricants in PVC processing which are harmful for human health.

According to our company's approach to produce safe and harmless products for human life, we introduce **LifeLub** to PVC industry which is formulated with high-quality, safe, nonhazardous and phthalate-free raw materials.



## Functions:

Functions of lubricants in PVC composition:

1- To reduce the friction between hot working surface of processing machinery and polymer when the composition is in processing (**external lubricant**).

2- To lower the inter-particle and inter-molecular friction in PVC polymer to reduce the melt viscosity and heat build-up (**internal lubricant**)

The way of acting lubricant is based on its compatibility with PVC. A true external lubricant is poorly compatible and a good internal lubricant is fairly compatible with the polymer.

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	Processing problems/ Fault in final products	Solution
Extrusion	Increasing pressure through barrel	Use more external lubricant
	Die swell	Use more internal lubricant
	Low output	Use more internal lubricant
	Rough surface	Use more external lubricant
	Plate-out	Use less external lubricant or use lubricant which is (e.g. LifeLub Ex321) a little more compatible with PVC
	Sneaky lines or scoring remarks on the final product's surface	Use less external lubricant
	Poor pigment and filler distribution	Use more internal lubricant
	Melt fracture in the output	Use more external lubricant
	Burning stains on the surface	Use less external lubricant
	Incomplete gelation in PVC	Use stronger internal lubricant (e.g. LifeLub In311)
Calendaring	Difficult detaching from rolls	Use more external lubricant
	Rough surface of produced sheets	Use more external lubricant
	Haze in produced sheets	Use less external lubricant
	Long tack-free time	Use more internal and external lubricant
	Dark output sheet	Use more internal and less external lubricant
	Brittle sheets	Use more internal lubricant or use stronger internal lubricant (e.g. LifeLub In311)
Injection Molding	Difficulty in mold releasing	Use more external lubricant
	Matt or rough surface of finished product	Use more external lubricant
	Low injection rate	Use more internal lubricant
	Agglomerated pigments in finished product	Use more internal lubricant or use stronger internal lubricant (e.g. LifeLub In311)
	Low printability of final product surface	Use less external lubricant
	Low weld line strength	Use less external lubricant
	Appearing flow line on the surface	Use more external and internal lubricant
Short shot	Use more internal lubricant or use stronger internal lubricant (e.g. LifeLub In311)	



## External Lubricants

### ADVANTAGES:

- Cost efficient
- Good processing
- Optimized machinery output
- Improved surface of end product



The dosage of external lubricant in PVC composition should be adjusted based on operating conditions in different PVC processes and surface properties of final product. The recommended dosage of external lubricant for rigid and non-rigid PVC products is typically **1 – 1.5 phr** for extrusion, **0.5 – 1.5 phr** for injection molding and **0.1 – 0.5 phr** for calendaring.



Name	Appearance	Melting Range [°C]	Remarks and Applications
LifeLub Ex320	PALE Yellow Flakes	61±2	High performance, general purpose external lubricant for different PVC applications and products
LifeLub Ex321		70±2	External lubricant with low tendency to plate-out





## Internal Lubricants

### ADVANTAGES:

- Reducing PVC melt viscosity
- Low volatility and high compatibility
- High output rate
- Good processing



Name	Appearance	Melting Range [°C]	Remarks and Applications
LifeLub In310	White Clumped Powder	87±2	General purpose internal lubricant for rigid and semi-rigid PVC products
LifeLub In311	Pale Yellow Paste	49±2	High performance internal lubricant for rigid PVC products





## Combination lubricants for molded products

PVC Injection molding requires lubricant to improve the processability and flowability of molten polymer which helps the mold to be filled with PVC resin and also acts as mold release agent. **LifeLub IJ331** and **LifeLub IJ332** are two combination lubricant formulated for injection molding products. **LifeLub IJ332** has more effect on PVC fusion and melt viscosity which help PVC fill the mold more easily especially in complex articles.



## Combination lubricants

Selecting suitable lubrication system in different PVC processes and the amount of each lubricant in PVC composition must be carefully considered.

FAN AVARAN SHIMI offers different combination lubricants to meet all requirements of different PVC processing and plastic properties. Besides, FAN AVARAN SHIMI is ready to produce tailor-based lubricants according to customer needs



Name	Appearance	Recommended dosage*	Application and feature
LifeLub IJ331	PALE Yellow Flakes	3-4 phr	Combined lubricant for injection molded product with moderate internal and external lubricity
LifeLub IJ332		3.5-5.5 phr	Combined lubricant for injection molded products with higher internal lubricity specialized For complex products

\*The dosage of lubricant should be specifically set for each product



## Combination lubricants for pipe

The role of lubricant in pipe manufacturing by extrusion technology for enhancement in processability of PVC and modify extrusion operating condition is critical. Fan Avaran Shimi offers two grades of lubricant for pipe manufacturing systems, which eliminates the need to use several chemicals as internal and external lubricants separately.



Name	Appearance	Recommended dosage*	Application and feature
LifeLub EP333	PALE Yellow Flakes	2-3 phr	Combined lubricant for production of general purpose pipes
LifeLub EP334		2-3 phr	Combined lubricant with more internal lubricity suitable for production of narrow pipes

\*The dosage of lubricant should be specifically set for each product



## PE Wax

**Polyethylene wax** and its derivatives are produced in different grades with different characteristics which are suitable for many industrial applications including plastic, packaging, textile, cosmetics and rubber industries. Based on production technology and modification process, PE wax and its derivatives have different properties and adds specific feature to plastics when using as plastic additives.

Generally PE wax with high melting point, low viscosity and good thermal stability, is an ideal plastic additives especially as lubricating agent, processing aid and impact modifier. PE wax is also a crucial additive for the preparation of masterbatches and acts as dispersant and wetting agent. PE wax and its derivatives also act as coupling agent in packaging and coating industries.

**Fan Avaran Shimi** produces modified PE wax in different forms like beads and flakes for different applications. PE waxes produced by our company varies in features according to the structure of polyethylene chain and the way of modification like oxidation, chlorination or grafting with maleic anhydride.



The background features a repeating pattern of a stylized 'P' logo inside a circle. Overlaid on this are several network diagrams consisting of interconnected nodes and lines, with some nodes highlighted in blue. The text 'Part 3:' is prominently displayed in the lower-left quadrant.

# Part 3:

Applications



# Applications of Stearates

Industry	Function							
	plastics	Phrama	paper	paints	metal working	lacquers varnishes	food food packing	cosmetics toiletries
anticaking							Ca,Mg	Ca,Zn,Mg
antifoaming			Zn,Al					
binding		Mg					Ca,Mg	Mg
corrosion resisting								
dusting	Ca,Zn,Ba							Zn,Mg
emulsifying		Ca					Ca,Mg	Ca,Zn,Al,Mg
flatting				Ca,Zn,Al,Mg		Ca,Zn,Al,Mg		
gelling	Ca,Mg	Al		Al		Al		Al,Mg
hardening			Al					
lubrication dry	Ca,Zn,Mg,Ba	Ca,Zn,Mg			Ca,Zn,Al			
int / ext	Ca,Zn,Ba		Ca		Ca,Zn,Al,Mg,Ba		Ca,Mg	Ca,Zn,Mg
pigment				Ca,Zn		Ca,Zn,Al		Mg
suspension				Al				
release	Ca,Zn,Al,Mg	Mg					Ca,Zn,Mg	Zn
sanding sealing				Zn		Zn		
vinyl stabilizing	Ca,Zn,Ba						Ca,Zn	
viscosity				Ca,Al		Ca		Ca,Mg
water repellent			Ca,Al					Ca,Zn
wetting				Al				

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