

The effect of coil dimension, size and material strength on the tension of OD bands is investigated. A model to predict OD bands is developed. In addition, the practice for eye bands is discussed by considering the shipping methods. This study will significantly reduce the incidents in band breakage and increase the efficiency and safety in handling coils.

Mechanical Behavior in Coil Banding

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Introduction

To prevent damage to the product and equipment and to enhance safety in transportation, hot-rolled coils are secured with tension-tied bands on the outer diameter (OD bands) before being removed from the coil car or the coil cradle. They are strapped with eye bands for shipping after having cooled down completely.

In this paper, the effect of coil dimension, and size and material strength on the tension of OD bands is investigated. By introducing the properties of the banding material and a safety factor, a model to predict OD bands is developed. In addition, the practice for eye bands is discussed by considering the shipping methods. This study will significantly reduce the incidents in band breakage and increase the efficiency in coil packaging operations. The conclusions could be used for standardizing the banding practice of coil packaging.

Background

Currently, the standard practice of packaging is ASTM A700-99. For carbon and alloy steel plates in coils, the practice recommends to secure the coils with a minimum of either one OD band and one eye band or with two eye bands. For carbon steel sheets in coils, the practice indicates that individual coils are usually secured with one to four flat steel bands.¹ Clearly, the practice is not adequate in

determining the number of bands for thicker, higher strength hot-rolled coils that are not packaged further.

In most plants, their internal standard practices in banding are established via experience. In addition, some special practices may be required or specified by customers. They are determined upon the type of handling or processing equipment used by the customers.

The breakage of OD bands is often encountered during removal off the line, shipping, as well as unloading, which could result in either loose outer wraps or damage to the product, as shown in Fig. 1 to Fig. 3.

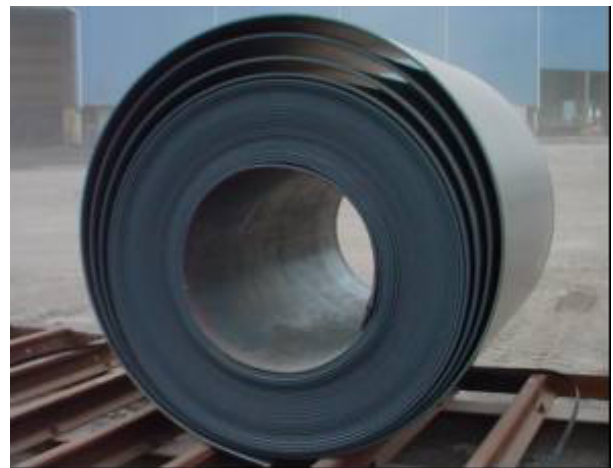


Fig. 1 - OD bands broken during taking-off the line

Figure 2 shows that the eye bands were broken first during deceleration of the railroad car, and that the OD bands were destroyed afterwards.