EPAct Test Fuel Matrix

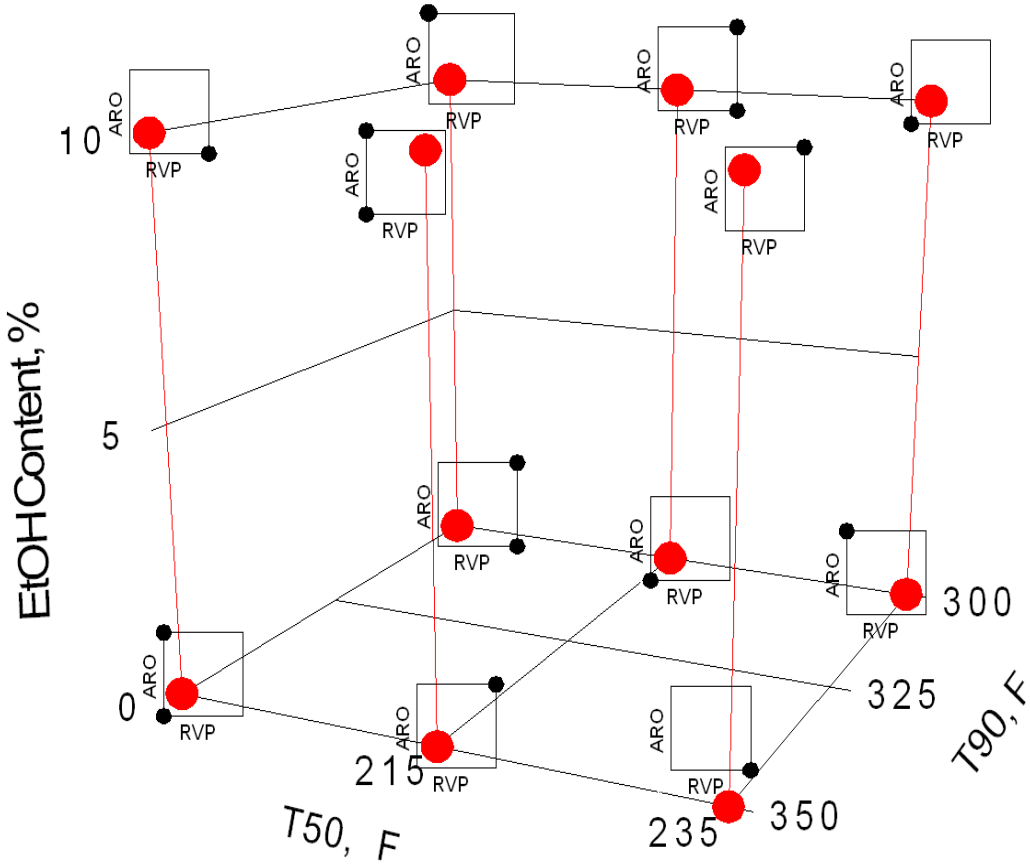
Meeting with NREL
October 22, 2007

Confidential – Do Not Distribute

Base Fuel Matrix

5 variables, 3x2x2x2x2, 17 fuels

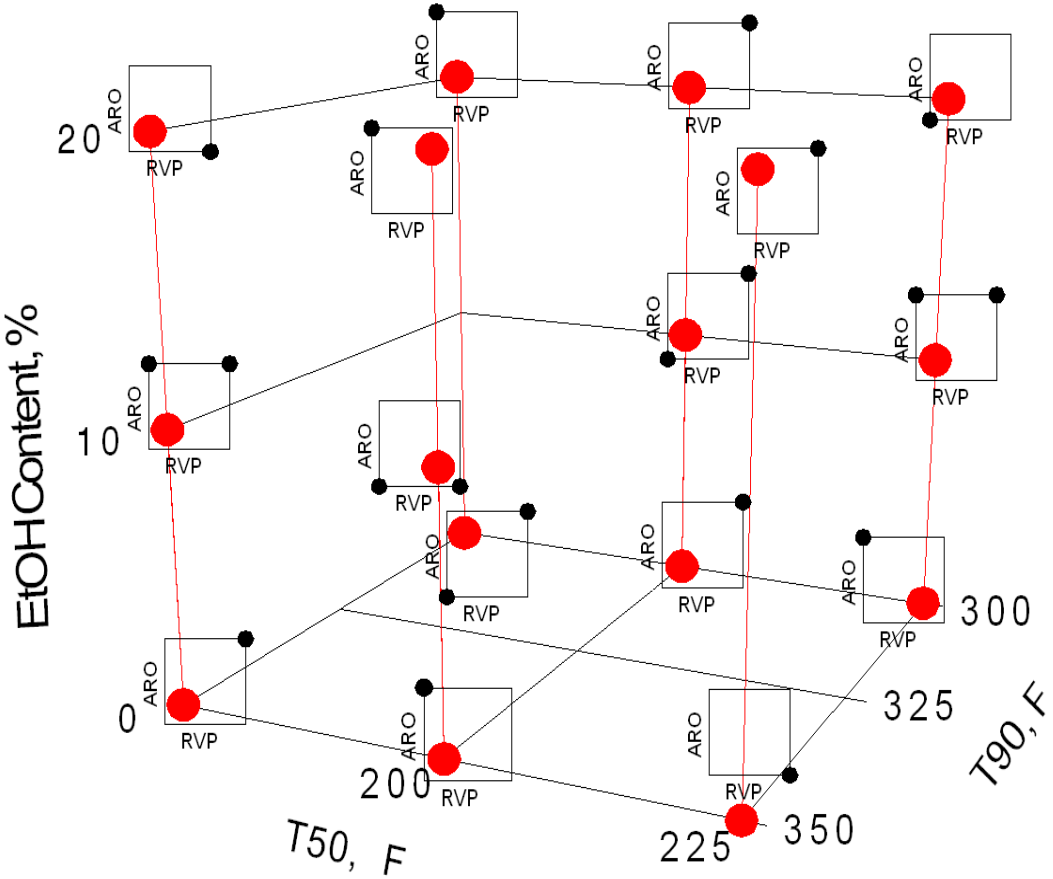
RVP range: 7-9 psi; Aromatic content range: 15 – 40%



Optimized Full Fuel Matrix – Original Version

5 variables, 3x3x2x2x2, 21+2(E85) fuels, G-Eff: 69.6%

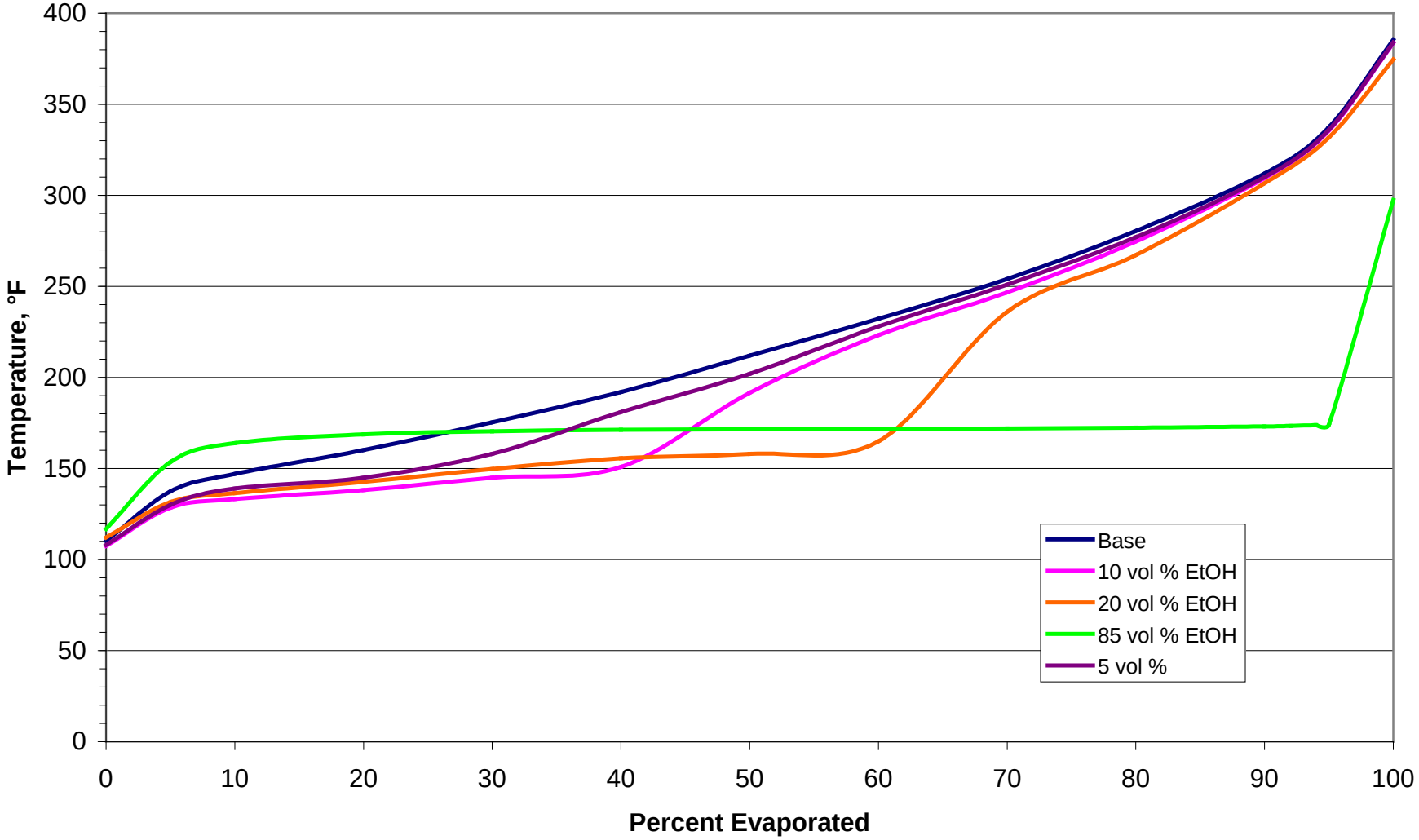
RVP range: 7-9 psi; Aromatic content range: 25 – 40%



E20 Effect on T50

- A single E20 fuel in CRC E-74b Program has T50 of 160°F
- T50 of three E20 fuels tested in 2006 CRC Gasoline Volatility Study ranged from 165 and 166°F
- Halterman blended three E20 fuels from our matrix
  - Could only vary T50 between 158 and 165°F

Effect of Ethanol Addition on the D 86 Distillation Curve

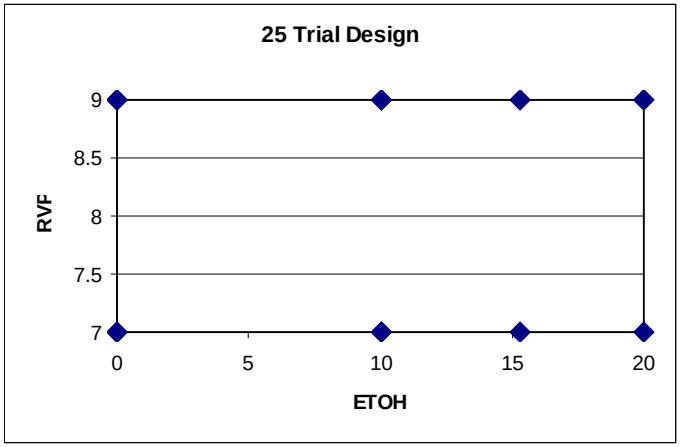


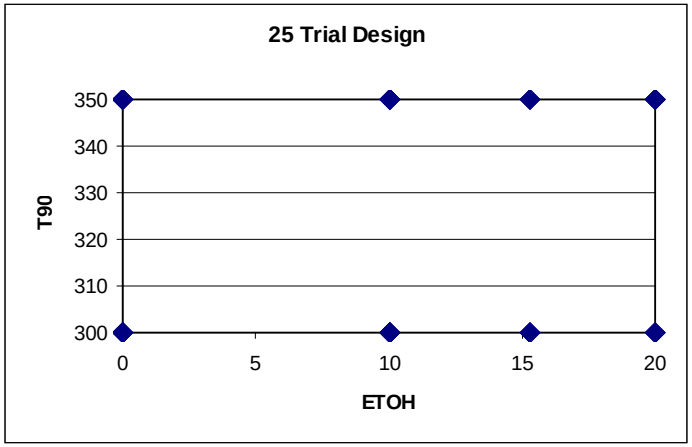
Source: Chevron

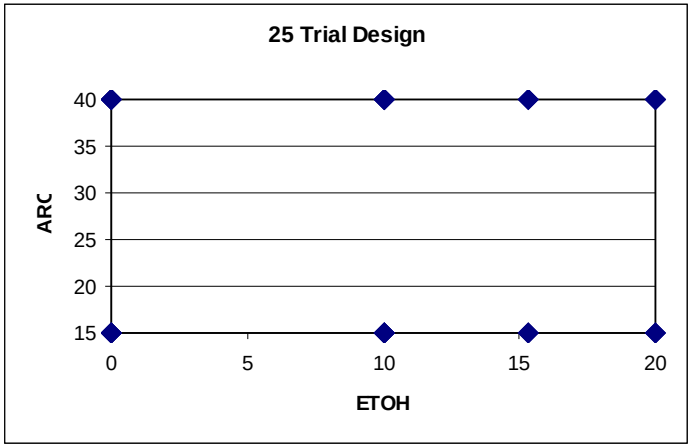
Fuel Matrix Optimized for E20

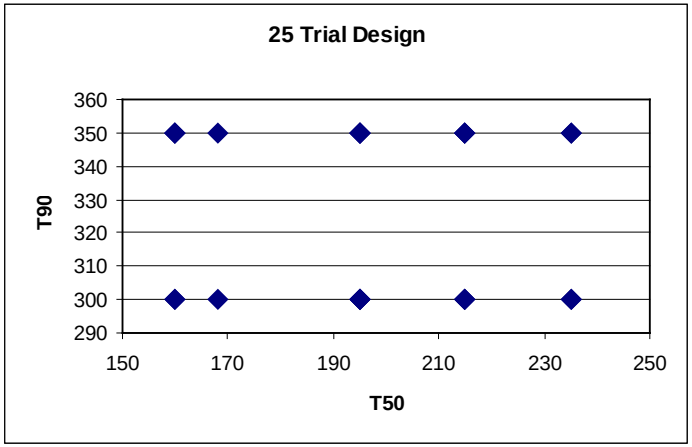
Trial	T50	T90	ETOH	RVP	ARO	BLOCK
1	235	300	10	7	15	Original
2	235	350	0	9	15	Original
3	195	350	10	9	15	Original
4	195	350	0	7	40	Original
5	195	300	10	7	40	Original
6	235	300	0	7	40	Original
7	215	350	10	7	15	Original
8	215	300	10	9	15	Original
9	215	350	0	9	40	Original
10	215	300	0	7	15	Original
11	215	300	10	9	40	Original
12	215	350	10	7	40	Original
13	195	350	0	7	15	Original
14	195	300	0	9	15	Original
15	235	350	10	9	40	Original
16	195	300	0	9	40	Original
17	160	300	20	7	15	Augment
18	168.2	300	15.3	7	15	Augment
19	160	350	20	7	40	Augment
20	160	300	20	9	40	Augment
21	160	350	20	9	15	Augment
22	195	300	15.3	7	15	Augment
23	168.2	350	15.3	9	40	Augment
24	195	350	15.3	9	40	Augment
25	160	350	20	9	40	Augment

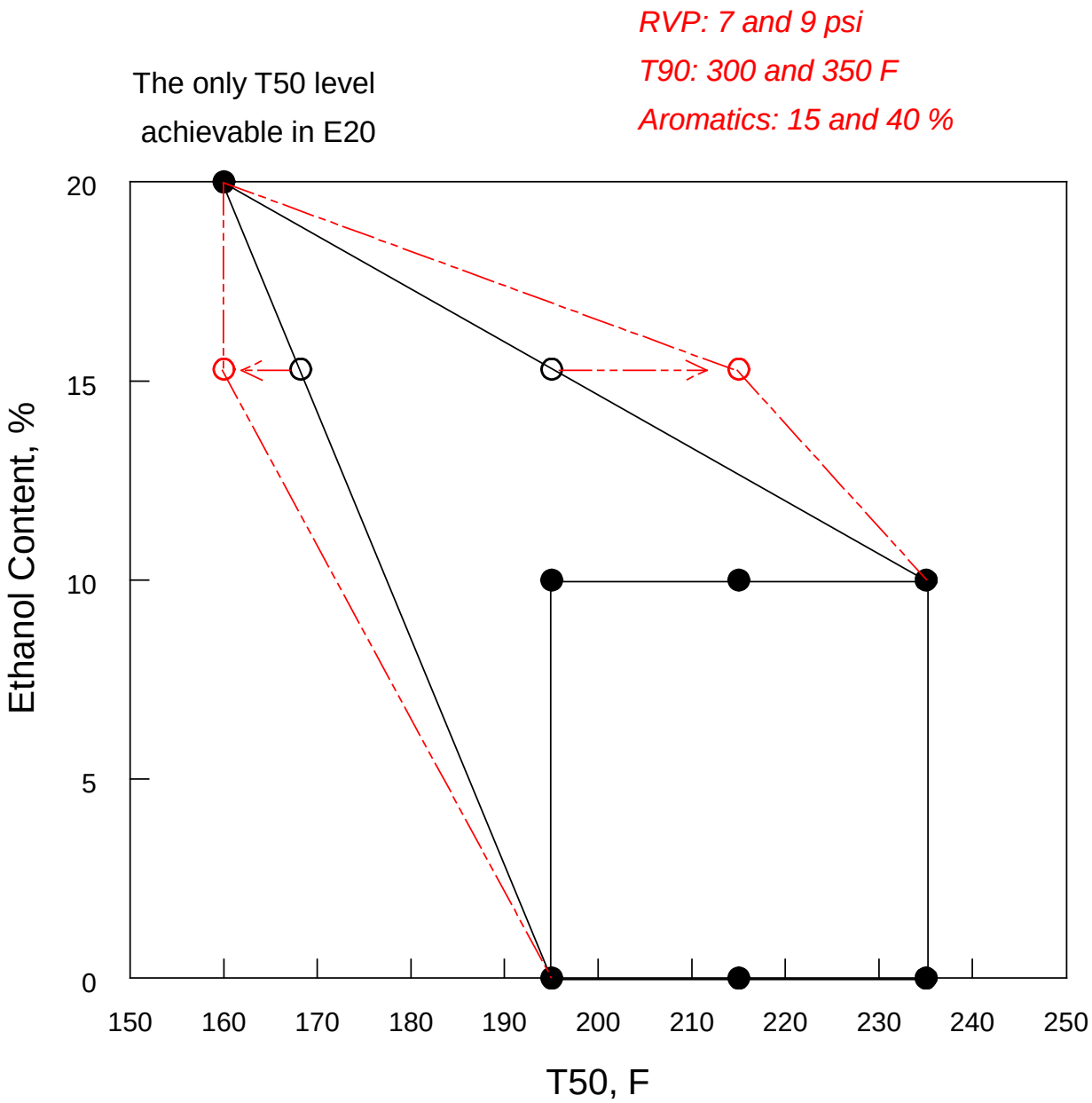
Fuel Matrix Optimized for E20 (Cont'd)










RVP: 7 and 9 psi
T90: 300 and 350 F
Aromatics: 15 and 40 %
The only T50 level
achievable in E20
Ethanol Content, %
T50, F
0
5
10
15
20
150
160
170
180
190
200
210
220
230
240
250

Fuel Matrix Optimized for E20 (Cont'd)

- Status of fuel matrix development:
  - Initial (possibly final) design completed
    - G-Efficiency ranges from 60 to 70%, depending on location of E15 fuels within T50 range
  - Halterman blending four E15 fuels to define T50 range
    - Will have results next Wednesday