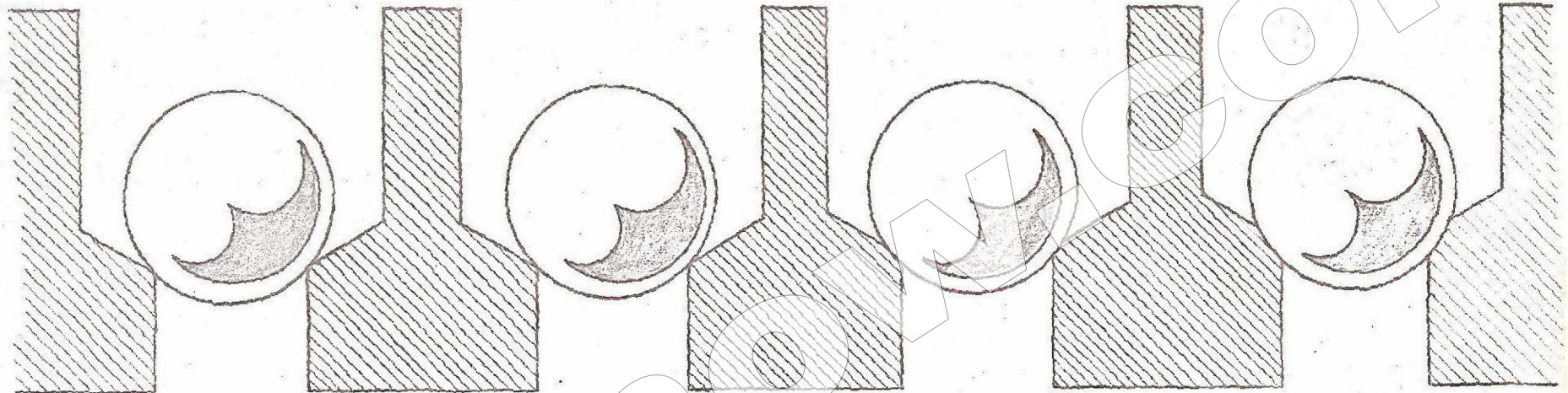


VALVE SEAT INFORMATION FROM ENERPAC

ENERPAC, BUTLER, WISCONSIN 53007 TELEPHONE (414) 781-6000 TELEX 020-692 DIVISION OF APPLIED POWER INDUSTRIES, INC.

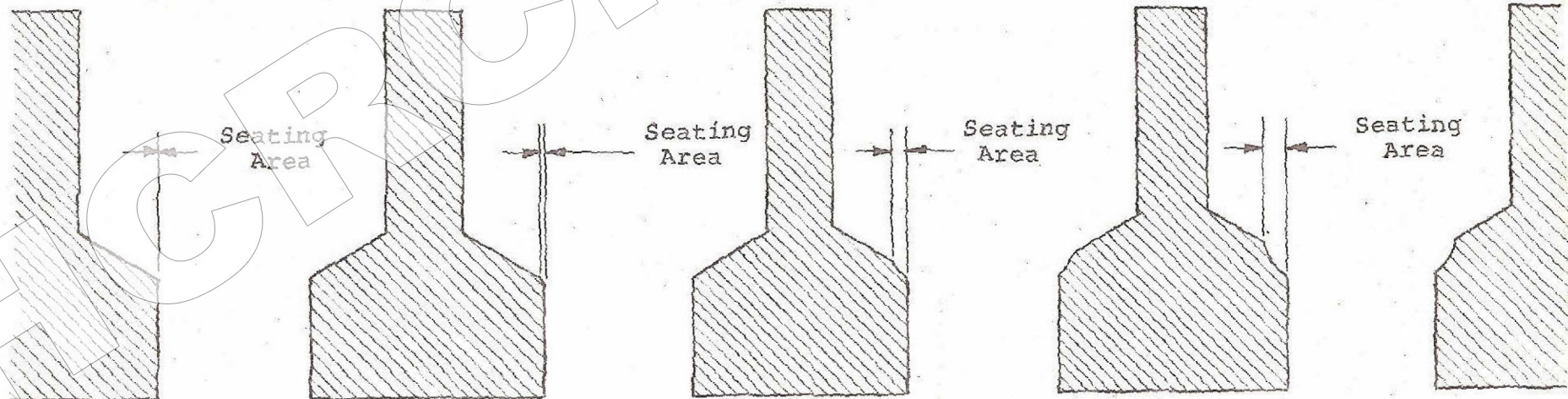


UNSEATED

GOOD SEAT

OVER SEATED

HEAVILY OVERSEATED



Seating Area

Seating Area

Seating Area

Seating Area

UNSEATED

APPEARANCE OF SEATING AREA

1. No chatter marks
2. No heavy swirls
3. No chips or burrs
4. No gouges

GOOD SEAT

APPEARANCE OF SEATING AREA

1. Seating area held to a minimum
2. No chatter marks
3. No heavy swirls
4. No chips or burrs
5. No gouges
6. Very fine shiny area around seating area.

OVERSEATED

APPEARANCE OF SEATING AREA

1. Ruined by heavy seating or re-seating
2. Large seating area visible

HEAVILY OVERSEATED

APPEARANCE OF SEATING AREA

1. Ruined by heavily over-seating or by continuous heavy seating.
2. Extremely large seating are visible

NOTES

When seating a ball in a seat - REMEMBER!!

1. Start with a good ball seat
2. Don't pound ball
3. Tap ball so that a minimum seating area is obtained.
4. Don't let dirt or chips ruin the seat
5. The ball seat should seal around the ball with the sharpest edge possible after tapping.
6. The object of tapping the ball is to decrease any out of roundness at the seating area
7. It doesn't take much to seat a ball
8. Use common sense when using small balls or soft materials
9. Examine the first seating and avoid over-seated conditions.
10. The ball seat is the heart of the pump or valve. A bad seat means a bad pump or valve. Bad seats are erratic and unreliable. Good seats make good pumps and valves.