

	Standard Operating Procedure		SOP Number A-101	Revision 4
	Numeric Data Entry and Rounding		Effective Date 10/18/22	Page Page 1 of 4
Written by/ Date K. Bunnick 06/02/22		Reviewed by/ Date  06/03/22		Approved by/ Date  06/06/22
Title: Quality Systems Manager		Title: Production Manager		Title: Quality Assurance Manager

1.0 Purpose

The purpose of this procedure is to define the process for rounding numbers and significant figures determination for data reporting.

2.0 Scope

This procedure describes the application of significant figures for the proper data reporting.

3.0 Responsibility

- 3.1 It is the responsibility of all employees recording data to comply with this procedure for significant figures and rounding.
- 3.2 It is the responsibility of each Supervisor/Manager, Data Reviewer, and/or QC to ensure that this procedure is properly followed.

4.0 Definitions

- 4.1 **Significant Figures** – The number of significant figures in a measured quantity is the number of digits that are known accurately, plus one that is in doubt. Zeros that appear to the left of the first non-zero digit are placeholders and are not considered significant. Zeros are located to the right of the first digit may be considered significant.
- 4.2 **QC** – Quality Control

5.0 References

N/A

6.0 Procedure

6.1 Significant Figures

6.1.1 A significant figure is any of the digits 0 through 9, except leading zeros and some trailing zeros.

6.1.2 Consider any non-zero digit as significant, e.g. 6.28 contains three significant figures.

6.1.3 Consider any zero located between non-zero digits as significant regardless of the position of the decimal point.

Example: 3.048 contains four significant figures.

6.1.4 Consider leading zeros as placeholders to locate the decimal point. A leading zero is any zero located to the left of a non-zero digit except when it is between two non-zero digits.

Example: 0.0789 contains three significant figures and two leading zeros.

6.1.5 It is not usually possible to determine if a trailing zero is significant by inspection of the result. A trailing zero is any zero that follows a whole number. For example, for the number 750, the zero may be significant but since it cannot be deleted, there is no way to make this determination without additional information. If this number were reported as 750.0, it contains four significant figures.

6.2 Rounding

6.2.1 Observed or calculated values usually contain more significant figures than are in the established acceptance criteria or specification.

6.2.2 Round off an observed or calculated final result to the number of places that is in agreement with the established acceptance or specification before the result is compared to the acceptance criteria or specification and reported.

6.2.3 Numeric data should be recorded to the same number of significant digits that the specification is stated.

Example: Yield specification is 95.0% - 105.0%. Record value to one (1) decimal place, i.e. 98.5% or if the component is 0.4268kg the weight should be reported to the fourth decimal place, e.g. 0.4268kg (4 significant figures).

6.2.4 For final results, when rounding off, only one digit in the decimal place to the right of the last place in the established specification should be considered.

Example: If the specification is 98.0% - 110.0% and the observed or calculated value is 98.045, consider only 98.04 when making rounding decisions. The number reported will be **98.0%**.

6.2.5 If the digit in the decimal place to the right of the last place in the established specification is less than 5, it is eliminated and the preceding digit is unchanged.

Example: The specification states 95.0% - 105.0% but the observed or calculated value is 98.04%. The number reported will be 98.0%.

6.2.6 If the digit in the decimal place to the right of the last place in the established specification is 5 or greater, the preceding digit is increased by one.

Example: The specification states 95.0% - 105.0% but the observed or calculated value is 98.05%, the number reported will be **98.1%**. (or) The specification states 95.0% - 105.0% but the observed or calculated value is 98.88, the number reported will be **98.9%**. (or) The specification states 95.0% - 105.0% but the observed or calculated value is 98.99, the number reported will be **99.0%**.

7.0 Revision History

Revision	Date	Description of Changes	CCR #	By
0	06/09/10	New.	-	-
1	05/13/13	Scheduled review: changed the format; updated SOP.	13-0376	V. Iltcheva
2	09/09/15	Scheduled review: updated SOP format.	15-0567	V. Iltcheva
3	01/02/19	Scheduled review: no changes made.	19-0003	K. Burris
4	06/02/22	Scheduled review: updated format and logo.	CC-22-0249	K. Burris