



## **PROCEDURE FOR INSTALLATION AND MAINTENANCE OF NYBORG FANS, CENTRIFUGAL AND AXIAL.**

### **1 Purpose**

The purpose of this procedure is to ensure that all delivered fans are mounted, installed and maintained carefully by the purchaser.

### **2 Limited Applications**

This procedure comprise NYBORG Fans, both Axial and Centrifugal, Belt and Direct driven. If any special requirements are available beyond this procedure, a procedure adjusted to the conditions will be issued.

### **3 Responsibility**

Manufacturing manager is responsible that this procedure is part of each fan delivery. Any competent person in purchaser's organization is responsible for all activities that this procedure describes.

### **4 Description**

#### **4.1 Installation/Mounting**

First of all, check the fan regarding to transport damages. Any damages must be reported immediately. It is strictly prohibited to lift the fan by the shaft, the bearings or the impeller. A good result can only be obtained by using correct foundation for the fan. The foundation has to be almost straight and made in a heavy duty design. It is important that the fan is not tightened up awry by the foundation bolts. Adjust with shims if it necessary before tighten up the foundation bolts. Concerning duct-top mounted axial fans, check that the top flange is straight.

If the fan is equipped with adjustable vibration isolators, these have to be adjusted until the fan is level. Then tighten the locknuts.

If the fan is equipped with flexible connections, like PVC-coated canvas collar or similar, these have to be mounted in such a position that the flexible conn. don't tighten at any place around the fan inlet or outlet.



## 4.2 Commissioning

Check all bolts for foundation, el.motor, and fixing bolt for impeller that they are tightened up before starting. Rotate the impeller by hand for examining that the impeller is running easily. Start the fan and stop immediately after. Check that direction of rotation agrees with indicating arrow on the fan housing. Start the fan once again, and let it run for appr. 1 hour.

If any abnormal noise/conditions occur, stop the fan immediately and find the causes. After running for appr. 1 hour, stop the fan. Check once more that all bolts mentioned above are tightened up. Equal check must be carried out after 1 week operation.

After this, the fan has to be checked at regular intervals (periodic), and the following points are highlighted:

- Out of balance/vibrations on fan caused by dirt/sediments on fan impeller.
- Heat generation in fan/motor.
- El.motor. Independent section
- Fan Bearings. Independent section.
- V-Belt Transmission. Independent section.

## 4.3 El.motors

El.Motors are usually equipped with ball bearings sealed for life. Lifetime is appr. 20.000 operating hours. After this time bearings ought to be changed. See also the instructions from the motor manufacturer.



#### 4.4 Fan Bearings

On V-Belt driven NYBORG fans, following main bearing designs are used.

- Ball Bearings, sealed and lubricated for life.

These demand no maintenance at all, only a minimum of supervision.

- Grease-filled Spherical Roller- and Ball Bearings.

Grease filled bearings have to be cleaned up and refilled with grease (lubrication) at regular intervals. Enclosed you will find an alignment chart. This alignment chart indicates the lubrication intervals in operating hours. Actual parameters in the alignment chart are fan speed (n/rpm) and shaft diameter ( $\varnothing$  d). Grease-filled bearings must not be supplied with more grease than half-filled. An increase outwards this, may cause heat generation. The lubrication intervals in the alignment chart are only guiding values. Local conditions as moisture, dust and extreme temperatures will make shorter lubrication intervals necessary. See also bearing manufacturer's own lubrication instructions.

#### 4.5 V-Belt Transmission

The alignment of the V-belt transmission has to be checked by the help of a straight edge ruler. The V-belt tension must be exact adjusted for obtaining as long lifetime as possible on the V-belts as well as the bearings. As a principal rule, a V-belt is correct straightened up when the V-belt can be forced together with a distance like the width of the V-belt by normal finger pressure. By high power ratings, an indicator for V-belt tension ought to be used.

The fan bearings are designed for normal V-belt transmission. If the V-belt tension is too high, unnecessary wear and tear of fan bearings as well as motor can occur. Shidding during starting is normal by power ratings higher than 15 kW. After appr. 1 week operation/running, the V-belt transmission has to be checked, and if necessary to be adjusted/straightened up. Later to be checked up at regular intervals (periodic supervision).

#### 4.6 Spare Parts

All fans manufactured by the NYBORG A/S company, are equipped with a manufacturing signboard (tag plate), which indicates serial no (L.No.), model, performance etc. By ordering spare parts, signboard data always must be specified.



5 Documentation

Procedure for installation and maintenance of NYBORG Fans, Centrifugal and Axial.

6 Forms: None.