

KS

KOREAN INDUSTRIAL STANDARD

Free Wheels and Hub Cogs for Bicycles

KS R 8022 : 1998

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Free Wheels and Hub Cogs for Bicycles

1. Scope

This Korean Industrial Standard specifies free wheels and hub cogs used mainly for bicycles for general use and bicycles for young children specified in **KS R 8002**

Remark The units and numerical values given in { } in this Standard are based on the traditional units.

2. Normative References

The following standards contain provisions which, through reference in this text, constitute provisions of this standard. The most recent editions of the standards indicated below shall be applied

- KS B 0201** Metric Coarse Screw Threads
- KS B 0204** Metric Fine Screw Threads
- KS B 0211** Limits of Sizes and Tolerances for Metric Coarse Screw Threads
- KS B 0214** Limits of Sizes and Tolerances for Metric Fine Screw Threads
- KS B 0224** Bicycle Thread
- KS B 2001** Steel Balls for Ball Bearings
- KS R 8002** Classification and Essential Characteristics of Cycles
- KS R 8013** Carbon Steel Balls for Bicycles
- KS R 8021** Chains for Bicycles

3. Classification

The kinds of free wheels and hub cogs shall be as shown in the following.

a) Single free wheel

The single free wheel shall be as shown in **Table 1**.

Table 1

Nominal tooth	3/32
thickness	1/8

b) Multiple free wheel

The multiple free wheel shall be as shown in **Table 2**.

Table 2

Nominal tooth thickness	Number of sprockets (speed steps)
3/32	4
	5
	6
	7
1/8	2
	3
	4
	5

c) Single hub cogs

The single hub cogs shall be as shown in Table 3.

Table 3

Nominal tooth thickness	3/32
	1/8

d) Multiple hub cogs

The multiple hub cogs shall be as shown in Table 4.

Table 4

Nominal tooth thickness	Number of sprockets (speed steps)
3/32	5
	6
	7

4. Parts Names

The parts names shall be shown in Attached Figs. 1 to 4
Further, examples of the main materials used are shown for informative reference.

5. Strength

The strength of respective parts of free wheels and hub cogs shall be as follows :

- a) When the internal body is fixed and the chain fitted on the ratchet chain ring or the largest sprocket of the multiple free wheel is pulled on the driving direction with a

force of 4900 N {500 kgf}, the ratchet chain ring, sprocket, pawl, ratchet and other parts shall not be broken. However, in the case of a multiple free wheel with a maximum number of teeth of 20 or more, the force shall be applied so as to cause the torque of 196 N · m {2000 kgf · cm} on the largest sprocket.

- b) When the hub cog is fixed to the hub engaging part and chain fitted on the largest sprocket in the case of multiple hub cog is pulled with a force of 4900 N {500 kgf}, the respective parts of the hub cog shall not be broken.

However, in the case of multiple hub cog with a large number of teeth of 20 or more, the force shall be applied so as to cause the torque of 196 N · m {2000 kgf · cm} on the largest sprocket.

6. Hardness

The hardness of respective parts of free wheels and hub cogs shall be as specified in Table 5.

Table 5

Parts name and position		Hardness (HRA)
Ratchet chain ring		72 and over
Teeth of sprocket	Number of teeth, 16 max.	70 and over
	Number of teeth, over 16	65 and over
External body of multiple free wheel		72 (or HRC 35) and over
Teeth of hub cog		70 and over
Pawl		75 to 82
Ball race part of internal body and screw cap		65 and over

7. Construction

7.1 Free Wheel

The construction of free wheels shall be as follows :

- The joint between the respective parts shall be secure.
- The screw cap shall have such a construction that it does not easily loosen or tighten during its use.
- Rotation shall be smooth without abnormal sound.
- The axial runout and radial runout shall be specified in Tables 6 and 7. For multiple free wheels, those runouts shall be measured at a position close to the tooth bottom by means of fixing the free wheel to a holder as shown in Fig 1.

Table 6. Runout of Single Free Wheel

Unit : mm

Division	When internal body is fixed and ratchet chain ring is rotated	When ratchet chain ring is stopped and internal body is rotated	Sum of both values measured
Axial runout of tooth bottom	0.3 max.	0.3 max.	0.5 max.
Radial runout of tooth bottom	0.3 max.	0.3 max.	0.5 max.

Table 7. Runout of Multiple Free Wheel

Unit : mm

Division	Number of teeth	When internal body is fixed and ratchet chain ring is rotated	When ratchet chain ring is stopped and internal body is rotated	Sum of both values measured
Axial runout of tooth bottom	11 to 17	0.3 max.	0.3 max.	0.5 max.
	18 to 26	0.4 max.	0.4 max.	0.7 max.
	27 min.	0.5 max.	0.5 max.	0.8 max.
Radial runout of tooth bottom		0.5 max.	0.5 max.	0.8 max.

- e) When the internal body is fixed as shown in Fig. 1 and the ratchet chain ring or sprocket is moved by applying a force to its tooth tip in the axial direction, the measured backlash shall be within 0.3 mm. The measuring position shall be the side surface of the tooth bottom part for single free wheels, and on a 30 mm or more radius of the largest sprocket for multiple free wheels.

Unit : mm

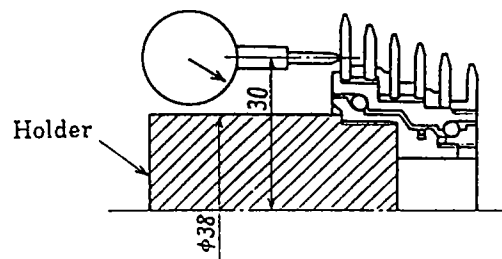


Fig 1

- f) When the internal body is fixed and the ratchet chain ring or external body is made to run idle for 50000 turns at a speed of 250 r.p.m., there shall not be produced a glossy surface with an area of 25% or more of the ball diameter, an indentation, or other defects at the ball race part.