

# Sample Command – MUS Sampling

## Used For

To select a random sample of monetary units, usually dollars, from a population or subpopulation. ACL selects random monetary units, but the output is a record that includes the random monetary unit.

## When Used

Whenever the auditor wants to select an MUS sample using ACL. Note: If you want to select a random sample of records instead of monetary units, see Sampling Command – Records Sampling.

## Examples

- Select a random sample of accounts receivable for confirmation.
- Select a random sample of inventory items to perform price testing.

## Calculating the Sample Size and MUS Sampling Interval

To calculate a monetary unit sample, the auditor enters four items:

1. The desired confidence level for the test. Typical confidence levels are 90% or 95%, but can be lower depending on the required degree of assurance from the test.
2. The dollar amount of the population, which can be determined using the Total command.
3. Materiality, which is usually tolerable misstatement for the sampling application.
4. The dollar amount of errors expected in the testing. Auditors generally expect little or no error when using MUS. However, the auditor may allow for a small amount of expected error so that the detection of one or a few small misstatements does not garner unacceptable test results.

When using the MUS Sampling command, the table must be organized consistently with your sampling needs. For example, if you wish to sample accounts receivable balances rather than invoices, a file of sales invoices may need to be summarized into a table of total accounts receivable by customer before selecting a sample for confirmation. ***Do not skip this step if the instructions indicate you are to sample individual customer balances rather than individual outstanding invoices.*** However, because the sampling unit in MUS is individual monetary units (dollars), a sample can be drawn from balances or invoices.

When using MUS Sampling, adjustments are often made to the population to determine samples size.

- The \$ value of key items (records) are often excluded. Key items are amounts exceeding a dollar limit that the auditor decides must be audited. An example is inventory items exceeding \$10,000.
- The \$ value of items the auditor decides not to include in the sample. An example is negative values in accounts receivable.

The auditor can include the key items in the sample size determination, but this will usually result in a larger sample size. Further, auditing standards require that these key items be tested. For this reason, auditors find it more convenient to exclude them from the population to be sampled and test the key items separately.


### Illustration of Calculating the Sample Size and MUS Sampling Interval

Following is an example from an audit program: Select a sample of inventory items from the Inventory table in the Sample\_Project for physical examination. The auditor's desired confidence level is 90%, and tolerable misstatement (materiality) is \$50,000. Therefore, key items are any inventory items with a total cost value more than or equal to \$50,000. Do not include negative balances in the sample. The auditor expects total errors in the population of \$1,500.

Before using the Sampling command to determine sample size, the auditor does the following:

1. Determine the total inventory value at cost in the Inventory table using ACL (\$680,479.94).
2. Filter out the key items. (One item totaling \$100,800 has a balance exceeding \$50,000.)
3. Determine the total amount of negative balances using a filter. (The total is \$-13,882.)

Note that the two filters can be combined. After applying these two filters, the remaining inventory value at cost is \$593,561.94. Although not required, it is recommended that the filtered table be saved as a separate table since it represents the population to be sampled.

 Click *Sampling* → *Calculate Sample Size* to open the *Sample command dialog*. Select the *monetary* radio button if not already selected.


4. Calculate the required sample size on the adjusted population using the indicated parameters.

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If you completed the steps as indicated, you should calculate a sample size of 28 and a sampling interval of \$20,619.04. Note that the maximum tainting is 7.27%, which is the expected number of errors divided by the sampling interval ( $\$1,500/\$20,619.04$ ). If the auditor finds an error that is greater than 7.27% of the account balance, the results of the sample will be considered unacceptable.

The 'Size' dialog box is shown with the following settings:

- Confidence: 90
- Population: 593561.94
- Materiality: 50000
- Expected Total Errors: 1500
- Sample Size: 28
- Interval: 20,619.04
- Maximum Tolerable Taintings (%): 7.27

 Click OK to close the Size window.

## Sample Records

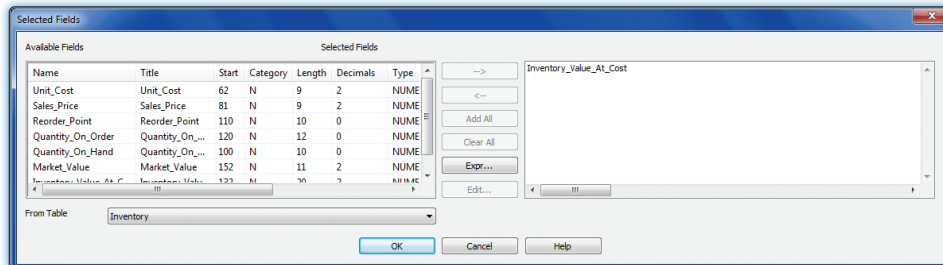
To select the sample items, use the following steps.

 Click Sampling → Sample.

The 'Sample' dialog box is shown with the following settings:

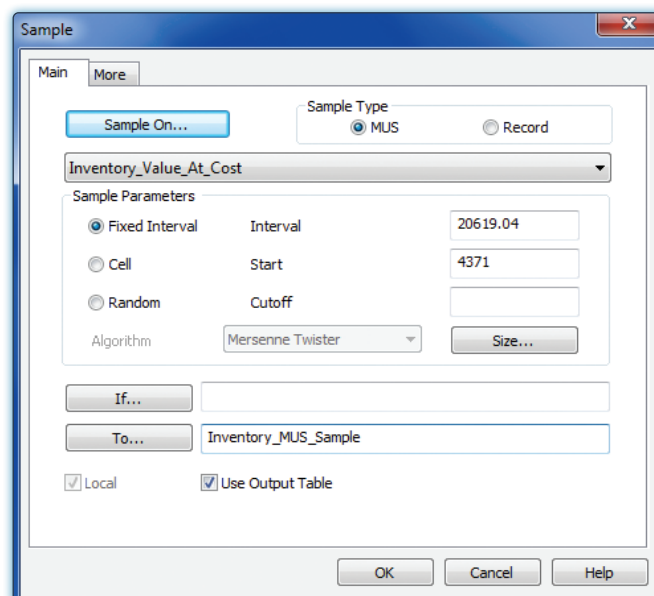
- Sample Type: MUS
- Sample On...: Inventory\_Value\_At\_Cost
- Sample Parameters: Fixed Interval
- Algorithm: Mersenne Twister
- Local:
- Use Output Table:

- Click the **MUS** radio button for **Sample Type** and the **Fixed Interval** radio button for **Sample Parameter** unless they are already selected as defaults.
- Click the **Sample On** box and select the field on which you want to select the sample.



- Click **OK** to return to the main command dialog.
- Enter the interval for the population in the **Interval** box as determined when the sample size was determined.
- Enter any number between 1 and the length of the interval in the **Start** box to assure a random start. (Use 4371 for the example.)
- Enter an output table name in the **To** box to save the random selection.

Use the **Cutoff** box for key items that will be automatically included in the sample if you have not already filtered them from the population. Similarly, use the **If** button if you plan to restrict the random selection to certain population items, such as positive account balances, if you have not already applied a filter to exclude them from the population to be sampled. The illustration below assumes that the key items and excluded items have already been filtered.

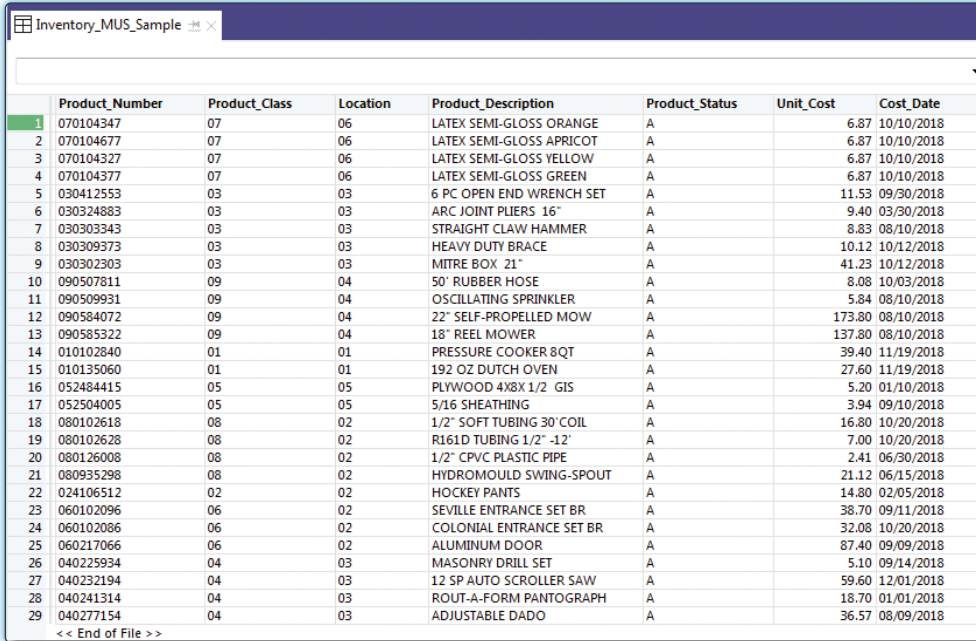


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- Click the More tab, check the No Repeats box.
- Click OK to run the Sample MUS command.

## Command Results

The output table includes the sample selected in records, not monetary units. An example of an MUS sampling table created with the Sampling command for the example follows:



	Product_Number	Product_Class	Location	Product_Description	Product_Status	Unit_Cost	Cost_Date
1	070104347	07	06	LATEX SEMI-GLOSS ORANGE	A	6.87	10/10/2018
2	070104677	07	06	LATEX SEMI-GLOSS APRICOT	A	6.87	10/10/2018
3	070104327	07	06	LATEX SEMI-GLOSS YELLOW	A	6.87	10/10/2018
4	070104377	07	06	LATEX SEMI-GLOSS GREEN	A	6.87	10/10/2018
5	030412553	03	03	6 PC OPEN END WRENCH SET	A	11.53	09/30/2018
6	030324883	03	03	ARC JOINT PLIERS 16"	A	9.40	03/30/2018
7	030303343	03	03	STRAIGHT CLAW HAMMER	A	8.83	08/10/2018
8	030309373	03	03	HEAVY DUTY BRACE	A	10.12	10/12/2018
9	030302303	03	03	MITRE BOX 21"	A	41.23	10/12/2018
10	090507811	09	04	50' RUBBER HOSE	A	8.08	10/03/2018
11	090509931	09	04	OSCILLATING SPRINKLER	A	5.84	08/10/2018
12	090584072	09	04	22" SELF-PROPELLED MOW	A	173.80	08/10/2018
13	090585322	09	04	18" REEL MOWER	A	137.80	08/10/2018
14	010102840	01	01	PRESSURE COOKER 8QT	A	39.40	11/19/2018
15	010135060	01	01	192 OZ DUTCH OVEN	A	27.60	11/19/2018
16	052484415	05	05	PLYWOOD 4'X8' 1/2" GIS	A	5.20	01/10/2018
17	052504005	05	05	5/16 SHEATHING	A	3.94	09/10/2018
18	080102618	08	02	1/2" SOFT TUBING 30' COIL	A	16.80	10/20/2018
19	080102628	08	02	R161D TUBING 1/2" -12'	A	7.00	10/20/2018
20	080126008	08	02	1/2" CPVC PLASTIC PIPE	A	2.41	06/30/2018
21	080935298	08	02	HYDROMOULD SWING-SPOUT	A	21.12	06/15/2018
22	024106512	02	02	HOCKEY PANTS	A	14.80	02/05/2018
23	060102096	06	02	SEVILLE ENTRANCE SET BR	A	38.70	09/11/2018
24	060102086	06	02	COLONIAL ENTRANCE SET BR	A	32.08	10/20/2018
25	060217066	06	02	ALUMINUM DOOR	A	87.40	09/09/2018
26	040225934	04	03	MASONRY DRILL SET	A	5.10	09/14/2018
27	040232194	04	03	12 SP AUTO SCROLLER SAW	A	59.60	12/01/2018
28	040241314	04	03	ROUT-A-FORM PANTOGRAPH	A	18.70	01/01/2018
29	040277154	04	03	ADJUSTABLE DADO	A	36.57	08/09/2018

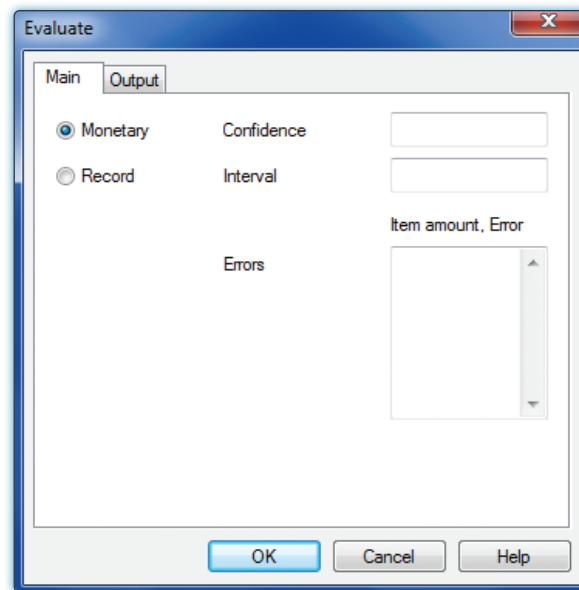
The auditor would then perform applicable tests on the resulting sample. For example, the auditor might perform pricing tests by relating the prices used in valuing inventory with a master file of inventory prices. If the MUS sample is for accounts receivable, the resulting output table can be used to prepare confirmations by relating the sample output table to the customer master file table and pulling the name, address, city, state, and zip code information into the sample table. The information can then be used for preparation of confirmations for mailing.

The interval approach illustrated is only one approach to selecting an MUS sample. The auditor can also choose to select random dollars or random dollars in an interval (cell method). Because these methods are less common in practice, they are not illustrated here.

## Evaluate Error in an MUS Sample

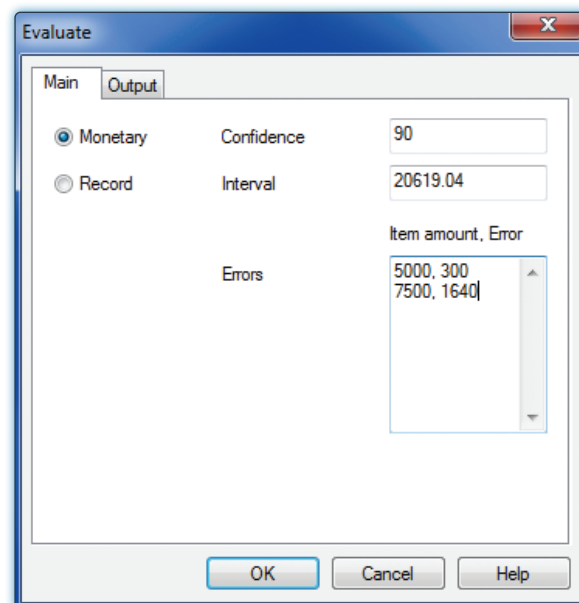
To evaluate the errors in MUS, use the following steps.

- Click Sampling → Evaluate Error. (See the illustration at the top of the following page.)



- Click the Monetary radio button if it has not already been selected.
- Enter the confidence level for the test. (90 in this example.)
- Enter the length of the sampling interval. (Use 20,619.04 for the example.)
- Enter each error in the format Item Amount, Error. For example, assume that a sampled inventory item with a total cost of \$5,000 had an overstatement error of \$300, and another inventory item with a total cost of \$7,500 had an overstatement error of \$1,640. These would be entered as follows:

5000, 300  
7500, 1640



- Click OK to complete run the command.



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### Command Results

The output table for the evaluation of sample results is included below.

<b>As of:</b>	02/16/2017 15:18:14			
<b>Command:</b>	EVALUATE MONETARY CONFIDENCE 90 ERRORLIMIT 5000, 300,7500, 1640 INTERVAL 20619.04 TO SCREEN			
<b>Confidence:</b>	90, <b>Interval:</b> 20619			
	<b>Item</b>	<b>Error</b>	<b>Most Likely Error</b>	<b>Upper Error Limit</b>
<b>Basic Precision</b>				47,630.00
	7,500.00	1,640.00	4,508.70	7,123.75
	5,000.00	300.00	1,237.14	1,781.48
<b>Totals</b>			5,745.84	56,535.23

The first line labeled Basic Precision is the allowance for sampling risk assuming no misstatements are found in the sample. The following two lines in the table present the two sample misstatements in order of percentage misstatement. The most likely error is the projected misstatement, calculated as the percentage misstatement times the length of the sampling interval ( $\$1,640/\$7,500 \times \$20,619.04 = \$4,508.70$ ). The last column is the projected error plus the incremental allowance for sampling risk. The auditor compares the upper error limit to the tolerable misstatement for the sampling application to conclude on the acceptability of the population.