



## Department of Metallurgy and Materials Science

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No.: COEP/Met/ /enquiry/2020-21/240

Date: 16 July 2021

To,

Vendor (s)

### Subject: Requirement of Double cone blender

Please quote for the following items with detail bifurcation of basic cost, taxes and other charges if any-

Double Cone blender	
Double cone blender vessel with dimensions as mentioned in the attached drawing Structure with mechanical holding arrangement inclusive of bearings as per the drawing Pg 2 of 2 (Note: Motor and Variable speed controller are not to be included)	Qty: One

You are requested to quote competitive rate within **08** days from the date of issue of enquiry letter. Please note that, quantity specified in the above table is tentative and it may vary as per the need of department.

Sealed envelope of your quotation shall super-scribe enquiry letter number.

Thanking you,

**Professor & Head**  
Dept. of Metallurgy and Materials Science  
College of Engineering,  
(An Autonomous Instt. of Govt. of Maharashtra)  
Shivajinagar, Pune - 411 005

**Cone assembly: Volume required for 300 g of iron powder:**

BPR: 10:1

Thus ball weight: 3000 g

Balls considered for the analysis are 6 mm diameter.

Volume of one ball is 0.113 cc. Density of SS304: 8 g/cc. Mass of one ball is 0.9 g.

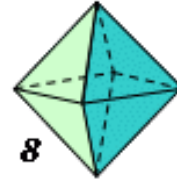
Volume occupied by 3000 g of balls along with the gaps between them is (Condition: 6 balls touching each other forming an octahedron with volume 0.1018 cc.) =  $[(3000/0.9) * 0.113] + \{[(3000/0.9) * 113]/6\} * 0.1018 = 382 \text{ cc}$

Powder to be milled is 300 g iron powder with apparent density 3.1 g/cc.

Volume occupied by the powder is around 100 cc.

Total volume required =  $382 + 100 = 482 \text{ cc}$ 

However, this has to be around 65% of the total volume.

Thus the total volume required is  $482 * 100/65 = 742 \text{ cc}$ .

Powder to be milled is 300 g aluminium powder with apparent density 1.22 g/cc.

Volume occupied by the powder is around 246 cc.

Total volume required =  $382 + 246 = 628 \text{ cc}$ 

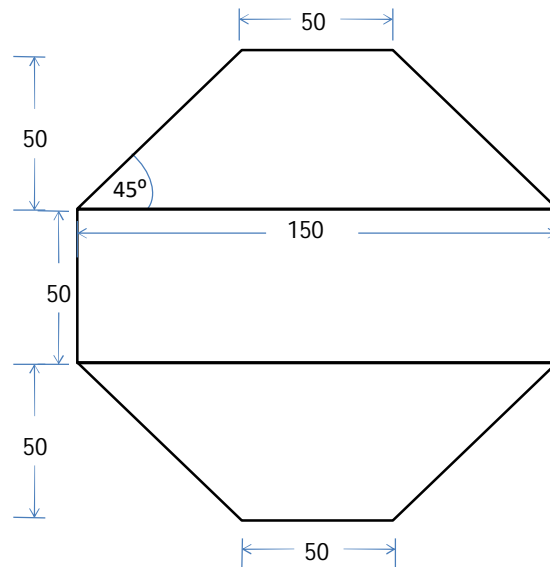
However, this has to be around 65% of the total volume.

Thus the total volume required is  $628 * 100/65 = 966 \text{ cc}$ .

But there may be some variation in powder sizes which may change the complete set up requirement. Also, there is a need to get a firm grip on the vessel during rotation and for that a minimum surface is required.

***Thus it is decided to go for the cone assembly with volume 3000 cc.***

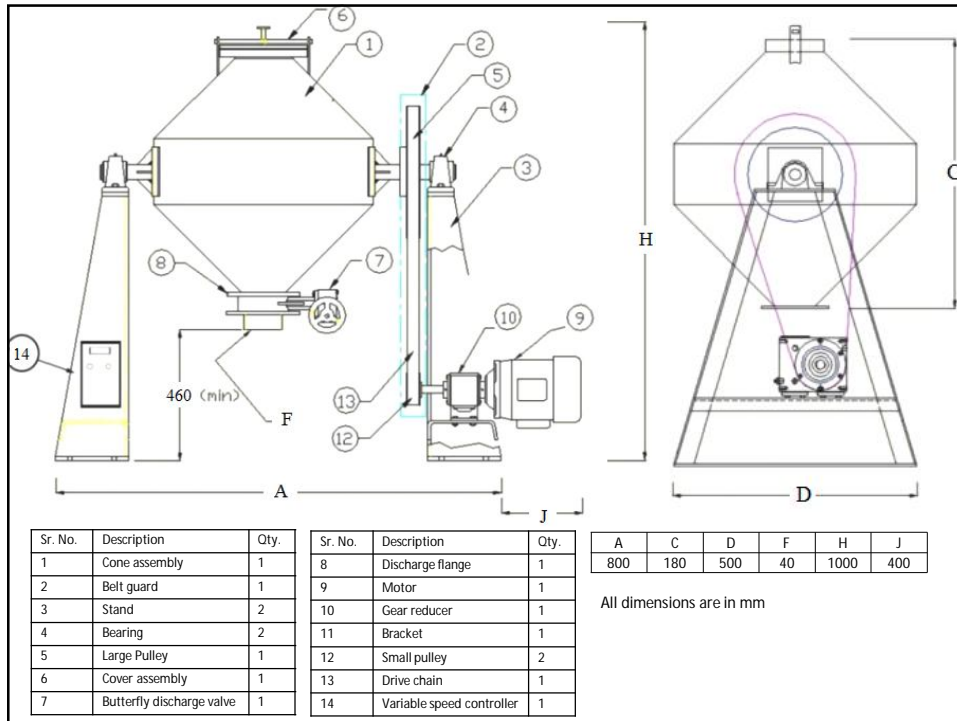
1



All the dimensions are in mm.

Volume of the cone assembly = Volume of truncated circular cone \* 2 + Volume of cylinder  
 $= 2 (1134) + 883 = 3151 \text{ cc}$

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