Using EXCEL to determine the Hammerlink custom curve parameters

The "Trend Line" function of EXCEL to provide the polynomial or exponential function required by the custom curve function of Hammerlink. The example used is based on real data collected in China by the Shaanxi Province Construction Science Research Institute, used to create the Chinese regional curve in SilverSchmidt ST/PC.

Data Format Required

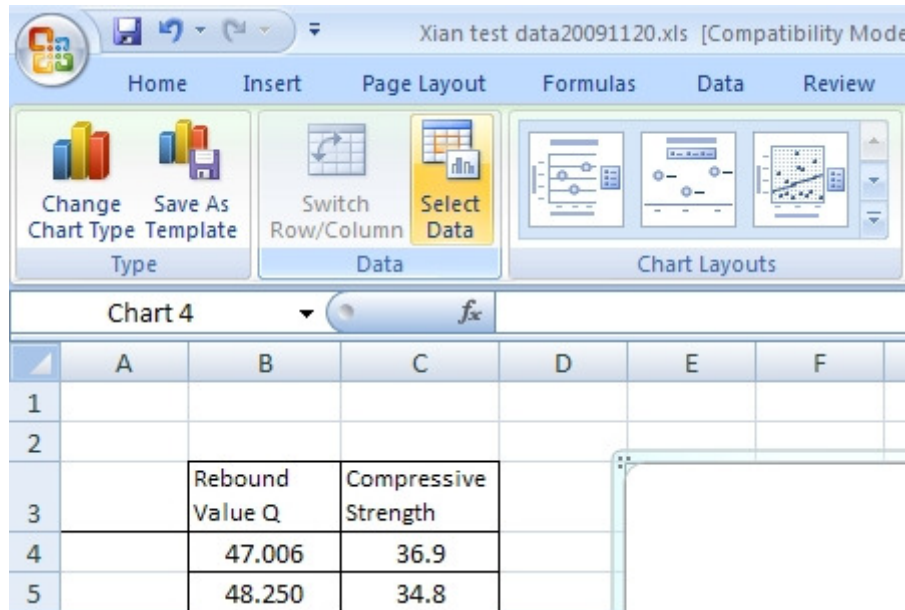| Rebound Value Q	Compressive Strength
47.006	36.9
48.250	34.8
49.750	37.1
49.500	39.3
49.531	36.1
48.906	37.6
45.594	35.7
46.000	34.5
46.750	32.0

In order to generate the custom curve the data is required in the above format with the measured Q-values in one column and the actual compressive strength measured in the press in the second column.

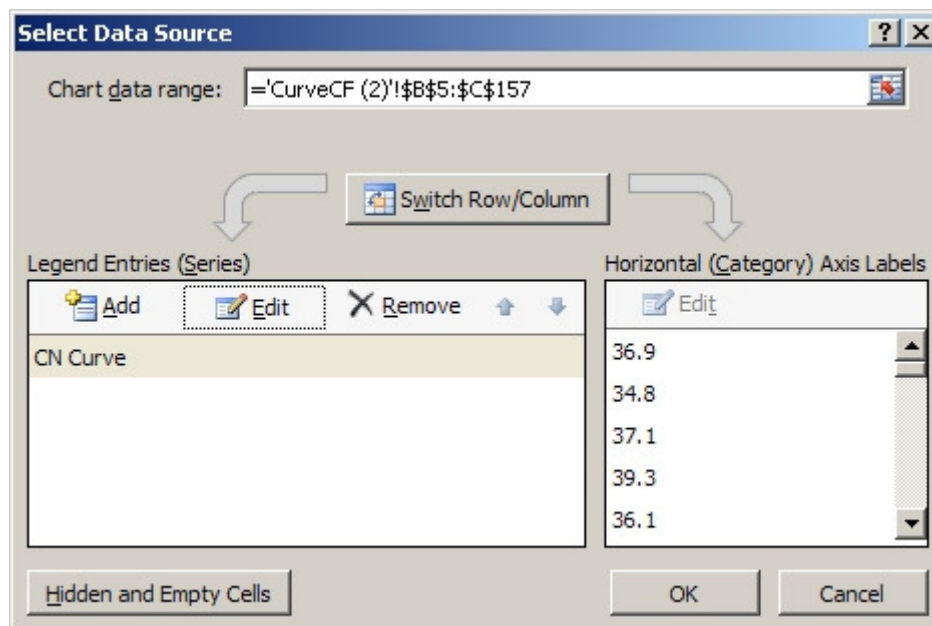**Step 1 – Putting the data into a chart**

Click on the menu item "Insert / Charts / Scatter" as shown, to insert a chart into the worksheet.

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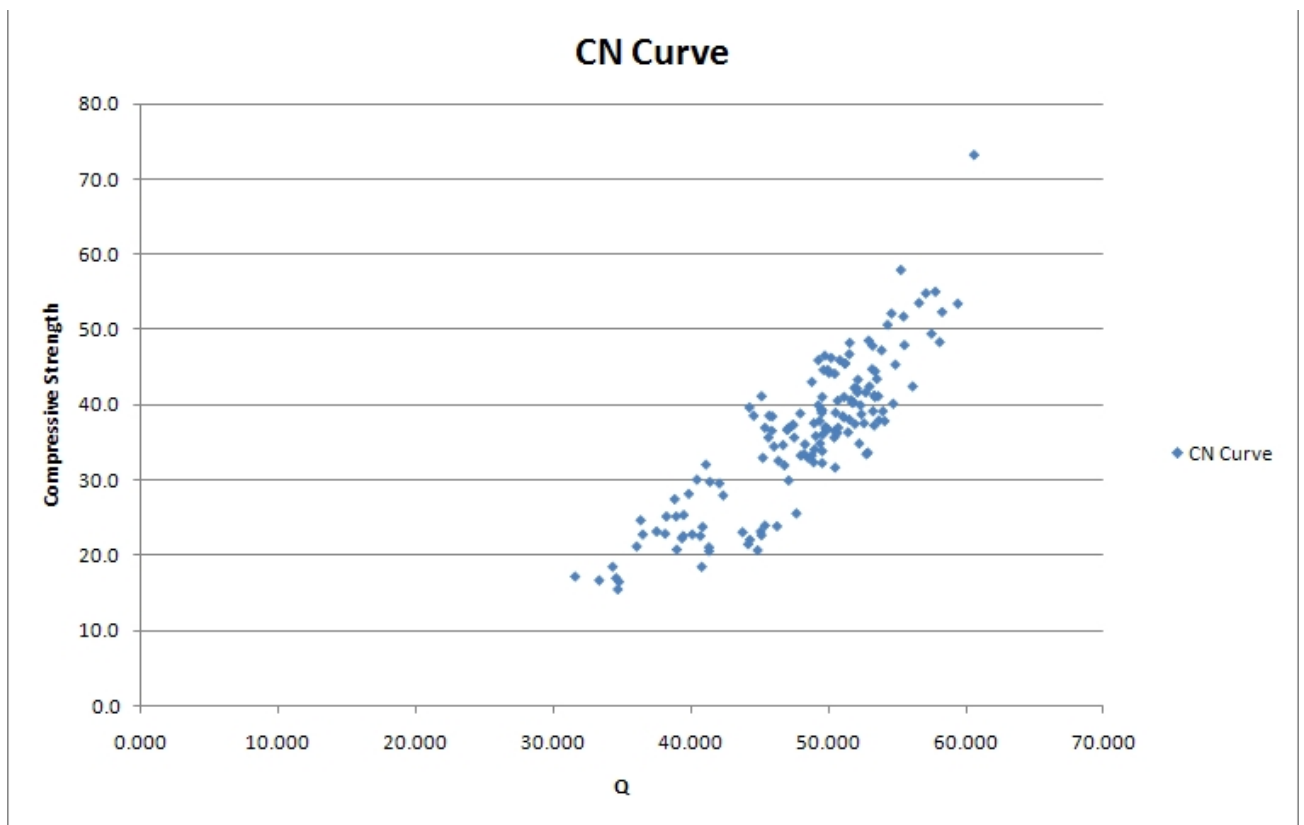Made in Switzerland   ... more than 50 years of know-how you can measure!

Click on the menu item "Select Data"

The wizard prompts you to select the data range. Here you must select the data in the two columns Q-value and MPa.

This will then plot the scatter chart:

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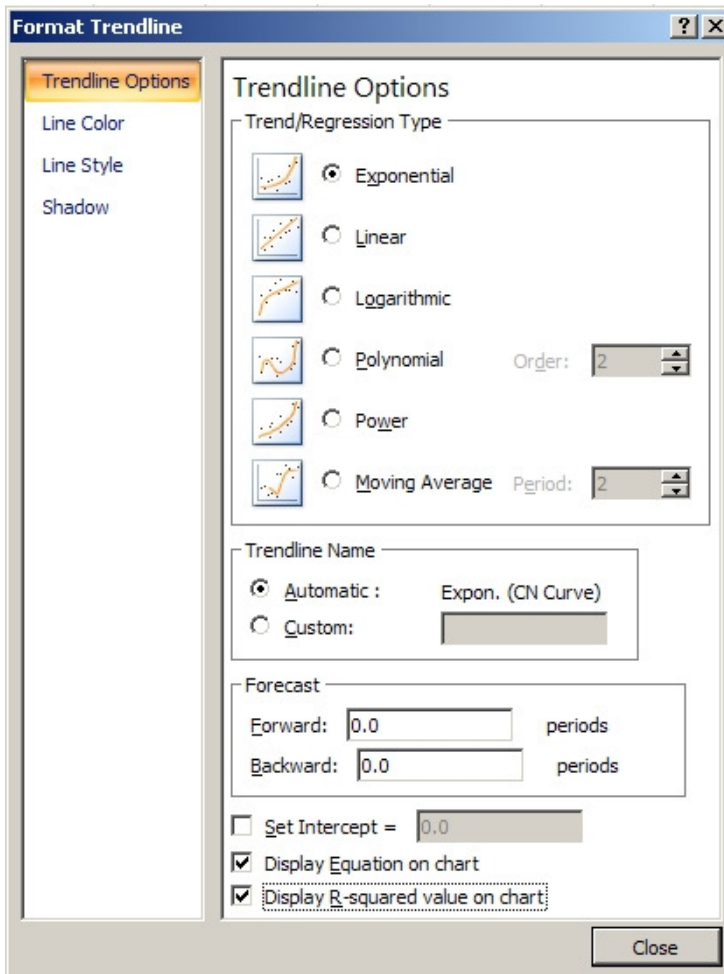## Step 2 - Adding a trend line

The "Trendline" function of EXCEL allows you to select the "best fit" curve to your actual data and provides the polynomial or exponential function that you need to program into the custom curve in Hammerlink. With the chart selected, click on "Trendline – More Trendline Options.."

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Format Trendline

Trendline Options

Trendline Options
Line Color
Line Style
Shadow

Trendline Options

Trend/Regression Type

- ○ Exponential
- ○ Linear
- ○ Logarithmic
- ○ Polynomial   Order: 2
- ○ Power
- ○ Moving Average   Period: 2

Trendline Name

- ⦿ Automatic :   Expon. (CN Curve)
- ○ Custom:

Forecast

Forward: 0.0   periods
Backward: 0.0   periods

- ☐ Set Intercept = 0.0
- ☑ Display Equation on chart
- ☑ Display R-squared value on chart

Close

Select the type of curve:
Exponential or 3rd order polynomial is recommended.

Make sure "Display Equation on chart" and "Display R-squared value on chart" are ticked.

Close the window.

The best fit curve will now be displayed on the chart.

The equation of the curve is displayed along with the coefficient of determination (R^2).

This provides the information you need to enter the curve into Hammerlink.

CN Curve

$$y = 4.1401e^{0.0442x}$$
$$R^2 = 0.7822$$

(Chart: X-axis labeled "Q" ranging 0.000 to 70.000; Y-axis labeled "Compressive Strength" ranging 0.0 to 80.0)

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