

KnowledgeBase Article 2131

Sand Usage

Guardian provides a means to calculate your Sand usage via Switch 226 #1 *"Turns the calculation of Sand Weight for Bill of Materials on or off"*. Sand Usage in Guardian is calculated using the density of the Sand along with the density of the Casting and the density of the manufactured Core(s). All three must use the same unit of measure – in the example below, "pounds" is the unit of measure. Density is therefore calculated as *pounds per cubic inch*.

The calculation to determine the total volume of Sand:

$$\begin{array}{r} \text{Flask Total Volume} \\ - \text{Casting Volume} \\ - \text{Core Volume} \\ \hline \text{Total Volume of Sand} \end{array}$$

1. The Alloy Density must be recorded in the Alloy master.

Guardian Version 8

Main Menu

- Favorites**
 - Sales
 - Salesperson Management
 - Customer Management
 - Quotation Management
 - Sales Order Management
 - Shipping - Receiving Management
 - Purchasing
 - Supplier Management
 - Purchasing Management
 - Engineering
 - Engineering Management
 - Part List
 - ECN List
 - ECN Reports
 - Duplicate Part
 - Product Code List

Part List x Alloy x 17-4

Freeze Print SDS Full Process Sheet

Alloy

Number 17-4

Description 17-4 PH

Inventory Category RECIPES ☐ Change Enabled

☐ Replaced By

☐ Tooling Reference

Status Active

Source Manufactured

Product Code ALLOY

Unit Of Measure POUNDS

Specification

Status Reason **Density 0.28000**

Cutting Speed 0.00000

Feed Rate 0.00000

Shrink Factor 0.00000

Planner

Engineer

Alloy Family ALUMINUM

Requires

☐ SDS

☒ Approved Suppliers

Analysis Codes

Number of Gates

USER FIELD 2

USER FIELD 3

USER FIELD 4

Save Completed

Full Access

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- Sand may be entered as a "Recipe" Part type, the same as your Alloy. This allows the system to consume from, and even return sand to inventory. The Unit of Measure for the examples in this article are all *Inches* and *Pounds*. Therefore, the Sand Density is entered as *pounds per cubic inch (lbs/in³)*.

Guardian Version 8

Main Menu: Favorites, Sales, Purchasing, Engineering

Part List: SAND

Alloy Form Fields:

- Number: SAND
- Description: Sand
- Inventory Category: RECIPES
- Status: Active
- Source: Purchased
- Product Code: Sand
- Unit Of Measure: POUNDS
- Specification:
- Analysis Codes:
- Number of Gates:
- Status Reason: Density 0.09427 (circled in red)
- Cutting Speed: 0.00000
- Feed Rate: 0.00000
- Shrink Factor: 0.00000
- Planner:
- Engineer:
- Alloy Family:
- Requires:
 - SDS
 - Approved Suppliers
 - Inspect Upon Receipt

Save Completed

Full Access

- On the Flask, the total Sand Capacity is the *total weight of the sand*. To calculate the total weight, find the volume (*Length x Width x Height*) and multiply by the Density of the sand from the Sand Alloy above.

Flask Length in inches	24
x Flask Width in inches	36
x Flask Height in inches	32
= Flask Volume in square inches	27,648
x Sand Density in lbs/in ³	0.09427
= Total Sand Capacity in pounds	2,606.37696

This is the total amount of sand to fill the flask without the pattern and cores. (2,606 pounds)

Guardian Version 8

Main Menu: Engineering, Pattern/Die/Mold Management, Costing Management

Part List: Alloy 17-4, Alloy SAND, Flask 24 x 36 Flask, Core 001

Flask Form Fields:

- Number: 24X36
- Storage Area: A1
- Sand Recipe: Sand
- Sand Capacity: 2606 (circled in red)
- Dimensions:
 - Width: 24.0
 - Length: 36.0
 - Cope Height: 14.0
 - Drag Height: 18.0

Save Completed

Full Access



- The manufactured Core Weight must be entered in the same Unit of Measure as the Pattern so that its density may be calculated within the system. Sand is recorded as a Bill of Material for the Core.

Guardian Version 8

Core

Number: 001
Description: Core
Inventory Category: CORES
Status: Active
Source: Manufactured
Product Code: FABRICATED PART
Unit Of Measure: EACH
Specification:
Drawing: DWG1121
Revision: 8
Date: 4/1/2021
Analysis Codes:
Number of Gates: 2
Weight: 1.00000
CoreBox: CORE BOX - WOODEN
Cores Per Box: 2
Lot Size: 12
Planner:
Engineer:
Requires:
SDS
Approved Suppliers

Bill Of Material

Name	Compon	Usage	Mold Usage	Description	Unit	Routin	Routing	Inventory Cate
Compo	SAND	3.00000	6.00000	Sand	LB			RECIPES

Save Completed

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- On the Casting, the Alloy, Sand and Core(s) are recoded within the Bill of Materials.

Guardian Version 8

Casting

Number: SC0001
Description: Pump Housing
Inventory Category: CASTING
Unit Of Measure: EACH
Pattern/Die/Mold: 1 - 1
Pieces Per Mold: 2
Drawing: DWG1121
Revision: A
Date:
Process Rev.:
Sample Date:
Supplemental Rev.:
Analysis Codes:
Number of Gates: 3
Weight:
Pour Weight:
Last Serial Number Used: XC2689
Test Bars: TEST BARS REQUIRED

Bill Of Material

Name	Compon	Usage	Mold Usage	Description	Unit	Routin	Routing	Inventory Cate
Alloy	17-4	10.00000	20.00000	17-4 PH	LB	0200	Pouring	RECIPES
Revert	17-4R	-5.00000	-10.00000	17-4 PH REVERT	LB	0200	Pouring	RECIPES
Sand	SAND	1.29900000	2.59800000	Sand	LB	0100	Molding	RECIPES
Compo	001	1.00000	2.00000	Core	EA	0100	Molding	CORES

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- When adding the Sand to the Bill of Materials, Guardian will calculate the usage based on the data entered on the above screens. Simply select the Routing Sequence and Save the item.

Bill Of Material

Usage	Mold Usage	Description
10.00000	20.00000	17-4 PH
-5.00000	-10.00000	17-4 PH REVERT
.00000	2.00000	Core

Bill Of Material

Component: SAND - Sand

Routing Sequence: 0100

Notes: 1,299.00000

Mold Quantity: 2

Automatically calculated

- Finally, should you wish to return Sand into inventory, enter the Sand as a negative value component in the Bill of Materials indicating the Routing Sequence where it is returned.

Guardian Version 8

Casting

Number: SC0001

Description: Pump Housing

Inventory Category: CASTING

Unit of Measure: EACH

Pattern/Die/Mold: 1 - 1

Pieces Per Mold: 2

Drawing: DWG1121

Revision: A

Date: Select a date

Process Rev.:

Sample Date: Select a date

Supplemental Rev.:

Analysis Codes:

Number of Gates: 3

USER FIELD 2:

USER FIELD 3:

USER FIELD 4:

Bill Of Material

Name	Compon	Usage	Mold Usage	Description	Unit	Routin	Routing	Inventory Cate
Alloy	17-4	10.00000	20.00000	17-4 PH	LB	0200	Pouring	RECIPES
Revert	17-4R	-5.00000	-10.00000	17-4 PH REVERT	LB	0200	Pouring	RECIPES
Sand	SAND	1,299.00000	2,598.00000	Sand	LB	0100	Molding	RECIPES
Compo	001	1.00000	2.00000	Core	EA	0100	Molding	CORES
Compo	SAND	-1,200.00000	-2,400.00000	Sand	LB	0300	Shakeout	RECIPES

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Full Access