



**FIGURE 11-8** Pressure losses for iron ore oxides in the range of 30–60  $\mu\text{m}$  (mesh 325-250). (From Lokon et al., 1982. Reprinted with permission of BHRA Group.)

Taconite is a very important source of iron in the United States. It is a form of iron sand found in the Mesabi range of Minnesota, as well as in Manitoba and Ontario, Canada.

The Shilling Mining Review (1981), in an editorial article, reported on the pumping of taconite tailings using 20 in  $\times$  18 in (500 mm  $\times$  450 mm) Warman tailings pumps sized to a pressure of 350 psi. The pumps were installed in six stages.

Taconite tailings are considered coarse sand and must be pumped in a range of speeds of 3.4–4.3 m/s (11–14 ft/s). Rubber-lined pipes are used. HDPE pipes are subject to very fast wear and are not used for tailings disposal. Taconite tailings are typically pumped at a weight concentration of 35%. The use of special flocculants in modern, efficient thickeners allows pumping up to a weight concentration of 45%.

The SAMARCO pipeline in Brazil is one of the longest ever built to transport iron ore oxides and features 500 mm (20 in) and 457 mm (18 in) pipe sections over a distance of 400 km (250 miles). Start-up occurred in 1977 and it is expected to remain in operation for 40 years (Weston, 1985).

Another long pipeline to transport iron ore oxide is the La Perla-Hercules pipeline in Mexico, with an overall length of 382 km (239 miles). The pipeline features one main and one booster pump station with single-acting triplex plunger pumps (Thompson, 1995).