

INTRODUCTION

Rolls represent one of the most fundamental inputs to mill productivity and quality of the products rolled. A lot of time and attention is given to the roll technology to ensure that the metallurgical characteristics achieve optimal roll performance as measured in terms of wear resistance (tons rolled per millimeter of roll consumed) as well as resistance to damage.

However, mills are dynamic environments that can challenge the strength and durability of any roll irrespective of application, manufacturing type or grade. In other words, no roll is indestructible. It is therefore not uncommon for any mill to experience a service related issue with one roll or multiple rolls within their operation at some point in time. Service issues can be minor events which result in only a small amount of usable roll life lost up to catastrophic events which result in total loss of roll life as well as mill damage and downtime.

It is therefore the aim of this document to increase the readers understanding of the most common types of roll service problems that can arise and how best to prevent occurrences. A thorough understanding of these mechanisms will hopefully aid the roll user in achieving improved overall roll performance, mill efficiency and quality of the rolled product. It is also the hope by establishing a common terminology of roll failure types and mechanisms that better communication between user and manufacturer can be achieved.

The document is organized by service problem type with each being described in terms of the following:

- Type of service problem
- Characteristics
- Examples (photographs, illustrations, etc)
- Mechanism
- Prevention
- Detailed Mechanism – only for specific service problems (provided for some readers who wish to have a more thorough understanding of some of the more complex problems)

This is not considered to be an exhaustive reference to all possible service problem mechanisms, but does provide a thorough review of the most common types. It is our intention to continue to update this document as new service problems arise in conjunction with mill updates and/or roll material developments.

Nondestructive testing (NDT) of rolls is a key factor for both the roll user as well as the roll manufacturer in order to optimize roll performance and prevent the onset of most common types of service problems. It is strongly recommended that each roll is suitably inspected prior to each campaign in order to ensure that it is free of indications that can lead to further unnecessary loss of roll life. Automated eddy current inspection systems are almost universally applied in roll shops throughout the world while automated ultrasonic inspection is being increasingly adopted. While adoption of these systems will have a large impact on the reliability of rolls in service, they are not infallible. We have therefore also included brief section on the most common forms of NDT (both primary and secondary) that are used as well as the capabilities of each to allow a better of understanding and implementation of an effective NDT program.