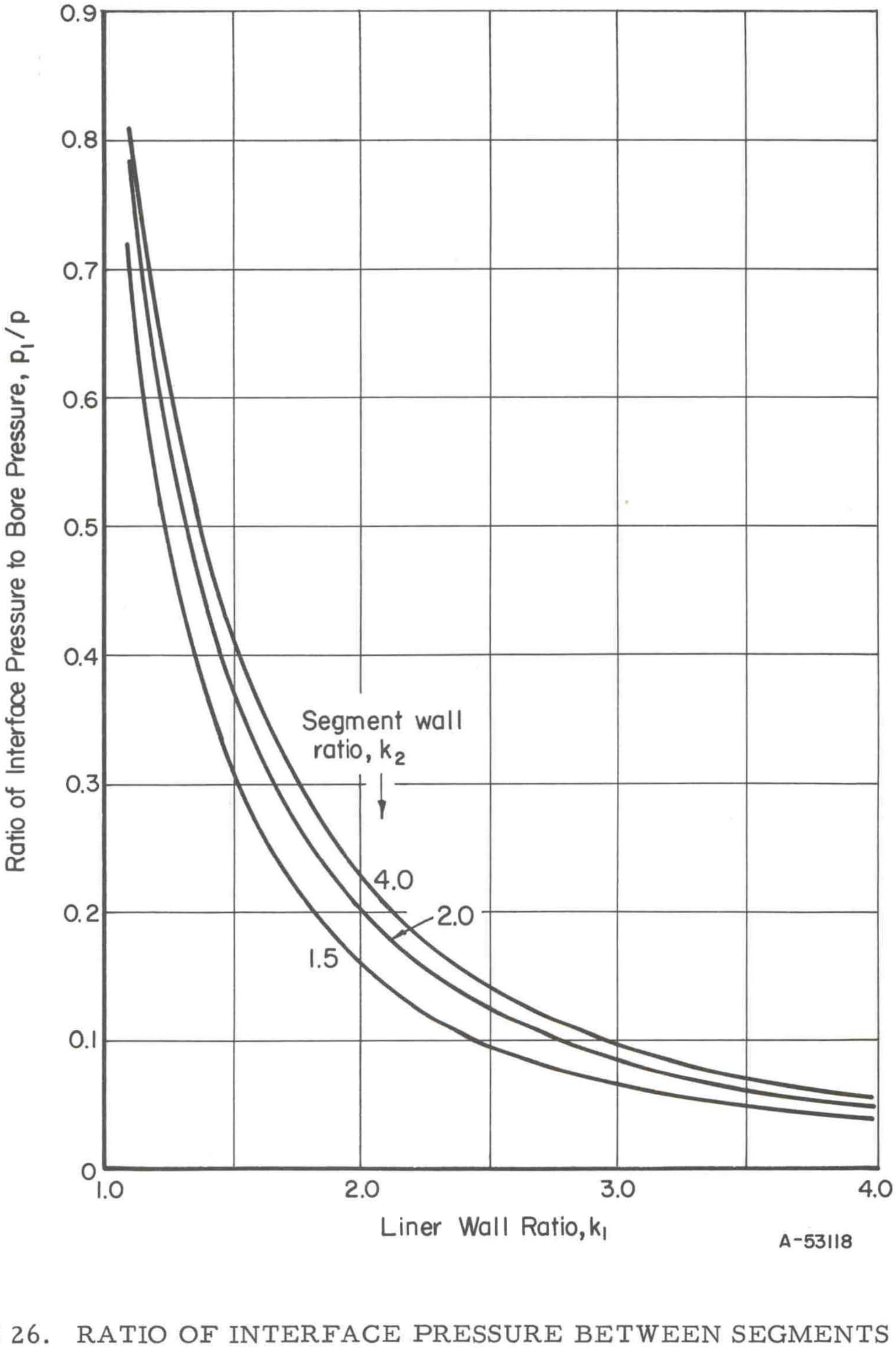


FIGURE 26. RATIO OF INTERFACE PRESSURE BETWEEN SEGMENTS AND LINER TO BORE PRESSURE FOR THE PIN-SEGMENT CONTAINER

strip has been wound on. Referring to Equation (47), we see that the pressure-to-strength ratio $p/\sigma_1$ depends only on the overall wall ratio K and $\alpha_r$ the stress-range parameter for the liner material. If K for the strip-wound vessel is taken as the ratio of the outside diameter of the last strip layer to the inner bore diameter, then Equation (47) can be used to estimate its pressure capability. Therefore, it may be concluded that the strip-wound container has a maximum pressure equal that of the multi-ring container. However, unknown local stress concentrations and contact conditions between strips may be detrimental in the strip-wound design. Because of these possible disadvantages and no better pressure capability than the multi-ring container, detailed analysis of the strip-wound vessel is not warranted. However, the strip-wound design does offer advantages in producibility of large diameter containers as pointed out later in the Design Requirements ... section of this report.

## Controlled Fluid-Fill Multi-Ring Container

A controlled fluid-fill container, shown in Figure 27, has been proposed by Berman[20]. All the rings are assumed to be made of the same ductile material and a shear strength criterion applies. Like the ring-segment-fluid container this container also uses the fluid-pressure support principle. The advantage of this design is that under static applications the residual stress limitation (the limit curve in Figure 10) can be overcome by controlling the pressures $p_n$; i.e., the pressures $p_n$ can be reduced to zero as the bore pressure, p, is reduced to zero. There are no shrink fits, so there are no residual stresses. Berman's analysis was based upon static strength. A similar analysis is now conducted based on fatigue strength.

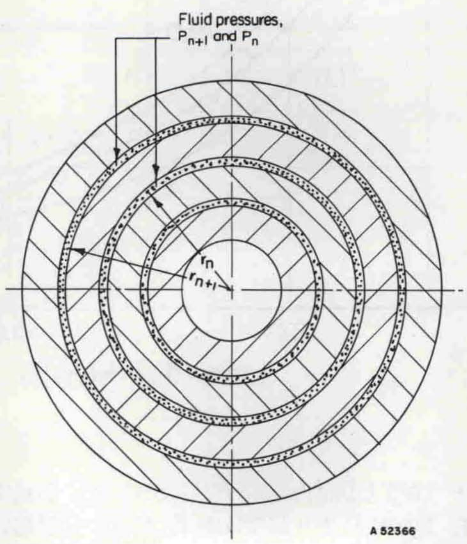


FIGURE 27. CONTROLLED FLUID-FILL CYLINDRICAL-LAYERED CONTAINER [REFERENCE (20)]