

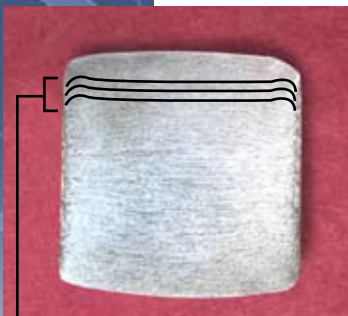
New Bearing Roller Patent Technology



Traditional cold formed part with a flash band imperfection.



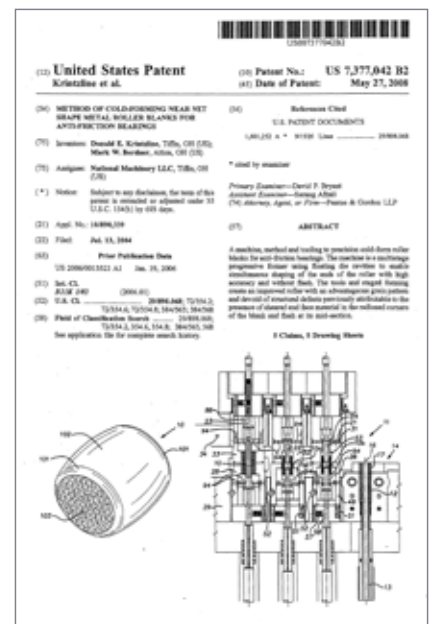
National's patented method, flashless part.



Improved continuous metal grain structure.

Traditionally cold formed rollers are formed in a single die process in which a 'body sized' wire is cut off and the material is forced to flow into the radii of the tool and die cavities. This results in the placement of cutoff imperfections onto the critical end radii. With this method, in order to generate the force needed to fill the corners, the material is allowed to spill out between the tool and die. This method then creates a flash band (aka equator), and it is common the radii will not fill uniformly. Extensive grinding is then needed to remove these imperfections. Typically, grinding operations may involve several steps before achieving a desired precise shape and finish. These secondary operations are necessary because of the characteristics and limitations of the traditional roller bearing forming methods and tooling used. Grinding processes are expensive and add significantly to the cost of the finished roller.

NATIONAL'S PATENTED METHOD FOR COLD FORMING NEAR NET SHAPE METAL ROLLER BLANKS FOR ANTI-FRICTION BEARINGS actually makes the bearing stronger than if it were created by the traditional method of forming. The patented process greatly reduces machining or grinding costs and results in an improved metal grain structure. The enhanced cold-formed part is produced from tooling that accurately forms the part without flash, and with a continuous grain structure that follows the contours of the end radii, thereby avoiding irregularities in the finished machined product. The improved grain structure prevents premature bearing failure and extends service life of the roller. This process requires a specialized progressive Formax Plus machine. These special 'roller machine' enhancements can be incorporated on any size of new Formax Plus machine. Because of National's patented roller bearing forming process, you will achieve stronger, higher quality rollers while reducing expensive secondary procedures.



Contact a National Machinery representative at these locations:

- | | |
|--|------------------|
| North America (NMLLC) - Tiffin, Ohio U.S.A. | 419-443-4800 |
| Americas: customersupport@nationalmachinery.com | |
| Europe (NME) - Nürnberg, Germany | 49-911-5198-250 |
| Europe: service@nationalmachinery.de | |
| Asia (NMA) - Nagoya, Japan | 81-568-89-0571 |
| Asia: mail@nma-a.com | |
| (NMGU) - Suzhou, China | 82-512-6616-1698 |
| support@nationalmachinery.cn | |



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National Machinery LLC World Headquarters

Tiffin, Ohio USA • Phone (+1) 419-447-5211 • FAX (+1) 419-447-5299 • www.nationalmachinery.com

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