

Qwix[®]

Frequently Asked Questions

What is Qwix[®] ?

Qwix[®] is a mineral additive used with Portland cement concrete to enhance the physical and chemical properties related to durability. All Qwix[®] reactions with Portland cement are completed in aqueous solutions, so Qwix[®] is regarded as a hydraulic cementitious material per ASTM C 219.

How does Qwix[®] work?

Qwix[®] is a mineral blend, which is very rich in Calcium Aluminum Sulfate crystals and other ingredients, which generate upon hydration a very strong cementitious matrix with Portland cement components.

What is the chemical analysis of Qwix[®] ?

The following table gives the chemical analysis range for all ingredients:

SiO ₂	10 - 12 %
AL ₂ O ₃	24 - 26 %
Fe ₂ O ₃	3 - 4 %
CaO	42 - 45 %
MgO	0.5 - 1.0 %
SO ₃	16 - 18 %
K ₂ O	0.2 - 0.3 %
Na ₂ O	0.2 - 0.3 %

Is Qwix[®] related to High Alumina cement?

Qwix[®] qualities of fast setting and high early strength development are not related to High Alumina cement, even though the Aluminum Oxide content is higher than the range of Portland cement. High Alumina cement is a refractory cement with a completely different microscopic crystal structure than Qwix[®].

Is there any chloride component in Qwix[®] to which fast setting quality could be attributed?

There are no chloride components in Qwix[®]. The qualities of fast setting and early high strength are attributed to a different hydration mechanism. Qwix[®] has all the advantages of a chloride accelerator without the adverse consequences of using chloride.

What is the shrinkage behavior of Qwix[®] concrete mixes?

Qwix[®] has a shrinkage reducing quality on concrete mixes. The shrinkage of Qwix[®] in concrete mixes, is at least three times less than that of Portland cement mixes for the same water/cement ratio.

What is the setting time for Qwix[®] mixes?

Upon mixing Qwix[®] with Portland cement, a wide range of setting time is achieved depending on the percentages of the two components. The table in the next question encompasses the conceivable range without using any retarding agent.

What is the strength range of Qwix[®] mixes?

The following table provides useful information regarding the strength of Qwix[®] mixes using different percentages of Portland cement. All data was obtained per ASTM C-109 for w/c=0.35 and W.R. Grace Plasticizer Adva 100 for a dose of 15 oz/100 lbs. of cement. No retarding agent was used:

Qwix	Set time	3hrs Strengths (psi)	24hrs Strengths (psi)	28days Strengths (psi)
50%	30 Min	4150	7708	9250
60%	20 Min	4660	8150	9780

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Is Qwix® related to type K shrinkage compensation cement?

Qwix® is a volume stable cement. There is no expansion to counterbalance the shrinkage behavior of Portland cement. Qwix® has a totally different mechanism of reducing the shrinkage related to the special quality of the crystals.

Does Qwix® exhibit regression?

Qwix® chemistry is different from High Alumina Cements and does not have regression characteristics. When combined with gypsum, there may be slight regression between the 7 and 14 day breaks with no strength loss on later day breaks.

Are Qwix® concrete mixes sulfate resistant?

Yes, Qwix® concrete mixes are higher in sulfate resistance than type V cement. For type V, the quality of sulfate resistance is due to the reduction of the destructive reactions of the C3A to a minimum level characterized by a maximum of 5% content. The sulfate resistance quality of Qwix® works in a completely different mechanism. Since all the C3A hydration takes place in the plastic stage, all destructive future reactions are eliminated.

Is Qwix® compatible with Type II and Type III cements?

Yes, Qwix® concrete mixes can be designed using any Portland Cement. The chemistry of the type of cement and the producer of each cement will vary the set times and strength curve. Trial batches need to be completed to determine optimum mix design.

What is the mixing procedure for Qwix® concrete?

All conventional concreting practices and procedures are applicable to Qwix® concrete mixes. Close attention should be paid to the limited working time available for Qwix® mixes. When the proper delay dose is used, the retarder should be diluted with water and mixed thoroughly with the aggregates before the introduction of Qwix® materials.

How could the working time of Qwix® concrete mixes be extended?

- Reducing the mix temperature by using warm weather concrete practices.
- Use the retarding agent, UC Delay, in the proper dose estimated in ounces per 100 lbs of cement. The following table illustrates the approximate dose of delay for one hour of working time. Since site conditions and the aggregate qualities affect the setting time and strength curve, actual concrete test batches should be made to determine the delay dose for specific site conditions.

Ambient Air Temp	Batching Temp (F)	Delay dose (oz/100 lbs cement)
40 – 50	50	6 – 8
50 – 60	55	8 – 10
60 – 70	60	10 – 12
70 – 80	60	12 – 14
80 – 90	60	14 - 16

What is the curing procedures of Qwix® concrete mixes?

There are no special curing recommendations in normal weather conditions. In case of windy or high temperature conditions, some precautions should be taken to prevent excessive surface evaporation and/or excessive heat accumulation.

Where can Qwix® be used?

Qwix® cement and concrete mixes are used in highway pavement repair, airport runways and taxiways, tilt-up panels, structural pre-cast concrete, ornamental pre-cast concrete, catalyst to enhance cold weather set time, catalyst for accelerated strength and set time in cementitious packaged products.

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