Version 5.1, dated March 1, 2004. This version fixes the oxygen key word (O2) so that the calculation follows the technical reference manual. In version 5.0 and earlier, the oxygen calculation used the oxygen to fuel ratio, whereas the technical reference manual states that it uses the oxygen to carbon ratio. The model now matches the guide.

Note 1. The combustion chemistry is based on the oxygen consumption calorimetry of Huggett[1] et al. It is important that the species key word values and the heat of combustion be consistent. Since there is no fundamental kinetic calculation in CFAST, there is no way for the model to check the consistency. For example, a heat of combustion of 50 MJ per kilogram matches a hydrogen/carbon ratio of 0.3. Using 24 MJ with a HCR of 0.3 will yield incorrect results and can also result in the model stalling.

Note 2. When a layer is driven to zero volume, there is no way to provide species by percent, since the total mass is zero. In this case, CFAST reports 0%. This can be seen with the data file specieserror.dat. Once the upper layer is larger than the minimum volume, the species can be normalized correctly and reported.

[1] Clayton Huggett, Fire and Materials, Vol. 4, No. 2, 61-65, June 1980.