



**SONGSTAB™**  
PVC stabilizers for rigid pipes  
and fittings applications

A range of customized stabilizers that offer an excellent balance between heat stability and lubricant system

# Songwon Industrial Co., Ltd.

SONGWON, which is headquartered in Ulsan, South Korea and operates group companies all over the world, has been developing, manufacturing and marketing a wide variety of additives and polymers for more than 60 years.

## These include:

- Tin stabilizers (methyl, butyl and octyl + mercaptide and carboxylate)
- Liquid mixed metals BaCdZn, BaZn, CaZn, and kickers
- Solid CaZn stabilizers
- Co-stabilizers
- Plasticizers (DOA, TOTM and polymeric adipates)
- Lubricants and blends
- Tin intermediates

## Solid mixed-metal stabilizers for PVC pipes and fittings

In the past, heat stabilizers for PVC pipes and fittings in most countries outside of USA were mainly lead-based. As awareness of safety and health issues grows around the world, lead stabilizers are being banned completely in many countries and have been replaced by alternatives for various applications.

In line with the trend in Europe, Asia is now also rapidly replacing lead stabilizers. Processors can easily substitute lead with alternative stabilizers as no major changes need to be made to processing machinery; however, if switching to tin-mercaptide stabilizers, care should be taken to prevent sulfur staining.

SONGWON's portfolio comprises a variety of stabilizers for pipes and fittings with diverse characteristics such as initial color, long-term heat stability, lubricity, and gelation behavior.

# SONGSTAB™ stabilizers

## SONGSTAB™ stabilizers generate significant value for PVC manufacturers

PVC pipes are produced by extrusion and in the past contained lead stabilizers. Numerous countries have now phased out lead or are in the process of replacing it by calcium-zinc or tin stabilizers.

There are no standard stabilizers for pipe application since these products are customized to suit various conditions, such as different extruder types, pipe specifications, die constructions and formulations, and to achieve the required rheological characteristics.

**SONGSTAB™ CZ-SP100** powerful core-solid calcium-zinc stabilizers, which promote outstanding heat stability, are designed for pipes with a diameter of 300 mm and more. To improve processability, the lubricant should be added separately.

**SONGSTAB™ CZ-SP600** one-pack solid calcium-zinc stabilizers for pipes up to 300 mm in diameter offer well-balanced heat stability and a lubricant system designed to ensure excellent gelation.

**SONGSTAB™ CZ-SP400** one-pack solid tin stabilizers offer outstanding heat stability and processability.

## SONGSTAB™ stabilizers generate significant value for PVC fitting producers

Good processability and easy dosing are among the advantages of this solid CaZn range. In lower amounts, the products are also suitable for fittings with smaller diameters.

**SONGSTAB™ CZ-SF600** calcium-zinc stabilizers, which contain a tin booster, are designed especially for fittings with silver-streak surface issues.

**SONGSTAB™ CZ-SF400** is a well-balanced range of solid, one-pack tin stabilizers that improve the Vicat softening point.

**SONGSTAB™ CZ-SF300** solid one-pack calcium-zinc stabilizers offer good processability combined with high heat stability and lubricity.

## SONGSTAB™ solid mixed-metal stabilizers recommended for PVC fittings

		Formulation					Two-roll mill condition	
		PVC resin [phr]	Stabilizer [phr]	CaCO <sub>3</sub> [phr]	Lubricants [phr]	TiO <sub>2</sub> [R] [phr]	Roll temp. (°C)	Mixing time (min)
One-pack tin-boosted calcium-zinc	SONGSTAB™ CZ-SF600	100	3	5	–	1	190	3
One-pack tin	SONGSTAB™ CZ-SF400	100	3	5	–	1	190	3
One-pack calcium-zinc	SONGSTAB™ CZ-SF300	100	3	5	–	1	190	3

### Static heat stability (185°C)

		10 min	20 min	30 min	40 min	50 min	60 min	70 min
One-pack tin-boosted calcium-zinc	SONGSTAB™ CZ-SF600							
One-pack tin	SONGSTAB™ CZ-SF400							
One-pack calcium-zinc	SONGSTAB™ CZ-SF300							

### Press heat stability – 2 mm sheet (200°C)

		5 min	15 min
One-pack tin-boosted calcium-zinc	SONGSTAB™ CZ-SF600		
One-pack tin	SONGSTAB™ CZ-SF400		
One-pack calcium-zinc	SONGSTAB™ CZ-SF300		

### Dynamic heat stability (185°C)

		5 min	10 min	15 min
One-pack tin-boosted calcium-zinc	SONGSTAB™ CZ-SF600			
One-pack tin	SONGSTAB™ CZ-SF400			
One-pack calcium-zinc	SONGSTAB™ CZ-SF300			

### Vicat softening point

		Temperature [°C]
One-pack tin-boosted calcium-zinc	SONGSTAB™ CZ-SF600	76 – 78
One-pack tin	SONGSTAB™ CZ-SF400	78 – 80
One-pack calcium-zinc	SONGSTAB™ CZ-SF300	Above 80

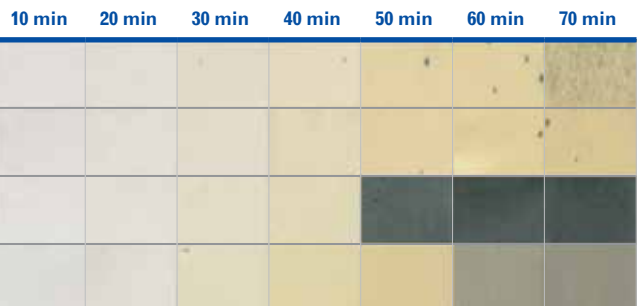
SONGWON's portfolio comprises a variety of stabilizers for different end applications with diverse characteristics. Please contact our Technical Service and Development (TS&D) department for more details and advice on suitable products.

## SONGSTAB™ solid mixed-metal stabilizers recommended for PVC pipe applications

		Formulation						Two-roll mill condition	
		PVC resin [phr]	Stabilizer [phr]	CaCO <sub>3</sub> [phr]	PE wax [phr]	Processing aids [phr]	TiO <sub>2</sub> [R] [phr]	Roll temp. (°C)	Mixing time (min)
Core calcium-zinc	SONGSTAB™ CZ-SP180	100	2.5	5	–	–	1	195	3
Core calcium-zinc	SONGSTAB™ CZ-SP180	100	2.5	5	0.5	–	1	195	3
One-pack calcium-zinc	SONGSTAB™ CZ-SP600	100	3	5	–	–	1	195	3
One-pack tin-mercaptide	SONGSTAB™ CZ-SP400	100	3	5	–	–	1	195	3

### Static heat stability (195°C)

Core calcium-zinc	SONGSTAB™ CZ-SP180
Core calcium-zinc	SONGSTAB™ CZ-SP180 + 0.5 phr PE wax
One-pack calcium-zinc	SONGSTAB™ CZ-SP600
One-pack tin-mercaptide	SONGSTAB™ CZ-SP400



### Press heat stability – 2 mm sheet (200°C)

Core calcium-zinc	SONGSTAB™ CZ-SP180
Core calcium-zinc	SONGSTAB™ CZ-SP180 + 0.5 phr PE wax
One-pack calcium-zinc	SONGSTAB™ CZ-SP600
One-pack tin-mercaptide	SONGSTAB™ CZ-SP400



### Dynamic heat stability (185°C)

Core calcium-zinc	SONGSTAB™ CZ-SP180
Core calcium-zinc	SONGSTAB™ CZ-SP180 + 0.5 phr PE wax
One-pack calcium-zinc	SONGSTAB™ CZ-SP600
One-pack tin-mercaptide	SONGSTAB™ CZ-SP400





For further information, please contact:

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