**Apparatus & Procedures（实验与采集装置）**

As shown in **Figure 1** above, the test stand consists of a 2 hp motor (left), a torque transducer/encoder (center), a dynamometer (right), and control electronics (not shown). The test bearings support the motor shaft. Single point faults were introduced to the test bearings using electro-discharge machining with fault diameters of 7 mils, 14 mils, 21 mils, 28 mils, and 40 mils (1 mil=0.001 inches). See [**FAULT SPECIFICATIONS**](http://www.eecs.case.edu/laboratory/bearing/fault_specs.htm)for fault depths. SKF bearings were used for the 7, 14 and 21 mils diameter faults, and NTN equivalent bearings were used for the 28 mil and 40 mil faults. Drive end and fan end bearing specifications, including bearing geometry and defect frequencies are listed in the [**BEARING SPECIFICATIONS**](http://www.eecs.case.edu/laboratory/bearing/bearing_specs.htm).

（如图所示，实验平台包括一个2马力的电机（左侧）（1hp=746W），一个转矩传感器（中间），一个功率计（右侧）和电子控制设备（没有显示）。被测试轴承支承电机轴。使用电火花加工技术在轴承上布置了单点故障，故障直径分别为0.007、0.014、0.021、0.028、0.040英寸（1英寸=2.54厘米）。其中前三种故障直径的轴承使用的是SKF轴承，后两种故障直径的轴承使用的是与之等效的NTN轴承。

Vibration data was collected using accelerometers, which were attached to the housing with magnetic bases. Accelerometers were placed at the 12 o?clock position at both the drive end and fan end of the motor housing. During some experiments, an accelerometer was attached to the motor supporting base plate as well. Vibration signals were collected using a 16 channel DAT recorder, and were post processed in a Matlab environment. All data files are in Matlab (\*.mat) format. Digital data was collected at 12,000 samples per second, and data was also collected at 48,000 samples per second for drive end bearing faults. Speed and horsepower data were collected using the torque transducer/encoder and were recorded by hand.

（实验中使用加速度传感器采集振动信号，通过使用磁性底座将传感器安放在电机壳体上。加速度传感器分别安装在电机壳体的驱动端和风扇端12点钟的位置。在有些实验中，传感器也被安放在电机支承底盘上。振动信号是通过16通道的DAT记录器采集的，并且后期在MATLAB环境中处理。数字信号的采样频率为12000S/s，驱动端轴承故障数据同时也以48000S/s的采样速率采集。

Outer raceway faults are stationary faults, therefore placement of the fault relative to the load zone of the bearing has a direct impact on the vibration response of the motor/bearing system. In order to quantify this effect, experiments were conducted for both fan and drive end bearings with outer raceway faults located at 3 o?clock (directly in the load zone), at 6 o?clock (orthogonal to the load zone), and at 12 o?clock

（外圈的故障是固定不变的，因此故障相对于轴承受载区域的位置对电机/轴承系统的振动响应有直接的影响。为了对这个影响进行定量研究，实验中分别对驱动和风扇端的轴承外圈布置3点钟、6点钟、12点钟方向的故障。

Digital data was collected at 12,000 samples per second, and data was also collected at 48,000 samples per second for drive end bearing faults. 数字信号已每秒12000个点来采集，驱动端轴承故障的数据同时也以48000个点每秒来采集）Speed and horsepower data were collected using the torque transducer/encoder and were recorded by hand.

|  |
| --- |
| **Download A Data File**  Data was collected for normal bearings, single-point drive end and fan end defects.  Data was collected at 12,000 samples/second and at 48,000 samples/second for drive end bearing experiments.  All fan end bearing data was collected at 12,000 samples/second.  Data files are in **Matlab** format.  Each file contains fan and drive end vibration data as well as motor rotational speed.  For all files, the following item in the variable name indicates:  DE - drive end accelerometer data FE - fan end accelerometer data BA - base accelerometer data time - time series data RPM- rpm during testing  Click on a link below to continue:  [Normal Baseline Data](http://www.eecs.case.edu/laboratory/bearing/download_normal.htm)  [12k Drive End Bearing Fault Data](http://www.eecs.case.edu/laboratory/bearing/download_12k.htm)  [48k Drive End Bearing Fault Data](http://www.eecs.case.edu/laboratory/bearing/download_48k.htm)  [Fan-End Bearing Fault Data](http://www.eecs.case.edu/laboratory/bearing/download_fan.htm) |

[**Download**](http://www.eecs.case.edu/laboratory/bearing/download.htm)**: Normal Baseline Data**

|  |  |  |
| --- | --- | --- |
| **Motor Load (HP)** | **Approx. Motor Speed (rpm)** | **Normal Baseline Data** |
| 0 | 1797 | [97](http://www.eecs.case.edu/laboratory/bearing/DataFiles/97.mat) |
| 1 | 1772 | [98](http://www.eecs.case.edu/laboratory/bearing/DataFiles/98.mat) |
| 2 | 1750 | [99](http://www.eecs.case.edu/laboratory/bearing/DataFiles/99.mat) |
| 3 | 1730 | [100](http://www.eecs.case.edu/laboratory/bearing/DataFiles/100.mat) |

**[Download](http://www.eecs.case.edu/laboratory/bearing/download.htm): 12k Drive End Bearing Fault Data**

\* = Data not available

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Fault Diameter故障直径** | **Motor Load负载 (HP)** | **Approx. Motor Speed电机转速 (rpm)** | **Inner Race** | **Ball** | **Outer Race  Position Relative to Load Zone (Load Zone Centered at 6:00)** | | |
|  |  |  |  |  | **Centered @6:00** | **Orthogonal @3:00** | **Opposite @12:00** |
| 0.007" | 0 | 1797 | [105](http://www.eecs.case.edu/laboratory/bearing/DataFiles/105.mat) | [118](http://www.eecs.case.edu/laboratory/bearing/DataFiles/118.mat) | [130](http://www.eecs.case.edu/laboratory/bearing/DataFiles/130.mat) | [144](http://www.eecs.case.edu/laboratory/bearing/DataFiles/144.mat) | [156](http://www.eecs.case.edu/laboratory/bearing/DataFiles/156.mat) |
|  | 1 | 1772 | [106](http://www.eecs.case.edu/laboratory/bearing/DataFiles/106.mat) | [119](http://www.eecs.case.edu/laboratory/bearing/DataFiles/119.mat) | [131](http://www.eecs.case.edu/laboratory/bearing/DataFiles/131.mat) | [145](http://www.eecs.case.edu/laboratory/bearing/DataFiles/145.mat) | [158](http://www.eecs.case.edu/laboratory/bearing/DataFiles/158.mat) |
|  | 2 | 1750 | [107](http://www.eecs.case.edu/laboratory/bearing/DataFiles/107.mat) | [120](http://www.eecs.case.edu/laboratory/bearing/DataFiles/120.mat) | [132](http://www.eecs.case.edu/laboratory/bearing/DataFiles/132.mat) | [146](http://www.eecs.case.edu/laboratory/bearing/DataFiles/146.mat) | [159](http://www.eecs.case.edu/laboratory/bearing/DataFiles/159.mat) |
|  | 3 | 1730 | [108](http://www.eecs.case.edu/laboratory/bearing/DataFiles/108.mat) | [121](http://www.eecs.case.edu/laboratory/bearing/DataFiles/121.mat) | 133 | [147](http://www.eecs.case.edu/laboratory/bearing/DataFiles/147.mat) | [160](http://www.eecs.case.edu/laboratory/bearing/DataFiles/160.mat) |
| 0.014" | 0 | 1797 | [169](http://www.eecs.case.edu/laboratory/bearing/DataFiles/169.mat) | [185](http://www.eecs.case.edu/laboratory/bearing/DataFiles/185.mat) | [197](http://www.eecs.case.edu/laboratory/bearing/DataFiles/197.mat) | \* | \* |
|  | 1 | 1772 | [170](http://www.eecs.case.edu/laboratory/bearing/DataFiles/170.mat) | [186](http://www.eecs.case.edu/laboratory/bearing/DataFiles/186.mat) | [198](http://www.eecs.case.edu/laboratory/bearing/DataFiles/198.mat) | \* | \* |
|  | 2 | 1750 | [171](http://www.eecs.case.edu/laboratory/bearing/DataFiles/171.mat) | [187](http://www.eecs.case.edu/laboratory/bearing/DataFiles/187.mat) | [199](http://www.eecs.case.edu/laboratory/bearing/DataFiles/199.mat) | \* | \* |
|  | 3 | 1730 | [172](http://www.eecs.case.edu/laboratory/bearing/DataFiles/172.mat) | [188](http://www.eecs.case.edu/laboratory/bearing/DataFiles/188.mat) | [200](http://www.eecs.case.edu/laboratory/bearing/DataFiles/200.mat) | \* | \* |
| 0.021" | 0 | 1797 | [209](http://www.eecs.case.edu/laboratory/bearing/DataFiles/209.mat) | [222](http://www.eecs.case.edu/laboratory/bearing/DataFiles/222.mat) | [234](http://www.eecs.case.edu/laboratory/bearing/DataFiles/234.mat) | [246](http://www.eecs.case.edu/laboratory/bearing/DataFiles/246.mat) | [258](http://www.eecs.case.edu/laboratory/bearing/DataFiles/258.mat) |
|  | 1 | 1772 | [210](http://www.eecs.case.edu/laboratory/bearing/DataFiles/210.mat) | [223](http://www.eecs.case.edu/laboratory/bearing/DataFiles/223.mat) | [235](http://www.eecs.case.edu/laboratory/bearing/DataFiles/235.mat) | [247](http://www.eecs.case.edu/laboratory/bearing/DataFiles/247.mat) | [259](http://www.eecs.case.edu/laboratory/bearing/DataFiles/259.mat) |
|  | 2 | 1750 | [211](http://www.eecs.case.edu/laboratory/bearing/DataFiles/211.mat) | [224](http://www.eecs.case.edu/laboratory/bearing/DataFiles/224.mat) | [236](http://www.eecs.case.edu/laboratory/bearing/DataFiles/236.mat) | [248](http://www.eecs.case.edu/laboratory/bearing/DataFiles/248.mat) | [260](http://www.eecs.case.edu/laboratory/bearing/DataFiles/260.mat) |
|  | 3 | 1730 | [212](http://www.eecs.case.edu/laboratory/bearing/DataFiles/212.mat) | [225](http://www.eecs.case.edu/laboratory/bearing/DataFiles/225.mat) | [237](http://www.eecs.case.edu/laboratory/bearing/DataFiles/237.mat) | [249](http://www.eecs.case.edu/laboratory/bearing/DataFiles/249.mat) | [261](http://www.eecs.case.edu/laboratory/bearing/DataFiles/261.mat) |
| 0.028" | 0 | 1797 | 3001 | [3005](http://www.eecs.case.edu/laboratory/bearing/DataFiles/3005.mat) | \* | \* | \* |
|  | 1 | 1772 | [3002](http://www.eecs.case.edu/laboratory/bearing/DataFiles/3002.mat) | [3006](http://www.eecs.case.edu/laboratory/bearing/DataFiles/3006.mat) | \* | \* | \* |
|  | 2 | 1750 | [3003](http://www.eecs.case.edu/laboratory/bearing/DataFiles/3003.mat) | [3007](http://www.eecs.case.edu/laboratory/bearing/DataFiles/3007.mat) | \* | \* | \* |
|  | 3 | 1730 | [3004](http://www.eecs.case.edu/laboratory/bearing/DataFiles/3004.mat) | [3008](http://www.eecs.case.edu/laboratory/bearing/DataFiles/3008.mat) | \* | \* | \* |

[**Download**](http://www.eecs.case.edu/laboratory/bearing/download.htm)**: 48k Drive End Bearing Fault Data**

\* = Data not available

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Fault Diameter** | **Motor Load (HP)** | **Approx. Motor Speed (rpm)** | **Inner Race** | **Ball** | **Outer Race  Position Relative to Load Zone (Load Zone Centered at 6:00)** | | |
|  |  |  |  |  | **Centered @6:00** | **Orthogonal @3:00** | **Opposite @12:00** |
| 0.007" | 0 | 1797 | [109](http://www.eecs.case.edu/laboratory/bearing/DataFiles/109.mat) | [122](http://www.eecs.case.edu/laboratory/bearing/DataFiles/122.mat) | [135](http://www.eecs.case.edu/laboratory/bearing/DataFiles/135.mat) | [148](http://www.eecs.case.edu/laboratory/bearing/DataFiles/148.mat) | [161](http://www.eecs.case.edu/laboratory/bearing/DataFiles/161.mat) |
|  | 1 | 1772 | [110](http://www.eecs.case.edu/laboratory/bearing/DataFiles/110.mat) | [123](http://www.eecs.case.edu/laboratory/bearing/DataFiles/123.mat) | [136](http://www.eecs.case.edu/laboratory/bearing/DataFiles/136.mat) | [149](http://www.eecs.case.edu/laboratory/bearing/DataFiles/149.mat) | [162](http://www.eecs.case.edu/laboratory/bearing/DataFiles/162.mat) |
|  | 2 | 1750 | [111](http://www.eecs.case.edu/laboratory/bearing/DataFiles/111.mat) | [124](http://www.eecs.case.edu/laboratory/bearing/DataFiles/124.mat) | [137](http://www.eecs.case.edu/laboratory/bearing/DataFiles/137.mat) | [150](http://www.eecs.case.edu/laboratory/bearing/DataFiles/150.mat) | [163](http://www.eecs.case.edu/laboratory/bearing/DataFiles/163.mat) |
|  | 3 | 1730 | [112](http://www.eecs.case.edu/laboratory/bearing/DataFiles/112.mat) | [125](http://www.eecs.case.edu/laboratory/bearing/DataFiles/125.mat) | [138](http://www.eecs.case.edu/laboratory/bearing/DataFiles/138.mat) | [151](http://www.eecs.case.edu/laboratory/bearing/DataFiles/151.mat) | [164](http://www.eecs.case.edu/laboratory/bearing/DataFiles/164.mat) |
| 0.014" | 0 | 1797 | [174](http://www.eecs.case.edu/laboratory/bearing/DataFiles/174.mat) | [189](http://www.eecs.case.edu/laboratory/bearing/DataFiles/189.mat) | [201](http://www.eecs.case.edu/laboratory/bearing/DataFiles/201.mat) | \* | \* |
|  | 1 | 1772 | [175](http://www.eecs.case.edu/laboratory/bearing/DataFiles/175.mat) | [190](http://www.eecs.case.edu/laboratory/bearing/DataFiles/190.mat) | [202](http://www.eecs.case.edu/laboratory/bearing/DataFiles/202.mat) | \* | \* |
|  | 2 | 1750 | [176](http://www.eecs.case.edu/laboratory/bearing/DataFiles/176.mat) | [191](http://www.eecs.case.edu/laboratory/bearing/DataFiles/191.mat) | [203](http://www.eecs.case.edu/laboratory/bearing/DataFiles/203.mat) | \* | \* |
|  | 3 | 1730 | [177](http://www.eecs.case.edu/laboratory/bearing/DataFiles/177.mat) | [192](http://www.eecs.case.edu/laboratory/bearing/DataFiles/192.mat) | [204](http://www.eecs.case.edu/laboratory/bearing/DataFiles/204.mat) | \* | \* |
| 0.021" | 0 | 1797 | [213](http://www.eecs.case.edu/laboratory/bearing/DataFiles/213.mat) | [226](http://www.eecs.case.edu/laboratory/bearing/DataFiles/226.mat) | [238](http://www.eecs.case.edu/laboratory/bearing/DataFiles/238.mat) | [250](http://www.eecs.case.edu/laboratory/bearing/DataFiles/250.mat) | [262](http://www.eecs.case.edu/laboratory/bearing/DataFiles/262.mat) |
|  | 1 | 1772 | [214](http://www.eecs.case.edu/laboratory/bearing/DataFiles/214.mat) | [227](http://www.eecs.case.edu/laboratory/bearing/DataFiles/227.mat) | [239](http://www.eecs.case.edu/laboratory/bearing/DataFiles/239.mat) | [251](http://www.eecs.case.edu/laboratory/bearing/DataFiles/251.mat) | [263](http://www.eecs.case.edu/laboratory/bearing/DataFiles/263.mat) |
|  | 2 | 1750 | [215](http://www.eecs.case.edu/laboratory/bearing/DataFiles/215.mat) | [228](http://www.eecs.case.edu/laboratory/bearing/DataFiles/228.mat) | [240](http://www.eecs.case.edu/laboratory/bearing/DataFiles/240.mat) | [252](http://www.eecs.case.edu/laboratory/bearing/DataFiles/252.mat) | [264](http://www.eecs.case.edu/laboratory/bearing/DataFiles/264.mat) |
|  | 3 | 1730 | 217 | [229](http://www.eecs.case.edu/laboratory/bearing/DataFiles/229.mat) | [241](http://www.eecs.case.edu/laboratory/bearing/DataFiles/241.mat) | [253](http://www.eecs.case.edu/laboratory/bearing/DataFiles/253.mat) | [265](http://www.eecs.case.edu/laboratory/bearing/DataFiles/265.mat) |

[**Download**](http://www.eecs.case.edu/laboratory/bearing/download.htm)**: 12k Fan End Bearing Fault Data**

\* = Data not available

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Fault Diameter** | **Motor Load (HP)** | **Approx. Motor Speed (rpm)** | **Inner Race** | **Ball** | **Outer Race  Position Relative to Load Zone (Load Zone Centered at 6:00)** | | |
|  |  |  |  |  | **Centered @6:00** | **Orthogonal @3:00** | **Opposite @12:00** |
| 0.007" | 0 | 1797 | [278](http://www.eecs.case.edu/laboratory/bearing/DataFiles/278.mat) | [282](http://www.eecs.case.edu/laboratory/bearing/DataFiles/282.mat) | [294](http://www.eecs.case.edu/laboratory/bearing/DataFiles/294.mat) | [298](http://www.eecs.case.edu/laboratory/bearing/DataFiles/298.mat) | [302](http://www.eecs.case.edu/laboratory/bearing/DataFiles/302.mat) |
|  | 1 | 1772 | 279 | [283](http://www.eecs.case.edu/laboratory/bearing/DataFiles/283.mat) | [295](http://www.eecs.case.edu/laboratory/bearing/DataFiles/295.mat) | [299](http://www.eecs.case.edu/laboratory/bearing/DataFiles/299.mat) | [305](http://www.eecs.case.edu/laboratory/bearing/DataFiles/305.mat) |
|  | 2 | 1750 | [280](http://www.eecs.case.edu/laboratory/bearing/DataFiles/280.mat) | [284](http://www.eecs.case.edu/laboratory/bearing/DataFiles/284.mat) | [296](http://www.eecs.case.edu/laboratory/bearing/DataFiles/296.mat) | [300](http://www.eecs.case.edu/laboratory/bearing/DataFiles/300.mat) | [306](http://www.eecs.case.edu/laboratory/bearing/DataFiles/306.mat) |
|  | 3 | 1730 | [281](http://www.eecs.case.edu/laboratory/bearing/DataFiles/281.mat) | [285](http://www.eecs.case.edu/laboratory/bearing/DataFiles/285.mat) | [297](http://www.eecs.case.edu/laboratory/bearing/DataFiles/297.mat) | [301](http://www.eecs.case.edu/laboratory/bearing/DataFiles/301.mat) | [307](http://www.eecs.case.edu/laboratory/bearing/DataFiles/307.mat) |
| 0.014" | 0 | 1797 | [274](http://www.eecs.case.edu/laboratory/bearing/DataFiles/274.mat) | [286](http://www.eecs.case.edu/laboratory/bearing/DataFiles/286.mat) | [313](http://www.eecs.case.edu/laboratory/bearing/DataFiles/313.mat) | [310](http://www.eecs.case.edu/laboratory/bearing/DataFiles/310.mat) | \* |
|  | 1 | 1772 | [275](http://www.eecs.case.edu/laboratory/bearing/DataFiles/275.mat) | [无](http://www.eecs.case.edu/laboratory/Final%20CWRU%20Website/287.mat) | \* | [309](http://www.eecs.case.edu/laboratory/bearing/DataFiles/309.mat) | \* |
|  | 2 | 1750 | 无 | [288](http://www.eecs.case.edu/laboratory/bearing/DataFiles/288.mat) | \* | [311](http://www.eecs.case.edu/laboratory/bearing/DataFiles/311.mat) | \* |
|  | 3 | 1730 | [277](http://www.eecs.case.edu/laboratory/bearing/DataFiles/277.mat) | [289](http://www.eecs.case.edu/laboratory/bearing/DataFiles/289.mat) | \* | [312](http://www.eecs.case.edu/laboratory/bearing/DataFiles/312.mat) | \* |
| 0.021" | 0 | 1797 | [270](http://www.eecs.case.edu/laboratory/bearing/DataFiles/270.mat) | [290](http://www.eecs.case.edu/laboratory/bearing/DataFiles/290.mat) | [315](http://www.eecs.case.edu/laboratory/bearing/DataFiles/315.mat) | \* | \* |
|  | 1 | 1772 | [271](http://www.eecs.case.edu/laboratory/bearing/DataFiles/271.mat) | [291](http://www.eecs.case.edu/laboratory/bearing/DataFiles/291.mat) | \* | [316](http://www.eecs.case.edu/laboratory/bearing/DataFiles/316.mat) | \* |
|  | 2 | 1750 | [272](http://www.eecs.case.edu/laboratory/bearing/DataFiles/272.mat) | [292](http://www.eecs.case.edu/laboratory/bearing/DataFiles/292.mat) | \* | [317](http://www.eecs.case.edu/laboratory/bearing/DataFiles/317.mat) | \* |
|  | 3 | 1730 | [273](http://www.eecs.case.edu/laboratory/bearing/DataFiles/273.mat) | [293](http://www.eecs.case.edu/laboratory/bearing/DataFiles/293.mat) | \* | 318 | \* |

（**Fault Specifications故障规格** (All dimension尺寸 in inches)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Bearing** | **Fault Location** | **Diameter** | **Depth** | **Bearing Manufacturer** |
| Drive End | Inner Raceway | .007 | .011 | SKF |
| Drive End | Inner Raceway | .014 | .011 | SKF |
| Drive End | Inner Raceway | .021 | .011 | SKF |
| Drive End | Inner Raceway | .028 | .050 | NTN |
| Drive End | Outer Raceway | .007 | .011 | SKF |
| Drive End | Outer Raceway | .014 | .011 | SKF |
| Drive End | Outer Raceway | .021 | .011 | SKF |
| Drive End | Outer Raceway | .040 | .050 | NTN |
| Drive End | Ball | .007 | .011 | SKF |
| Drive End | Ball | .014 | .011 | SKF |
| Drive End | Ball | .021 | .011 | SKF |
| Drive End | Ball | .028 | .150 | NTN |
| Fan End | Inner Raceway | .007 | .011 | SKF |
| Fan End | Inner Raceway | .014 | .011 | SKF |
| Fan End | Inner Raceway | .021 | .011 | SKF |
| Fan End | Outer Raceway | .007 | .011 | SKF |
| Fan End | Outer Raceway | .014 | .011 | SKF |
| Fan End | Outer Raceway | .021 | .011 | SKF |
| Fan End | Ball | .007 | .011 | SKF |
| Fan End | Ball | .014 | .011 | SKF |
| Fan End | Ball | .021 | .011 | SKF |

**Bearing information轴承信息**

**Drive end bearing驱动端轴承**: 6205-2RS JEM SKF, deep groove ball bearing深沟球轴承

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Size尺寸**: (inch)   |  |  |  |  |  | | --- | --- | --- | --- | --- | | **Inside Diameter** | **Outside Diameter** | **Thickness** | **Ball Diameter** | **Pitch节距 Diameter** | | 0.9843 | 2.0472 | 0.5906 | 0.3126 | 1.537 | |
| **Defect frequencies故障频率**: (multiple of running speed **in Hz 转速的倍数**)   |  |  |  |  | | --- | --- | --- | --- | | **Inner Ring内圈** | **Outer Ring外圈** | **Cage Train保持架组** | **Rolling Element** | | 5.4152 | 3.5848 | 0.39828 | 4.7135 | |

**Fan end bearing风扇端轴承**: 6203-2RS JEM SKF, deep groove ball bearing

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Size尺寸**: (inches)   |  |  |  |  |  | | --- | --- | --- | --- | --- | | **Inside Diameter** | **Outside Diameter** | **Thickness** | **Ball Diameter** | **Pitch Diameter** | | 0.6693 | 1.5748 | 0.4724 | 0.2656 | 1.122 | |
| **Defect frequencies**: (multiple of running speed **in Hz**)   |  |  |  |  | | --- | --- | --- | --- | | **Inner Ring** | **Outer Ring** | **Cage Train** | **Rolling Element** | | 4.9469 | 3.0530 | 0.3817 | 3.9874 | |

数据链接：

http://csegroups.case.edu/bearingdatacenter/pages/apparatus-procedures