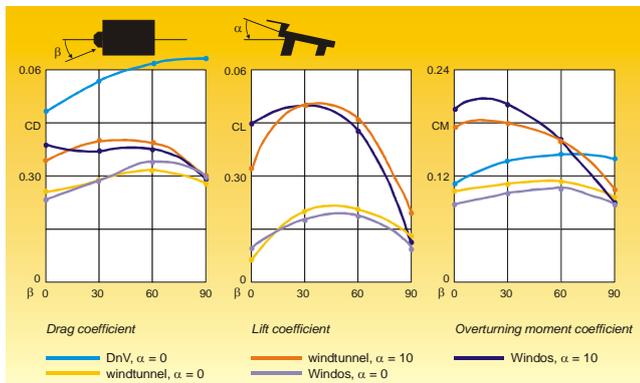


## Assessment of wind loads on ships and offshore structures

# WINDOS

WINDOS is a computer program for the calculation of wind loads on offshore structures. The program has been developed to bridge the gap between the two common methods used for wind load prediction: the simple calculation models provided by the classification societies and model testing in a windtunnel. The program can handle arbitrary types of ships and offshore structures.



Comparison between wind force coefficients calculated according to the rules of a classification society, measured in a wind tunnel and calculated with WINDOS

### Computational approach

The program is based on a building block approach. The structure is composed of a number of standard components of which the resistance coefficients are stored in the program's database. These standard components include rectangular prisms, cylinders, lattice structures, ship hulls, helicopter decks and user defined components. Theoretical and empirical relations are used to calculate interactions (shielding) between the components and lift forces on elevated and tilted decks. Extensive windtunnel tests have been carried out to validate and extend the calculation model. The program is able to compute the drag, lift and overturning moment on arbitrary structures in various tilted conditions.

### Input

The input includes the following items:

- Number, location, type and dimensions of standard components.
- User defined component data.
- Type of wind velocity profile.
- Wind velocity and wind angles relative to the structure.
- Orientation of the structure (roll and pitch angle).

### Output

The output consists of:

- Review of the input.
- Forces and moments for each orientation.

### Application

WINDOS allows a quick and easy assessment of wind loads on arbitrary offshore structures. The structure types include semi submersibles, jack-up rigs, jackets, fixed structures and ships.

The accuracy is sufficient for use in the design stage.

### References

- Walree, F. van and E. Willemsen, 'Wind loads on offshore structures', BOSS-88 Conference, Trondheim, June 1988.
- Walree, F. van and H.J.J. van den Boom, 'Wind, wave and current loads on semi-submersibles', OTC-91 Conference, Houston, May 1991.

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