

### Binding Effects in Hematite and Magnetite Concentrates

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#### **Abstract**

An industrial taconite facility, 'Plant F', processed both magnetite and hematite ores during the year. The concentrates were pelletized with a binder, bentonite. Plant personnel believed less bentonite was required to make hematite pellets. Thus, the authors intended to quantify in-plant observations through bench-scale pelletization tests. As-received magnetite and as-received hematite were pelletized and tested for wet-drop number and dry-crush strength. Hematite pellets exceeded industrial minimum wet-drop and dry-crush values of 5 drops and 22 N/pellet without bentonite addition, while magnetite pellets exceeded industrial minimum values at a bentonite dose of 6.6 kg/t (0.66 %). It is known that finer particles increase pellet strength, so additional magnetite was ground to a similar particle size distribution as the as-received hematite. The ground magnetite was pelletized and tested for wet-drop number and dry-crush strength. Wet drop and dry crush values increased after grinding the magnetite concentrate. However, they were significantly less than hematite pellets at similar bentonite doses. Consequently, particle size effects were not the dominant cause for higher strengths in the hematite concentrate.