

CUTLER-HAMMER, INC.
BUL. 505-506 A.I.S.E. BRAKE
WHEELS & LININGS

July 10, 1968

N O T I C E

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PLAINTIFF'S
EXHIBIT

78891.00

MATERIAL SPECIFICATIONS

1. WHEELS -

72-46-03 Ductile iron

72,000 Psi Minimum Tensile strength
46,000 Psi Minimum yield strength
3% elongation in 2"

Hardness 192-235 Brinell maximum
(3000 Kg Load)

Heat treatment - normalized and tempered to
required hardness

2. LININGS -

Folded and compressed impregnated asbestos

"Asbestos yarn with soft non-ferrous wire core,
woven into cloth, filled with heat resisting
compound, stacked, and finished with pressure
and heat. Working face is to be ground."

Min. coefficient of friction = .3
Maximum rubbing speed = 7500 FPM
Maximum pressure = 75 Psi

Min. Life - 500,000 foot pounds required to
wear .001 cu. inch, when applied intermittently
at 60 Psi against a steel wheel with face
hardened to Rockwell C40 Min. and operating at
160°C and at 3000 FPM rubbing speed.

The following manufacturer's types have been
found to meet the above specification:

Johns-Manville #600
Raybestos - Manhattan #G1000
Asbestos Mfg. Co. #8266

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WHY DUCTILE IRON?

- 1) Ductile iron combines the excellent frictional characteristics of cast iron with the high strength of steel, while minimizing the undesirable properties of both.
- 2) Ductile iron wheels are not prone to "patch weld" as are steel wheels and can withstand higher temperatures before patch welding will occur. Patch welding is a term used to describe the condition which occurs when a wheel begins to score and particles of wheel material become imbedded in the friction lining. This imbedded material increases scoring - and heating - of the wheel so that finally the instantaneous temperatures become so high that the particles weld together into the lining.
- 3) If a surface crack does develop, ductile iron's molecular structure resists propagation of the crack, in contrast to cast iron and steel, in which, once formed, a crack will continue to enlarge.

WHY FOLDED AND COMPRESSED LININGS?

- 1) This lining material exhibits a constant coefficient of friction over the entire temperature range, and does not "fade" as some other materials do.
- 2) In over 3 years of testing under varying conditions, this material exhibited the best wear characteristics of all the various lining materials available. Other lining materials will provide longer life, but only at the expense of rapid wheel wear.

FIELD-PROVEN COMBINATION

The ductile iron wheels and folded and compressed linings have been proven in over 12 years of steel mill service. Previous designs used cast iron, cast steel and hardened steel, with much less satisfactory performance records.

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