

# Calendering MARK<sup>®</sup> Tin Stabilizers

	Product Group	BuSnS			BuSnO/S	OcSnS										OcSnO/S		
		17 M	T 22 M/GV	T 218 A		T 634	17 MOK	17 MOK-A	17 MOK-C	17 MOK-D	17 MOK-N	17 MOK-P	17 MOK-S	T 281	T 216 GV	T 650	T 652	
	Supply Form	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
Appro- val*	EU	no	no	no	no	yes	yes	yes	yes	yes	yes	yes	yes	yes	no	no	no	no
	FDA	no	no	no	no	yes	yes	yes	yes	yes	yes	yes	yes	yes	no	no	no	no
Application**	Rigid	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Semi-rigid	2	2	2	2	1	2	1	1	1	1	1	2	1	2	1	2	2
	Plasticized	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Properties	Initial color	1	1	1	2	1	1	1	1	1	1	1	1	1	2	1	2	2
	color retention	2	1	1	2	2	2	2	2	2	2	2	2	1	2	1	2	2
	Long term heat stability	2	1	1	2	1	2	2	1	1	2	1	2	1	2	1	2	2
	Transparency	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Lubricating effect	-	-	-	1	-	-	3	-	-	3	-	-	-	1	1	1	1
	Plate-out-behavior	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	ESBO-synergism	2	2	2	3	2	2	1	2	2	1	2	2	2	3	2	3	3
	Fogging-behavior	2	1	1	3	1	2	3	1	1	3	1	2	2	3	2	3	3
	Odor (plast. PVC)	3	3	1	3	3	3	3	3	3	3	3	3	2	3	2	3	3
	Odor (rigid PVC)	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2
	Printability	2	1	1	2	1	1	2	1	1	2	1	1	1	2	1	2	2
	Weathering stability	3	3	3	2	3	3	3	3	3	3	3	3	3	2	3	2	2
	Phenol free	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
	Ageing properties (120°C)	2	1	1	3	2	2	2	2	2	2	2	2	1	3	1	3	3
Performance with E-PVC	2	2	1	2	2	1	2	2	2	2	3	1	2	3	2	3	3	
Remarks	The weathering stability can be markedly improved by the addition of UV absorbers						The choice of the optimum OcSnS stabilizer largely depends on the total formulation (PVC/lubricants)											

L liquid      P paste (contains ESBO)      S solid

1 very good      2 good      3 satisfactory

\*National approvals for chemicals may vary and the specific use in applications have to be observed and therefore please request actual regulatory information from our Regulatory Compliance Team.

\*\*with regard to the European Marketing & Use Directive and other national regulatory approvals

# Extrusion

# MARK<sup>®</sup> Tin Stabilizers

	Product Group	BuSnS				OcSnS								OcSnO		OcSnO/S		MeSnS		
		17 M	T 22 M/GV	T 218 A	T 634	17 MOK	17 MOK-A	17 MOK-C	17 MOK-D	17 MOK-N	17 MOK-P	17 MOK-S	T 281	T 216 GV	T 682	T 161	T 650	T 652	1984 E	1995
	Supply Form	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
Appro- val*	EU	no	no	no	no	yes	yes	yes	yes	yes	yes	yes	yes	no	yes	yes	no	no	yes	yes
	FDA	no	no	no	no	yes	yes	yes	yes	yes	yes	yes	yes	no	no	yes	no	no	yes	yes
Appli- cation**	Rigid	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Plasticized	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	2	2	2	2
Properties	Initial color	1	1	2	2	1	1	1	1	1	1	1	1	2	2	2	2	1	1	
	Color retention	2	1	1	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2	
	Long term heat stability	2	1	1	2	1	2	2	1	1	2	1	2	1	1	2	2	1	1	
	Transparency	1	1	1	2	1	1	1	1	1	1	1	1	2	2	2	2	1	1	
	Lubricating effect	-	-	3	1	-	-	3	-	-	3	-	3	-	3	3	1	1	-	-
	Plate-out-behavior	1	1	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	ESBO-synergism	2	2	2	3	2	2	1	2	2	1	2	1	2	2	2	3	3	2	2
	Fogging-behavior	2	1	1	3	1	1	3	1	1	3	1	1	1	-	-	3	3	3	3
	Odor (plast. PVC)	3	3	1	2	3	3	3	3	3	3	3	2	2	1	1	2	2	-	-
	Odor (rigid PVC)	2	2	1	2	2	2	2	1	2	2	2	2	1	1	1	2	2	2	2
	Printability	2	1	2	2	1	1	2	1	1	2	1	2	1	1	1	2	2	1	1
	Weathering stability	-	-	3	2	-	-	-	-	-	-	-	1	3	1	1	2	2	-	-
	Phenol free	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
	Ageing properties (120°C)	2	1	1	3	2	2	2	2	2	2	2	1	1	1	1	3	3	-	-
Performance with E-PVC	-	3	1	-	-	1	-	-	-	-	-	1	2	-	-	-	-	-	-	
Remarks	The weathering stability can be markedly improved by the addition of UV absorbers										The choice of the optimum Alkyl-SnS stabilizer largely depends on the total formulation package (PVC & lubricants)									

L liquid      P paste (contains ESBO)      S solid

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1 very good      2 good      3 satisfactory

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# Injection Molding

# MARK<sup>®</sup> Tin Stabilizers

	Product Group	BuSnS		OcSnS										OcSnO		OcSnO/S		MeSnS	
		17 M	T 22 M/GV	T 634	17 MOK	17 MOK-A	17 MOK-C	17 MOK-D	17 MOK-N	17 MOK-P	17 MOK-S	T 281	T 216 GV	T 161	T 682	T 650	T 652	1984 E	1995
	Supply Form	L	L	L	L	L	L	L	L	L	L	L	L	L	L	1	L	L	L
Appro- val*	EU	no	no	no	yes	yes	yes	yes	yes	yes	yes	yes	no	yes	yes	no	no	yes	yes
	FDA	no	no	no	yes	yes	yes	yes	yes	yes	yes	yes	no	yes	yes	no	no	yes	yes
Appli- cation**	Rigid	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Plasticized	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	2	2	2
Properties	Initial color	1	1	2	1	3	1	1	1	1	1	1	1	2	2	1	2	1	1
	Color retention	2	1	2	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2
	Long term heat stability	2	1	2	1	2	2	1	1	2	1	2	1	1	1	2	2	2	2
	Transparency	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1	2	1	1
	Lubricating effect	-	-	1	-	-	3	-	-	3	-	-	-	3	3	2	1	-	-
	Plate-out-behavior	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	ESBO-synergism	2	2	3	2	2	1	2	2	1	2	2	2	2	2	2	3	2	2
	Fogging-behavior	2	1	3	1	1	3	1	1	3	1	1	1	-	-	3	3	3	3
	Odor (plast. PVC)	3	3	3	-	-	3	-	-	3	-	3	2	1	1	2	2	-	-
	Odor (rigid PVC)	2	2	2	2	2	2	1	2	2	2	1	2	1	1	2	2	2	2
	Printability	2	1	2	1	1	2	1	1	2	1	1	1	1	1	2	2	1	1
	Weathering stability	-	-	2	-	-	-	-	-	-	-	-	3	1	1	2	2	-	-
	Phenol free	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
	Ageing properties (120°C)	2	1	3	2	2	2	2	2	2	2	2	1	1	1	2	3	-	-
Performance with E-PVC	-	3	-	-	1	-	-	-	-	3	1	2	-	-	3	-	-	-	
Remarks	The weathering stability can be markedly improved by the addition of UV absorbers						The choice of the optimum Alkyl-SnS stabilizer largely depends on the total formulation (PVC/ lubricants)												

L liquid      P paste (contains ESBO)      S solid

1 very good      2 good      3 satisfactory

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# Extrusion Blow Molding      MARK<sup>®</sup> Tin Stabilizers

	Product Group	BuSnS			OcSnS						OcSnO	MeSnS
		17 M	T 22 M/GV	17 MOK	17 MOK-A	17 MOK-D	17 MOK-N	17 MOK-S	T 281	T 216 GV	T 682	1984 E
	Supply Form	L	L	L	L	L	L	L	L	L	L	L
Appro- val*	EU	no	no	yes	yes	yes	yes	yes	yes	no	yes	yes
	FDA	no	no	yes	yes	yes	yes	yes	yes	no	no	yes
Appli- cation**	Rigid	1	1	1	1	1	1	1	1	1	1	1
	Plasticized	-	-	-	-	-	-	-	-	1	-	-
Properties	Initial color	1	1	1	3	1	1	1	2	1	2	1
	Color retention	2	1	2	2	2	2	2	2	1	2	2
	Long term heat stability	2	1	1	2	1	1	1	2	1	2	2
	Transparency	1	1	1	1	1	1	1	1	1	1	1
	Lubricating effect	-	-	-	-	-	-	-	-	-	-	-
	Plate-out-behavior	1	1	1	1	1	1	1	1	1	1	1
	ESBO-synergism	2	2	2	2	2	2	2	2	2	3	2
	Fogging-behavior	2	1	1	1	1	1	1	1	1	2	3
	Odor (plast. PVC)	-	-	-	-	-	-	-	-	2	-	-
	Odor (rigid PVC)	2	2	2	2	1	2	2	2	2	1	1
	Printability	2	1	1	1	1	1	1	1	1	1	1
	Weathering stability	-	-	-	-	-	-	-	-	3	1	-
	Phenol free	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Ageing properties (120°C)	2	1	2	2	2	2	2	2	1	-	-	
Performance with E-PVC	-	2	-	1	-	-	-	1	-	-	-	
Remarks												

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**Injection Blow Molding  
and Film Blowing**

**MARK® Tin  
Stabilizers**

	Product Group	BuSn							OcSnS						
		T 22 M/GV	17 MOK	17 MOK-N	17 MOK-S	17 MOK-C	17 MOK-A	T 281	T 22 M/GV	17 MOK	17 MOK-A	17 MOK-D	T 281	T 682	
	Supply Form	L	L	L	L	L	L	L	L	L	L	L	L	L	
Appro- val*	EU	no	yes	yes	yes	yes	yes	yes	no	yes	yes	yes	yes	yes	
	FDA	no	yes	yes	yes	yes	yes	yes	no	yes	yes	yes	yes	no	
Appli- cation**	Rigid	1	1	1	1	1	1	1	1	1	1	1	1	1	
	Plasticized	-	-	-	-	-	-	-	-	-	-	-	-	-	
Properties	Initial color	1	1	1	1	1	3	1	1	2	2	2	2	2	
	Color retention	1	2	2	2	2	2	2	1	2	2	2	2	2	
	Long term heat stability	1	1	1	1	2	2	1	1	1	1	1	1	2	
	Transparency	1	1	1	1	1	1	1	1	1	1	1	1	1	
	Lubricating effect	-	-	-	-	-	-	3	-	-	3	-	3	-	
	Plate-out-behavior	1	1	1	1	1	1	1	1	1	1	1	1	1	
	ESBO-synergism	2	2	2	2	2	2	2	2	2	2	2	2	3	
	Fogging-behavior	1	1	1	1	3	1	1	1	1	1	1	1	2	
	Odor (plast. PVC)	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Odor (rigid PVC)	2	2	2	2	2	2	2	2	2	1	1	1	1	
	Printability	1	1	1	1	2	1	1	1	1	1	1	1	1	
	Weathering stability	-	-	-	-	-	-	-	-	-	-	-	-	1	
	Phenol free	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	
	Ageing properties (120°C)	1	2	2	2	2	2	2	1	2	2	2	2	-	
Performance with E-PVC	3	-	-	-	-	1	-	3	-	-	-	-	-		
Remarks	The choice of the optimum tin stabilizer largely depends on the total formulation (PVC/ lubricants).														

L liquid  
P paste  
(contains  
ESBO)  
S solid

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