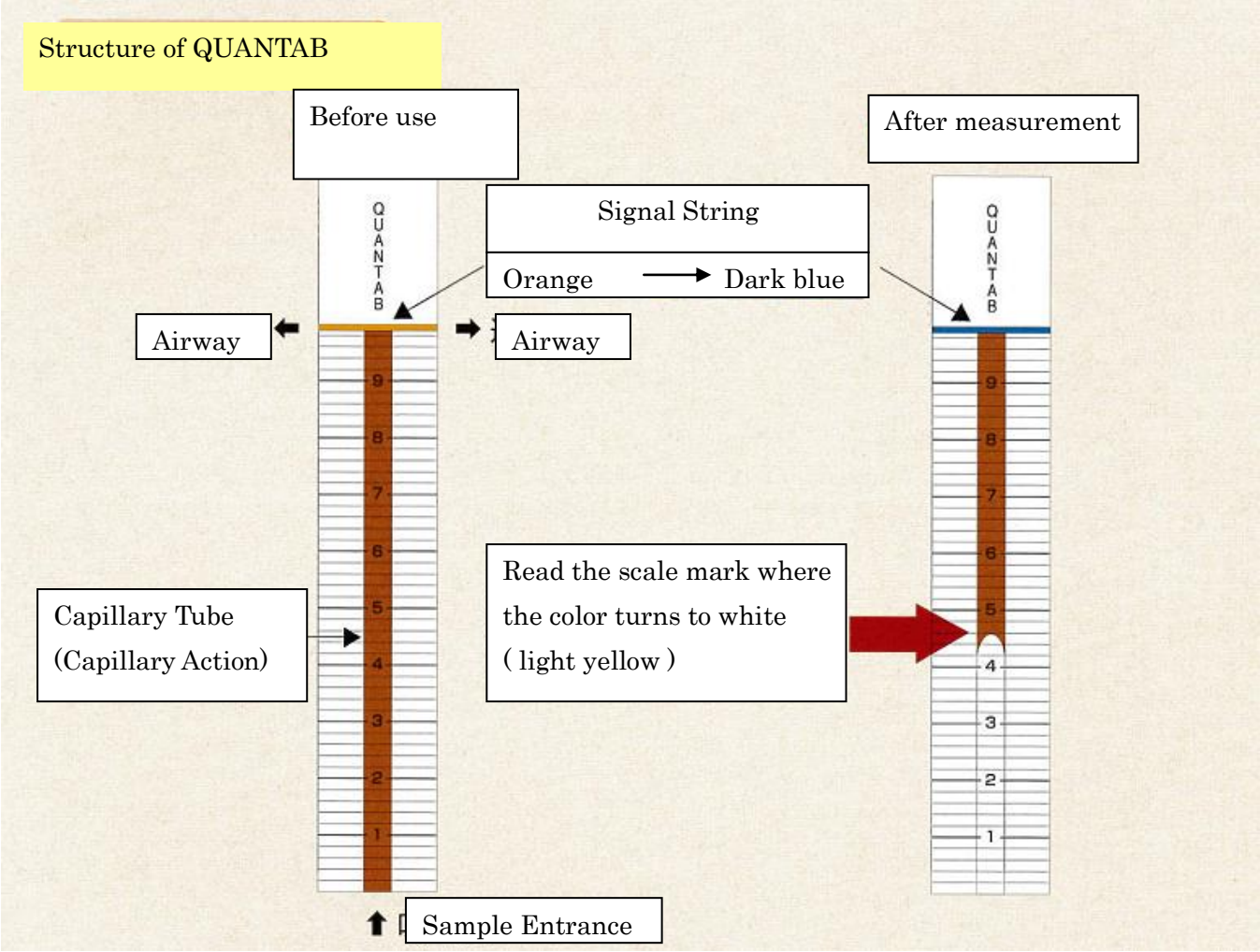
Handy Typed Salinometer for Ready-mixed Concrete

QUANTAB

Taiheiyo Materials Corporation

What is QUANTAB ?

QUANTAB can measure chloride contained in fresh concrete and is an easy-to-use salt meter for fresh concrete. The principle to measure chloride with QUANTAB is the Mohr's method in chlorine analysis, and the dry chemistry technique which has made remarkable progress in the field of clinical chemistry testing introduced in QUANTAB. QUANTAB uses the principle that a dark brown reagent turns to white in the presence of chlorine ions.



Measuring Mechanism with QUANTAB

QUANTAB should be inserted into the sample of concrete. Water in the concrete is sucked-up through the Sample Entrance, and the color change of the Signal String from orange to dark blue indicates the completion of the measurement of chloride content in concrete.

If chloride is contained in the concrete, the color of Capillary Tube turns to white or light yellow with curve. According to reading the scale mark of the top of the curve, the value of chloride content in concrete is obtained by using the enclosed conversion table in a box of QUANTAB.

(If no chloride exists in concrete, the above mentioned reaction does not take place.)

Then the chloride content in the concrete is calculated with unit quantity of water in the recipe for concrete.

Feature of QUANTAB

There are several methods to measure chloride content in concrete such as using colorimeter or electrodes.

1. QUANTAB offers high accuracy and there is no measurement error by each individual.

2 QUANTAB requires no electrode calibration. Anyone can easily make measurement.

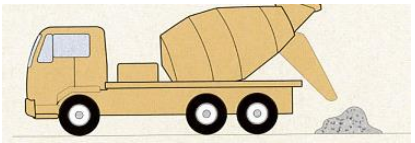
3 QUANTAB needs no electric power etc. for measurement and can be carried anywhere.

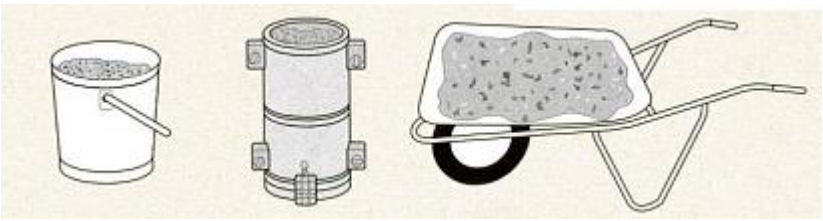
4 QUANTAB itself can be left and kept as measurement records.

5 No maintenance cost is necessary.

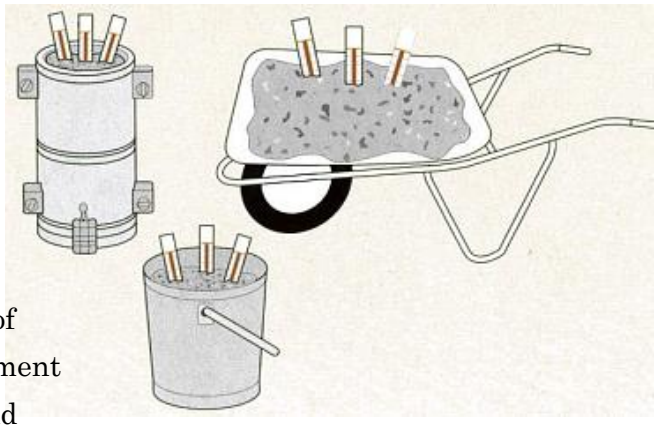
HOW TO USE QUANTAB

1) Take sample of fresh concrete in a suitable container.
*Approx. 1 lit. of sample is enough. Take sample from a typical portion of concrete according to JIS A1115 (the method of sampling concrete which has not been set) etc.
As sample, concrete packed in a. mould for strength testing can be used.

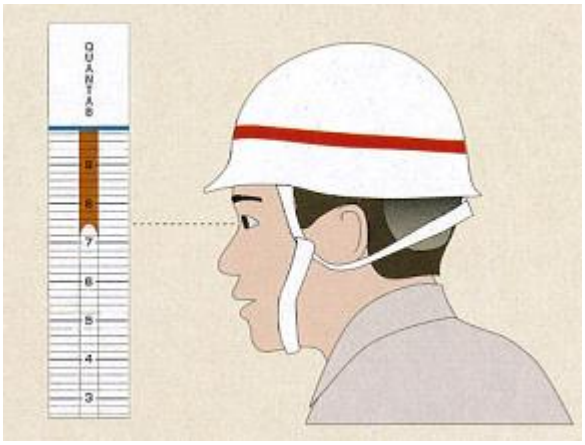




2) Three(3) strips of QUANTAB should be directly put into the sample (by about 1/3 of the total length of the QUANTAB strip). It should be confirmed that the color of the signal string turns to dark blue that means the measurement of chloride content completes. It takes about 10 minutes.
① QUANTAB gets bad influences by direct sunlight and moisture. QUANTAB strips should be taken out of the aluminum foil just before measurement. Direct sunlight and moisture should be avoided in measurement with QUANTAB.
② If the QUANTAB airway touches water, the color of the signal string changes, so that precise measurement is not conducted. The airway of QUANTAN should never be got wet.
③ Three(3) strips of QUANTAB should not put into concrete laying one on the others. Appropriate distance between the strips should be secured.



3) The QUANTAB strips should be taken out of the sample concrete after the color change of the signal strings from orange to dark blue is confirmed. The scale mark of the top of the curve where the color is changed from dark brown to white (light yellow) in the capillary tube should be read in the position of one decimal place.



●The time required for measurement is about 10 minutes but it might get longer depending on temperature conditions, mix proportion of concrete, the quantity of chloride etc.(The measurement completes when the color of the signal string turns to dark blue.)

●If no chloride is included in concrete, no color change to white takes place. However, there are some possibilities that the color change to dark brown occurs under some conditions. This is not the color change caused by the existence of chloride.

4) The Cl ion concentration in the water in the fresh concrete should be obtained with the conversion table sheet enclosed in a QUANTAB box from each of three strips of QUANTAB reading. The average of these values should be taken and the amount of chloride content in the concrete should be calculated by using the following formula :

$$\text{Chloride content in concrete}(kg/m^3) = \frac{\text{Average value of the concentration of Cl ion obtained from the conversion table}(\%)}{100} \times \text{quantity of unit water in concrete } (kg/m^3)$$

＊ The values obtained with QUANTAB are the concentration of Cl ion to water in the fresh concrete. Therefore, the chloride content in 1 m^3 of concrete should be obtained by calculation.

The following is an example of calculation

Example 1 : High Range		Example 2 : Low Range
0.109 0.115 0.115	The value of the concentration of Cl ion obtained from the conversion table (%)	0.0263 0.0263 0.0276
163	Unit water content (kg/m^3)	172
$\frac{\frac{0.109+0.115+0.115}{3}}{100} \times 163$	Calculation of chloride content in concrete (kg/m^3)	$\frac{\frac{0.0263+0.0263+0.0276}{3}}{100} \times 172$
0.184	Calculated value (kg/m^3)	0.0459
0.18	Reported value (kg/m^3)	0.05

HOW TO KEEP QUANTAB
(as a record after measurement)

The following is the procedure to keep QUANTAB as a record :

1) Wrap QUANTAB strip with tissue-paper or paper waste, place it on a table or hard surface, and squeeze out the sucked-up water from upper of the capillary tube toward the sample entrance by using the bottom of a pencil or a ball-point pen.
2) Stick the QUANTAB strip onto a report or construction record notes with adhesive tape and store the notes avoiding light (sunlight, fluorescent light, etc.).
3) Do not store the QUANTAB strip in a sealed container such as an aluminum pack or a vinyl bag since the measured value tends to get higher.

Note :

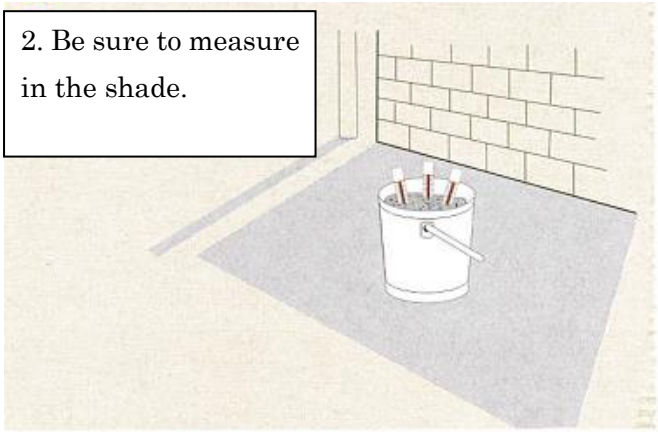
① If the water is not fully squeezed out, the coloring will advance a little with the passage of time.

② After measurement, the color of reagent in the capillary tube changes gradually to a mixed color of gray, brown and yellow due to impurities, the color change progresses to around scale mark 3.

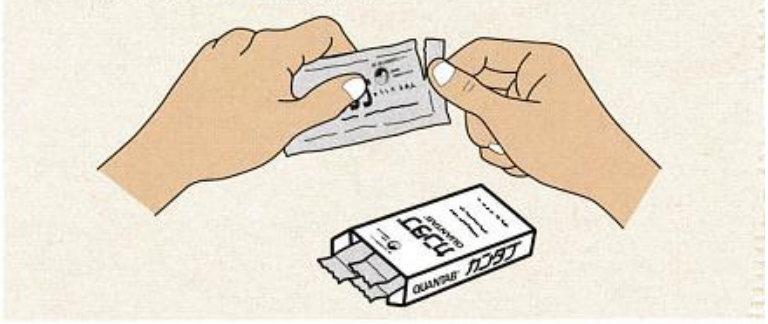
PRECAUSIONS

1. Be sure to use the conversion table enclosed in the same box as QUANTAB strips to be used.
(Conversion tables are examined every production lot of QUANTAB. Therefore, a conversion table should never used for the different lot of QUANTAB.)

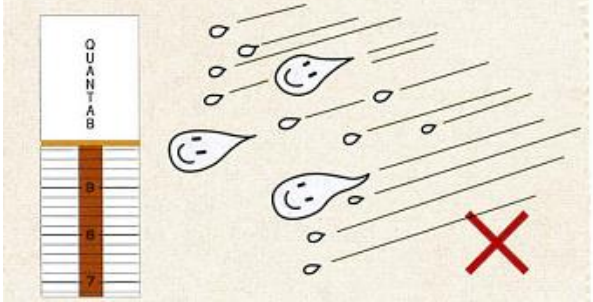
2. Be sure to measure in the shade.



3. QUANTAB should be used as soon as it is taken out of the aluminum pack.



4. Never get wet the signal string.



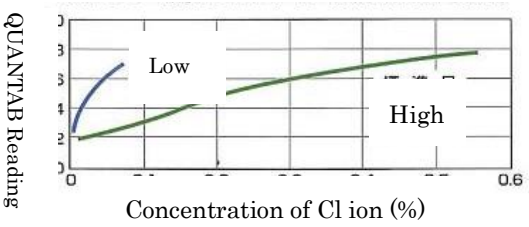
5. Store QUANTAB in a dry place avoiding direct sunlight and moisture.

6. If QUANTAB is left inserted in the concrete after measurement, further supply of water slightly gets the top of the color change of the capillary tube higher. Therefore, QUANTAB should be promptly removed after measurement.
7. Depending on conditions, a dark brown portion in the capillary tube of QUANTAB might turn to blackish color to around scale mark 3, which makes it difficult to read the white portion. In this case, the amount of chloride is regarded as less than the indicated value by the scale of the blackened portion though the absolute amount of chloride cannot be obtained. Especially, this phenomenon often takes places in case the quantity of cement is much more such as PC Grout materials, cement paste, etc.
8. Do not use QUANTAB beyond its validity. (The shelf life of an unopened QUANTAB is about two years.)

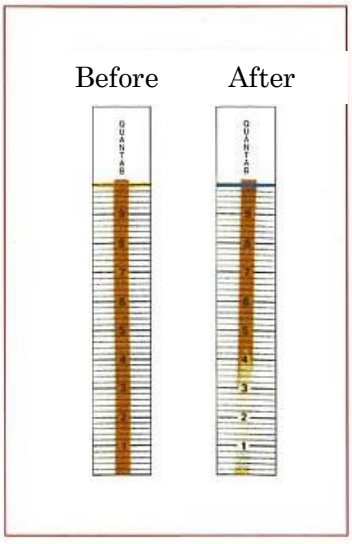
Type of QUANTAB and measurement range

Type of QUANTAB	Low Range	High Range
Measurement Range (Cl% converted as the concentration of water)	0.003 ~ 0.05	0.05 ~ 0.5

Relationship between QUANTAB Reading and Concentration of Cl ion



Package of QUANTAB

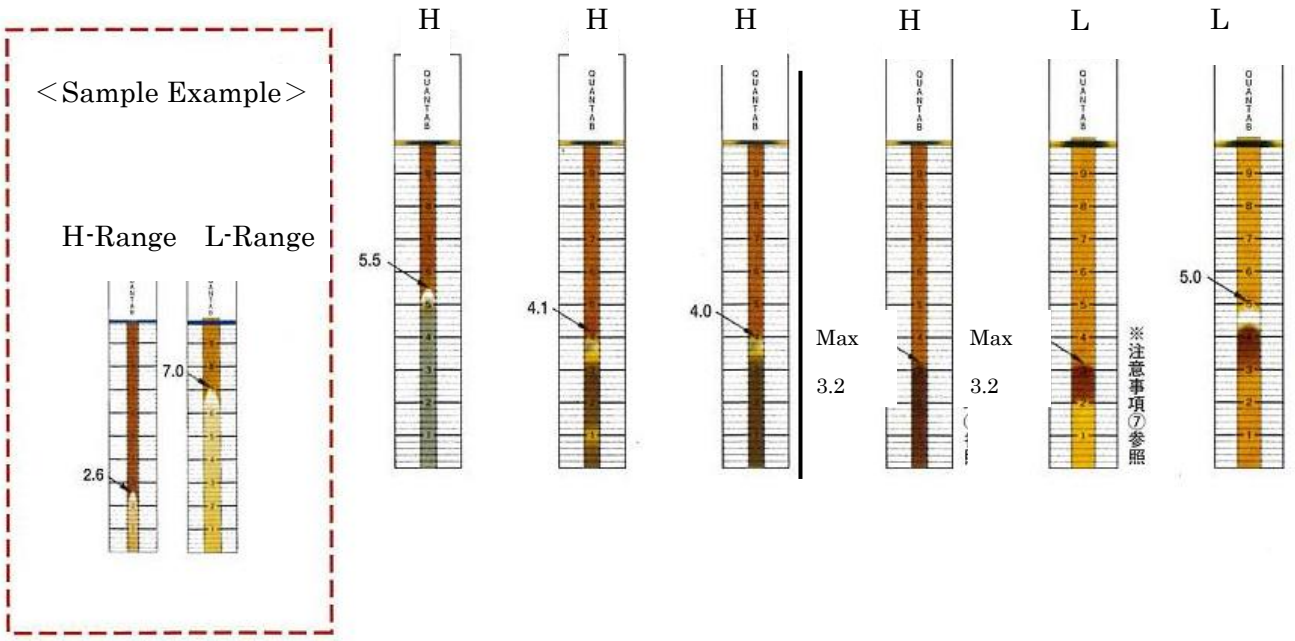


*3 strips / Aluminum foil, 12 aluminum foils (36 strips) / Box (enclosed with conversion table)

READING SAMPLES

Examples of readings for fresh concrete and mortar

H = High Range QUANTAB,　L = Low Range QUANTAB



* The above shows results of measuring chloride in the same fresh concrete by using High Range QUANTAB and Low-Range QUANTAB.

Taiheiyo Materials Corporation

International Business Dept.

Business Div.

Tabata ASUKA Tower 15th Fl.

6-1-1, Tabata, Kita-ku, Tokyo, 114-0014, JAPAN

Phone +81-3-5832-5226　Facsimile +81-3-5832-5263

URL :http://www.taiheiyo-m.co.jp