

HDS - Heat Dissipation System

RHL's Patented Calender Roll Heat Dissipation System

RHL's Heat Dissipation System is a patented system for reducing the internal and surface temperature of conventional 'pressed' calender rolls ('bowls').

Calender rolls fitted with the HDS have been proven to operate with surface and internal temperatures 15% - 30% lower than equivalent rolls without the HDS. This helps to avoid overheating / burning, increases roll life and allows operation at higher line pressures and speeds.

Applications

The following calender roll types can be fitted with the HDS:

Blue Denim • Woollen Paper • Linen Papers • Cop Cotton • Raw Cotton • Superelastic

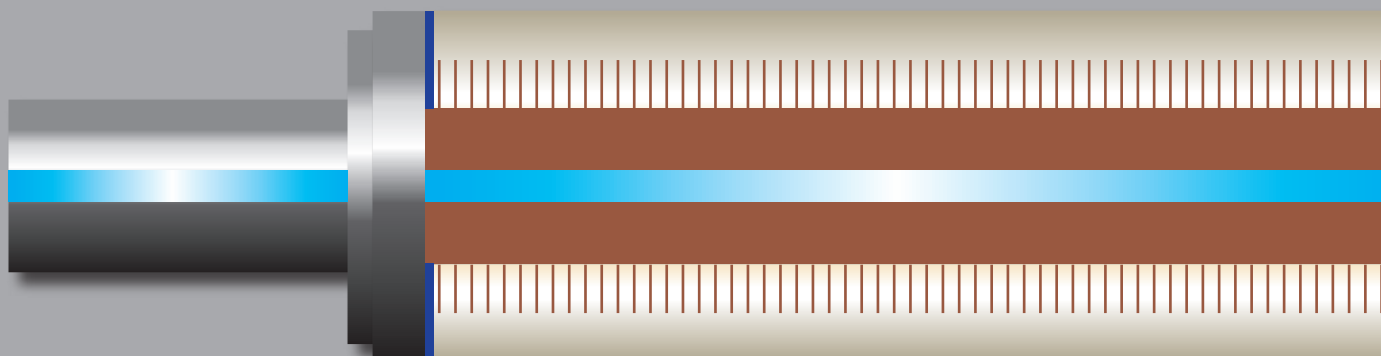
The Heat Dissipation System can be installed on existing calender rolls during re-covering.

The HDS System

The Heat Dissipation System comprises a series of thin copper discs fitted at regular intervals (approx every 12mm) within the cover material of the calender roll.

The copper discs contact the roll shaft which is copper plated for improved heat conductivity. The outside diameter of the discs is set below the minimum usable diameter of the roll and the resilience and calendering performance of the roll is unaffected.

To complete the system, the copper plated roll shaft which acts as a 'heat sink' for the fibre based cover, is bored through to allow the circulation of cooling water thus removing transferred heat from the centre shaft.



Performance

The Heat Dissipation System enables the dissipation of frictional and process heat generated within the internal fibrous structure of the calender roll cover.

In addition, the system has been proven to significantly even out the temperature profile of the roll along its face length.

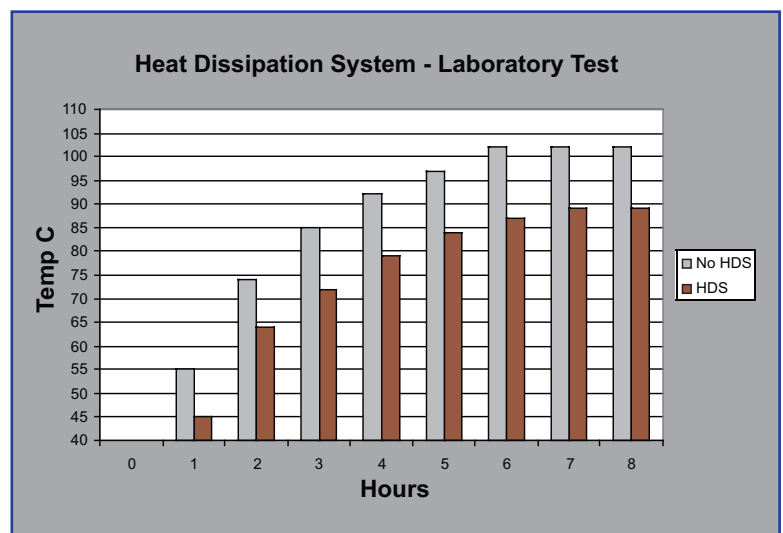
The performance of the HDS is assisted by the excellent conductive performance of copper. The following table shows the thermal conductivity of copper compared to Steel and a typical Cotton cover material.

Co-efficient of Thermal Conductivity of Copper:	378 W/m K
Co-efficient of Thermal Conductivity of Steel:	45 W/m K
Co-efficient of Thermal Conductivity of Cotton Cover:	2 W/m K

The following laboratory test demonstrates the cooling effect the Heat Dissipation System:

Cover Material: 18% Woollen Paper
Roll Size: 300mm face length x 250mm diameter
Copper Disc Diameter: 190mm
25mm bore in steel shaft with water circulation
Linear Pressure: 200kg/cm
Steel Roll Temp: 350°C

Test carried out over 8 hours under controlled conditions with and without HDS



Tests carried out on HDS Bowls in service indicate a decrease in surface and internal temperature of typically 15% and a temperature profile of maximum +/- 1°C.

Benefits

- **Helps to avoid overheating / burning**
- **Increases roll life**
- **Allows increases in speed and / or line pressure**
- **Promotes even temperature profile**
- **Improves uniformity of finish**

Richard Hough Limited
calender roll technology



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