Database name: Thermotech Ti-based Alloys Database
Database acronym: TTTI3 **Database version:** 3.0
Database owner: ThermoTech
Database segment: Titanium Based Alloys

Brief description

TTTI3 is a comprehensive database with special aims of allowing phase diagram calculations to be performed for industrially useful conventional Ti- or TiAl-based alloys.

Applications

Ti- and TiAl-based alloy design and engineering.

Included Elements

Al B C Cr Cu Fe H Mn Mo N Nb Ni O Re Ru Si Sn
Ta Ti V Zr

Included Phases

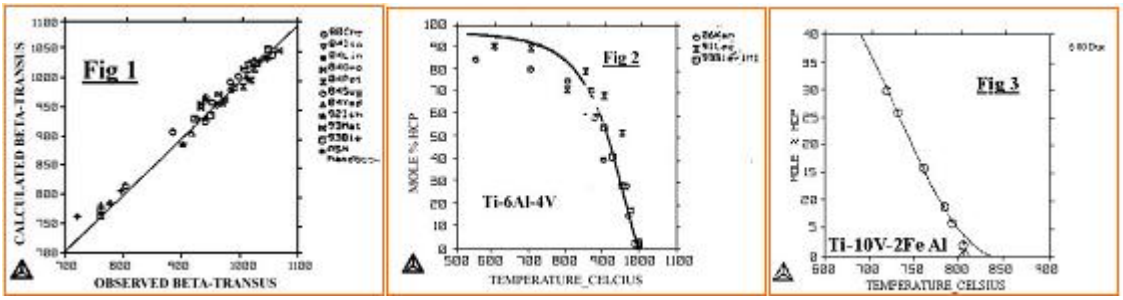
ALPHA_TIMN	CHI_A12	LAVES	TI2CU	TIB
BCC_A2	FCC_A1	LIQUID	TI2NI	TIH2
BETA_TIMN	GAS	MB2_C32	TI3AL	TIM_B2
C15_FCC	HCP_A3	SIC	TI5SI3	TIZRSI

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, the Ideal Gas Model for gas mixture phase, etc), which are applicable over a wide temperature-pressure-composition range.

Validation

TTTI3 has been tested against a wide range of commercial alloys ranging from near α-types such as IMI834 to α/β-types such as SP-700 to β-types such as Ti15-3-3-3. The comparison of calculated and observed beta-transus temperature is shown in Figure 1, while β-approach curves for two sample alloys (one near-α in Ti-6Al-4V and other near-β in Ti-10V-2Fe-3Al) are illustrated in Figures 2 and 3, respectively.



Limits

Combinations of several critically-assessed systems can calculate and extrapolate higher-order multicomponent systems. Such extrapolations require experience and understanding and the producer or vendor should be contacted if problems occur. Critical calculations must always be verified by equilibrium experimental data; it is the user's responsibility to verify the calculations but Thermo-Calc Software is interested to know about any significant deviations in order to improve any future release.

Scientific Models & References

See the Thermo-Calc Software reference list available at: http://www.thermocalc.com/Library.htm