

KRITILEN®

Masterbatches for PS & PP Thermoforming

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Selection Guide

1) WHITES for PP & PS thermoforming

WHITE PS & PP masterbatches are recommended for PS & PP products, where they ensure better dispersion and homogenization than PE based masterbatches and do not affect the mechanical properties of the end product. Such products are WHITE PP952, PP950, PP9505, PP9507, PS7306, PS730, PS734, PS741, PS7452 and PS760.

For products where antistatic properties are required we recommend WHITE PP9352 or WHITE PP9509 which combine TiO₂ and one or more antistatic agents.

KRITILEN® White Masterbatches / PP-PS

KRITILEN® White	Carrier Resin	White Pigments %	White Pigments types	Undertone	Additives	Filler	Injection moulding	Blow-moulding	Sheets	PP tapes	PP fibers
PP952	PPH	50	TiO ₂	B		♦	•	•	o	o	
PP950	PPH	50	TiO ₂	B			•	•	•	o	
PP9505	PPH	50	TiO ₂	B*		♦	•	•	•		
PP9352	PPH	35	TiO ₂	M	AT	♦	•	•	•		
PP9507	PPH	60	TiO ₂	M			•	•	•	o	o
PP9509	PPH	50	TiO ₂	M	AT	♦	•	•	•	o	
PS7306	PSGP	25	TiO ₂	B*		♦	•		•		
PS730	PSGP	30	TiO ₂	B*		♦	•		•		
PS734	PSGP	30	TiO ₂	M		♦	•		•		
PS741	PSGP	40	TiO ₂	B*		♦	•		•		
PS7452	PSGP	45	TiO ₂	B*		♦	o		•		
PS 760	PSGP	60	TiO ₂	M					•		

AT : anti-static
B : bluish

PPA : polymer processing aid
M : milky

• : recommended
* : extra bluish

o : can be used
♦ : yes

Modified versions of the above products can be produced upon request, e.g. with another base resin, white pigments type/content or containing different types/levels of additives.

2) FILLERS for PP & PS thermoforming

KRITILEN® FILLER masterbatches are concentrates of Calcium Carbonate (CaCO₃) or Talc in a polymer base. They offer a convenient way of incorporating CaCO₃ and Talc in thermoplastics, without contamination by dust. They have perfect dispersion and optimized flow properties, ensuring easy processing.

The CaCO₃ and talc grades used in KRITILEN® FILLER masterbatches are of excellent quality. Their typical properties are as follows:

Property	CaCO ₃	Talc
Median size (D50), mic.	3,2	5,4
Top Cut (D98), mic.	9,5	20
Hardness (Mohs)	1,5	1
Oil Absorption (gr / 100 gr)	14	25

Selection Guide for Thermoforming

KRITILEN® Filler	BASE RESIN	FILLER TYPE	FILLER %
PP977	PP-H	CaCO ₃	75
PP 980	PP-H	CaCO ₃	80
PP 985	PP-H	CaCO ₃	85
PS 780	PS-GP	CaCO ₃	80
PS 781 (*)	PS-GP	CaCO ₃	80
5809 (**)	Proprietary	CaCO ₃	75
PP956	PP-H	Talc	50
PP960	PP-H	Talc	60
PS 7603	PS-GP	Talc	60

(*) contains TiO₂

(**) Advanced type for PS thermoforming applications requiring high addition rates of mineral fillers

Benefits of using Minerals in Thermoforming

- Increased thermal conductivity
- Increased modulus of elasticity
- Lower shrinkage
- Lower transmission rate (better barrier properties)
- Lower overall migration

Examples

- **Thermal Conductivity** (shorter heating and cooling time, higher production rate)

Material	Thermal Conductivity (w / m°C°)
PP	0.2
HIPS	0.17
CaCO ₃	2.7
Talc	2.1
20% CaCO ₃	0.42
20% Talc	0.37

- **Stiffness** (reduction of wall thickness, lower cost)

Material	Tensile Modulus (MPa)
PP	1200
PP+20% Talc	2200
PP+30% Talc	2500
PP+20% CaCO ₃	1500
PP+30% CaCO ₃ %	1700

- **Shrinkage** (Lower internal stresses, better dimensional stability)

Material	Tensile Modulus (MPa)
PP	1.9
PP+10% CaCO ₃	1.6
PP+20% CaCO ₃	1.4
PP+30% CaCO ₃	1

Aspects that should be considered for Minerals Incorporation the Thermoforming Applications

- Color Influence
- Limited use for food contact of acidic products (solution for this is Co Extrusion)

Typical Additions

- Single layer film: 10-20% Talc, 20-40% CaCO₃
- Co Extrusion film: Structure 20% / 60% / 20% up to 40-50% minerals can be incorporated in the middle layer.

3) Clarifying-nucleating masterbatches

KRITILEN® NC 15 contains a highly effective nucleating agent for homopolymer or random PP copolymer products resulting to :

- Higher productivity
- Reduced distortion
- Improved clarity
- Improved hot filling and microwave performance

KRITILEN® NC 16 is a new generation clarifier for crystal clear PP thermoforming parts.

KRITILEN®	CARRIER RESIN	ADDITIVES (%)	ADDITIVE TYPES	RECOMMENDED ADDITION (%)	FOOD APPROVAL
NC 15	PP	3	Heterophasic nucleator	1-2	Yes
NC 16	PP	10	Soluble melt clarifier	2-5	Yes