

## Fan Wheels

### Technical information

The PUNKER fan wheels supplied by us are technical products whose operational and functional capability do not depend on the quality guaranteed by us only, but from the application and the operating conditions with our customer and their customers, too.

It is thus of mutual interest to us that the following technical details are noted by the customer.

#### 1. General

- 1.1 The fan wheel is an important component of a fan or unit. The fan manufacturer has to make the correct wheel selection himself, when developing the unit. As specialists we support our customers with advice and proposals on the basis of the operating conditions being as comprehensive as possible when given to us (e.g. all details available for the fan wheel corresponding to the specification DIN 24 166).
- 1.2 The technical details indicated for our products are based on empirical values, which we have gathered by tests under normal laboratory conditions. These are average values where manufacturing tolerances may occur to the accepted limits in the industry concerned. It should be determined by extensive tests in applying these values that in practice customer's theoretical selection of the wheels is correct and suitable to be used under his or his customer's usual operating conditions. Upon request we can assist you in determining the test conditions.
- 1.3 With special consideration to 1.2 the manufacturer must also consider carefully any possible consequent damage and warranty claims which could result from a wheel failure. That is why higher safety factors should be taken into account if necessary when selecting the wheel e. g. in reducing our admissible working data, selection of a strengthened wheel or similar).

#### 2. Air duty

- 2.1 The data indicated in our catalogue only apply in connection with the measuring arrangement stated and when the fan wheel is used in connection with the housing and fan inlet recommended by us.
- 2.2 For arrangements varying from 2.1 we can give probable results only, which must be checked by the manufacturer.
- 2.3 Losses on the suction side and pressure side must be added to the characteristic curve of the fan and the unit resp.

#### 3. Strength

- 3.1 The fan wheels may only be used within the respective limits of the catalogue for speed, temperature etc.
- 3.2 The limits as to 3.1 only apply if there is no essential additional unbalance (e. g. concentric running errors of the shaft, through dirt accumulation, thermal distortion, stresses produced by shocks, mounting etc.). As the residual unbalance may under certain circumstances change in operation, a regular examination is necessary and if need be the rebalancing of the wheel.
- 3.3 The limits as to 3.1 only apply if there are neither bending vibrations in operation (e. g. operation near a critical speed etc. nor torsional vibrations being bigger than 30 % of the admissible driving torque in the catalogue and in the characteristic curve.

3.4 Please, note in connection with 3.2 and 3.3 that there will be vibrations in every rotating system. It is therefore necessary that each manufacturer makes sure by tests that there are no inadmissibly high sympathetic vibrations in connection with the mounting of the unit and/or the place of mounting and that the values as to VDI 2056 are not exceeded „practically“. These phenomena are not only a property of the fan wheel, and unfortunately they are unknown till the development of a unit has been finished.

3.5 The manufacturer has to dimension the hub bore and the shaft connection in accordance with the torque to be transmitted. With direct starting asynchronous motors having power levels  $\geq 5,5$  kw, problems will be experienced if the maximum bore of the Punker hub recommendations are exceeded as starting moments of inertia can be in excess of 12 times the nominal running conditions, which must be considered at the design stage and stated when the order is placed.

3.6 In mounting the wheel, the manufacturer must provide for an axial safety sufficient for the application. In the case where light metal hubs are used, the thermal expansion at higher temperatures must be considered.

3.7 When the fan wheels are supplied without hubs, the user must determine the admissible limits by tests himself. If further treatment of non-welded wheels is carried out, care must be taken that the original strength of the wheel joint is not inadmissibly damaged through alignment and balancing.

3.8 If the wheels are used for higher stresses and speeds than indicated in our catalogue, permission must be obtained by PUNKER and confirmed in writing.

#### 4. Machining Limits

Machining limits at the values of our products stated (among others weight, dimensions, performance details, limits) may occur to the accepted limits in the industry concerned.

#### 5. Transport and mounting by the customer

- 5.1 Our fan wheels are under exact control till dispatch has been effected. Although the goods are carefully packed and it is indicated on the packing to be handled with care, they may be damaged in transit by rail or by road. If so, we ask for a statement of facts to be sent to PUNKER immediately upon receipt of the goods.
- 5.2 It is of course a condition of the limits as to 3. that the state of our fan wheels upon delivery is also preserved when being handled and mounted by our customers.
- 5.3 It is recommended that trials are carried out upon receipt, as well as mounting of the fan, to establish if damage in accordance with 5.1 and 5.2 (in special unbalance) has not been noticed and to eliminate it before effecting delivery.