



KYORITSU

**PACKTEST**  
ION SELECTIVE

INSTRUCTIONS

## Residual Chlorine (Free)

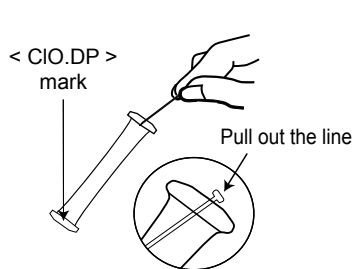
Model WAK-CIO-DP

DPD color comparison Method

Main reagent: N,N-diethyl-*p*-phenylenediamine sulfate

Range: 0.1 - 5 mg Cl/L (ppm)

### How to use



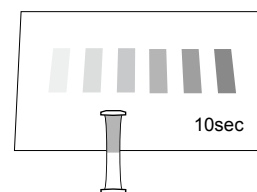
(1) Remove the line to clear the aperture from the top of the tube.



(2) Press the sides of the tube to expel approximately half of volume. Maintain pressed.



(3) Immerse the tube in the sample. Release the sides to fill the tube up to the half. Shake the tube lightly a few times.



(4) After 10 seconds, put the tube on the color chart as shown and compare with the standard colors.

### How to read the test

After the reaction time, compare the color of the tube with the standard colors. The nearest color indicates the measured value of the sample. A color between two standard colors indicates a value between the two standard values.

### Care in handling of PACKTEST before and after use

Keep PACKTEST out of the reach of children.

Keep PACKTEST in a cool, dry and dark place.

PACKTEST should be thrown with burnable garbage. Conform to the legislation of waste management.

Use a package as soon as possible after opening.

The PACKTEST tube must not be opened before and after use.

### First Aid Measures

Eye contact → Immediately rinse eyes with water for at least 15 minutes. Consult a physician.

Skin contact → Immediately flush skin with water.

Ingestion → Immediately rinse mouth. Consult a physician.

In case of doubt, consult a physician.

**KYORITSU CHEMICAL-CHECK Lab., Corp.**37-11, DEN-ENCHOFU 5 CHOME, OHTA-KU, TOKYO 145-0071 JAPAN  
FAX: 81-3-3721-0666 <http://kyoritsu-lab.co.jp>

## PACKTEST Residual Chlorine (Free)

### Features

The Residual Chlorine(Free) PACKTEST is suitable for city water, swimming pool water and drinking water. If you wish to measure the total residual chlorine, we recommend to use the Total Residual Chlorine PACKTEST WAK-T•CIO.

### Cautions

1. Chloride ion  $\text{Cl}^-$  is not measurable by this method. We recommend to use the Chloride ion PACKTEST WAK-Cl(200) or the Chloride ion (Low range) PACKTEST WAK-Cl(D)).
2. For high free residual chlorine concentrations ( $\approx 100 \text{ mg/L}$ ), PACKTEST color becomes dark red. Beyond, the color becomes lighter and over about  $500 \text{ mg/L}$ , it tends towards light yellow or white. For high free residual chlorine concentrations, we recommend to use the Residual Chlorine (High range) PACKTEST WAK-CIO(C).
3. Beyond one minute, the reaction color could become darker because of combined residual chlorine, and later, because of the dissolved oxygen.
4. The normal pH range is 5 - 9. If necessary, adjust the pH with diluted sulfuric acid or sodium hydroxide solution.
5. Ensure that PACKTEST tube is filled up to the half.
6. Partially undissolved reagent will not affect the measurement.
7. Keep sample temperature in the range  $15^\circ\text{C} - 40^\circ\text{C}$ . Lower temperature necessitates longer reaction time.
8. Read the test under a daylight type lamp.
9. Put the line back into the aperture after use to prevent reagent spilt.

### Interferences

Standard colors were determined from standard solutions. However, coexisting substances will cause inaccurate results. The list below reports substances concentrations under which ones interferences are insignificant:

$\leq 1000 \text{ mg/L}$	: $\text{B}^{3+}$ , $\text{Ba}^{2+}$ , $\text{Ca}^{2+}$ , $\text{Cd}^{2+}$ , $\text{Cl}^-$ , $\text{F}^-$ , $\text{I}^-$ , $\text{K}^+$ , $\text{Mg}^{2+}$ , $\text{Mn}^{2+}$ , $\text{Na}^+$ , $\text{PO}_4^{3-}$ , $\text{SO}_4^{2-}$ , $\text{Zn}^{2+}$
$\leq 500 \text{ mg/L}$	: $\text{Ni}^{2+}$ , $\text{NO}_3^-$
$\leq 100 \text{ mg/L}$	: $\text{Co}^{2+}$
$\leq 50 \text{ mg/L}$	: $\text{Cr}^{3+}$ , Phenol
$\leq 30 \text{ mg/L}$	: $\text{Mo}^{6+}$
$\leq 5 \text{ mg/L}$	: $\text{Al}^{3+}$ , $\text{Cu}^{2+}$

$\text{CN}^-$ ,  $\text{Fe}^{2+}$ ,  $\text{NO}_2^-$  and other reductive substances can interfere by residual chlorine consumption.  
 $\text{Cr}^{6+}$ ,  $\text{Fe}^{3+}$  and other oxidizing chemical can react with the main reagent and induce a colouring.  
The free residual chlorine concentration can decrease because of the reaction with  $\text{NH}_4^+$ . However, the total residual chlorine (Free + Combined) remains unchanged.  
The Residual Chlorine PACKTEST is not suitable for sea water samples.