

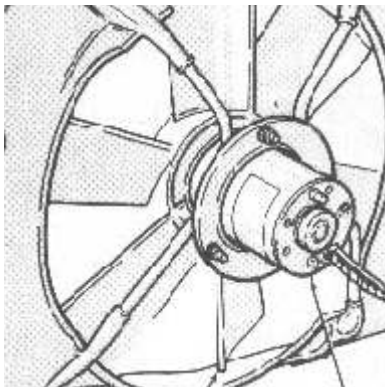
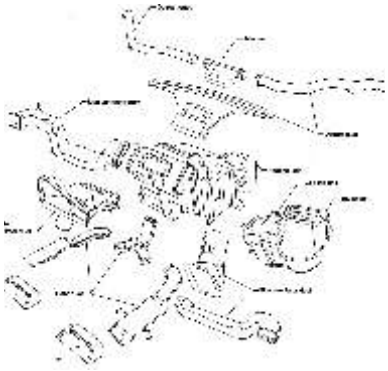




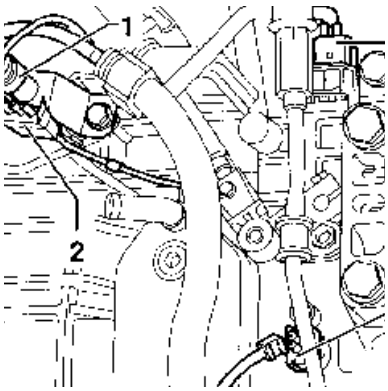



TALC

add polymer

TALC

CAS Number : 14807-96-6
Chemical Formula : $Mg_3Si_4O_{10}(OH)_2$

Theoretically chemical composition of Pure talc by weight is approx.19.2% magnesium, 29.6% silicon, 50.7% oxygen and 0.5% hydrogen. In terms of metal oxides 31.7% MgO and 63.5% SiO2 with remaining 4.8% being H2O. Other elements found in talc are impurities such as Ca, Al, Fe and trace elements Pb, As, Zn, Ba, Sb.

Typical Characteristics of Talc.

Talc is a natural mineral found worldwide and is the major constituent of rocks known as soapstone or steatite. Talc can be gray, green, blue, pink or even black depending on the source and composition of other elements in rock.

Crystal Structure	Monoclinic
Typical Chemical Composition wt %	
MgO	24.33-31.90%
SiO2	46.40 -63.50%
CaO	0.40 - 13.00%
Al2O3	0.30-0.80%
Fe2O3	0.10 -1.80%
Platelet aspect ratio	5-20
Density 103 Kg / m-3	2.58-2.83 x 103
pH	9.30-9.60
Oil Absorbtion (ASTM D281)	20-57%
Refractive Index	1.54- 1.59
Mohs hardness	1.00-1.50
Brightness	78-93
Thermal conductivity WK 1 m1	0.02
Specific heat J Kg-1 1 K-1	8.70 x 102
Coefficient of thermal expansion K-1	8.00 x 10-6

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General Benefits of Talc

Talc is important reinforcing filler for plastics and in particular polypropylene (PP). Major benefits of incorporation talc in plastics is summarised as follows.

- Talc in inert to most chemical reagent.
- Improves in Heat Deflection temperature (HDT)
- Improves rigidity.
- Improves creep resistance.
- Improves impact resistance.
- Lowers shrinkage of moulded articles.
- Improves dimensional stability.
- Increases brightness.
- Acts as Nucleating agent and anti block additive.
- Reduces coefficient of thermal expansion.
- Talc can easily delaminate and can be used as lubricant.
- In Rubber industry talc is used to increase stiffness and processability.
- Talc filled composites have low gas permeability and high resistivity because of plate like nature of the impermeable talc particles and the resultant tortuous, complicated diffusion path.

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Specific Applications

Talc is used in LLDPE (Linear Low Density Polyethylene) as anti blocking agent preventing two or more contacting film layers from sticking together. Talc Helps in reducing the dosage of fluorocarbon-elastomer polymer processing aid (PPA)

Talc is used In HDPE Wires and cables & 2-10% loading leads to 15-80% improvement in tensile strength.

Some grades of Talc which are coated with Zinc Stearate are used in Cross Linked Low density Polyethylene (XLPE) wire coatings to improve flame retardancy, increase char build-up and act as thixotropic agent to reduce dripping.

In PVC flooring Talc can be loaded as high as 50% to save on manufacturing cost and improved physical properties and durability

Specific Improvement in Performance

Improvement in HDT	In Homopolymer PP HDT increases by 60^{o}C at 40% loading. In PP copolymer HDT increases by 75^{o}C at 40% loading.
Improvement in Modulus	In Homopolymer PP double stiffness at 40% loading. In PP copolymer fourfold increase at 40% loading.
Increase in Tensile Strength	In HDPE 15-80% improvement at 2-10% loading.
CLTE / Mould Shrinkage	In Homopolymer 57% decrease in mould shrinkage at 30% loading. In PP copolymer 39% decrease in mould shrinkage at 30% loading.
Lower Permeability	In HDPE 15-55% decrease in permeability with 2-10% loading.
Enhanced Moisture Barrier	In both Homo and Copolymer 50% increase in barrier by 20% loading.

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Changes in Homo & Copolymer by sing Talc

Property	Homopolymer loading by			Copolymer loading by		
	Weight %			Weight %		
	Unfilled	20%	40%	Unfilled	20%	40%
Density 103 Kg / m-3	0.903	1.05	1.22	0.899	1.04	1.22
Flexural Modulus MPa	1655	2482	3275	756	2206	2896
Yield tensile strength MPa	35.5	34.1	31.4	27.6	27.9	25.8
Rockwell R Hardness	99	98	95	82	87	85
Heat Deflection Temperature degree C (455kPa)	97	123	131	85	117	127
Notched Izod impact Strength J m-1	45.7	32.0	20.9	133.5	53.4	32.0

Talc and Environment

Talc is approved by US Food and Drug Administration (FDA) for use in polymeric compounds in contact with food.

Title 21	Food And Drugs
Chapter I	Food And Drug Administration, Department Of Health And Human Services
Subchapter A	General
Part 73	Listing Of Colour Additives Exempt From Certification
Subpart B	Drugs
Sec	73.1550

Talc is considered Generally Recognised As Safe for food application (GRAS) ID Code : 14807-96-6. There are minimal concerns with skin contact other than dryness with continuous exposure. Eye contact causes mild mechanical irritation while ingestion is of no concern. Please refer to our MSDS for details about safety requirements while usage and handling this product.

TALC

Standard Specifications for Talc 545, 565, 580, 510

Control Item	Test Method	Test Condition	Minimum Value	Maximum Value	Unit
Appearance	Visual	White Powder	Must Comply	Not applicable	Not Applicable
Whiteness	Colorimetry	Measure the whiteness and compare with known standard	80	99	%
Loss on Drying	TGA	Measure the loss on Drying which is derived from TGA analysis of compound	Nil	7	%
Heavy Metals	Measure the Lead, Arsenic and Mercury content by Atomic	Measure the deviation and absorbance of specific wavelength of light using Atomic Absorbtion	Nil	10	%
Asbestos	Chemical Analysis	Should be NIL	NIL	NIL	ppm
Purity by SiO2	Atomic Absorbtion Flame Photometry ICP	Measure the SiO2 content by Atomic absorbtion or ICP and compare the actual results with molecular formula to arrive at actual purity	Typically 46.4-63.5%	Minimum 99%	%
MgO	Atomic Absorbtion Flame Photometry ICP	Measure MgO content by Atomic absorbtion ,ICP, or Flame Photometry	Typically 24.33-31.90%	Complies	%
CaO	Atomic Absorbtion Flame Photometry ICP	Measure CaO content by Atomic absorbtion, ICP, or Flame Photometry	Typically 0.4-13 %	Complies	%
Al2O3	Atomic Absorbtion Flame Photometry ICP	Measure Al2O3 content by Atomic absorbtion,ICP, or Flame Photometry	Typically 0.3-0.8 %	Complies	%
Fe2O3	Atomic Absorbtion Flame Photometry ICP	Measure Fe2O3 content by Atomic absorbtion, ICP, or Flame Photometry	Typically 0.1-1.8 %	Complies	%

Talc Grades

We offer several grades of talc, Though our Chemicals Paramater remains almost the same across the grades the Different Particle size and grade names which we offer are as follows.

GRADE	D50 max	D98 max
TALC 545	4.5 µ	= 15 µ
TALC 565	6.5µ	= 30 µ
TALC 580	8.0µ	= 50 µ
TALC 510	10.0µ	= 80 µ

Disclaimer

Although the information and recommendations in this brochure are presented in good faith and believed to be correct, Polymer Add Pte Ltd. makes no representations or warranties as to the completeness or accuracy of the information.

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