



# CONSTRUCTION MATERIALS INDUSTRY

---

## CONSTRUCTION MATERIALS INDUSTRY

To sustain its economic development Iran requires construction materials of all kinds. These include cement, lime, plaster, asbestos (products), and decorative stones, which are discussed in this article. The production of bricks, tiles, and sanitary ware is discussed in the article [BRICKS AND CERAMICS INDUSTRY IN IRAN](#). Other construction materials such as glass, steel, lumber, and metal ware are discussed separately under their own heading.

*Cement industry.* Iran is richly endowed with the raw materials (limestone, clay, gypsum, quartz, etc.) required for cement production. The latter is energy-intensive, but Iran has abundant and cheap energy resources. Iran, therefore, only needs to import spare parts and electrical components, mainly from Germany, Austria, France, Japan, and Romania. The final products are clinker (un-milled cement), ordinary cement and white cement. The latter is produced in 14 varying types and qualities for different applications. Currently, 60 percent of the machinery for cement production is produced locally and according to the development plan this figure will increase to 80 percent by the end of 2010.

Until the 1930s, lime mixed with clay was used in Iran instead of cement. However, at that time Iran began a major development program. Numerous



infrastructure projects (railway, dam, roads, factories, housing) were undertaken. Consequently, many industrial factories were established. Iran was rich in mineral resources to make construction materials, but it lacked modern technology. In 1933, Iran's first cement production plant, the state-owned company *Simān-e Ray* (100 tons per day capacity), became operational. The cement factory in Ray (near Tehran) had only 360 workers in 1936, but after its expansion in 1939 to a capacity of 300 tons per day it boasted of 1,000 workers (Floor 1984, p. 62). Its output did not suffice to satisfy domestic demand and there was still import of cement (see [TABLE 1](#); see also Zāhedi, p. 85, referring to 4,000 tons import in 1935-36).

The Ray plant's nominal capacity of 300 tons per day was reduced due to deterioration of the plant during World War II (hard service, lack of no suitable parts and maintenance), and the production level dropped after 1943-44. As of 1946, cement production increased again. The Anglo-Iranian Oil Company (AIOC) was allowed to import cement duty free; otherwise a tariff of 16 percent was applied. Iran's consumption had been 10 kg per capita between 1936 and 1940, the period of the realization of major development projects in Iran. The low level of the use of cement in Iran, which was 4 kg per capita as compared with 17 kg per capita in Turkey in 1946, was due to scarcity and its high production cost. The final retail price was much higher due to high transportation costs. The official government price of cement was 2,200 rials per ton in 1948. However, the cost of this cement in Tabriz was 2,900 rials, rising to 3,400 rials in Mashad or Shiraz. The operating costs were high due to manual quarry operation, high overhead, frequent shutdowns due to equipment breakdown and short life of the locally manufactured refractory bricks. Overseas Consultants therefore recommended rehabilitation of the Ray plant as well as the construction of new capacity outside Tehran to enable a more cost-effective distribution of cement (Roberts, p. 22; Overseas Consultants, IV, p. 149). Demand for cement depended on construction, which rose consistently after 1950. Private investors erected a second plant (60 tons per day capacity) in the early 1950s. Two additional plants therefore were built (Lowšān, near the Safid Rud dam, and Du Rud, on the Khorramshahr-Tehran railroad line), which increased total capacity to 460 tons per day in 1955. By 1962, there were eight cement factories that produced 567,000 tons of Portland cement and 11,000 tons of ordinary cement. Two of the factories were government owned, two others were partly government owned. As a result of the economic recession that had hit Iran in 1961, the cement industry suffered from overcapacity (Echo of Iran, 1963, p. 245). The problem was



resolved when the economic recession ended and new capacity needed to be built. By 1971, some 11 cement plants produced about 3 million tons of cement, and the government expected that with new plants under construction Iran would be able to satisfy domestic demand without necessitating imports (Echo of Iran, 1972, pp. 317, 330-31). The government, however, had imposed price controls to keep inflation in check, which discouraged investment. As a result a black market for cement emerged. Consequently, cement had to be imported because national capacity could not meet demand. The situation improved after the 1973 oil crisis, when Iran was awash in foreign exchange, resulting in a substantial increase in construction projects. By 1975, some 3.6 million tons of cement and in 1976 some 4.8 million tons were produced. By 1979, a total of 20 plants existed with a total capacity of 42,300 tons per day (Echo of Iran, 1975-77).

After 1979, most cement plants were nationalized (previously, there were only two state-owned plants), and the government took a majority stake in the others. In the 1980s, the capacity grew as a result of investments made before 1979. Thus only four more cement factories were built because of the difficulties due to the war with Iraq, adding 8,300 tons per day to the country's cement production capacity. After the Iran-Iraq War (1980-88), the demand grew due to government sponsored new housing projects; domestic cement production capacity was therefore insufficient. In order to add to capacity, the government therefore made available foreign exchange below the market price. As a result, during the 1990s a further 10 more plants were constructed, producing an additional 16,500 tons per day of cement. By then, there was a total of 29 plants with 51 production lines producing 74,060 tons per day (23.3 million tons of cement from 22.5 million tons of clinker a year, out of a nominal capacity of 26.9 million tons of clinker; [TABLE 2](#)).

The cement industry is still primarily state-owned, with only 10 percent of the factories in private hands. Like other state-owned industries, the cement industry too was inefficient with a capacity utilization rate of 75-80 percent, although it is improving. Because of long distances, cement is bagged and transported thus increasing costs. See [TABLE 3](#) below:

TABLE 3

Cement Plants: Capacity, Production, Efficiency and Export

1381 Š. (2002/03)



Name	Clinker capacity tons per year	Cement capacity tons per year	No Plants	No Kilns	Output	Efficiency	Export tons per year in 1378 [1999]
Abadeh	165,000	171,600	1	1	14,160	99.0	–
Abadeh	2,250,000	2,340,000	1	2	176,501	100.7	74,701
Ardabil (ES: Ehdas San'at Corp.)	690,000	717,600	1	1	60,427	101.0	140,120
Behbahan (FKCC)	825,000	858,000	1	1	76,612	107.0	242,120
Bojnurd	600,000	624,000	1	1	58,702	112.8	–
Bushehr	900,000	936,000	1	1	6,878	8.8	–
Dorud (FKCC)	1,197,000	1,244,880	1	1	37,222	38.8	351,729
Ekbatan	165,000	171,000	1	3	11,046	77.0	–
Isfahan	996,000	1,035,840	1	1	66,289	76.9	317,140
Estahban	315,000	327,600	1	2	20,869	76.7	–
Fars (FKCC)	787,500	819,000	1	1	70,487	76.4	–
Qa'en	660,000	686,000	1	1	54,155	103.0	13,280
Gharb (FKCC)	600,000	624,000	1	1	32,333	62.1	20,069
Heqmatan (ES)	690,000	717,600	1	1	51,349	85.8	29,866
Hormozogan (ES)	1,800,000	1,872,000	1	2	134,950	86.5	264,140
Ilam (THRN: Tehran Cement Co.)	600,000	624,000	1	1	35,521	68.3	12,800
Karun	900,000	936,000	1	1	49,234	63.1	–
Kerman	1,104,000	1,148,000	1	3	75,418	78.8	336,756
Khash (ES)	600,000	624,000	1	1	61,038	117.3	52,494
Khazar	600,000	624,000	1	1	46,200	88.8	18,704
Khuzestan (ES)	900,000	936,000	1	1	85,272	109.3	49,863
Kurdistan (ES)	690,000	717,600	1	1	70,201	117.3	50,470
Loshan (THRN)	198,000	205,920	1	2	9,754	56.4	–
Neka	600,000	624,000	1	1	48,647	93.5	21,946
Neiriz white (FKCC)	165,000	171,600	1	1	8,614	63.1	–
Qeshm	0	144,000	–	1	0	0	–
Saveh white	157,000	163,800	1	2	10,907	40.1	97,963
Sepahan	1,980,000	2,059,200	1	2	184,175	107.0	32,165
Shahrud	690,000	717,600	1	1	63,725	106.5	34,850
Sharq	1,392,750	1,448,460	1	3	87,642	72.6	13,621
Shomal	660,000	686,400	1	3	58,120	101.6	13,163
Shomal white	85,800	89,232	1	1	6,920	93.0	4,702
Sufiyan	1,428,000	1,485,000	1	4	101,565	82.0	51,485
Tehran (THRN)	2,325,000	2,418,000	2	7	112,906	56.0	–
Tehran 7th unit (THRN)	600,000	624,000	1	1	39,013	75.0	–
Urmiyeh	855,000	889,200	1	1	34,641	47.6	105,660
Urmiyeh white	157,500	163,800	1	1	1,074	7.8	–
Total	28,579,050	29,722,212	36	60	2,075,718	83.8	1,250,839



Source: Cement Magazine, 1999.

In 2003, 35 firms producing cement in Iran had a total output of about 31 million tons. Iran's cement output is expected to reach 33.5 million tons by March 2004 once five new cement firms become operational. Iran also exports cement, although in the past this was subject to the needs of the domestic market. After a rise in the mid-1990s, the government even imposed an export ban in 1997 resulting in a fall of 80 percent in export in that year. Most cement production companies have managed to find suitable export markets, total exports amounting to 5.3 percent of cement and 1.6 percent of clinker production of the country, but some plants such as *Khash Cement*, being remotely situated, do not have easy access to other provinces nor to ports, and are therefore working below capacity. To facilitate the growing export of cement, a cement export terminal called "Ehdas Payaneh" [Eḥdāt Pāyāna] was built at Bandar-e Emām Komeyni (formerly *Bandar-e Šāhpur*) in 1998. The most important export markets are Iran's neighbors, in particular to the small Gulf countries, although competition from Saudi Arabia and Iraq will challenge Iran's position. The latter have mostly cement mills and thus need clinker for their process, which thus opens export prospects for Iran. Cement exports, however, are still a minor item representing only 0.3 percent of the share of Iran's total exports in 1999 (see statistics in United Nations Industrial Development Organization (UNIDO) 1995 and 1999).

*Lime (gač)* mixed with clay was used in Iran in the past instead of cement, but the introduction of cement reduced its use in the construction industry (Floor 2003, pp. 55-60). Until the 1960s, lime of poor quality was made in many small kilns and dispersed over the country. No hydrated lime was made (Overseas Consultants, Inc., IV, p. 153). In 1972, Iran produced 2,517 tons of limestone (Echo of Iran, 1972, p. 346). By the mid-1970s, there were two large plants (400,000 tons per year) and many small limekilns. Large industries, such as steel and sugar mills, and petrochemical plants, also produce lime as a by-product. Production in Iran increased during the 1980s following a shortfall of cement production. Furthermore, new capacity was added in the 1980s, but given improved availability of cement, lime production dropped. The two factories only produced 60,000 tons per year in the mid-1990s.

Plaster (*āhak*) is a building material in Iran for at least the last 4,000 years. Until recently, gypsum plaster of poor quality was produced in a large number of small kilns throughout Iran using traditional methods (Floor 2003, pp. 54-55; Overseas Consultants, Inc., IV, p. 153). By 1971, Iran produced 843 tons



of gypsum, an eight-fold increase over the previous year (Echo of Iran, 1972, p. 317, 346). The first modern plaster factory became operational in 1971 with a capacity of 720,000 tons of packaged plaster and 450,000 sq square meters of prefabricated plaster products. A second plant came on line in 1972 with a capacity of 432,000 tons. By 1977, there were nine plants in Iran with a capacity of 2.2 million tons per year. Given the ongoing building boom, more plants were established as plaster is used for covering of walls and ceilings. There is also potential for export.

*Asbestos (panba-ye kuhi)* production for goods such as pipe and roofing materials is associated with cement production. In 1959, the first asbestos plant was built (30,000 tons per year), and a second plant came on line in 1969 (20,000 tons per year). By 1980, there were eight plants in Iran with a capacity of more than 500,000 tons per year. Production of fiber cement pipes and corrugated sheets started in 1957 in Tehran, and 15 years later a second one in Isfahan. The industry employs simple technology and is highly profitable. Thereafter, eight other plants were erected. The input requirements are cement, asbestos and acrylic. The latter two are imported, although asbestos is produced in Khorasan and acrylic will be produced in the future domestically. The total capacity of fiber cement products is 280,000 tons per year, of which half is not used. Thus, considerable scope for export exists. However, the industry suffers from overcapacity, substitute products, foreign exchange needs (one-third of the costs of the final product), and environmental concerns, which constrains its export potential. All the machinery for the production of asbestos sheets and pipes are made locally (TABLE 4).

*Construction and decorative stones.* Iran has enormous deposits of limestone and sandstone for construction, and granite, marble and travertine as decorative stones. The latest estimate of the country's reserves, made in 1996, was 4,400 million tons. Iran stands second in the world in terms of stone resources, but has only a 0.3 percent share of international trade in rocks. Marmoreal, travertine, marble and granite are Iran's major export stones (Lorestān, Fārs, Isfahan). There are about active 530 mines, and some 5,000 stone factories. Export in 1999 had a value of 17 million US dollars and in 2000 some 30.2 million US dollars (Iranian Chamber of Commerce, Industries, and Mines [ICCIM], ICCIM Online Publications).

Although in centuries past, some of these resources were mined to be used in construction, it was only in the 1970s that the stone industry got its real start. In 1970, only 335 tons of stone were produced, while in 1991 this figure had



risen to 7 million tons. During the same period the number of operational stone factories increased from 200 to 3,000 employing 30,000 workers. Most of them still use traditional methods to produce soft stones for domestic consumption. However, the major demands in the international market are for hard stones (granite) and for soft ones. At present, Iranian factories are not able to meet both international demand for hard stones and the soft ones, according to the international market specifications.

The government has therefore stimulated the development of this industry encouraging better exploitation of the mines and quarries. It also has convinced almost all exploiters of decorative stones to avoid the use of explosives and resort to cutting in order to prevent cracks in the stone blocks. It authorized some 15 modern stonecutting and processing lines to be operated by the government and private sectors. These production units are capable of producing a total of 1.5 million square meters of polished stones meeting international standards in dimension, thickness, grinding, and polishing. These units will guarantee the export of wrought stones in the form of slab and tile. The main thrust of the country's Second Five Year Development Plan is to increase non-oil exports. The stone industry is among those to fulfill this policy. In the recent years the number of modern stonecutting factories has increased and the standards and tolerances of cutting have largely improved. The machinery for stone cutting is made in Iran, but export-oriented companies still import it from Italy to meet international standards (Saba News, 4 December 2001).

## BIBLIOGRAPHY

---

Echo of Iran, *Iran Almanac*, Tehran, 1961-77.

Willem Floor, *Industrialization in Iran 1900-1941*, Durham Occasional Pares Series 23, Durham, England, 1984.

Idem, *Traditional Crafts in Qajar Iran (1800-1925)*, Costa Mesa, Calif., 2003.



*Iran Yearbook*, Bonn, 1989-90.

Overseas Consultants, Inc., *Report on Seven Year Development Plan for the Plan Organization of the Imperial Government of Iran*, 5 vols., New York, 1949.

N. S. Roberts, *Iran. Economic and Commercial Conditions*, London, 1948.

United Nations Industrial Development Organization (UNIDO), Economist Intelligence Unit, *Islamic Republic of Iran. Industrial Revitalization*, Vienna, 1995, pp. 106-10.

United Nations Industrial Development Organization, *Islamic Republic of Iran. Industrial Sector Survey on the Potential for Non-Oil Manufactured Exports*, Vienna, 1999.

Internet resources.

Iranian Chamber of Commerce, Industries, and Mines [ICCIM], ICCIM Online Publications, "Export in Industrial, Mining Sector to Reach 2 Billion Dollars in Current Year," formerly posted at [http://www.iccim.org/English/Magazine/iran\\_commerce/no1-2002/21.htm](http://www.iccim.org/English/Magazine/iran_commerce/no1-2002/21.htm).

Saba News, "Technical Dept. News: Optimization of Energy Efficiency in Ceramic and Tile Industry," 4 December 2001, formerly posted at <http://www.iraneeo.com/news.html>.

(Willem Floor)

July 20, 2009