

CHATTER SUPPRESSION TECHNOLOGY

VI PISTON

(Vibration Inhibiting PISTON)



The Achievers

INDUSTRIAL AUTOMATION SERVICES



VI PISTON - An Overview

The **VI Piston** is designed as a passive device which replaces one or more of the existing roll pistons within the mill, typically the backup roll balance pistons or the main HGC pistons. In both cases it will require the construction of a specially designed piston to replace the existing piston.

Though replacement of the HGC piston may entail greater initial expense, this approach only requires the construction of two pistons for each vibrating stand and provides the greatest performance improvement.

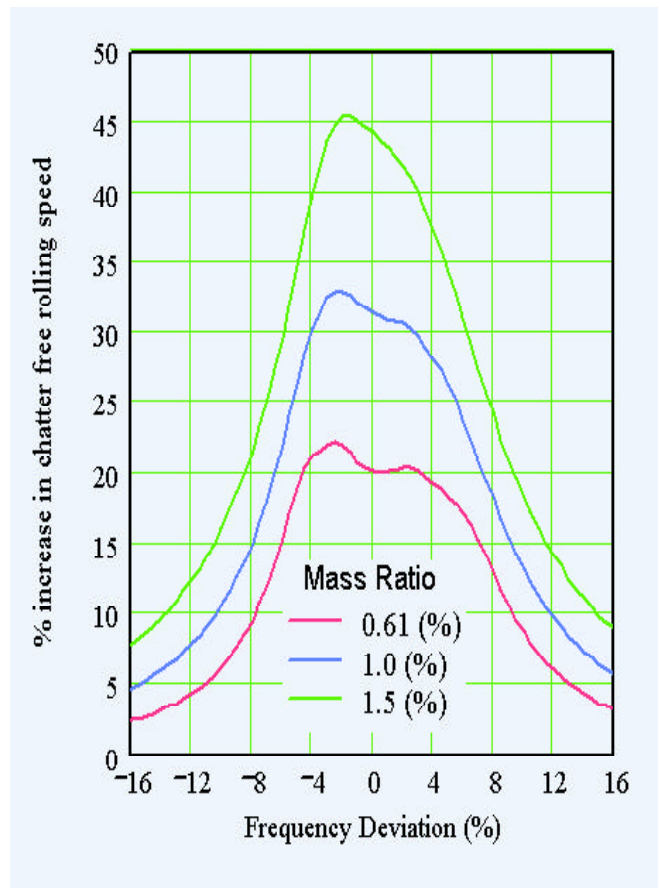
The effectiveness of the **VI Piston** is determined primarily by:

- the mass ratio which can be obtained,
- the range of frequencies over which the chatter occurs and
- the inherent damping which exists within the stand.

The mass ratio, one of the primary performance parameters, is the total mass of the combined **VI Piston** compared to the mass of the vibrating components.

These would include the mass of one work roll, one backup roll and the associated chocks. The typical performance for different mass ratios is provided for in the this diagram.

The mass of the **VI Piston** would be about one third to one half of the mass of the piston it is replacing.





The **VI Piston** is a passive device which does not require any additional hardware or instrumentation. However it would be strongly advised that a Chatter Monitoring system be installed with the device to enable the optimum mill performance to be achieved. Such a device will allow the mill to operate as closely as possible to the chatter speed, and such devices have been reported to produce 10 to 15 per cent increases in mill throughput.

To obtain the optimum performance the Pistons are specifically designed for each site. The design process encompasses measuring the range of chatter levels and frequencies on the mill allowing a benchmark of current mill performance to be obtained.

The calculation of the inherent mill damping and the resonant frequency for the range of products rolled are essential steps in the design process. Measurements required for this analysis require vibration monitoring of the mill and this service can be provided by IAS. The design also entails examining the physical construction of the mill in order to ascertaining the constraints on a suitable piston design.

Industrial Automation Services are able to provide a complete solution for the attenuation of mill chatter including services associated with vibration monitoring and benchmarking and the design, supply, installation and commissioning of **VI Piston**.

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