

## TTTIAL1: ThermoTech TiAl-based Alloys Database

<i>Database name:</i>	ThermoTech TiAl-based Alloys Database	<i>Database acronym:</i>	TTTIAL
<i>Database owner:</i>	ThermoTech	<i>Database version:</i>	1.0

TTTIAL1 is suitable to be used for prediction of stable and metastable phase equilibria in multicomponent  $\gamma$ -TiAl based alloys.

### Included Elements (13)

Al B Cr Mn Mo Nb O Si Ta Ti V W Zr

### Included Phases

AL2O3	BCC_A2	LIQUID:L	TI3B4	TIB
AL3TI	HCP_A3	SIGMA	TI5SI3	TIB2
B2_BCC	LAVES	TI3AL	TIAL	TIZRSI

### Assessed Systems

All phases have been critically assessed and treated by some appropriate thermodynamic models (e.g. the Sublattice Model for solid solutions and liquid mixture phases), which are applicable over a wide temperature-pressure-composition range.

### Validation

TTTIAL1 has been developed to be used for the prediction of stable and metastable phase equilibria in multicomponent  $\gamma$ -TiAl based alloys. It represents a new state of the art in modelling techniques and includes features which allow, uniquely, the inclusion of O in the  $\alpha$ 2-Ti3Al and  $\gamma$ -TiAl phases and the incorporation of new models to allow for the important B2\_bcc transformation to be reproduced in multicomponent alloys. It is compatible with TTTI which was designed for conventional Ti alloys, and they will eventually be fully incorporated into a single large and unique database. The database has been constructed using a combination of published information, unique proprietary data and newly developed extrapolation methods, and has been designed for use with  $\gamma$ -TiAl alloys but can, to a certain degree, also be used with super  $\alpha$ 2-Ti3Al based alloys and this capability will be expanded at a later stage with the incorporation of the orthorhombic "O" phase.

### Limits

As in the spirit of the CALPHAD method, predictions can be made for multicomponent systems by extrapolation into multicomponent space of data critically evaluated and assessed based on binary, ternary and in some cases higher order systems. However, critical calculations must always be verified by equilibrium experimental data; it is the user's responsibility to verify the calculations but Thermo-Calc Software AB is interested to know about any significant deviations in order to improve any future release.