

# **Analysis on the Causes of Broken Rolls in Finishing Roller Rings of High-speed Wire Rod Mills**

**Keyword:**

TC ring material; Roll ring with roller; Roll gap; Guide; TC ring cooling water

**Description:**

Tungsten carbide tungsten carbide roll rings have good thermal conductivity, less hardness drop at high temperature, good thermal fatigue resistance, and wear resistance. It has the characteristics of high strength and high strength, so it is widely used in the finishing mill of high-speed wire rod mill.

**Related Product:** [Tungsten carbide roll rings](#)

<https://lmmrolls.com/cemented-carbide-rolls/>

The high-speed wire rod rolling mill ensures the cross-section accuracy of the product with its precise pass design, reasonable tension and looper control, non-twisting high-speed continuous rolling method, sufficient rolling mill rigidity and wear-resistant tungsten carbide roll ring with small roll diameter. , Because of its high rolling speed, the production efficiency has been greatly improved compared with ordinary rolling mills, and finally the production cost has been greatly reduced.

Tungsten carbide-based tungsten carbide roll rings are generally used in the finishing rolling of high-speed wire rod mills. Tungsten carbide tungsten carbide roll rings have good thermal conductivity, less hardness drop at high temperature, good thermal fatigue resistance, and wear resistance. It has the characteristics of high strength and high strength, so it is widely used in the finishing mill of high-speed wire rod mill.

## ● **Analysis on the Causes of Broken Rolls in Finishing Roller Rings**

### **1.Improper selection of roll ring materials in finishing rolling**

The current high-speed wire rod finishing mill is generally composed of 8 to 10 rolling mills. The rolling force and impact force of each rolling mill are different, and with the increase of rolling passes, the rotation speed of the roll ring will also be greatly increased, and the wear of the roll ring will also increase. Therefore, the rolling force, impact force and wear resistance of each stand should be fully considered when selecting the material of the roll ring of each stand. Otherwise, due to improper material selection, it will cause roll collapse in finishing rolling. The occurrence of the phenomenon, and the cause of the roll collapse is not easy to pinpoint. As far as the rolling mills in the finishing rolling are concerned, the front stands are subject to large rolling loads and impact forces due to the large section size and large deformation of the rolling stock. Therefore, the first few stands of the finishing rolling line. The roll ring of the rolling mill should be considered to be made of materials with high strength index and good thermal fatigue resistance, and the wear resistance index should be placed in the second place; while the roll ring of the rear stand is subject to a small rolling load, and the impact force is small. If it is smaller, the wear resistance and thermal fatigue resistance of the roller ring should be given priority.

## **2. Shaking and stacking of rolling stock in finishing rolling**

### 2.1 The roller ring is not well matched with the roller

Morgan Company requires that in addition to the gear transmission ratio between each stand, the finishing mill also requires that the outer diameter error of the roll ring of the same pass should satisfy  $\pm 0.05$  mm, and the roll diameter of any rolling piece stand is not allowed to be smaller than the previous one. One roll diameter, if the roll diameter of the rolled oval piece is larger than that of the previous round hole roll, the rolled piece will shake between the two stands, and eventually the steel will be stacked between the two stands. The heat of the parts is transferred to the roller rings of the two sorties, resulting in an increase in the temperature of the roller rings and a concentration of thermal stress.

### 2.2 The roll gap setting is not good

Since Morgan Company has strict requirements on the matching rolls of the inner roll ring in the finishing rolling, the operator is required to set the roll gap of each frame in the finishing rolling in strict accordance with the roll gap value specified in the process regulations. It can be set to reduce the pile of steel caused by the poor setting of the roll gap between each frame, and reduce the impact force on the roll ring caused by the pile of steel and the concentration of thermal stress caused by the increase in the probability of the roll ring being broken. Production went smoothly.

### 2.3 The size of the finished rolling stock is not good

After the rolling stock exits the pre-finishing mill, due to the bad size, especially the oversized rolling stock, the impact force on the roll ring of the first stand of the finishing mill is often increased, the deformation is increased, and the rolling force is increased. At the same time, it also increases the rolling force of the first few stands of the finishing mill and causes the rolling stock to jitter between the first several mills, and finally increases the probability of the roll ring of the first several mills of the finishing mill.

### **3.The roller ring is subjected to excessive impact due to the misalignment of the guide and guard installation**

The guides of each frame in the finishing rolling should be installed so that the rolling piece can pass through the guides smoothly without impacting the roll ring. Therefore, after each replacement of the inner guides in the finishing rolling, a flashlight and a small mirror should be used to inspect the finishing inside the finishing rolling. The guide guards at the entrance and exit of each frame are checked to ensure that the guide guards of each frame are properly installed. If the guide guards are not installed properly, the rolling stock will cause an impact force on the roll ring each time the steel passes through, and eventually the roll ring will be impacted by the impact. If the force is too large, the roller ring will be broken. Every time the inner guides of the finishing rolling are replaced and the finishing mill is inspected, the alignment of the guide guards at the inlet and outlet of each frame in the finishing rolling should be checked to reduce the damage caused by the guide. The impact force on the roller ring caused by the poor alignment of the guard and the probability of the roller ring breaking the roller.