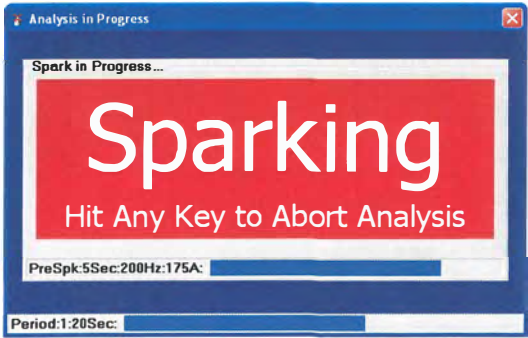




Argon flush period



Pre-spark period

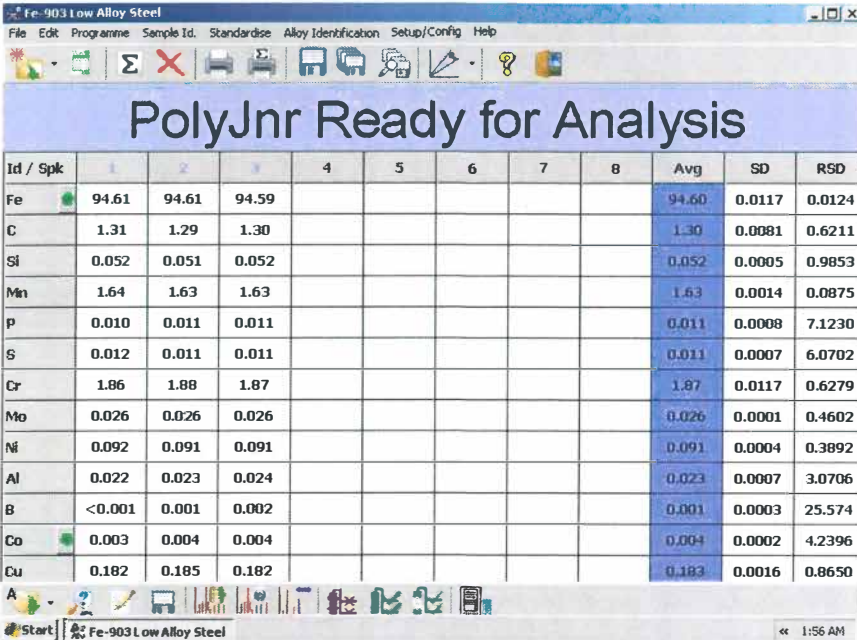


Exposure period

At the end of the exposure period the analysis will be displayed on the screen. A second measurement should always be taken to confirm the analysis of the sample under test. Ensure that the electrode is clean and that the new analysis is made on an un-sparked area of the sample. Following subsequent measurements statistical information will be displayed in the form of an average value with standard deviation and relative standard deviation if these have been set-up in the system configuration (see [section 3.2](#)). Additional measurements may be taken to provide further statistical results.

3.1 Working with results

At the end of the spark sequence the result will be shown in column 1 of the analytical screen display. A second result should be taken for confirmation of the result; this will then produce statistical information including Average, Standard deviation and Relative standard deviation as shown below.



Id / Spk	1	2	3	4	5	6	7	8	Avg	SD	RSD
Fe	94.61	94.61	94.59						94.60	0.0117	0.0124
C	1.31	1.29	1.30						1.30	0.0081	0.6211
Si	0.052	0.051	0.052						0.052	0.0005	0.9853
Mn	1.64	1.63	1.63						1.63	0.0014	0.0875
P	0.010	0.011	0.011						0.011	0.0008	7.1230
S	0.012	0.011	0.011						0.011	0.0007	6.0702
Cr	1.86	1.88	1.87						1.87	0.0117	0.6279
Mo	0.026	0.026	0.026						0.026	0.0001	0.4602
Ni	0.092	0.091	0.091						0.091	0.0004	0.3892
Al	0.022	0.023	0.024						0.023	0.0007	3.0706
B	<0.001	0.001	0.002						0.001	0.0003	25.574
Co	0.003	0.004	0.004						0.004	0.0002	4.2396
Cu	0.182	0.185	0.182						0.183	0.0016	0.8650

Further results may be taken as required. The individual results may be independently selected to perform several functions. To include specific results for averaging simply click the sample number at the top of the column for each result to be included in the averaging process.

File Edit Programme Sample File Data/Results Edit Identification Setup Profile Check Help

Storage Results

PolySpek Ready for Analysis

Id / Spk	1	2	3	4	5	6	7	8	9	10	Avg	SD	RSD
Fe	92.68	92.64	92.68								92.68	0.0017	0.0018
C	0.428	0.424	0.424								0.426	0.0025	0.5957
Si	1.11	1.10	1.11								1.11	0.0033	0.2989
Mn	0.415	0.421	0.417								0.416	0.0016	0.3904
P	0.073	0.074	0.073								0.073	0.0001	0.2004
S	0.045	0.045	0.044								0.044	0.0006	1.4232
Cr	1.70	1.73	1.70								1.70	0.0026	0.1541
Mo	0.426	0.438	0.426								0.426	0.0001	0.0336
Ni	1.99	1.99	2.00								1.99	0.0018	0.0912
Al	0.043	0.046	0.044								0.044	0.0008	1.9035
B	0.003	0.003	0.003								0.003	0.0001	2.1131
Co	0.028	0.027	0.027								0.027	0.0001	0.5107
Cu	0.445	0.443	0.444								0.444	0.0008	0.1746

Fig. F-1783 Low Alloy Steel - Std. Res. Sample Id. Spk. 1538 56.8

and click the Average Results button shown below



The selection of results may be changed and the average re-calculated without removing any of the other on-screen results.

Alternatively specific results may be deleted by selecting the result to be deleted and clicking on the Delete button shown below



The remaining results will be re-positioned and the averaging automatically recalculated on the screen.

3.2 Display options

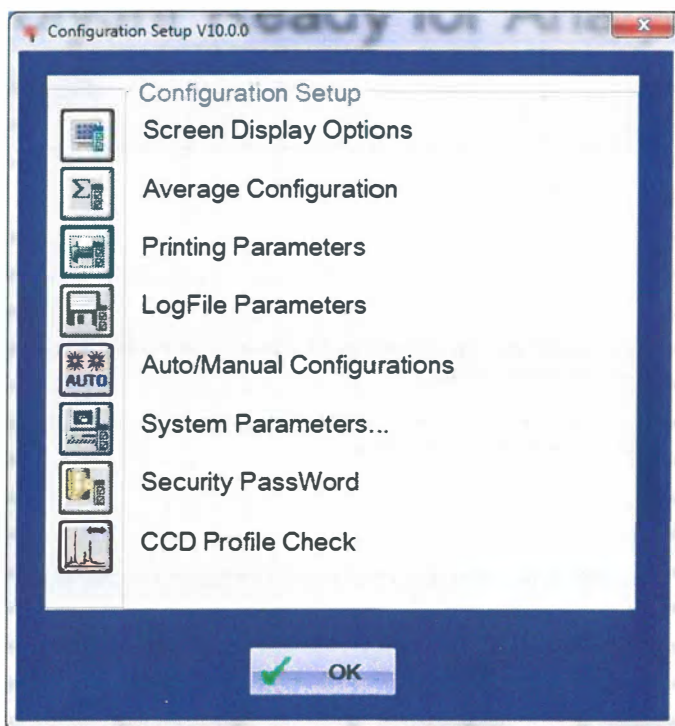
3.2.1 Results display options.

The analytical display may be modified to include or omit the columns displaying the Average **AVG**, Standard Deviation, **SD** and Relative standard deviation, **RSD**

To modify the display click on the System Set-up icon



The Configuration set-up screen will then be displayed.

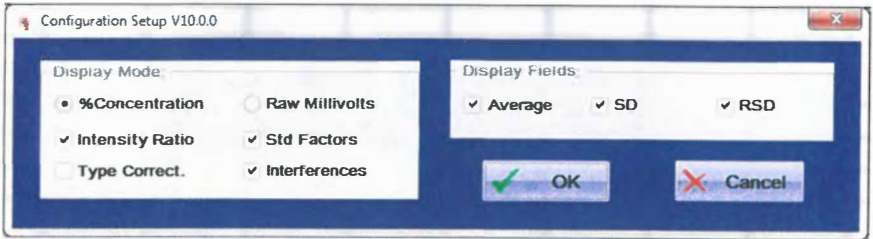


Click on 'Screen Display Options'

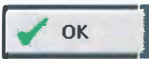
or

Press the 'F1' key on the keyboard.

The following Configuration Set-up screen will be displayed



Tick the check box for the desired screen display of Average, SD and RSD options followed by the OK button



Note: DO NOT change the Mode settings without prior knowledge of their use and subsequent implications!

3.2.2 Average configuration

If the screen display has been configured to automatically display the running average result, this will be displayed after a pre-set number of values. The default setting for this is after two results but the user may configure this.

To modify the number of results used to calculate the average value click on the System Set-up icon



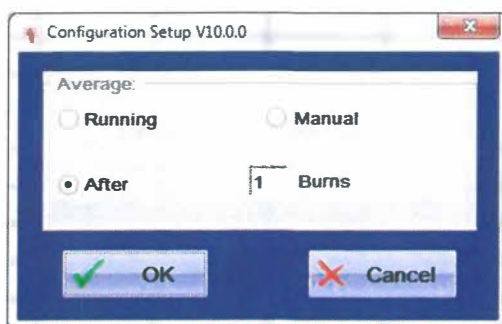
The Configuration set-up screen will then be displayed.

Click on 'Average Configuration'

or

Press the 'F2' key on the keyboard

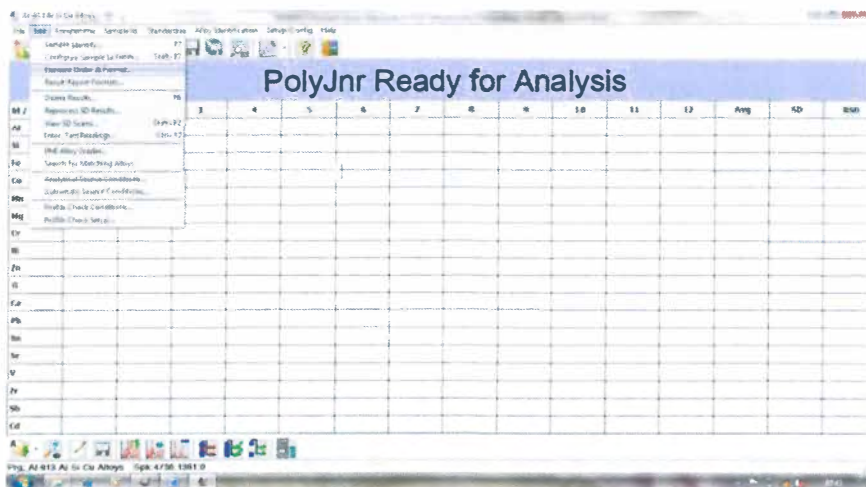
The following screen will be displayed



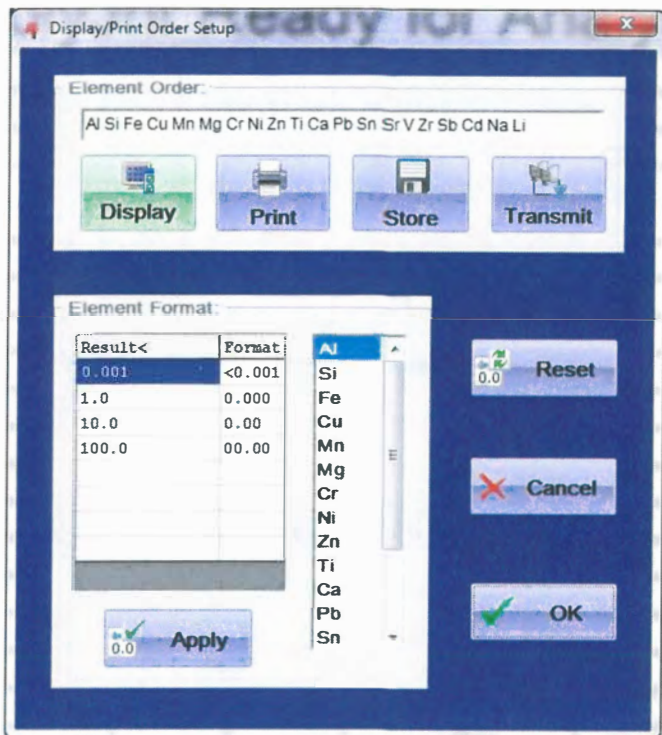
An automatic average result will be displayed after the pre-set number of burns or if the **Running Radio** button is checked. Alternatively the user can calculate the average manually if the **Manual Radio** button is checked. (See [section 3.1](#))

3.2.3 Element order and format

The elements included in the calibration are displayed in a pre-set factory sequence. This however may be modified to suit the user for several output methods including the on-screen display, the output to the printer, results storage and optional results transmission. To modify the element order for any of these output methods simple click on Edit from the drop down menu at the top of the screen followed by 'Element Order & Format' as shown below



The Display/Print Order Set-up screen will then be displayed as shown below



The default selection is for the on-screen display and the element order is shown at the top of the screen. To change the element order, simply edit the sequence ensuring the correct use of capital letters and a space input between elements. Although all of the elements will be included in the analytical calculation they do not have to be displayed or indeed printed, stored or transmitted. To modify the element order for these output modes simply click on the corresponding icon



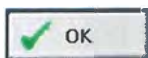
The element result format may also be configured so that the number of decimal places is automatically displayed dependent on the result value. In the example above for the element Al the display will show

- 0.000 for values <1%
- 0.000 for values >1% but <10%
- 00.00 for values >10% but <100%

The values may be edited and saved by clicking on the **Apply** icon



When the configuration is complete click on the OK button to confirm the changes.



3.3 Printing results

The on-screen results may be printed either manually or automatically (see [section 6.4](#) System Configuration for details).

To print specific results from the on-screen display click on the columns that are to be included in the print out

El / Spk	1	2	3	4	5	6	7	8	9	10	11	12	Avg	SD	RSD
Al	97.52	87.28											92.30	0.0224	0.0257
Si	9.59	9.64											9.62	0.0339	0.3528
Fe	0.195	0.195											0.195	0.0001	0.0576
Cu	0.882	0.876											0.879	0.0040	0.4567
Mn	0.097	0.099											0.098	0.0016	1.6721
Mg	0.781	0.784											0.782	0.0019	0.2404
Cr	0.018	0.019											0.019	0.0001	1.7529
Ni	0.769	0.769											0.769	0.0002	0.0257
Zn	0.052	0.051											0.052	0.0001	0.5794
Ti	0.037	0.038											0.038	0.0005	1.2829
Ca	0.004	0.004											0.004	0.0000	0.2240
Pb	0.034	0.027											0.030	0.0049	16.418
Sn	0.008	<0.001											0.004	0.0005	141.42
Sr	0.057	0.055											0.056	0.0008	1.5133
V	0.005	0.005											0.005	0.0001	2.4077
Zr	<0.001	<0.001											<0.001	0.0000	0

In the example above the highlighted columns 1, 2 and Avg have been selected.

Click on the Print Results icon



Alternatively if the average result is to be printed simply click on the Print Average icon.



This may also be configured to include the results or statistical values. (See [section 6.4](#) System Configuration)

3.4 Storing results

The on-screen results may be stored either manually or automatically (see [section 6.6](#) System Configuration for details).

The results will be stored as a CSV (comma separated value) file and may be retrieved using the A-PLUS software or exported to be used in another third party software program such as Microsoft Excel or any other spread sheet or database software that accepts CSV file import. The stored fields include the analytical results and those used in the sample identity. The sample identity is also user configurable (see [section 6.1](#) System Configuration).

To store specific results from the on-screen display click on the columns that are to be included and click the Save Results icon.



The results will be saved to a pre-determined destination (see [section 6.6](#) System Configuration for details).

Alternatively all of the on-screen results may be stored by clicking on the Save All Results icon

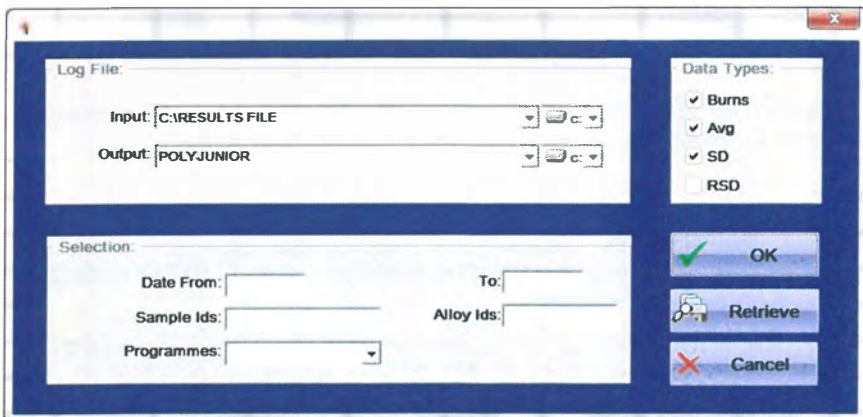


3.5 Retrieving results

The stored results may be retrieved on-screen at any time by clicking on the Retrieve Results icon



This will then display the 'Retrieve Logged Results' screen as shown below

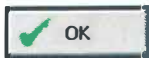


The Log File window is a dialog box with a blue border. It contains the following sections:

- Log File:**
 - Input:** A text box containing 'C:\RESULTS FILE' with a file explorer icon and a drive dropdown set to 'C:'.
 - Output:** A text box containing 'POLYJUNIOR' with a file explorer icon and a drive dropdown set to 'C:'.
- Selection:**
 - Date From:** and **To:** empty text boxes.
 - Sample Ids:** and **Alloy Ids:** empty text boxes.
 - Programmes:** a dropdown menu.
- Data Types:**
 - ☒ Burns
 - ☒ Avg
 - ☒ SD
 - ☐ RSD
- Buttons:**
 - OK:** A button with a green checkmark icon.
 - Retrieve:** A button with a magnifying glass icon.
 - Cancel:** A button with a red X icon.

The Log File window displays the Input location for the stored results, (this normally corresponds to the location set-up in System Configuration in section 6).

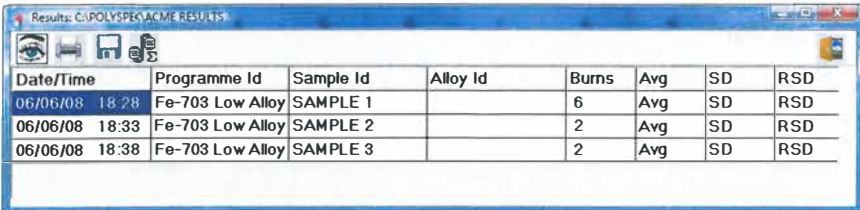
If the retrieved results are to be viewed in the A-PLUS software the output should be as above. The results can be filtered using the Selection criteria. This includes 'From' and 'To' dates, specific sample identity, alloy specifications or calibration programs from a drop down list. The output data can be further filtered using the Data Types check boxes. The selections may be saved at this time by clicking on the OK button



or retrieved by clicking on the Retrieve button



In the example below the Fe-703 Low alloy steel program has been selected as the filter for the retrieved results and will result in the following output.



The Results window shows a table of retrieved data. The title bar reads 'Results: C:\POLYSPEK\ACME RESULTS'.

Date/Time	Programme Id	Sample Id	Alloy Id	Burns	Avg	SD	RSD
06/06/08 18:28	Fe-703 Low Alloy	SAMPLE 1		6	Avg	SD	RSD
06/06/08 18:33	Fe-703 Low Alloy	SAMPLE 2		2	Avg	SD	RSD
06/06/08 18:38	Fe-703 Low Alloy	SAMPLE 3		2	Avg	SD	RSD

The results can be viewed, printed, saved to an alternative destination or transmitted.

Click on the result to be included and click on the respective icon.

Show/View



Print



Save



Transmit



The Show/View result selection will display the analytical results selected

PolyJnr Ready for Analysis

Date/Time	Programme Id	Sample Id	Alloy Id	Burns	Avg	SD	RSD
11/05/11 08:14	AI 913 AI Si Cu	AM9101		2	Avg	SD	
12/02/11 08:54	AI 913 AI Si Cu	AM9102		2	Avg	SD	
12/02/11 08:55	AI 913 AI Si Cu	AM9100		2	Avg	SD	

Id/Spk	1	2	3	4	5	6	Avg	SD	RSD
Al	87.32	87.28					87.30	0.0224	
Si	9.59	9.64					9.62	0.0339	
Fe	0.195	0.195					0.195	0.0081	
Cu	0.892	0.876					0.879	0.0040	
Mn	0.097	0.099					0.099	0.0016	
Mg	0.781	0.784					0.782	0.0019	
Pb	0.018	0.019					0.019	0.0003	
Sn	0.769	0.769					0.769	0.0002	
Sr	0.052	0.051					0.052	0.0003	
Ti	0.037	0.038					0.038	0.0006	
Ca	0.004	0.004					0.004	0.0000	
Pb	0.036	0.037					0.037	0.0003	

If multiple results are selected to view these can be displayed using the forward and reverse arrows to step through the results.



When the results retrieval is complete simply click on the Exit icon to return to the previous screen.



3.6 Pseudo and calculated elements and values

Not all channels displayed with the analytical result have to be specific wavelengths and the option exists to create calculated elements.

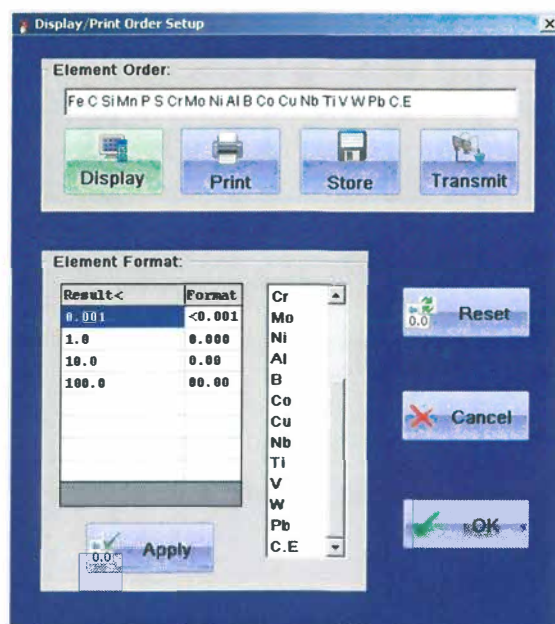
Calculated elements can be used to automatically output values calculated from the analytical result. Typically calculations such as the carbon equivalence value can be displayed or perhaps the product of elements considered to be traces in a sample that must be controlled or checked.

The calculated element can be identified by a 3 character alphanumeric name. The calculation is entered using conventional mathematical operators such as +, -, * and / and appropriate parentheses. In the example below the calculated element is for the carbon equivalence figure often used by foundries.

The mathematical expression for C.E varies slightly from foundry to foundry, and the following example shows just one relationship. The calculation has been entered as $C.E = C + (Si + P)/3$

Note: This can only be performed by trained engineers. Please contact your ARUN Technology representative for support with this topic.

The added pseudo element should now be displayed in the analytical program element list



The analysis will now automatically calculate the C.E 'Carbon equivalence' pseudo element as shown below from the results of the sample under test.

Fe-903 Low Alloy Steel

File Edit Programme Sample Id. Standardise Alloy Identification Setup/Config Help

PolyJnr Ready for Analysis

Id / Spk	1	2	3	4	5	6	7	8	Avg	SD	RSD
Cr	1.87	1.89	1.88						1.88	0.0115	0.6140
Mn	0.026	0.027	0.026						0.026	0.0007	2.5584
Ni	0.092	0.091	0.091						0.091	0.0004	0.3892
Al	0.022	0.024	0.023						0.023	0.0007	3.0706
B	<0.001	0.001	0.001						0.001	0.0001	8.3240
Co	0.003	0.004	0.004						0.004	0.0002	4.2396
Cu	0.182	0.182	0.185						0.183	0.0016	0.8650
Nb	0.079	0.082	0.079						0.080	0.0016	2.0506
Ti	<0.001	<0.001	<0.001						<0.001	0.0002	40.614
V	0.011	0.012	0.012						0.012	0.0008	6.7691
W	<0.001	<0.001	<0.001						<0.001	0.0000	0
Pb	<0.001	<0.001	<0.001						<0.001	0.0000	0
C.E	0.133	0.136	0.131						0.134	0.0024	1.7952

Prg: Fe-903 Low Alloy Steel Spk:4472:2878:95

Another example of calculated values would be the sum of trace elements and this calculated element could then be used as part of an alloy specification. The calculated element must be added to the analytical calibration program data.

4 Standardisation

The instrument will require standardising to ensure the analytical performance of the PolySpek Jnr is maintained. Each calibration is supplied with the relevant Setting-Up Samples (SUS) for standardisation.

Restandardisation is a simple procedure

- Select the analytical program
- Select Standardisation from the drop-down menu or click on the standardisation icon



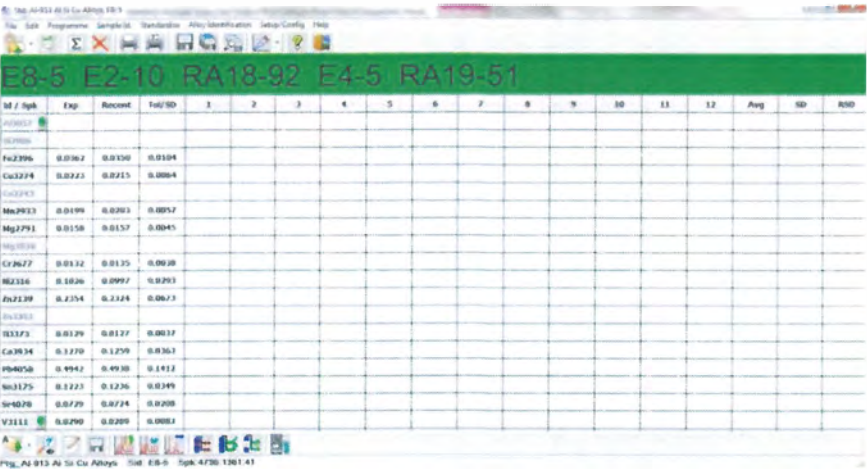
- Spark the SUS in the sequence displayed at the top of the screen at least 3 times or as many as necessary to obtain reproducible factors. These values are not concentrations but are ratios and only those shown in bold are actually included in the standardisation. Results may be averaged or deleted as in analysis to provide the final result.
- If the results are reproducible click on the SUS name
- The next SUS to be sparked is displayed
- Repeat until all of the SUS have been sparked.

After clicking on the last SUS name the new standardisation factors are displayed along with any warnings. The cause of warnings at this stage may be indicative of poor burns or the use of an incorrect SUS. If the element is a trace element that is not relevant to the particular analysis the value can be accepted otherwise appropriate action should be taken if warnings are displayed and the procedure repeated.

The screen shots overleaf show the initial and final Standardisation-screens.

Note: During standardisation of the PolySpek Jnr both high and low points on the calibration curves are adjusted. It is however possible to standardise single high or low points on the instrument but is not recommended.

The required SUS samples are listed at the top of the screen. These should be prepared using the appropriate sample preparation method just before the standardisation procedure.



The screenshot displays the PolySpek Jnr software interface. At the top, a green header bar contains the text "E8-5 E2-10 RA18-92 E4-5 RA19-51". Below this, a table lists various elements and their concentrations. The table has columns for "El / Spk", "Exp", "Recent", "Total SD", and then columns for elements 1 through 12, followed by "Avg", "SD", and "RSD". The elements listed in the first column are: Fe2396, Cu3274, Cu3293, Mn2923, Mg2791, Mg3036, Cr2677, Ni2356, Pb2139, Ba3353, U3373, Co3934, Pb405b, Ni3175, Sr4070, and V2111. The values in the "Recent" column are: 0.0362, 0.0223, 0.0199, 0.0158, 0.0132, 0.1026, 0.2354, 0.0129, 0.1270, 0.4942, 0.1223, 0.0779, 0.0290, 0.0104, 0.0064, 0.0057, 0.0045, 0.0030, 0.0203, 0.0673, 0.0037, 0.0363, 0.1812, 0.0349, 0.0208, and 0.0083.

El / Spk	Exp	Recent	Total SD	1	2	3	4	5	6	7	8	9	10	11	12	Avg	SD	RSD
Fe2396		0.0362	0.0350	0.0104														
Cu3274		0.0223	0.0215	0.0064														
Cu3293																		
Mn2923		0.0199	0.0203	0.0057														
Mg2791		0.0158	0.0157	0.0045														
Mg3036																		
Cr2677		0.0132	0.0135	0.0030														
Ni2356		0.1026	0.0997	0.0203														
Pb2139		0.2354	0.2324	0.0673														
Ba3353																		
U3373		0.0129	0.0127	0.0037														
Co3934		0.1270	0.1259	0.0363														
Pb405b		0.4942	0.4930	0.1812														
Ni3175		0.1223	0.1236	0.0349														
Sr4070		0.0779	0.0774	0.0208														
V2111		0.0290	0.0289	0.0083														

Note: Sparking SUS that have not been freshly prepared may cause some variance in the expected values and consequently incorrect analysis, particularly when standardising Aluminium and Magnesium based alloys. This is due to the natural oxidation of the sample surface.

When the final sample has been sparked, all of the new standardisation factors are displayed. The screen shows the expected and obtained values for both the high and low points for each calibration curve in the analytical program. The old factors are also displayed to show the variance from the previous standardisation.

Element	Exp	Old	Exp	Old	Bar	Old	High	Old
Fe	0.2667	0.2622	0.2674	0.2729	1.0237	0.9917	1.0237	0.9917
Fe2706	0.0076	0.0084	0.0087	0.0091	1.0017	1.0013	1.0017	0.9911
Cu2724	0.4774	0.4715	0.4723	0.4715	1.0016	0.9998	1.0016	0.9998
Cu2743	1.4407	1.4640	0.3940	0.3815	0.9917	0.9114	0.9917	0.9114
Mn2702	0.5893	0.5864	0.5930	0.5935	1.0017	0.9998	1.0017	0.9998
Mg2707	0.2781	0.2754	0.2750	0.2752	1.0016	0.9998	1.0016	0.9998
Mg2730	0.9909	0.3073	0.1816	0.1804	1.0017	0.9997	1.0017	0.9997
Co2727	0.1707	0.1791	0.1932	0.1935	1.0017	0.9993	1.0017	0.9993
Ni2716	1.1429	1.1220	0.1876	0.1897	0.9998	0.9998	0.9998	0.9998
Zn2735	0.0751	0.0811	0.2754	0.2729	1.0167	0.9998	1.0167	0.9998
Zn2760	0.1450	0.1706	0.0467	0.0476	0.9995	0.9911	0.9995	0.9911
11217	0.1724	0.1702	0.1929	0.1922	1.0171	0.9998	1.0171	0.9998
Ca2734	0.4634	0.4536	0.4229	0.4220	1.0266	0.9917	1.0266	0.9911
Pb2708	0.9617	0.9461	0.4947	0.4928	1.0246	0.9167	1.0246	0.9167
Sn2725	0.5090	0.5095	0.1273	0.1276	1.0174	0.9998	1.0174	0.9998
Al2705	1.0115	1.0014	0.0729	0.0704	1.0295	0.9913	1.0295	0.9913
V2711	0.1700	0.1703	0.0790	0.0795	1.0147	0.9994	1.0147	0.9994
Zr2702	1.4781	0.4716	0.1220	0.1207	1.0160	0.9998	1.0160	0.9998
102708	2.7360	0.2829	1.7900	1.7900	1.0017	0.9167	1.0017	0.9167
170708	0.1013	0.1013	0.1013	0.1013	0.9918	0.9167	0.9918	0.9167

Click on any key to return to the analytical screen.

The instrument is ready for analysis!

4.1 Replacing setting up samples

The setting up samples supplied will over time be consumed through sample face preparation. Before the sample is too thin or beyond its useful life to use for the restandardisation procedure, a replacement should be ordered. The most common scenario is that the replacement SUS is from a new sample batch. For example setting up sample E2/9 will be replaced by E2/10. The elements and concentrations will be almost the same but not exactly so the standardisation factors will need to be modified accordingly to correct for the differences. This can be done using the **'Replace SUS sample....'** Procedure as described below.

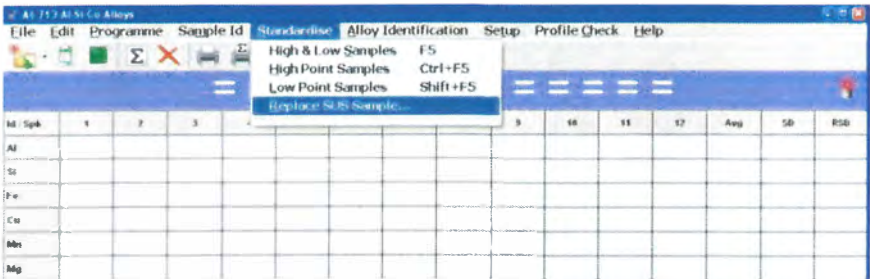
From the drop down menu click on

'Standardise'

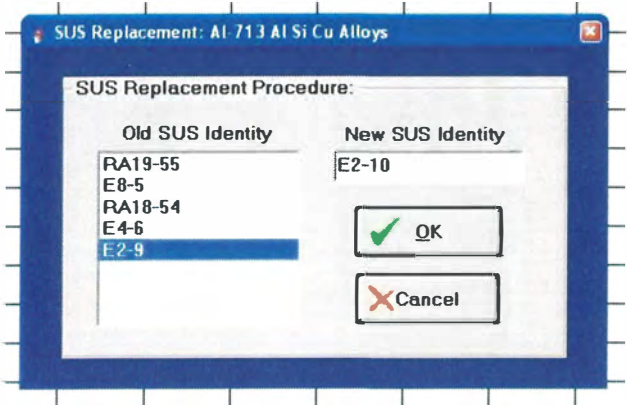
And then

'Replace SUS sample....'

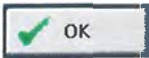
As shown below



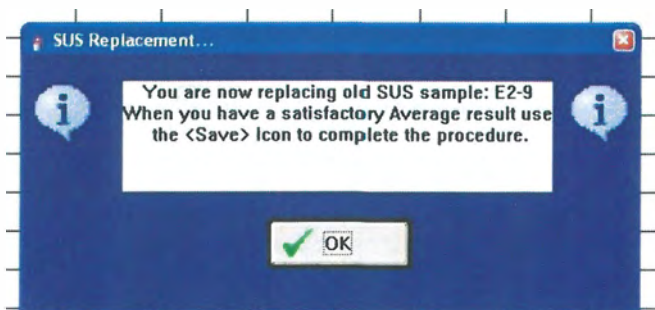
The SUS replacement procedure will list all of the current SUS samples used in the selected calibration program. Click on the SUS identity of the sample to be replaced under the 'Old SUS Identity' heading.



And click



A confirmation dialogue box will then be displayed confirming the identity of the SUS sample to be replaced.



The screen will then display the sample to be run. The replacement SUS sample should be parked a minimum of 3 times or as many times as required to give a reproducible result. The values shown will be intensities for the base element, in this case Aluminium and intensity ratios for the other elements.

Al 713 Al Ni Cu Alloys 12.9.12.10

File Edit Programme Sample Id Standardise Alloy Identification Setup Profile Check Help

Store/Replace SUS: E2-9

Ready

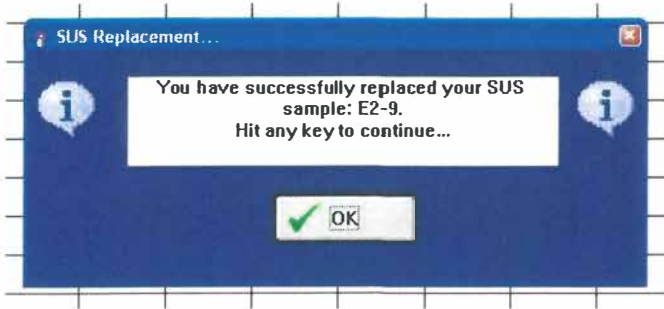
Id	Spk	1	2	3	4	5	6	7	8	9	10	11	12	Avg	SD	RSD
Al9999	25673	74491	75711	78564										25119	672.89	2.6738
Al2652	70536	76199	75594	75853										76047	1245.3	1.6362
Al3585	48773	47951	46867	46657										47784	398.47	2.6538
Si2842	9.3432	6.3424	6.3484	6.3488										6.3461	0.0022	0.6367
Si3966	0.8788	0.8711	0.8776	0.8733										0.8755	0.0008	0.1193
Fe2262	0.9773	0.9887	0.9758	0.9783										0.9782	0.0014	0.9761
Cu3274	0.1855	0.1889	0.1879	0.1885										0.1877	0.0015	0.8008
Cu2961	0.0068	0.0076	0.0078	0.0077										0.0074	0.0004	5.8717
Mn2933	0.1247	0.1274	0.1256	0.1262										0.1260	0.0011	0.8758
Mg2791	0.2483	0.2581	0.2583	0.2486										0.2487	0.0007	0.7718
Cr2677	0.0621	0.0627	0.0618	0.0618										0.0620	0.0002	0.3691
Mo2366	0.1267	0.1278	0.1273	0.1268										0.1272	0.0005	0.8800
Zn2345	0.0956	0.0966	0.0958	0.0961										0.0960	0.0004	2.6791
Ti3373	0.1665	0.1698	0.1685	0.1675										0.1681	0.0014	0.8376
Ca3934	0.7429	0.7739	0.7318	0.7433										0.7218	0.0053	5.2947
Pb4058	0.0536	0.0577	0.0549	0.0571										0.0534	0.0010	1.8683
Sn3175	0.0278	0.0286	0.0290	0.0286										0.0285	0.0005	1.7199
Se4078	3.7627	3.8175	3.8008	3.7598										3.7961	0.0005	1.8627
V3111	0.0949	0.0957	0.0954	0.0957										0.0951	0.0004	0.3774
Zr2182	0.0439	0.0427	0.0474	0.0434										0.0432	0.0005	2.6355
Sn2948	0.5374	0.5695	0.5833	0.5587										0.5502	0.0147	2.6887

Prog: Al 713 Al Ni Cu Alloy Std: E2-9 F2-10 Spk: 182 154 26

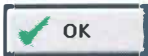
Click on the Store/Replace SUS icon



The average result will be stored for the sample and the intensity ratio values used to update the standardisation factors for the sample being replaced. A screen confirming the successful replacement of the setting up sample will be displayed.



Click on



to complete the procedure

Where the sample is to be replaced by a completely different setting up sample you should contact your after sales service for support.

5 Working with alloys

5.1 Alloy data input

The A-PLUS software offers an array of features for working with alloys, the icons of which can be seen at the lower left-hand side of the analytical screen as shown below.



The input of alloy specifications can be requested with the instrument order or the user can input alloy information into the alloy library at any stage very quickly and simply.

Load the respective calibration for the alloy and then click in the Enter/Edit Alloy icon



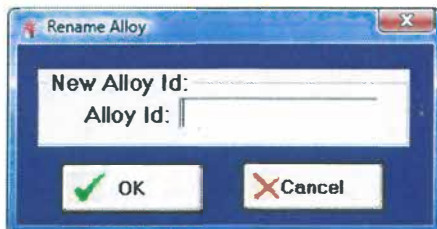
The following screen will be displayed



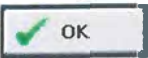
click on the New Alloy icon



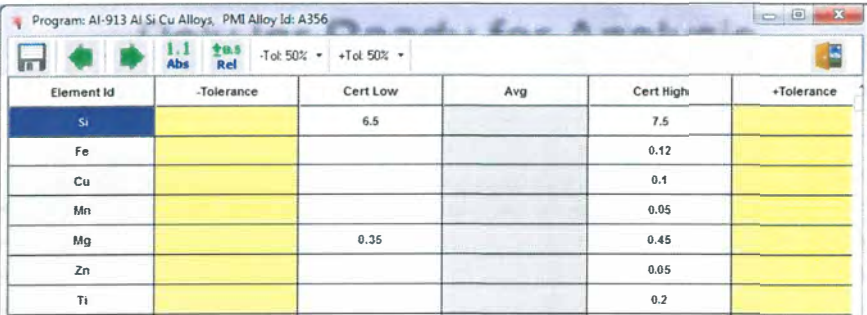
The following screen will be displayed



Enter the alloy identity e.g. A356 and click on the OK button



The alloy entry screen will appear and the user can input the alloys specification data. The first column is for the elements to be included. The upper and lower limits of the specification are then entered in the 'Cert High' and 'Cert Low' columns. The user may also enter a $\pm$ tolerance value if desired. The alloy check will be performed against the tolerance column values unless these are left blank. Entries into the tolerance columns may be absolute, relative or percentage values.

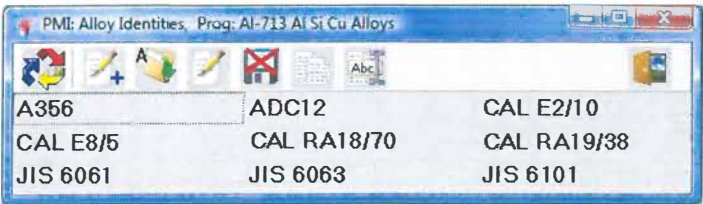


Element Id	-Tolerance	Cert Low	Avg	Cert High	+Tolerance
Si		6.5		7.5	
Fe				0.12	
Cu				0.1	
Mn				0.05	
Mg		0.35		0.45	
Zn				0.05	
Ti				0.2	

Click on the 'Save' icon to store the alloy into the alloy library.



The alloy is then displayed in the alloy library as shown below.



A356	ADC12	CAL E2/10
CAL E8/5	CAL RA18/70	CAL RA19/38
JIS 6061	JIS 6063	JIS 6101

Further alloy data may be entered or edited at this stage. If alloys are similar then the

Copy Edit



Rename



features may be used to simplify this process.

5.2 Using the Alloy library

The alloy library can be used to search for matching alloy specifications of the on-screen analysis or alternatively a specific alloy can be loaded for confirmation of agreement during analysis.

5.2.1 Alloy library search feature

Where the sample under test is unknown, the current average of the on-screen analysis may be checked against all alloy specifications in the alloy library to find any matching specifications.

Click on the Search Alloys icon



The on-screen average result will then be compared against all of the alloy specifications in the alloy library. If a match is found then the alloy identity will be displayed at the top of the screen as shown below.

File Edit Programs Samples Standards Auto Identification Setup/Config Help



A356

Id / Spk	1	2	3	4	5	6	7	8	9	10	11	12	Avg	SD	RSD
Al	93.32	93.13											93.23	0.00127	0.0029
Si	6.65	6.66											6.66	0.0071	0.1063
Fe	0.072	0.073											0.073	0.0009	1.2216
Cu	0.009	0.008											0.009	0.0007	0.7990
Mn	0.041	0.042											0.042	0.0007	1.7039
Mg	0.392	0.398											0.395	0.0045	1.1290
Cr	0.001	0.001											0.001	0.0000	1.1476
Ni	0.016	0.015											0.016	0.0010	6.5813
Zn	0.048	0.048											0.048	0.0005	1.0718
Ti	0.019	0.020											0.019	0.0003	1.6251
Ca	<0.001	<0.001											<0.001	0.0000	0.2033
Pb	0.041	0.034											0.039	0.0061	15.888
Se	<0.001	<0.001											<0.001	0.0000	0
Sr	<0.001	<0.001											<0.001	0.0001	22.010
V	0.003	0.002											0.002	0.0005	20.117
Zr	0.003	0.003											0.003	0.0003	12.164



File_A356 Al Si Cu Alloys Chk: A356 Spk: 478 1361 0

If the analysis is found to match more than one alloy specification then all matching specifications will also be displayed.

IF NO MATCHING SPECIFICATIONS ARE FOUND THEN THE FOLLOWING SCREEN WILL BE DISPLAYED

No Matching Alloys

Id / Spk	1	2	3	4	5	6	7	8	9	10	Avg	SD	RSD
Al	91.41	91.40									91.40	0.0072	0.0079
Si	6.89	6.89									6.89	0.0016	0.0228
Fe	0.203	0.206									0.204	0.0013	0.6424
Cu	0.014	0.014									0.014	0.0000	0.0324
Mn	0.306	0.307									0.307	0.0008	0.2704
Mg	0.611	0.614									0.612	0.0021	0.3462
Cr	<0.001	<0.001									<0.001	0.0000	0.6415
Ni	0.004	0.004									0.004	0.0000	0.5350
Zn	0.145	0.146									0.146	0.0009	0.6495
Ti	0.109	0.110									0.109	0.0004	0.3997
Ca	<0.001	<0.001									<0.001	0.0000	1.1085

5.2.2 Working with Alloy specifications

For the user who is melting metal the analysis of the PolySpek Jnr will need to be checked against particular alloy specifications. The specification can be loaded into the analytical program and the average result of all subsequent analyses performed on the sample under test will be compared to the specification.

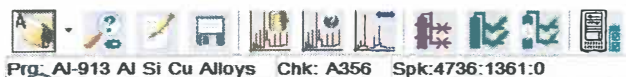
To work with a specific alloy click on the Load Check Alloys icon



The alloy library will then be displayed, click on the alloy identity to work with and then click on the Load Alloy icon



The analytical screen will then be displayed and the alloy identity selected will be displayed against the 'Chk:' label at the bottom of the screen as shown below



In this example the alloy identity is A356

If the average result of the sample under test matches the alloy specification then the alloy identity will be displayed in green at the top of the screen as confirmation of a correct match.

If however the average result does not match the alloy specification the alloy identity will be displayed at the top of the screen in red. Those elements with a value outside of the specification limits will also be highlighted in red in the average column as shown below.

File Edit Properties Sample Alls Identification Setup Config Help

A356

Id / Spk	1	2	3	4	5	6	7	8	9	10	11	12	Avg	SD	RSD
Al	93.32	93.33											93.33	0.0027	0.0029
Si	5.65	5.66											5.66	0.0054	0.0951
Fe	0.022	0.023											0.023	0.0009	1.2216
Cu	0.106	0.107											0.106	0.0005	0.4686
Mn	0.001	0.002											0.001	0.0004	0.4818
Mg	0.392	0.398											0.395	0.0045	1.1390
Cr	0.001	0.001											0.001	0.0000	1.1476
Ni	0.016	0.015											0.016	0.0010	6.5813
Zn	0.048	0.048											0.048	0.0005	1.0718
Ti	0.019	0.020											0.019	0.0003	1.6251
Ca	<0.001	<0.001											<0.001	0.0000	0.2833
Pb	0.043	0.034											0.039	0.0061	15.888
Sb	<0.001	<0.001											<0.001	0.0000	0
Sr	<0.001	<0.001											<0.001	0.0001	27.010
V	0.003	0.002											0.002	0.0005	20.117
Zr	0.003	0.003											0.003	0.0003	12.164

Poly. A1 913 A1 Si Cu Alloy. Cht: A356 Spk: 4758 1301 0

In this example the average result of the sample under test does not match the A356 alloy specification. The average result highlights that the Si, Cu and Mn values are outside the specification limits

The average result may be viewed against the specification upper and lower limits to see why the sample has failed. To view the alloy specification click on the alloy identity highlighted in red at the top of the screen. The average result will then be displayed along with the specification data as shown below.

A356					
El / Sign	Tolerance	Cent Low	Avg	Cent High	+Tolerance
Al			93.37		
Si		0.50	0.002	7.50	
Fe			0.002	0.12	
Cu			0.11	0.10	
Mn			0.005	0.005	
Mg		0.35	0.40	0.45	
Cr			0.001		
Ni			0.005		
Zn			0.005	0.050	
Ti			0.010	0.20	
Ca			<0.001		
Pb			0.005		
Sb			<0.001		
Se			<0.001		
V			0.002		
Zr			0.002		
Bi			0.12		
Co			<0.001		

It can be seen from this that the Si value is too low and the Cu & Mn values are too high to meet the A356 specification limits.

To return to the analytical screen click on the alloy identity at the top of the screen highlighted in red.

6 System configuration

The A-PLUS software for the PolySpek Jnr is highly configurable to meet the user's specific requirements. The PolySpek Jnr will be installed with a number of default parameters during the installation of the instrument at the customer site. However since each customer is an individual, the software has been designed to offer simple 'user system configuration' set-up.

For example some of the system configuration options include: -

- Sample identification options
- Analytical screen display options
- Printing options
- Results storage and retrieval options
- System parameters
- Passwords

6.1 Sample identity

A pre-requisite for many users is the ability to identify the sample under test to enable complete traceability as required by international production standards. The information required to identify the sample will vary from user to user and therefore the sample identity input is configurable to suit the individual needs of the user. To change the default sample identity fields click on the Sample Identity icon



This will display the Sample Identity... screen as shown below.

A screenshot of the 'Sample Identity...' dialog box. The dialog has a blue border and a white background. It contains the following fields: 'Sample Identity:', 'Customer Id:', 'Comment:', 'SerialNo:', and 'Type:' (which is a dropdown menu). At the bottom, there are five buttons: 'OK' (with a green checkmark), 'New' (with a red 'X' and a document icon), 'Config' (with a document icon), 'Clear' (with a trash can icon), and 'Cancel' (with a red 'X').

Sample Identity Configuration:

Sample Identity:

Customer Id:

Comment:

SerialNo:

Type:

OK New Config Clear Cancel

The typical fields may include

- Sample Identity:
- Customer Id:
- Comment:
- Serial No:
- Type:

To modify the default setting click on the Config button



The 'Sample Identity Scheme' window is displayed allowing the custom configuration of 7 data fields F(0-7).

A screenshot of a software window titled "Sample Identity Scheme". Inside the window, there is a section titled "Sample Identity Configuration:". Below this title is a table with three columns: "Title / F(0-7) Prompt Text", "Min", and "Max". The table contains several rows for configuring data fields. The first row is highlighted with a blue selection bar and contains the text "Sample Identity" in the first column, and "0" and "20" in the "Min" and "Max" columns respectively. The second row contains "Sample Identity", "0", and "20". The third row contains "Customer Id", "0", and "20". The fourth row contains "Comment", "0", and "20". The fifth row contains "SerialNo", "0", and "12". The sixth row is empty. The seventh row is empty. The eighth row contains "Type", "0", and "20". At the bottom of the window, there are three buttons: "OK" with a green checkmark icon, "Clear" with an eraser icon, and "Cancel" with a red X icon.

The user can enter the field name followed by the field size. If the field size has a minimum value entered then this field must have a value when entering the sample identification in the analysis mode. A maximum field size of 20 characters is recommended. The Last field titled "Type" is reserved for use with Type Standardisation. All of the entered fields will be

saved with the analytical result as part of the CSV data file and it is recommended to create a new log file after modifications to the Sample Identity Scheme are completed.

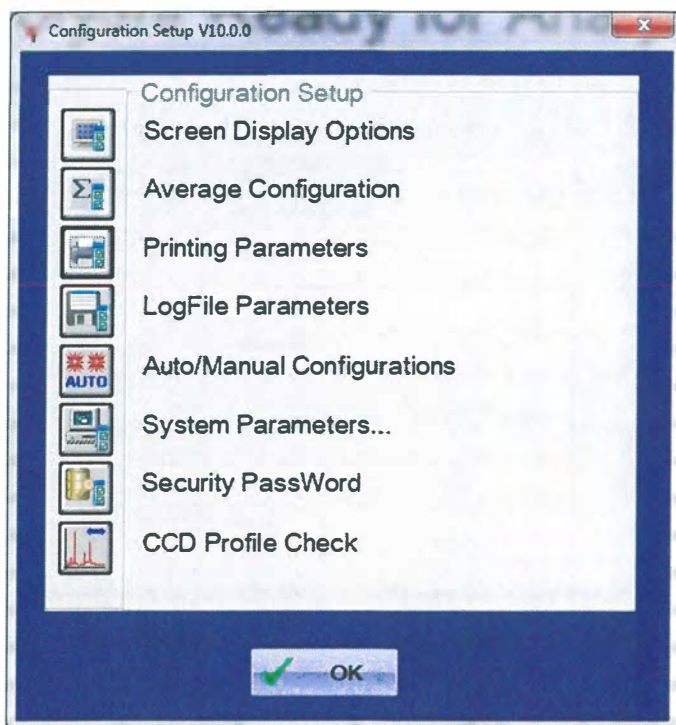
Note: **Do not** use any commas in the sample identity as this will upset the CSV files!

Many of the other more general configuration options are grouped together under the PolySpek Jnr Configuration Set-up.

To change the system configuration click on the System Set-up icon

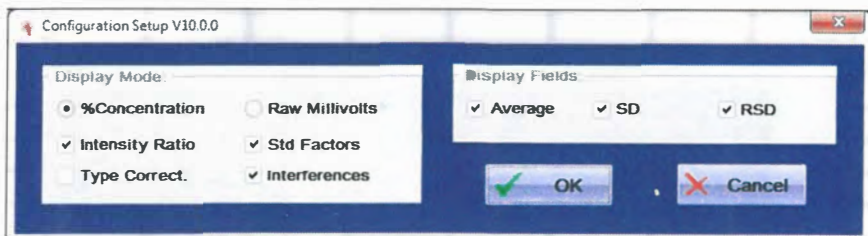


This will display the System Configuration-screen



Clicking on the respective icon will display the relevant configuration-screen

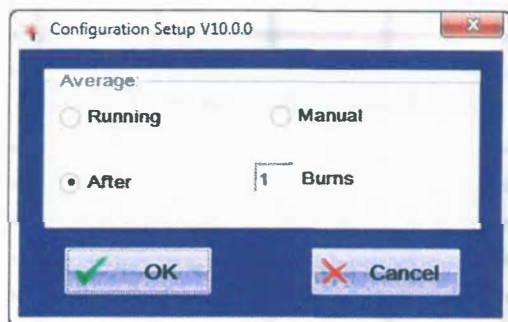
6.2 Screen display options



Note: The Mode options should **NOT** be changed without prior knowledge.

The screen display configuration includes the options to display the Average, Standard deviation and Relative standard deviation for the analytical result (see [section 3.2.1](#) Results display options for more details).

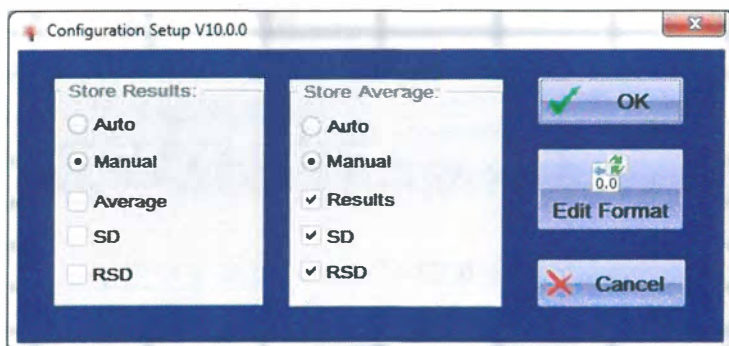
6.3 Average Configuration



An automatic average result will be displayed after the pre-set number of runs or if the Running Radio button is checked. Alternatively the user can calculate the average manually if the Manual Radio button is checked (See [section 3.1](#)).

6.4 Printing Parameters

The user can set a number of printing parameter options to achieve the desired output to the printer.



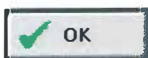
Radio buttons are used to select Automatic or Manual options and check boxes are used to select those values to include in the print out. Options under the Print Results heading relate to the Print Results icon



and those under the Print Average heading relate to the Print Average icon

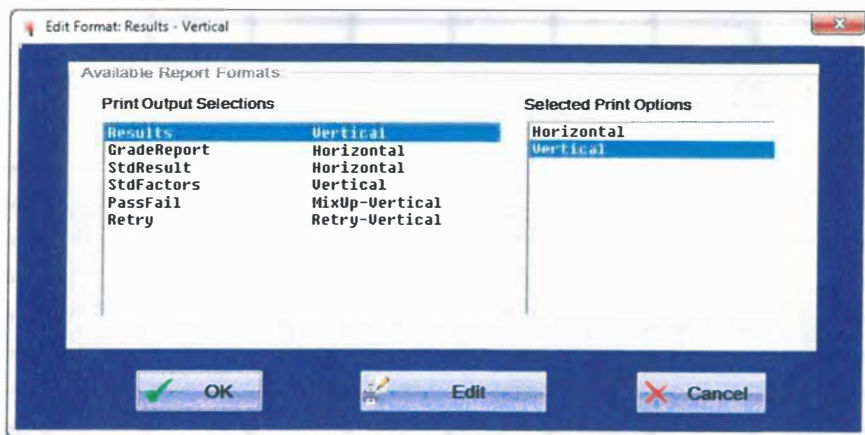


When the configuration is complete click on the OK button

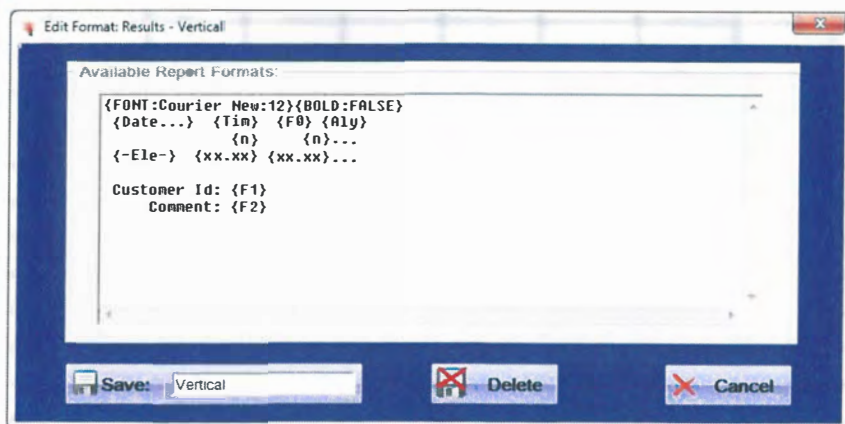
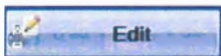


6.5 Print results format

The output to the printer can be further configured using the Edit Format option. This will display the 'Edit Format: Results' screen as shown below.



This allows the printout report format to be selected for several key areas of the software including analytical results, Standardisation results and Standardisation factors. Options include printout in either Horizontal or vertical format and the font type and size. To change the font type and or size, first select from the Print Output Selections and then the output format from the Selected Print and click on the Edit button



In the above example the font selected is Courier New 12 point.

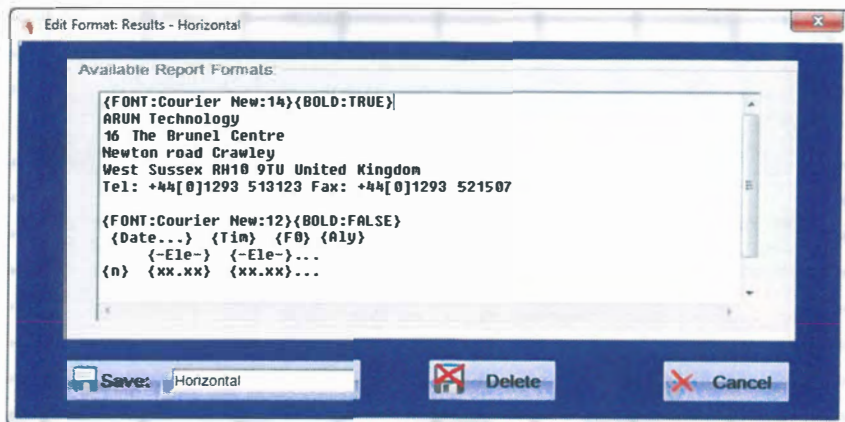
Note: **DO NOT** modify any of the other text without prior knowledge

Click on the Save button when the font type and size have been selected.



6.6 Customising the print results output

The printed results may be further customised with company name and address information. This may also include a company logo and other information. To add text to the print results output the 'Edit format results' screen can be edited as shown below.



This will result in the printed results being preceded by the additional information as shown in the example below.

ARUN Technology
16 The Brunel Centre
Newton road Crawley
West Sussex RH10 9TU United Kingdom
Tel: +44[0]1293 513123 Fax: +44[0]1293 521507

24-Feb-11 12:31

	Al	Si	Fe	Cu	Mn	Mg	Cr	Ni
1	87.32	9.59	0.195	0.882	0.097	0.781	0.018	0.769
2	87.28	9.64	0.195	0.876	0.099	0.784	0.019	0.769
Avg	87.30	9.62	0.195	0.879	0.098	0.782	0.019	0.769

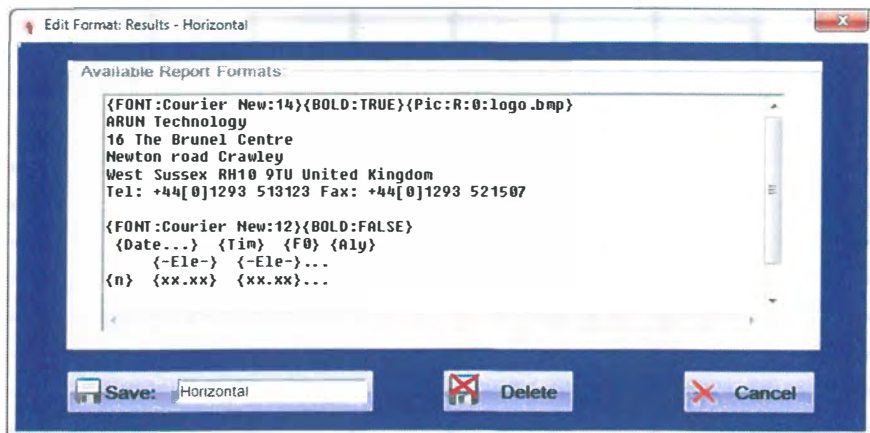
	Zn	Ti	Ca	Pb	Sn	Sr	V	Zr
1	0.052	0.037	0.004	0.034	0.008	0.057	0.005	<0.001
2	0.051	0.038	0.004	0.027	<0.001	0.055	0.005	<0.001
Avg	0.052	0.038	0.004	0.030	0.004	0.056	0.005	<0.001

	Sb	Cd
1	0.047	0.003
2	0.047	0.003
Avg	0.047	0.003

Customer Id:

To add a company logo the 'Edit format results' screen can be edited as shown below. The logo to be used must be in the form of a either bitmap file with the .BMP extension or a graphics interchange format file with the .GIF extension and must be located in the PolyJunior directory.

Note: **DO NOT** modify any of the other text without prior knowledge



This will result in the printed results being preceded by the additional information including the company logo as shown in the example below. The position of the logo can be pre-set using 'L' for left, 'C' for centre or 'R' for right in the {Pic:R:0:logo.bmp} or {Pic:R:0:logo.gif} code input.

ARUN Technology
 16 The Brunel Centre
 Newton road Crawley
 West Sussex RH10 9TU United Kingdom
 Tel: +44[0]1293 513123 Fax: +44[0]1293 521507



24-Feb-11 12:24

	Al	Si	Fe	Cu	Mn	Mg	Cr	Ni
1	87.32	9.59	0.195	0.882	0.097	0.781	0.018	0.769
2	87.28	9.64	0.195	0.876	0.099	0.784	0.019	0.769
Avg	87.30	9.62	0.195	0.879	0.098	0.782	0.019	0.769
	Zn	Ti	Ca	Pb	Sn	Sr	V	Zr
1	0.052	0.037	0.004	0.034	0.008	0.057	0.005	<0.001
2	0.051	0.038	0.004	0.027	<0.001	0.055	0.005	<0.001
Avg	0.052	0.038	0.004	0.030	0.004	0.056	0.005	<0.001
	Sb	Cd						
1	0.047	0.003						
2	0.047	0.003						
Avg	0.047	0.003						

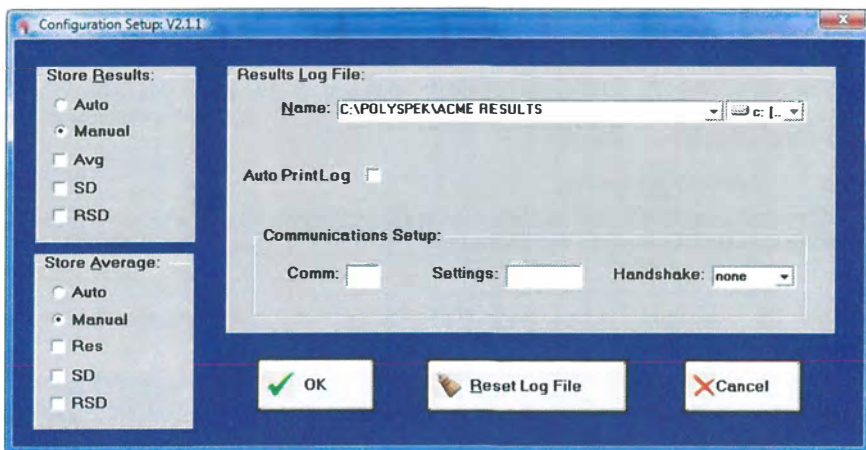
Customer Id:

6.7 LogFile Parameters

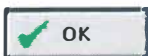
The logging of the analytical results to a specified location is defined in the 'Results Log File' configuration. This also allows the user to select the values to be stored when using the Save to icon



In the example below the log file destination is C:\POLYSPEK\ACME RESULTS. There is also an optional check box to automatically print a log of the results as they are stored to the log file destination.



Click the OK button to confirm the selection



6.8 Auto/Manual Configurations

The PolySpek Jnr can be configured to automatically select the analytical program calibration to use for unknown samples.

Note: This requires special factory set-up and should be specified at time of order

Click on the appropriate Radio button to select the Manual or Automatic option for Program selection



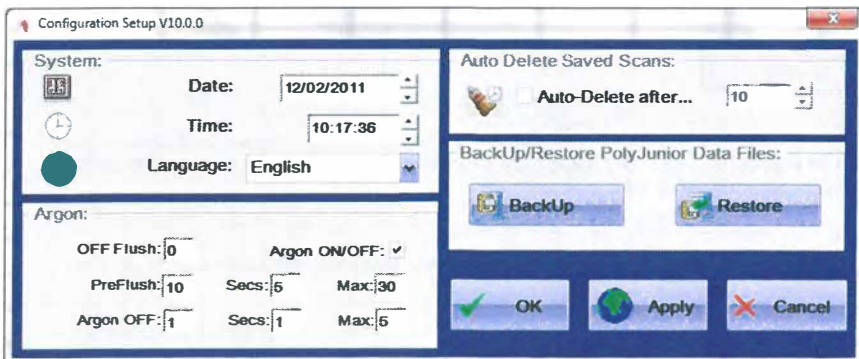
The search for matching alloys from the alloy library can also be configured to be an automatic function. Select the appropriate Radio button for the desired operation. When the analytical program is selected the search for matching alloys will be performed as soon as the average result is displayed.

6.9 System Parameters...

The system parameters configuration-screen allows the user to configure basic system information such Date, Time and Language.

Note: The language file relates only to the A-PLUS software and not the computer operating system.

It also offers argon control selection although this is generally controlled by the calibration program itself or by the argon control icons found at the bottom of the analytical screen. These can be manually selected to provide either additional argon flush prior to the start button being pressed or to manually invoke the 'Rapid Start' sequence.



The Culling or deletion of saved scans can be set to be an automatic feature after a preset number of scans are stored. This will overwrite existing stored scan information and it is generally only recommended to use the Auto-culling if hard disk space is a consideration.

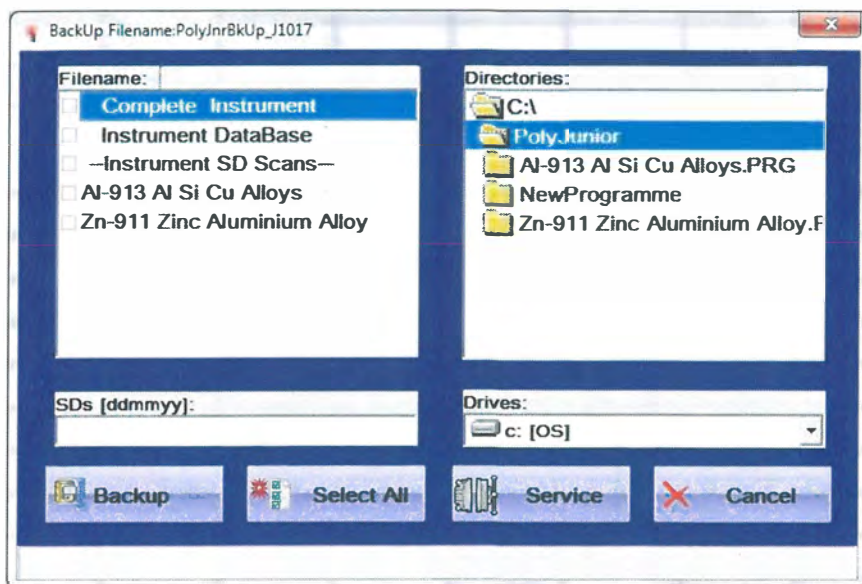
6.10 System Backup

The Backup and Restore options are important for the security and disaster recovery of the A-PLUS data files stored on the computer system. A backup of the PolySpek Jnr data files should be performed periodically especially if additional data has been added such as alloy specification information.

To perform a backup click on the Backup button



The following screen will be displayed.

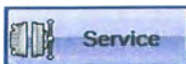


The user can select the files to back-up by simply clicking on the tick boxes against the relevant files. Typically this would be for the 'Complete Instrument'. The destination for the back-up can be selected from the drop-down list under 'Drives'. There is also a selection for Scan Data, 'Instrument SD Scans', for a specific date and the instrument database i.e. program files using 'Instrument DataBase'. If all of these are to be backed up then simply click on the Select All icon

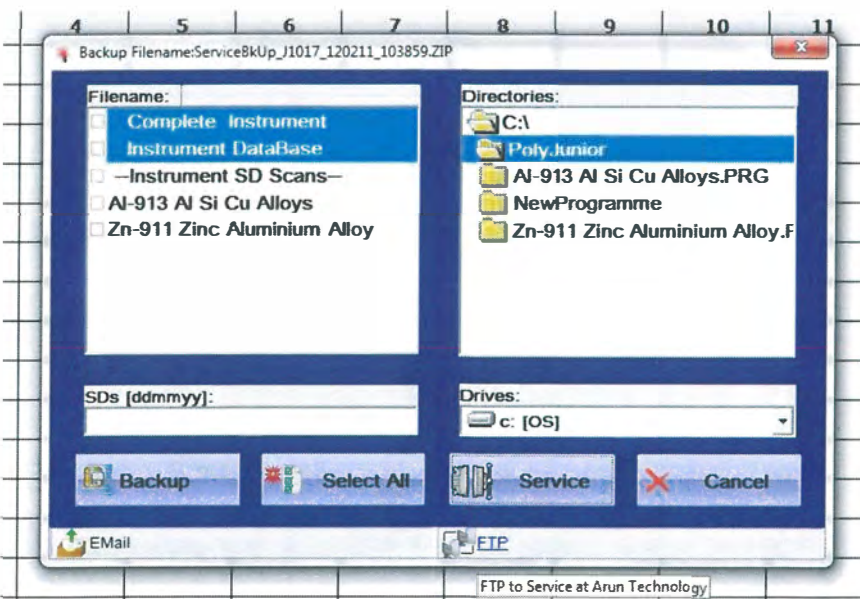


The service department at ARUN Technology may request the backup information to troubleshoot a particular problem when assistance is required.

In this instance the backup data file can be sent using the Service icon



The backup data file may be sent via email by clicking on the Email icon at the bottom of the screen or if it is too large to send by conventional email it can be sent to our FTP server. By clicking on the FTP icon at the bottom of the screen



The backup data files will be compressed into a zip file to minimise the size of the file.

Press the Cancel icon when finished



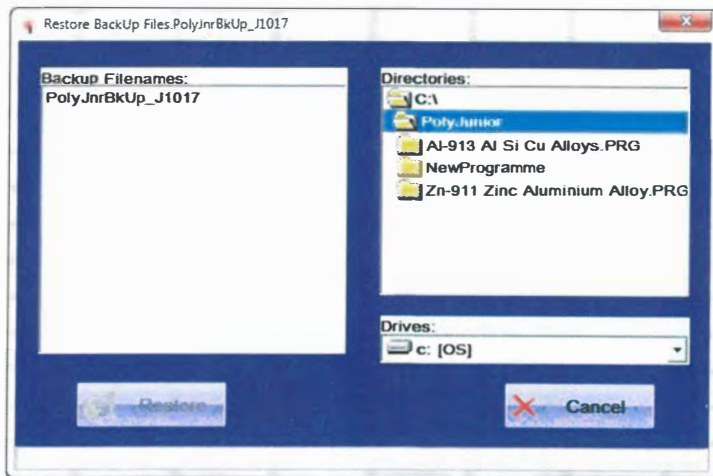
6.11 System Restore

The restore option is available to quickly recover files in the event of their loss or corruption.

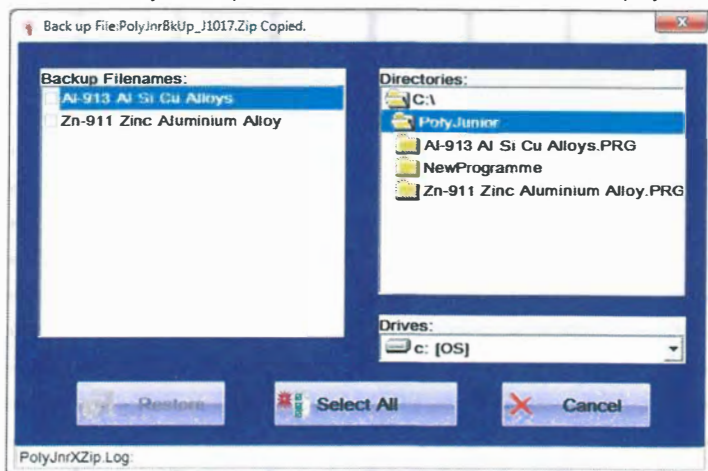
To perform a restore click on the Restore button



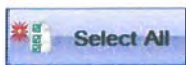
The following screen will be displayed.



Double click on the PolyJnrBkUp file name and the data within will be displayed



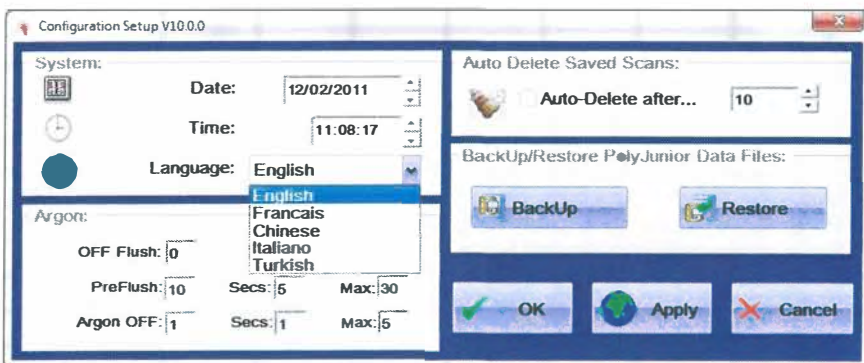
The user can select the files to restore by simply clicking on the tick boxes against the relevant files or selecting the 'Select All' icon



6.12 Software language selection

The user can configure the A-PLUS software to be displayed in another language, this does not affect the operating system language.

To change the language simply click on the drop down selection as shown below



And then click on the Apply icon

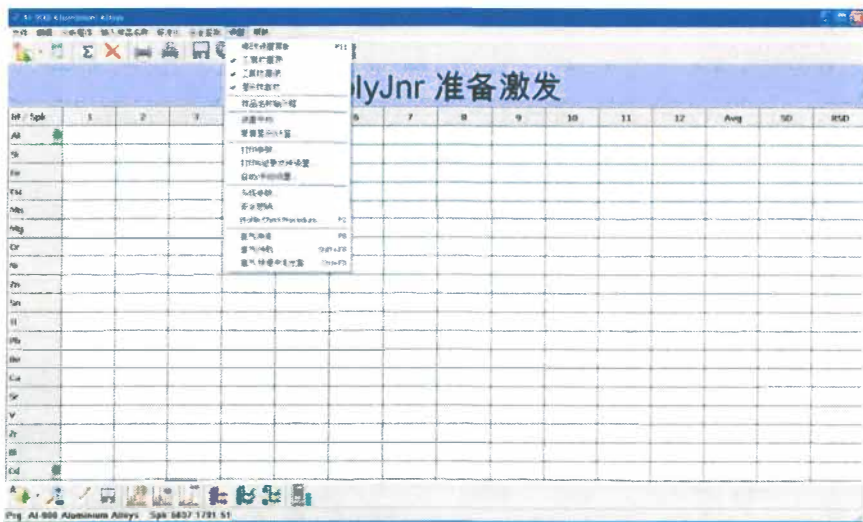
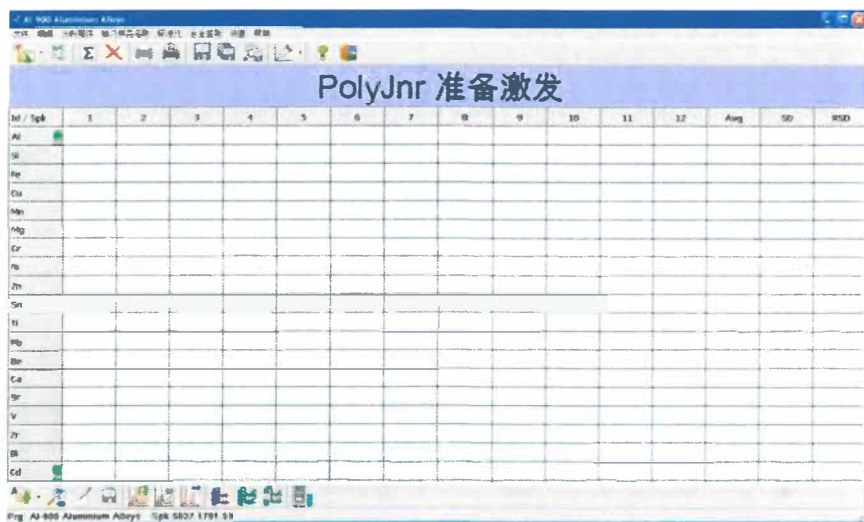


The display in the 'System' and 'Argon' windows will then change to the selected language.



Now click on the OK icon for the remainder of the A-PLUS to be displayed in the selected language





7 Control Type Standards

Control or type standards are used to refine a particular base or matrix calibration for a specific alloy type to obtain a more accurate analysis over a specific range of element concentrations. Control or Type standards are used in addition to the setting-up samples (SUS) and must also be of good quality, homogeneous and of known chemical composition.

Note: You cannot add elements that are not included in the factory matrix calibration.

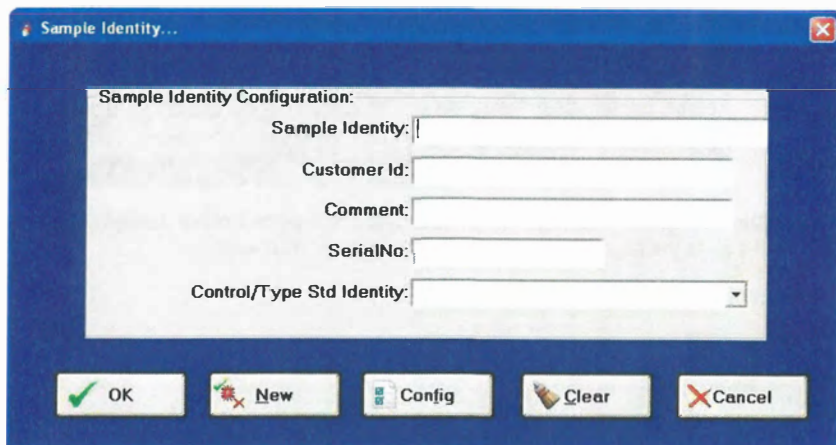
7.1 Configure Control/Type Standard Identity

To use Control or Type standards it is necessary to ensure that the sample identity dialogue box has been enabled for 'Control/Type Standard Identity'.

Click the 'Sample identity' icon to confirm the selection

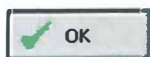


This will display the **Sample Identity...** screen as shown below.

A screenshot of the 'Sample Identity...' dialog box. The dialog has a blue title bar with the text 'Sample Identity...' and a close button. The main area is titled 'Sample Identity Configuration:' and contains five input fields: 'Sample Identity:', 'Customer Id:', 'Comment:', 'SerialNo:', and 'Control/Type Std Identity:'. The 'Control/Type Std Identity:' field is a dropdown menu. At the bottom, there are five buttons: 'OK' (with a green checkmark), 'New' (with a red 'X' and a plus sign), 'Config' (with a gear icon), 'Clear' (with a trash can icon), and 'Cancel' (with a red 'X').

The last field should display 'Control/Type Std Identity:'

If it does then click on the OK button



If it is not displayed, click on the Config button



This will display the 'Sample Identity Configuration:' screen as shown below.

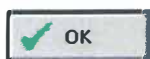
The dialog box titled 'Sample Identity Scheme' contains a section for 'Sample Identity Configuration:'. It features a table with columns for 'Title / F(0-7) Prompt Text' and 'Field Size' (with sub-columns 'Min' and 'Max'). The table contains the following entries:

Title / F(0-7) Prompt Text	Min	Max
Sample Identity...		
Sample Identity	0	40
Customer Id	0	20
Comment	0	20
SerialNo	0	12
Control/Type Std Identity	0	20

At the bottom of the dialog box are three buttons: 'OK' (with a green checkmark), 'Clear' (with an eraser icon), and 'Cancel' (with a red X).

Type 'Control/Type Std Identity' into the last field at the bottom of the dialogue box and set the field size to the suggested values of 0 and 20 as shown above.

Click on the OK button



7.2 Entering Control/Type Standard information

Entering Control/Type Standard data is similar to entering alloy data (See [section 5](#)).

Load the respective calibration (See [section 3](#)) for the Control/Type Standard and then click in the Enter/Edit Alloy icon



The following screen will be displayed



Click on the 'Switch Type/PMI Alloys' icon



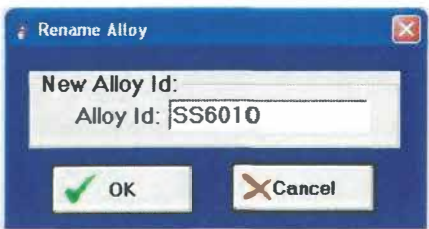
The following screen will be displayed



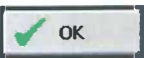
click on the New Alloy icon



The following screen will be displayed



Enter the alloy identity that the Type/Control standard is to be used for e.g. SS6010 and click on the OK button



The following screen will be displayed

Program: AI-913 Al Si Cu Alloys, Type Alloy Id: SS6010

Save

Back

Forward

Print

Help

Tel: 01234 567890 Fax: 01234 567890

Type Standardisation Samples:

	Type ReStd Identity	Period	Date	Time
1				
2				
3				
4				
5				

Element Id	High Std	Exp High%	ObtHigh%	Low Std	Exp Low%	ObtLow%
Al						
Si						
Fe						
Cu						
Mn						
Mg						
Cr						
Ni						
Zn						
Ti						
Ca						
Pb						

Enter the identity of the Control/Type Standard, 6010 in the example below and then enter the identity against those elements to be modified. More than one sample may be used for the Control/Type Standard. These can be for both high and low values and will be associated with the Type Alloy Id, SS6010 in this example.

Program: Al 716 Al Mg Si Type Alloy Id: SS6010

Save Type/PMI Alloy

1.1 Abs ±0.5 Rel (at 50% = 1.0000)

Type	ReStd Identity	Period	Date	Time
1	6010			
2				
3				
4				
5				

Element Id	High Std	Exp High%	Obt High%	Low Std	Exp Low%	Obt Low%
Al						
Si	6010	1.01				
Fe	6010	0.249				
Cu	6010	0.466				
Mn	6010	0.474				
Mg	6010	1.02				
Cr	6010	0.153				
Ni						
Zn	6010	0.0076				
Pb						
Sn						
Ti	6010	0.0575				
V						
Zr						

Enter the certified value for each element in the sample in the 'Exp High%' column and when complete Click on the 'Save' icon



Additional Control/Type standards for the selected matrix calibration may also be entered at this time.

When the data entry is complete click on the exit icon to return to the analysis screen.



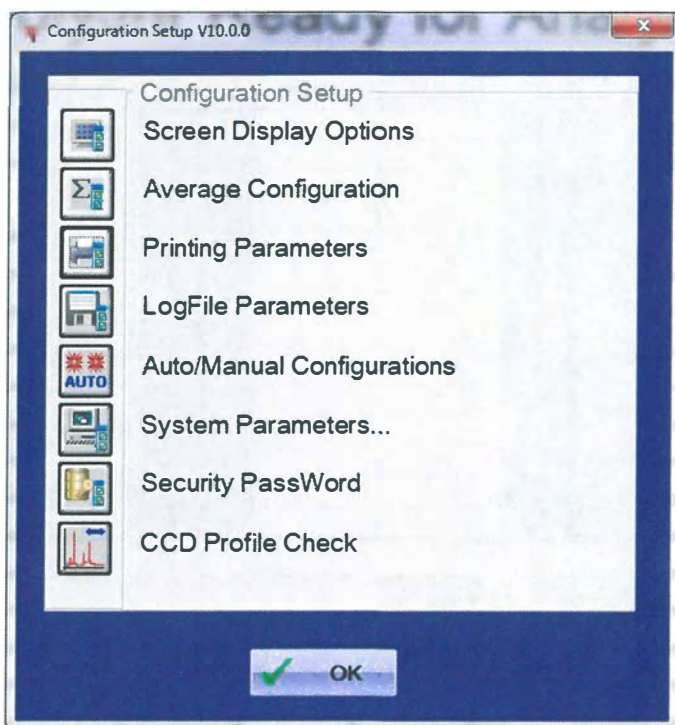
7.3 Applying Control/Type Standards

To use Control/Type standards during analysis the system configuration must be set to include 'Type Correct'.

To change the system configuration click on the System Set-up icon



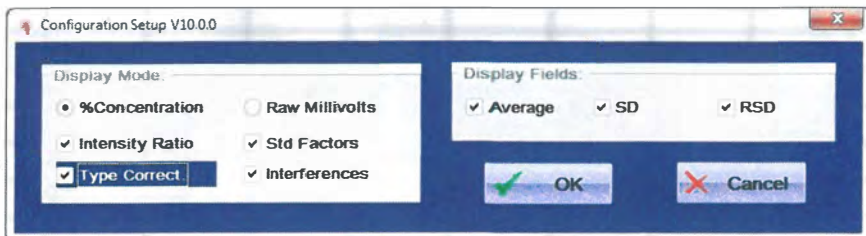
This will display the System Configuration-screen



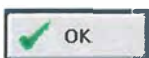
Click on the 'Screen Display Options' icon'



The following screen will be displayed



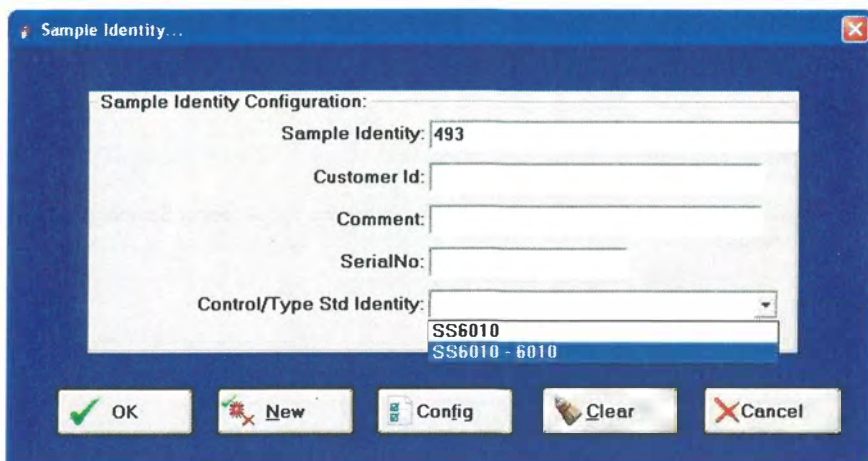
Ensure that the 'Type Correct' check-box is selected and click on the OK button



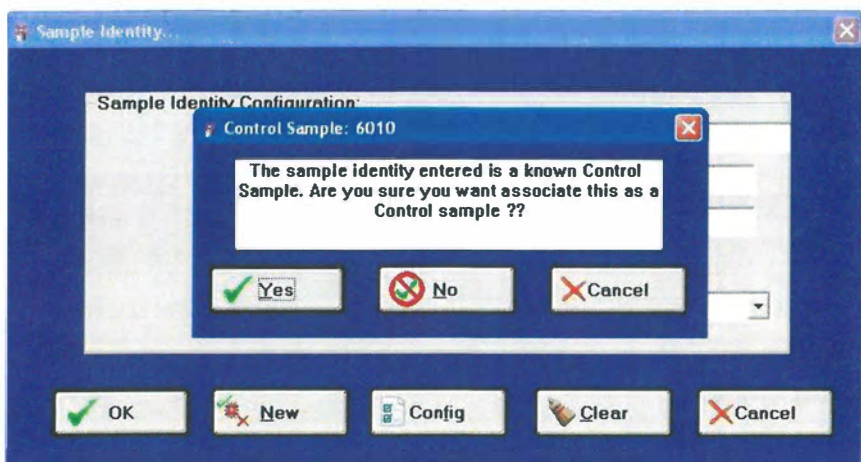
Next click on the Sample Identity icon



Then click on the drop-down list against the 'Control/Type Std Identity:' field as shown below and select the sample to use. There may be several samples associated with the Type Alloy Id, SS6010 in this example and these will be displayed against the Type Alloy Id. In the example below the sample is 6010 and associated to the SS6010 alloy.



When the sample is selected the following screen will be displayed.



The software recognises that the sample identity is for a known 'Control/Type' sample and requests confirmation that the operator wishes to continue. Click on the 'Yes' button to proceed.



The freshly prepared sample is then sparked several times in the normal way until a representative result is achieved, normally after a minimum of three results. The average result for the 'Control/Type' sample is then stored by clicking on the 'Save Results' icon



This will confirm that the result to be stored is that for the Type/Control Sample 6010 as shown below.

Alt 716 Al Mg Si Control Sample Id: 6010

File Edit Programme Sample Id Standardise Alloy Identification Setup Profile Check Help

PolySpek Ready for Analysis

Id / Spk	1	2	3	4	5	6	7	8	9	Avg	SD	RSD
Al	96.60	96.54	96.56	96.61	96.62					96.59	0.0338	0.0350
Si	0.983	1.000	0.997	0.976	0.969					0.985	0.0132	1.3450
Fe	0.225	0.231	0.227	0.225	0.224					0.227	0.0026	1.1662
Cu	0.414	0.421	0.421	0.415	0.411					0.416	0.0045	1.0722
Mn	0.465	0.471	0.465	0.460	0.465					0.465	0.0039	0.8426
Mg	0.938	0.954	0.951	0.935	0.949					0.945	0.0082	0.8647
Cr	0.161	0.163	0.161	0.161	0.160					0.161	0.0011	0.6552
Ni	0.010	0.007	0.008	0.009	0.006					0.008	0.0016	19.660
Zn	0.014	0.019	0.015	0.011	0.012					0.014	0.0029	20.392
Pb	0.0127	0.0140	0.0120	0.0141	0.0116					0.0129	0.0011	8.9128
Sn	0.0041	0.0028	0.0075	0.0046	<0.003					0.0038	0.0027	71.746
Ti	0.059	0.058	0.061	0.061	0.056					0.059	0.0021	3.5386
V	0.013	0.013	0.012	0.012	0.012					0.012	0.0005	4.2079
Zr	0.003	0.002	0.004	0.002	0.002					0.003	0.0006	22.971

Alt 716 Al Mg Si Std: 6010 Spk: 4056/574/54

This will store the average result for the repeat measurements on the sample and automatically enter the achieved values into the 'Obt High%' column for the 'Control/Type' sample under test.

The time and date when the 'Control/Type' sample was run is also stored with the result. This can be seen by returning to the 'Entering Control/Type Standard data' as described at the beginning of this section. The following screen shows the data stored for the Control/Type sample.

Program: Al 716 Al Mg Si, Type Alloy Id: SS6010

1.1

±0.5

Rel

50%

50%

Type Standardisation Samples:

	Type ReStd Identity	Period	Date	Time
1	6010		29/01/09	13:52
2				
3				
4				
5				

Element Id	High Std	Exp High%	Obt High%	Low Std	Exp Low%	Obt Low%
Si	6010	1.01	0.985			
Fe	6010	0.249	0.227			
Cu	6010	0.466	0.416			
Mn	6010	0.474	0.465			
Mg	6010	1.02	0.945			
Cr	6010	0.153	0.161			
Zn	6010	0.0076	0.014			
Ti	6010	0.0575	0.059			

Click on the exit icon to return to the analysis screen.

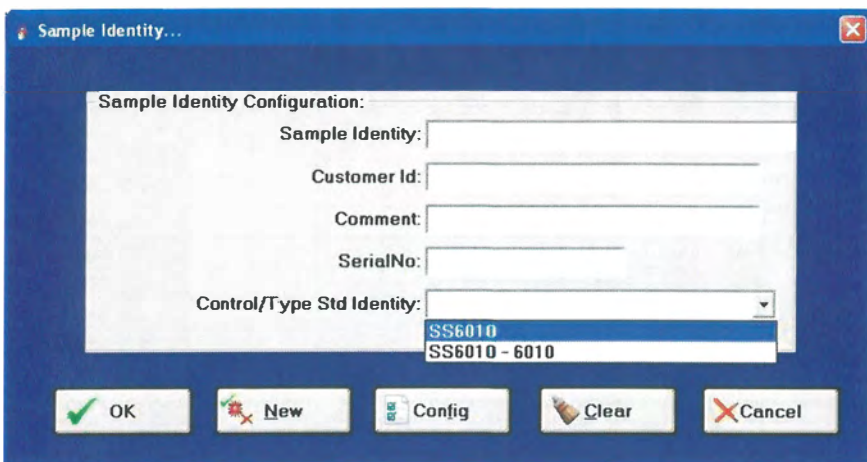


7.4 Using 'Control/Type samples

When a 'Control/Type' sample for an alloy is to be used the operator must click on the Sample Identity icon

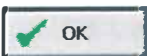


Then click on the drop-down list against the 'Control/Type Std Identity:' field as shown below and select the Type alloy identity to use.



The image shows a 'Sample Identity...' dialog box with a blue title bar and a close button in the top right corner. The main area is titled 'Sample Identity Configuration:' and contains five input fields: 'Sample Identity:', 'Customer Id:', 'Comment:', 'SerialNo:', and 'Control/Type Std Identity:'. The 'Control/Type Std Identity:' field is a dropdown menu with a list box showing two options: 'SS6010' (highlighted in blue) and 'SS6010 - 6010'. At the bottom of the dialog are five buttons: 'OK' (with a green checkmark icon), 'New' (with a red 'X' and a plus icon), 'Config' (with a document icon), 'Clear' (with an eraser icon), and 'Cancel' (with a red 'X' icon).

In the above example SS6010 has been selected as the 'Control/Type' sample alloy identity. The other fields of the 'Sample identity' dialogue box are completed as normal and then click on the OK button



Program: Al 716 Al Mg Si 556010

File Edit Programme Sample Id Standardise Alloy Identification Setup Profile Check Help

PolySpek Ready for Analysis

Id / Spk	1	2	3	4	5	6	7	8	9	Avg	SD	RSD
Al	96.60	96.54	96.56	96.61	96.62					96.59	0.0338	0.0350
Si	1.01	1.02	1.02	1.00	0.994					1.01	0.0132	1.3117
Fe	0.247	0.253	0.249	0.247	0.246					0.249	0.0026	1.0629
Cu	0.464	0.471	0.471	0.465	0.461					0.466	0.0045	0.9573
Mn	0.474	0.480	0.474	0.469	0.474					0.474	0.0039	0.8266
Mg	1.01	1.03	1.03	1.01	1.02					1.02	0.0082	0.8012
Cr	0.153	0.155	0.153	0.153	0.152					0.153	0.0011	0.6895
Ni	0.010	0.007	0.008	0.009	0.006					0.008	0.0016	19.660
Zn	0.007	0.012	0.008	0.005	0.006					0.008	0.0029	37.318
Pb	0.0127	0.0140	0.0120	0.0141	0.0116					0.0129	0.0011	8.9128
Sn	0.0041	0.0028	0.0075	0.0046	<0.003					0.0038	0.0027	71.746
Ti	0.057	0.057	0.059	0.060	0.056					0.058	0.0021	3.6308
V	0.013	0.013	0.012	0.012	0.012					0.012	0.0005	4.2079
Zr	0.003	0.002	0.004	0.002	0.002					0.003	0.0006	22.971

Prog: Al 716 Al Mg Si Type: 556010 Spk: 4856 574 54

The subsequent results will then be modified to have the difference values obtained when the Control/Type standard(s) was run. These are automatically applied and are valid for the period as set in the dialogue box below.

Program: Al 716 Al Mg Si, Type Alloy Id: 556010

1.1 Abs ±0.5 Rel 1x 50% = 17x 50%

Type Standardisation Samples:

Type ReStd Identity	Period	Date	Time
6010		29/01/09	13:52
2			
3			
4			
5			

Element Id	High Std	Exp High%	Obt High%	Low Std	Exp Low%	Obt Low%
Si	6010	1.01	0.985			
Fe	6010	0.249	0.227			
Cu	6010	0.466	0.416			

The period value is set in minutes or daily if the word 'DAILY' is entered into the field.

The Type Alloy modification may be turned on or off by simply selecting the Type Alloy identity in the sample identity field as described at the beginning of this section.



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BETRA MANUFACTURING - ANALYTICAL REPORT
8/25/2016 07:37 SS355 test

	1	2	3	Avg
Al	92.11	92.29	92.17	92.19
Si	5.27	5.18	5.24	5.23
Fe	0.356	0.331	0.337	0.342
Cu	1.22	1.17	1.21	1.20
Mn	0.082	0.081	0.082	0.082
Mg	0.520	0.516	0.516	0.517
Cr	0.028	0.026	0.027	0.027
Ni	0.049	0.045	0.046	0.047
Zn	0.077	0.076	0.077	0.077
Ti	0.134	0.131	0.130	0.132
Ca	0.0003	0.0003	0.0003	0.0003
Pb	<0.01	<0.01	<0.01	<0.01
Sn	0.007	<0.005	<0.005	<0.005
Sr	0.0201	0.0191	0.0199	0.0197
V	0.014	0.013	0.014	0.014
Zr	<0.001	<0.001	<0.001	<0.001
Sb	<0.05	<0.05	<0.05	<0.05
Cd	<0.005	<0.005	<0.005	<0.005
Bi	<0.015	<0.015	<0.015	<0.015
Co	<0.005	<0.005	<0.005	<0.005
Ag	<0.005	<0.005	<0.005	<0.005
B	<0.001	<0.001	<0.001	<0.001
Be	<0.0005	<0.0005	<0.0005	<0.0005