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Perlite is an amorphous volcanic glass having pearl like lustre. Colour of crude perlite is light grey to glossy black whereas the colour of expanded perlite ranges from snowy white to greyish white. Perlite is formed by the hydration of obsidian and has a relatively high water content than other volcanic glass i.e. Obsidian and Pitchstone. Distinguishing feature apart from other volcanic glasses is that perlite when heated to about 850-900⁰C expands 4 to 20 times its original volume. This expansion is due to the presence of 2 to 5% combined water in crude perlite that when heated vaporises forming countless tiny bubbles.

Perlite is used in industry in both the forms: Crude Perlite and Expanded Perlite. Crude perlite is prepared by crushing and screening perlite in various size fractions. Expanded perlite is one which has been expanded by heating.

Typical Analysis of Crude Perlite (in percentage)

SiO ₂	72-76
Al ₂ O ₃	11-17
K ₂ O	4-5
Na ₂ O	2.9-4.0
CaO	0.5-2.0
Fe ₂ O ₃	0.5-1.5
MgO	0.1-0.5
TiO ₂	0.03-0.20
H ₂ O	2-3

RESOURCES

The only deposit of perlite is located in the village Patanvav, Rajkot district, Gujarat. It is found to occur on Osam Hill in the form of discontinuous sill. The total resources of perlite as per UNFC system as on 1.4.2005 are estimated at 1.89 million tonnes, out of which 15% are high grade, 18% medium grade, 11% low grade and remaining 56% fall under unclassified category. Out of the total resources, about 27% fall under reserves and rest as resources (Table-1).

**Table - 1 : Reserves/Resources of Perlite as on 1.4.2005
(By Grades/State)**

(In '000 tonnes)

Grade/State	Reserves			Remaining resources			Total resources (A+B)
	Proved		Total (A)	Pre-feasibility STD222	Reconnaissance STD334	Total (B)	
	STD 111	STD122					
All India : Total	188	316	504	334	1051	1385	1889
By Grades							
High	19	132	151	132	-	132	283
Medium	90	116	206	130	-	130	336
Low	79	68	147	72	-	72	219
Unclassified	-	-	-	-	1051	1051	1051
By State							
Gujarat	188	316	504	334	1051	1385	1889

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PRODUCTION AND STOCKS

The production of perlite was nil in 2007-08 due to lack of demand and temporary discontinuance of mine work.

Mine-head stocks at the end of 2007-08 were nil as against 15 tonnes at the beginning of the year (Tables - 2 to 4).

The average daily employment of labour was 5 in 2006-07 and 6 in the previous year.

**Table - 2 : Production of Perlite, 2005-06 to 2007-08
(By State)**

(Qty. in tonnes; value in Rs. '000)

State	2005-06		2006-07		2007-08(p)	
	Quantity	Value	Quantity	Value	Quantity	Value
India	122	110	68	68	Nil	Nil
Gujarat	122	110	68	68	Nil	Nil

**Table - 3 : Production of Perlite, 2006-07 and 2007-08
(By Sector/State/District)**

(Qty. in tonnes; value in Rs. '000)

State/District	2006-07			2007-08 (p)		
	No. of mines	Quantity	Value	No. of mines	Quantity	Value
India/ Private sector	1	68	68	Nil	Nil	Nil
Gujarat/Rajkot	1	68	68	Nil	Nil	Nil

**Table - 4 : Mine-head Stocks of Perlite
2007-08 (p)**

(In tonnes)

State	At the beginning of the year	At the end of the year
India	15	-
Gujarat	15	-

construction, horticultural and industrial applications.

Construction Applications

In the construction and manufacturing fields, expanded perlite on account of its acoustic properties is used in light weight plasters and mortars, insulation, ceiling tiles and as filter aids.

In addition to providing thermal insulation, perlite enhances fire resistance, reduces noise transmission and it is resistant to rot, vermin and termites. Perlite is also ideal for insulating low temperature and cryogenic vessels. When perlite is used as an aggregate in concrete, a light weight,

USES

There are different uses of perlite in both crude and expanded form. These uses can be grouped under three general categories :

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fire resistant, insulating concrete is produced that is ideal for roof decks and other applications. Perlite can also be used as an aggregate in portland cement and gypsum plasters for exterior applications and for fire protection of beams and columns.

Horticultural Applications

In horticultural application, expanded perlite is used throughout the world as a component of soil-less growing mixes where it provides aeration and optimum moisture retention for superior plant growth. Studies have shown that outstanding yields are achieved with perlite hydroponic systems. Other benefits of perlite in horticulture are its neutral pH and the fact that it is sterile and weedfree. In addition, its light weight makes it ideal for use to grow plants in small containers. Besides, perlite is a good carrier for fertilizer, herbicides and pesticides and for pelletizing seed. Horticultural perlite is useful for the home gardeners as well as commercial growers. In greenhouse plantations, landscaping applications and in-house plants, use of perlite has shown encouraging results too. This represents approximately 10% of annual perlite consumption world over.

Industrial Applications

Industrial applications for perlite are the most diverse, ranging from high performance fillers for plastics to cements for petroleum, water and geothermal wells. Other applications include its use as a filter media for pharmaceuticals, food products, chemicals and water for municipal systems and swimming pools.

Additional applications include its use as an abrasive in soaps, cleaners and polishes. Its high

resistance to heat is taken advantage of in manufacturing refractory bricks, mortars and pipe insulation. Crude perlite is used in retention of heat in foundry and ferro-alloys industry.

SUBSTITUTES

There are a number of materials that can be used in place of perlite for many of its applications. These materials (such as vermiculite, diatomite, pumice, expanded clay and shale, etc.) may be used in place of perlite without losing any of the benefit that perlite provides.

WORLD REVIEW

The world reserve base of perlite is placed at 7,700 million tonnes of which Turkey accounted for 5,700 million tonnes (Table - 6).

The world production of perlite in 2007 was estimated at 3.6 million tonnes. China (39%), Greece (30%), USA (12%) and Japan (7%) were the leading producers. Other important producers were Turkey, Mexico, Hungary, Italy and Russia (Table - 7).

**Table - 6 : World Resources of Perlite
(By Principal Countries)**

(In '000 tonnes crude ore)

Country	Reserve base
World : Total	7700000
Greece	300000
Turkey	5700000
USA	200000
Other countries*	1500000

Source: Mineral Commodity Summaries, 2008.

* Including Japan, Hungary and Mexico.

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**Table - 7 : World Production of Perlite
(By Principal Countries)**

(In '000 tonnes)

Country	2005	2006	2007
Armenia	50	50 ^(e)	50 ^(e)
China ^(e)	700	1380	1400
Greece	1053	1100 ^(e)	1100 ^(e)
Hungary	70	71	68
Italy ^(e)	60	60	60
Japan ^(e)	240	240	240
Mexico	92	82	54
Russia ^(e)	45	45	45
Turkey	157	160 ^(e)	160 ^(e)
USA	508	457	444 ^(e)

Source: World Mineral Production, 2003-2007.