

CARBOFEN® NCX

Air-Entraining Agent

PRODUCT DESCRIPTION

Carbofen NCX is a modified, saponified and powdered natural resin. It has excellent properties as a ready-for-use air entrainer for concrete and mortar, since our product allows the user to eliminate the process step of neutralization. Carbofen NCX is water-soluble and may be added pure to the cement or as an aqueous solution.

Carbofen NCX results from a saponification reaction, between caustic soda (sodium hydroxide) and modified resins. These resins are derived from the synthesis of polyphenolic resin acids extracted from the “pine knot,” a resinous part of the *araucaria angustifolia* (Parana Pine).

SPECIFICATIONS

pH (in solution at 2%, ASTM E-70)	9.5 – 11
Free Alkali (mg NaOH/g), EQP MA 85	20 – 50
Moisture (%), 2h in drying oven, 120°C	Max. 8

ADVANTAGES OF USING CARBOFEN NCX AS AN AIR-ENTRAINING AGENT IN CONCRETE:

- Higher resistance to cracks caused by the freeze-thaw cycle;
- Better chemical resistance to sulfate;
- Improved workability in lean, harsh mixes and reduces bleeding caused by grading deficiencies in concrete;
- Increases plasticity;
- Reduces permeability;
- Extends the longevity of buildings and structures made of concrete and/or mortar.

APPLICATIONS

Air entraining agents have large use in foundations, slabs, dikes, tunnels, canals, bridges, highroads and others. Carbofen NCX can be used in the construction of any of above mentioned structures and can be used for concrete highway projects. In addition, our product can be used in:

- All types of concrete, including light weight and prestressed concrete where optimum air entrainment is desired;



- Concrete containing Pozzoloth or other admixtures (water reducers, accelerators, retarders, densified and water repellents).

DIRECTIONS FOR USE:

Dissolve 1 part of Carbofen NCX in 9 parts of water. Do not mix Carbofen NCX with any other admixtures.

Dosages of 50 ml to 70 ml per 50 kg of cement are usually enough to produce a content of air in the range of 3% to 6% in concrete. To enhance the properties, these quantities may be increased, provided that experimental tests take place first.

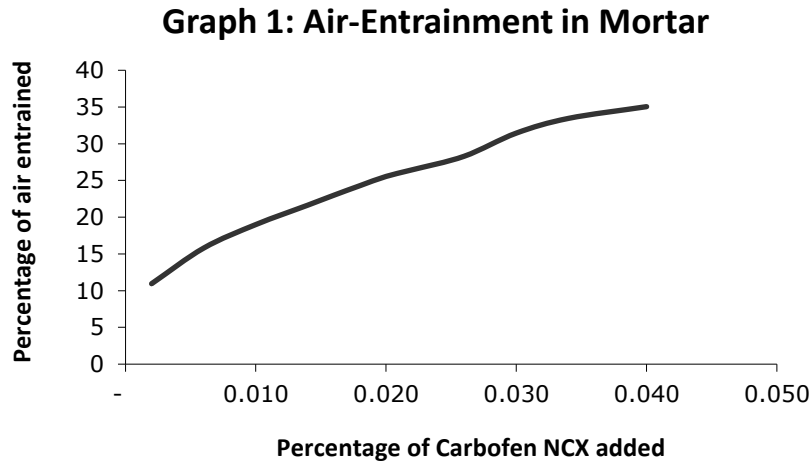
Trial mixes should determine the exact quantity of the Carbofen NCX needed. Factors to consider are:

- Concrete making materials; type and brand of cement, grinded sand, sand-aggregate ratio, slump, use of extra fine materials such as fly ash and micro silica;
- Conditions of mix;
- Mixing time;
- Temperature;
- Means of conveying and placement.

A regular program of air tests should be instituted in order to adjust the dosage to changing conditions.

EFFICIENCY OF CARBOFEN NCX

In Graph 1 below, one can observe the rapid increase in entrained air with small increments of Carbofen NCX added to the cement mix.



Below is Table 1, which displays the tests conducted with concrete mixed with Carbofen NCX in 4 different water to cement ratios to observe the resulting incorporation of air in concrete and their respective compressive strength, following the NBR13279/1995 guidelines after 7 and 28 days.

Table 1: Concrete Compressive Strength using Carbofen NCX with different Water to Cement Ratios

Water to Cement Ratio	Air Incorporated (%) into cement mix	Specific Weight (g/cm ³) of prepared concrete	Concrete Compressive Strength (MPa) after 7 days	Concrete Compressive Strength (MPa) after 28 days
0.4	2.485	2.442	25.06	33.01
0.5	2.790	2.307	18.83	24.89
0.6	3.125	2.297	13.82	18.62
0.7	3.398	2.275	8.76	12.12

As stated in the table above, it is clear that concrete becomes lighter as more air is incorporated in its mix and at the same time, its compressive strength decreases. So, the end user should choose the best condition that fits their particular needs. We also encourage our clients to conduct their own tests to determine the optimal added amount of Carbofen NCX into the cement mix.

SOLUBILITY

Soluble in water.

PACKAGING

- Paper bags of 20 kg (44.09 lbs)
- We recommend storage in dry and fresh places

PRODUCT INFORMATION AND SAFETY

Please read our Material Safety Data Sheet (MSDS) for more detailed information.

Note: The information given here is valid at the time of publication and Polytrade reserves the right to amend any without notice. We try our best to keep our records up to date, but if you want the latest information, contact one of our agents. Also, the data and suggestions regarding this product are given in good faith, but without guarantee, since the ultimate use of our products is beyond our control.