

Die Management

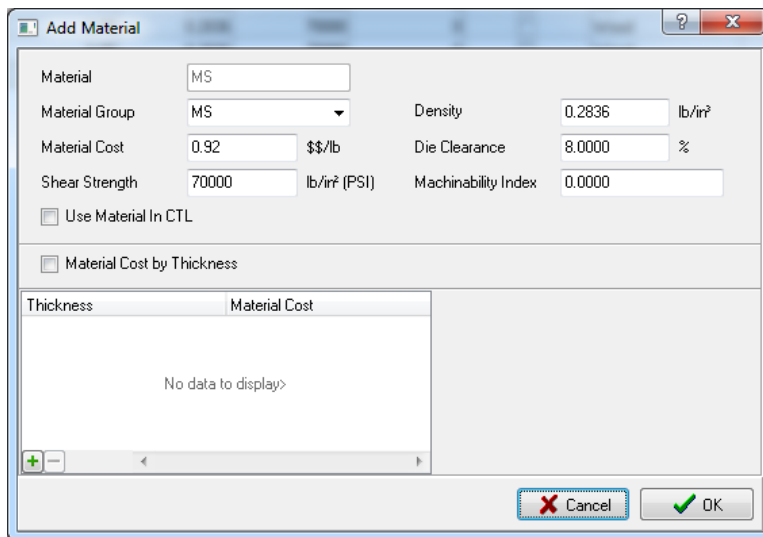
SigmaNEST can manage the selection of the correct die to be used for the material and thickness required. The correct die selection can greatly improve the tool life.

There are two types of die management, dedicated dies and dynamic dies. In Dedicated Dies management, every punch tool has its own die. For example, if you are punching mild steel in three different thicknesses, you will need to have three punches with three separate dies. In Dynamic Dies management, three dies, one for each material thickness, could be used with the same punch

Die Management Set-up

The first step in either method is to select the correct die clearance. A typical die clearance for MS is 16% of the material thickness. (Please consult the tool manufacture for recommend settings.)

SigmaNEST requires the value to be entered in the Material Setup, which be accessed by clicking the *Technology Setup* button and selecting the *Material* tab. On the material tab, select the material and enter information in the remaining fields. The Die Clearance entered must reflect the space needed on each side. For example, if the total clearance is 16% enter 8% for the die clearance in the material dialog setup, as shown below



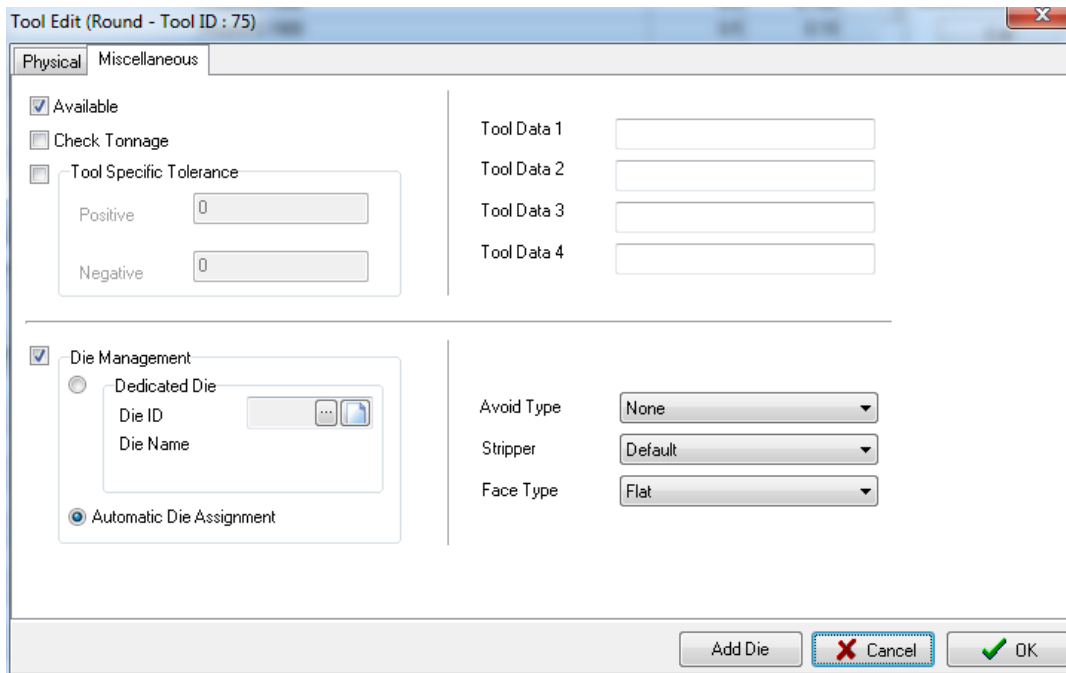
Setting up the Tool and dies

The material we will use in this tutorial is mild steel, or MS, and the thickness we will set dies for are 16 GA (.059), 12 GA (.105) and 10 GA (.135).The tool will be a ¼” Diameter Tool.

Dynamic Dies

Open the Tool Manager dialog by clicking the *tool manager* button, located on the Work-space ribbon. Select the round tab from below the list of tools, select the ¼" diameter tool and click the *Edit* button. The Tool Edit dialog will open. Click on the *Miscellaneous* tab. Choose a Die Management option, in this case, select *Automatic Die Assignment*.

If multiple ¼ tools are present, set all but one to not available by removing the check next to Available under Miscellaneous tab. Marking a tool as unavailable reduces the risk of the wrong tool being selected during this tutorial.



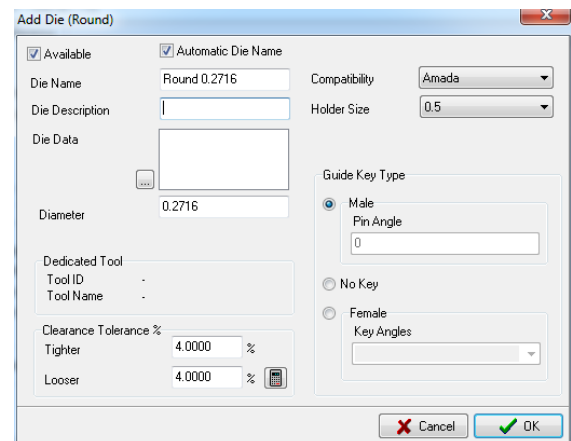
Select the *Add Die* button. To calculate the Die diameter use the formula:

Die Diameter = Tool Diameter + (Material Thickness * Die Clearance).

For example, when using the 10 GA, the die Diameter using 16% die clearance the die diameter would be: **Die Diameter = .250 + (.135*.16) for a Die Diameter of .2716 .**

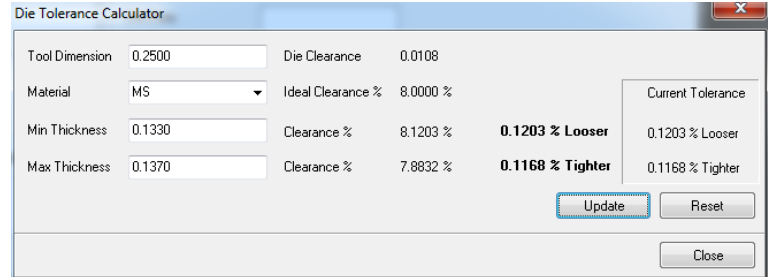
Enter the Diameter of .2716 in the Diameter field to set up the first die for 10 GA material.

To adjust the die to handle a thickness that varies from the nominal thickness, select the calculator icon to open the *Die Tolerance* calculator.



In the Die Tolerance Calculator, values can be calculated for expanding the range beyond the nominal thickness.

Enter the Tool Diameter as .250, and the Material as MS. The nominal material thickness for 10GA is .135 so expanding the range to cover .133 min to .137 max will calculate the tolerance required. Click the *Reset* button to calculate. Click *Update* to save the changes and *Close* to close the calculator dialog. The values of .1203 looser and .1168 tighter are added to the *Clearance Tolerance %*.



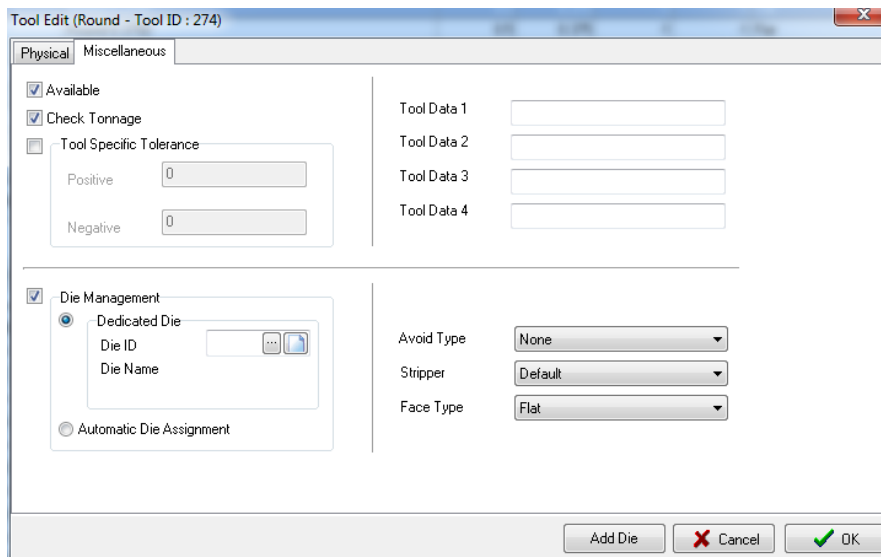
This step can be repeated for the 12 GA, and the 16 GA Thicknesses.

Dedicated Dies



In a dedicated dies system, each punch has a specific die; the punch tool will not be selected unless the die matches the material and thickness required for selection.


In this example, we will create dedicated dies for .375 diameter tools. Three rounds tools will need to be created prior to starting.

Select one of the three tools.



There are three methods to creating a dedicated die:

- Enter an id number for a die that has been created.
- Select the  icon to calculate the correct die.
- Select the  icon to create a die

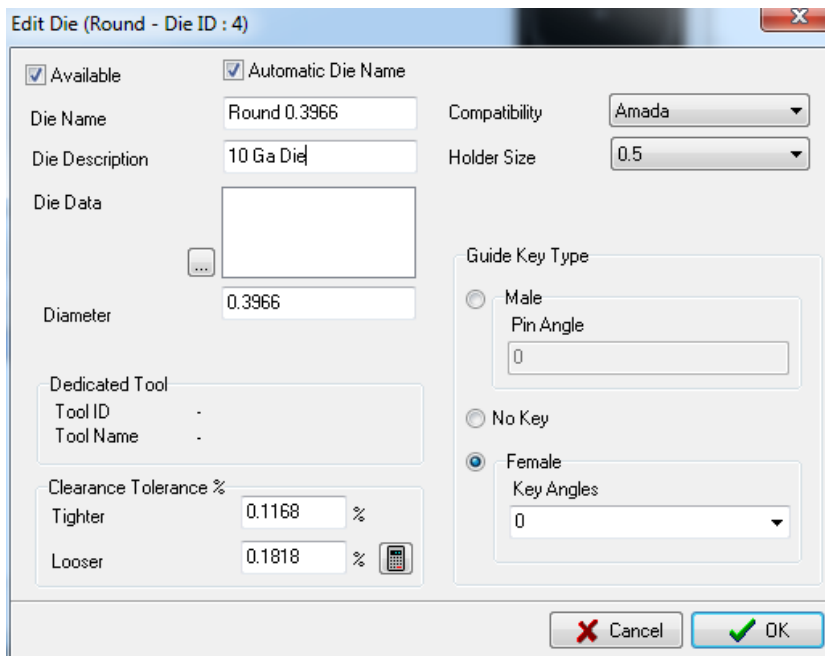
In this example, we will select the  icon.

Select Available and enter the name, description, compatible machine, holder size and guide key type.

Enter the die diameter using the formula:

Die Diameter = Tool Diameter + (Material Thickness * Die Clearance).

Click the calculator icon to open the *Die Tolerance Calculator* and calculate the tolerance, as described above.



Repeat the process to create two more dies for 12 GA, and 16 GA materials.

Test the results by creating three parts, with .250 and .375 diameter holes, one for each of the material thickness. After tooling use the *Used Tool Report* to view which tool and die were selected.