

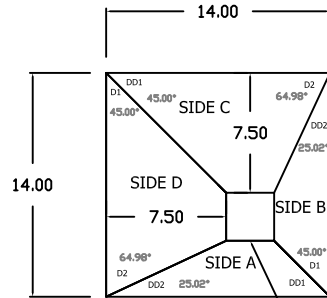
SIDE D  
PITCH S = 8:12

S = 33.69007°  
 D1 = arctan(tan(S) ÷ tan(S)) = 45°  
 R1 = arctan(tan(S) \* sin(D1)) = 25.23940°  
 P2 = arctan(cos(S) ÷ tan(D1)) = 39.76216°  
 C5 = arctan(sin(R1) ÷ tan(D1)) = 23.09347°

SIDE D  
PITCH S = 8:12

S = 33.69007°  
 D2 = arctan(tan(SS) ÷ tan(S)) = 64.98310°  
 R1 = arctan(tan(S) \* sin(D2)) = 31.13710°  
 P2 = arctan(cos(S) ÷ tan(D2)) = 21.22071°  
 C5 = arctan(sin(R1) ÷ tan(D2)) = 13.56656°

Martindale's Bin and Hopper Angles Case Study 3  
All corner angles are 90°



SIDE A

Run = 3.5  
 Rise = tan(33.69007°) \* 7.5 = 5  
 SS = arctan( 5 / 3.5 ) = 55.00798°  
 D2 = arctan(tan(SS) ÷ tan(S)) = 64.9831°  
 D22 = arctan(tan(S) ÷ tan(SS)) = 25.0169°  
 R1 = arctan(tan(SS) \* sin(D22)) = 31.13711°  
 P2 = arctan(cos(SS) ÷ tan(D22)) = 50.86232°  
 C5 = arctan(sin(R1) ÷ tan(D22)) = 47.93405°

SIDE C

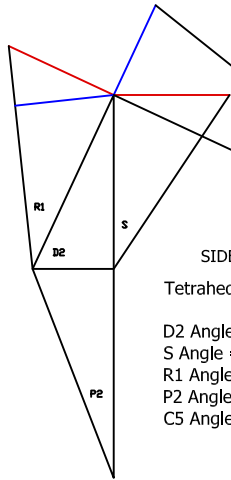
PITCH S = 8:12  
 S = 33.69007°  
 DD1 = arctan(tan(S) ÷ tan(S)) = 45°  
 R1 = arctan(tan(S) \* sin(DD1)) = 25.23940°  
 P2 = arctan(cos(S) ÷ tan(DD1)) = 39.76216°  
 C5 = arctan(sin(R1) ÷ tan(DD1)) = 23.09347°

SIDE B

SS = 55.00798°  
 D22 = arctan(tan(S) ÷ tan(SS)) = 25.0169°  
 R1 = arctan(tan(SS) \* sin(D22)) = 31.13711°  
 P2 = arctan(cos(SS) ÷ tan(D22)) = 50.86232°  
 C5 = arctan(sin(R1) ÷ tan(D22)) = 47.93405°

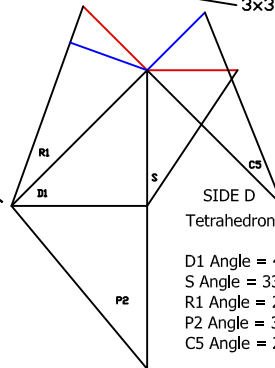
SIDE B

SS = 55.00798°  
 D1 = arctan(tan(SS) ÷ tan(SS)) = 45.00°  
 R1 = arctan(tan(SS) \* sin(D1)) = 45.28938°  
 P2 = arctan(cos(SS) ÷ tan(D1)) = 29.83265°  
 C5 = arctan(sin(R1) ÷ tan(D1)) = 35.40023°



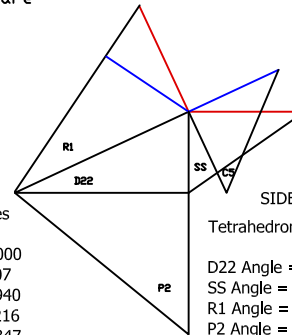
SIDE D  
Tetrahedron Angles

D2 Angle = 64.98310  
 S Angle = 33.69007  
 R1 Angle = 31.13710  
 P2 Angle = 21.22071  
 C5 Angle = 13.56656



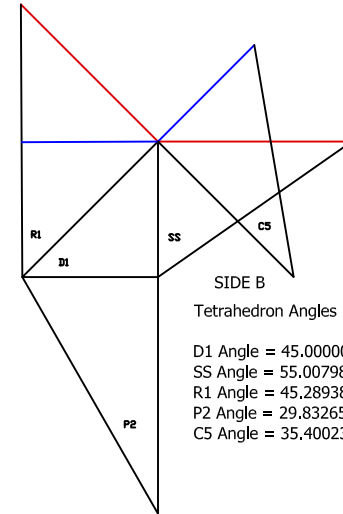
SIDE D  
Tetrahedron Angles

D1 Angle = 45.00000  
 S Angle = 33.69007  
 R1 Angle = 25.23940  
 P2 Angle = 39.76216  
 C5 Angle = 23.09347



SIDE A  
Tetrahedron Angles

D22 Angle = 25.01690  
 SS Angle = 55.00798  
 R1 Angle = 31.13711  
 P2 Angle = 50.86232  
 C5 Angle = 47.93405



SIDE B  
Tetrahedron Angles

D1 Angle = 45.00000  
 SS Angle = 55.00798  
 R1 Angle = 45.28938  
 P2 Angle = 29.83265  
 C5 Angle = 35.40023