

OCTOBER 2020

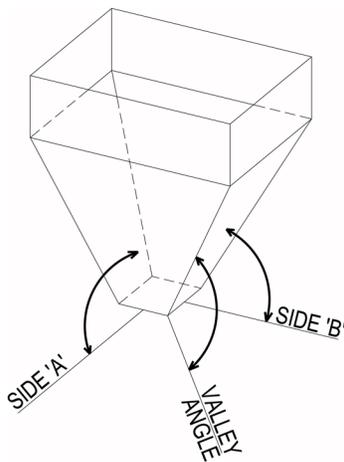


From Experience

Valley Angles and Material Flow

All bins or chutes designed for dry ingredients contain a potential fatal flaw known as a "Valley Angle." Formed where two adjacent slopes meet, valley angles are shallower than the adjacent wall angles and must be accounted for in the design process. Valley angles which are too shallow can create flow problems during production such as "arching" where the material forms an arch over the outlet or "ratholing," in which areas of stagnant material form, decreasing the usable capacity of the storage vessel.

In addition to the original design, it is also important to understand valley angles when changing the material that will be stored in a particular bin. Realize that another material may have different flow properties and may not work as well with the valley angle as the original material did. If the material is changed, additional equipment such as bin activators, aerators, vibrators, etc. may be needed to prevent flow problems.



On the following page is a sample of some valley angles created by the angles of the adjacent walls in a bin or chute. To see the complete chart, or learn more about dry storage and valley angles, please contact Hixson at the number in the contact section.

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EXPERIENCE IN BRIEF

Proper storage vessel design requires detailed knowledge of the flow characteristics of the material being stored. Wall friction properties, as well as the material's cohesive strength, compressibility and permeability all play a role. Because the formulae needed to determine wall angles and finishes, minimum opening sizes, etc., are complex and based on a series of tests, it is recommended to have materials, particularly those not used by your plant before, analyzed by a reputable lab to determine its handling properties.

| SIDE "B" DEGREES (FROM HORIZONTAL) | SIDE "A" DEGREES (FROM HORIZONTAL) | | | | | |
|---------------------------------------|------------------------------------|----|----|----|----|----|
| | | 45 | 50 | 50 | 60 | 65 |
| | 45 | 35 | 37 | 39 | 41 | 42 |
| | 50 | 37 | 40 | 42 | 44 | 46 |
| | 55 | 39 | 42 | 45 | 48 | 50 |
| | 60 | 41 | 44 | 48 | 51 | 53 |
| 65 | 42 | 46 | 50 | 53 | 57 | |

Extract from Hixson's "Table of Valley Angles."

CONTINUING EDUCATION

Hixson associates regularly participate in continuing professional education events across the country. To learn more about the events listed below, e-mail Hixson at: info@hixson-inc.com.

- "Beyond COVID-19: The Future of Food Plants," a Hixson **Food Plant of the Future** webinar! November 5, 2020 at 2:00 p.m. ET. [Register Today!](#)
- "From Design to Operation: Smoothing Out the Start Up," a **Food Plant of the Future** webinar. Click to view the archive [here](#).

FREE WEBINAR SERIES!

Go to www.hixson-inc.com/insights/foodplant-of-the-future to register or access archives of Hixson's webinars.



CONTACT US

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