FIGURE 8.37 Checking for physical imperfections in coated tablets. (Courtesy of Smith, Kline & French.)

more uniform and uses less coating material, resulting in tablets that are lighter, smaller, and easier to swallow and less expensive to package and ship.

Irrespective of the method used in coating, all tablets are visually or electronically inspected for physical imperfections (Fig. 8.37).

IMPACT OF MANUFACTURING CHANGES ON SOLID DOSAGE FORMS

The quality and performance of a solid dosage form may be altered by changes in formulation or by changes in the method of manufacture.

The changes in formulation may arise from (*a*) the use of starting raw materials, including both the active ingredient and pharmaceutical excipients, that have different chemical or physical characteristics (e.g., solubility or particle size) than the standards set for the original components; (*b*) the use of different pharmaceutical excipients (e.g., magnesium stearate instead of calcium stearate as the lubricant); (*c*) the use of different quantities of the same excipients in a formulation (e.g., use of a more concentrated wet tablet binder); or (*d*) the addition of a new excipient to a formulation (e.g., a revised tablet-coating formula).

The changes in the method of manufacture may be (*a*) use of processing or manufacturing equipment of a different design; (*b*) a change in the steps or order in the process or method of manufacture (e.g., different mixing times); (*c*) different in-process controls, quality tests, or assay methods; (*d*) production of different batch sizes; (*e*) employment of different product reprocessing procedures; or (*f*) employment of a different manufacturing site.

Changes such as these may be proposed or implemented during the product development stage, during scale-up of product manufacture before NDA approval, or after NDA approval and product marketing. In all instances, it is critical to assess any effects of the change in meeting the proposed or established standards for product quality (e.g., dissolution rate and bioavailability). It is necessary for a manufacturer to document the change, validate its effect, and provide the necessary information to the FDA. Some changes are considered minor (e.g., a change in tablet color) and do not affect product quality; they do not require prior FDA approval. Other changes that may affect product quality and performance (e.g., use of a substantially different quantity or grade of an excipient or use of a piece of manufacturing equipment that changes the methodology of manufacture) require prior FDA approval (21).

OFFICIAL AND COMMERCIALLY AVAILABLE TABLETS

There are hundreds of tablets recognized by the USP and literally thousands of commercially available tablet products from virtually all pharmaceutical manufacturers, in most therapeutic categories and in various dosage strengths. Examples of a limited number of these are presented in Table 8.1.