

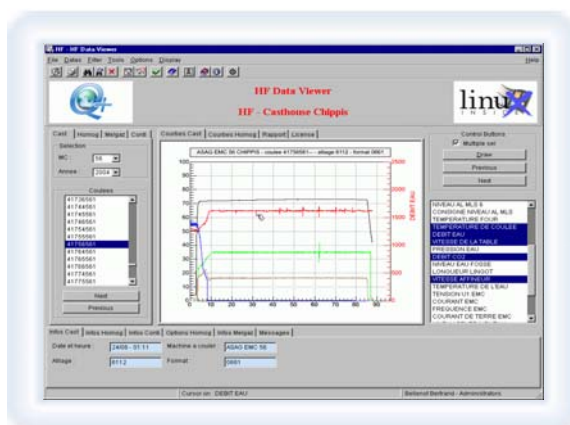
GUI Applications Examples

The screens below illustrate the powerful Graphical User Interface capabilities of ROOT. They come from several concrete applications used in the aluminum industry (ALCAN Aluminium Valais SA).

Data Visualization

The following applications are mainly used to visualize data coming from different facilities, on different platforms (Windows NT and QNX).

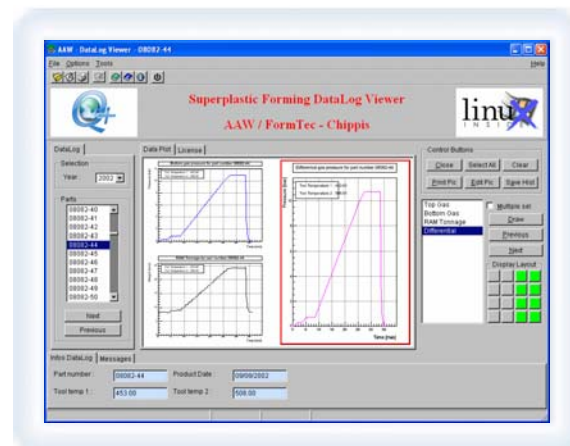
Data are collected on a Windows server, converted into Root format, validated, then archived on CD once a year.



The main application used in the aluminium casting plant is **HFViewer** , which regroups data from :

- liquid metal treatment (Ar + Cl₂)
- spectrometric analysis (alloy composition)
- casting process
- homogenization

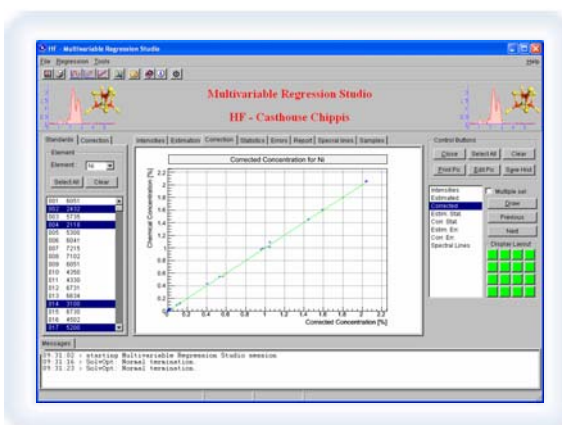
It is also used for validation of the product before expedition.



DigView is another data visualization application used to show data coming from the superplastic forming process. This process uses air pressure to form metal sheets (special aluminium alloys) into specific complicated shapes (e.g. car body parts).

Data Analysis

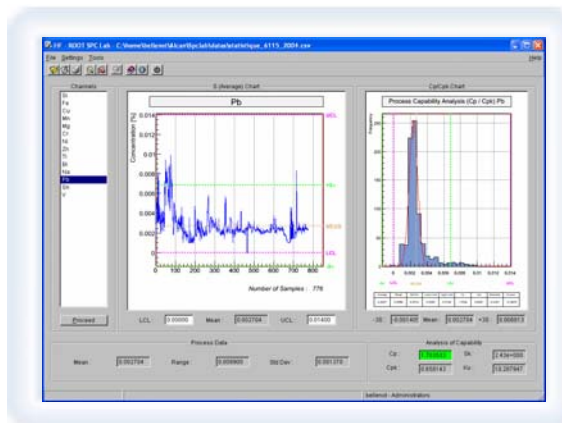
The next applications are for data analysis. These use statistics, i.e. SPC (statistical Process Control) and MVR (multivariate regression). They are used for Quality Insurance and Spectrometry.



The multivariable regression (MVR) calculation is an empirical correction procedure to minimise, in a multicomponent matrix, the influence of interfering elements on an analyte.

The **MVR's** options provide facilities and flexible mathematical algorithms to compute simultaneously the basic curve polynomials and coefficients for additive and/or multiplicative corrections.

The calculation is performed on the intensities and concentrations of a set of samples used as standards.



The **SPCLab** application determines the process capability of spectrometry analysis.

Process Capability (Cp) :

is the capability of a process to meet a specific tolerance. A process is considered as capable when the percentage of samples of a variable for that process that fall within the upper and lower specification limits is greater than a specified value.

The inherent process capability is defined as: $C_p = \frac{(USL - LSL)}{6\sigma}$

Cp > 1.0 Indicates the process variation is within the specified limits (USL and LSL) and therefore, is capable.

$C_p < 1.0$ indicates the process is not capable.

The process capability based on worst case data is defined as : $C_{pk} = \frac{\min\{(USL - \bar{X}), (\bar{X} - LSL)\}}{3\sigma}$

Cpk < 0.0 Indicates the process mean is outside the specified limits (USL and LSL).

Cpk = 0.0 Indicates the process mean is equal to one of the specified limits

Cpk > 0.0 Indicates the process mean is within the specified limits.

Cpk = 1.0 Indicates that one side of the 6 σ limits falls on a specification limit

Cpk > 1.0 Indicates that the 6 σ limits fall completely within the specified limits