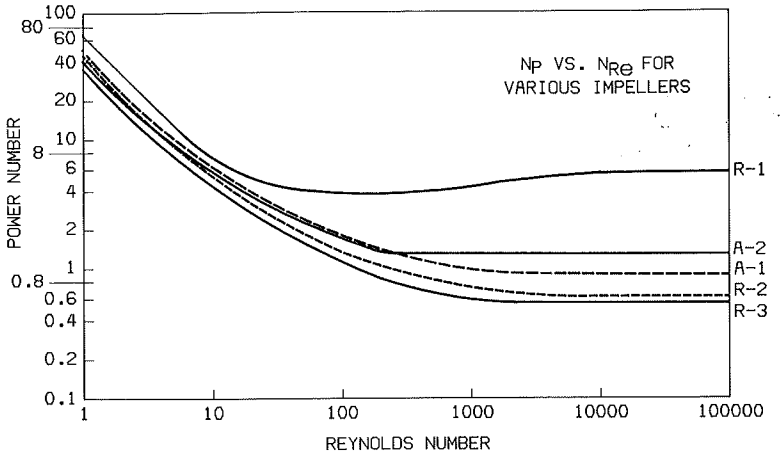

Figure 3-16 N_p versus N_{Re} for open impellers.

area. The impeller was designed to perform as an A-1 impeller but also to overcome many physical disadvantages.

1. The A-3 is lighter in weight than the A-1. The A-1 is of heavy cast construction, and its weight hinders shaft design, especially when large impellers are required.
2. The A-3 is less expensive than the A-1.
3. The A-3 is of frabricated construction and produced with a better surface finish than the cast A-1.
4. The A-3 is easily split into three sections, allowing for small tank openings, and bolted together at the hub. It is also made in a one-piece, all-welded construction for open-tank installations. It is available in the 20- to 120-in.-diameter range (0.51 to 3.05 m) for motor horsepowers from 1 through 500 (0.75 through 375 kW). Typical impeller speeds are from 56 to 125 rpm.

Large flow-directing stabilizer fins improve the pumping capacity of A-3 impellers when fluid viscosity is between 500 and 1500 cP (0.5 and 1.5 Pa · sec). This produces a higher power number in the turbulent regime ($N_p = 0.53$) compared with an A-3 without stabilizing fins, as shown in Table 3-1 ($N_p = 0.45$).

A-4 Impeller (Double Spiral)

Designed for very viscous materials, the A-4 impeller is constructed with an inner and outer flight. The inner flight pumps in one direction (downward) while the outer flight pumps in the reverse direction (upward).

The diameter of the inner flight is one-third the impeller diameter. The width of the outer ribbon is $\frac{1}{6}D$. The power number at $N_{Re} = 5$ is 51 (Fig. 3-17) when the