

# DIRECTIVES FOR VENTILATION PRACTICE

1434

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October 1999  
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Ventilation is required for reasons of health and safety. In addition for solvent containing coatings the quality of a coating system is greatly affected by the amount and type of residual solvent in the layer when the coating dries or cures.

Adhesion, water resistance, mechanical and chemical properties can all be adversely affected when solvents remain trapped in the paint film. Very slow evaporation of trapped solvents can also develop internal stresses due to shrinkage.

The ventilation must be maintained throughout the application process at a minimum level of 10% of LEL value and for a period after application is completed when the paint cures or dries. As a guide line for good ventilation after application the confined space should be ventilated 4 to 5 times its contents per hour. Product data sheets indicate when any special ventilation requirements are required.

Hot ventilation: Ventilating air with too high temperature can cause surface curing of epoxy coatings and although it may be necessary to produce a dry substrate before painting, the steel and air temperature should be such that when the application starts, the temperature of the ventilation (dehumidifier/heater) should be dropped so that the conditions stay stable. Hot ventilation air should be replaced by cool dry ventilation air as soon as possible after application of any coat is completed.

Good ventilation consists of at least extraction at the lowest areas, but in most cases when controlled conditions are needed, also of air input (dry and/or heated). The combination of in and output must be correctly balanced.

The opening of the extraction hose should be close to the bottom of the tank (approx 30-60 cm).

Ventilation air should be directed to the bottom of the tank or compartment and should be extracted by exhaust fans of correctly balanced capacity.

For complex structures the ventilation should be distributed over all compartments and confined spaces in order to facilitate good ventilation in all areas.

## BALLAST TANKS AND OTHER CONFINED SPACES.

Due to regulations of the shipbuilding industry ballast tanks and double skin tanks count for many square meters confined spaces. Therefore it is necessary to pay good attention to the ventilation conditions during application, drying and curing of the coating on these areas.

Depending on the structure of the ballast tanks, forced ventilation or natural ventilation is used during coating of the new building blocks.

However, natural ventilation in many cases is not sufficient due to half open box conditions and can cause serious drawbacks related to health and safety as well as curing and performance of the coating.

When ventilation is not sufficient solvents will not be removed, but will drift to the lower part of the section. As normally first the upperparts of a section will be painted, the solvents evaporating from the applied coating will drift to the lower part where it will attack the earlier applied coating (not yet fully cured) and this coating will absorb part of the solvents and swell. This coating will then be overcoated and problems related to bad adhesion, curing, water resistance etc. will result.

In case of waterborne paints, this advice is not valid. Water vapour rises to the upper areas of the tank and may give condensation. Therefore it is recommended to position an extra exhaust outlet at the top of the tank.



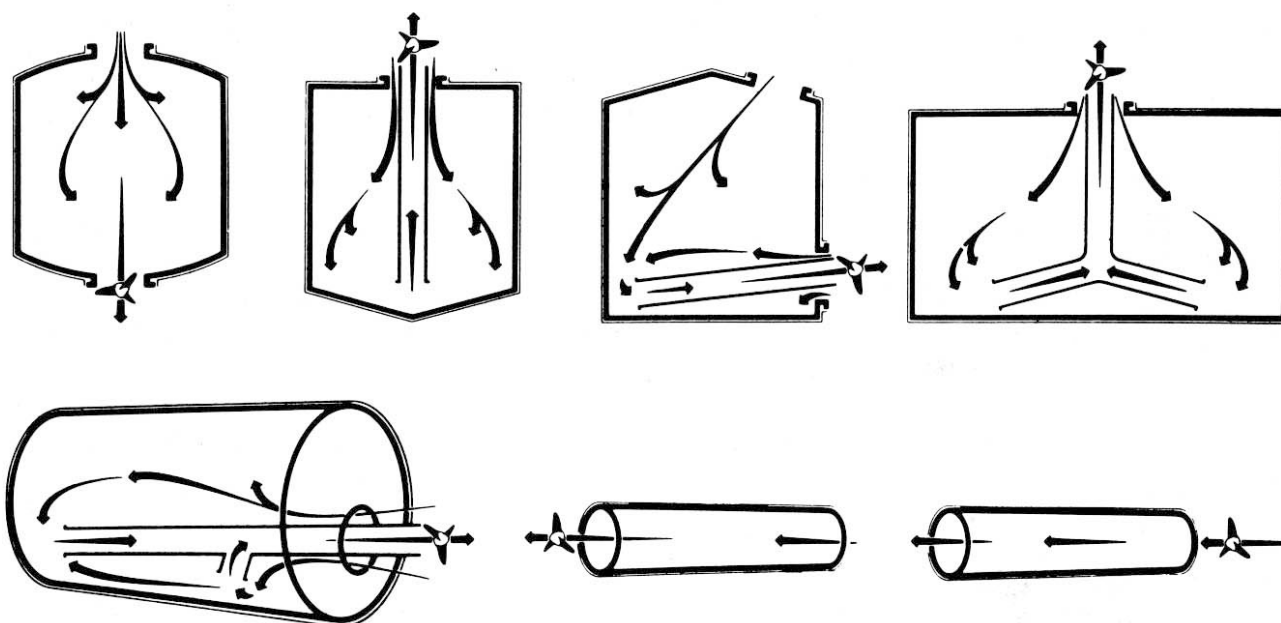
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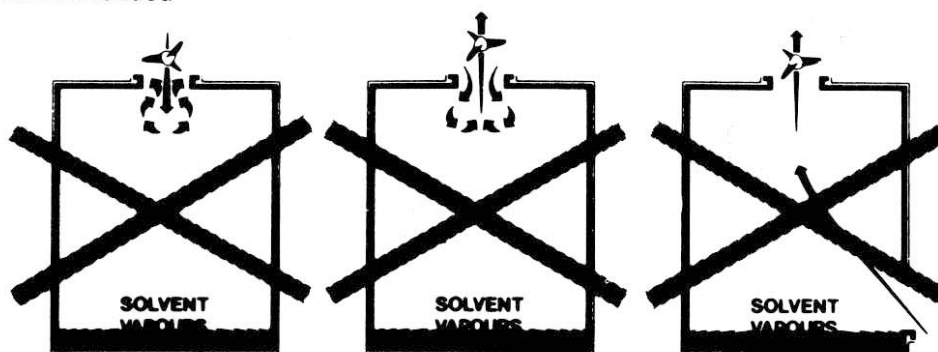
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Also in this case ventilation is of utmost importance as drying under insufficient ventilation will prevent paint film formation.

## Practices recommended



## Practices not recommended



→ Airflow and direction    ⚙ Fan

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