



# Appendix F

## TEST 4 RESULTS



**Test 4 Matrix**

**Soft**

\* All measurements are in millimeters

**Measurements**

Ref. Point	Height	Ref. Point	Height
1	51.647	26	51.704
2	51.648	27	51.843
3	51.645	28	51.705
4	51.639	29	51.849
5	51.633	30	51.712
6	51.631	31	51.856
7	51.635	32	51.721
8	51.640	33	51.861
9	51.848	34	51.755
10	51.846	35	51.843
11	51.832	36	51.735
12	51.818	37	51.827
13	51.809	38	51.721
14	51.810	39	51.837
15	51.821	40	51.731
16	51.838	41	20.440
17	51.865	42	20.443
18	51.729	43	13.106
19	51.864	44	13.100
20	51.726	45	51.725
21	51.849	46	51.856
22	51.711	47	51.831
23	51.848	48	51.825
24	51.711	49	51.846
25	51.845		

**Landing**

Ref. Point	Depth
1	0.201
2	0.198
3	0.187
4	0.179
5	0.176
6	0.179
7	0.186
8	0.198
<b>Average</b>	<b>0.188</b>

**Design**

Ref. Point	Depth
17	0.136
19	0.138
21	0.138
23	0.137
25	0.141
27	0.138
29	0.137
31	0.135
<b>Average</b>	<b>0.138</b>

**Lettering**

Ref. Point	Depth
33	0.106
35	0.108
37	0.106
39	0.106
<b>Average</b>	<b>0.107</b>

**Dome**

<b>0.035</b>
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**Diameter**

Ref. Point	Diameter
D1	49.938
D2	49.941
D3	49.946
D4	49.949
D5	49.951
D6	49.950



**Test 4 Matrix**

**Hardened**

\* All measurements are in millimeters

**Measurements**

<i>Ref. Point</i>	<i>Height</i>	<i>Ref. Point</i>	<i>Height</i>
1	51.620	26	51.678
2	51.621	27	51.817
3	51.620	28	51.678
4	51.611	29	51.822
5	51.603	30	51.686
6	51.601	31	51.830
7	51.606	32	51.694
8	51.613	33	51.830
9	51.822	34	51.723
10	51.820	35	51.817
11	51.805	36	51.709
12	51.790	37	51.798
13	51.782	38	51.686
14	51.784	39	51.806
15	51.795	40	51.696
16	51.812	41	20.441
17	51.839	42	20.429
18	51.704	43	13.096
19	51.838	44	13.085
20	51.702	45	51.697
21	51.833	46	51.830
22	51.696	47	51.806
23	51.824	48	51.801
24	51.685	49	51.824
25	51.818		

**Landing**

<i>Ref. Point</i>	<i>Depth</i>
1	0.202
2	0.199
3	0.185
4	0.179
5	0.179
6	0.183
7	0.189
8	0.199
<b>Average</b>	<b>0.189</b>

**Design**

<i>Ref. Point</i>	<i>Depth</i>
17	0.135
19	0.136
21	0.137
23	0.139
25	0.140
27	0.139
29	0.136
31	0.136
<b>Average</b>	<b>0.137</b>

**Lettering**

<i>Ref. Point</i>	<i>Depth</i>
33	0.107
35	0.108
37	0.112
39	0.110
<b>Average</b>	<b>0.109</b>

**Dome**

**0.033**

**Diameter**

<i>Ref. Point</i>	<i>Diameter</i>
D1	49.915
D2	49.910
D3	49.925
D4	49.921
D5	49.921
D6	49.922





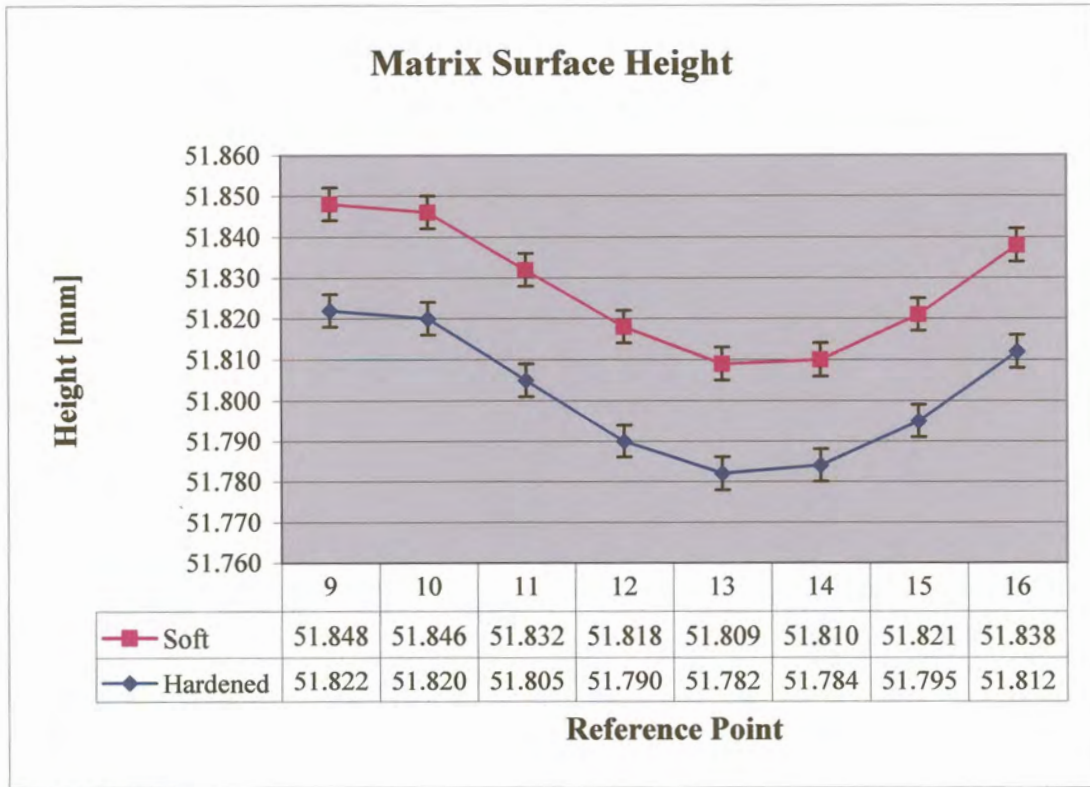


FIGURE F 1

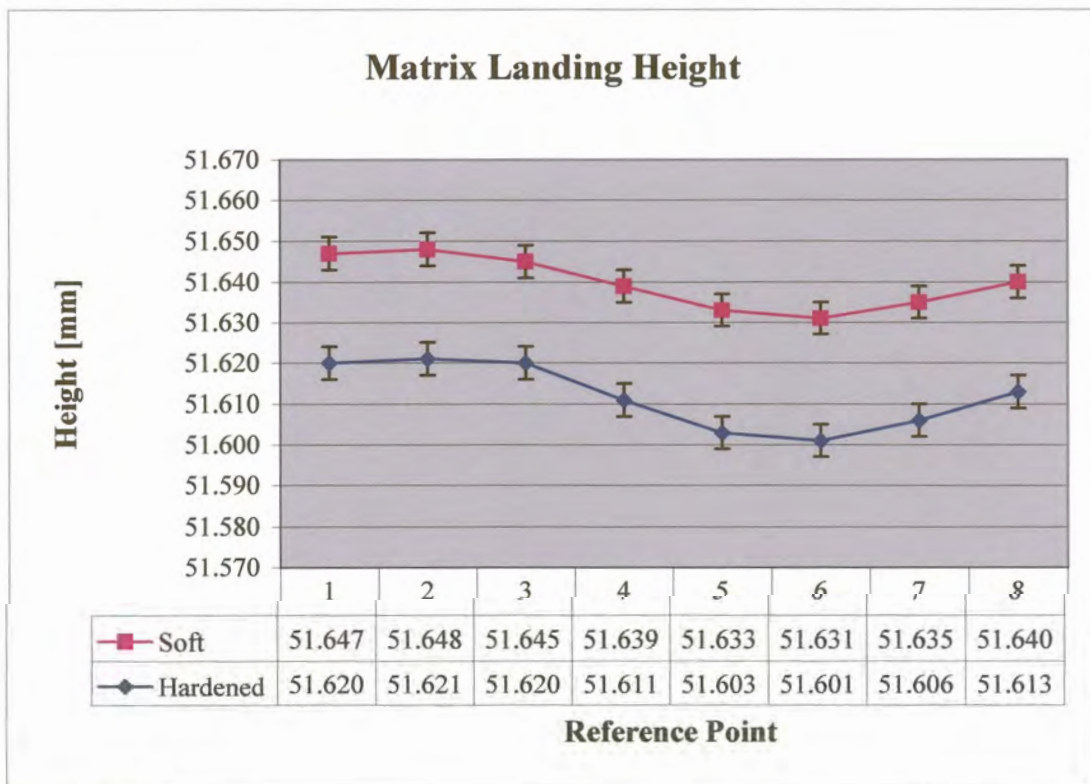
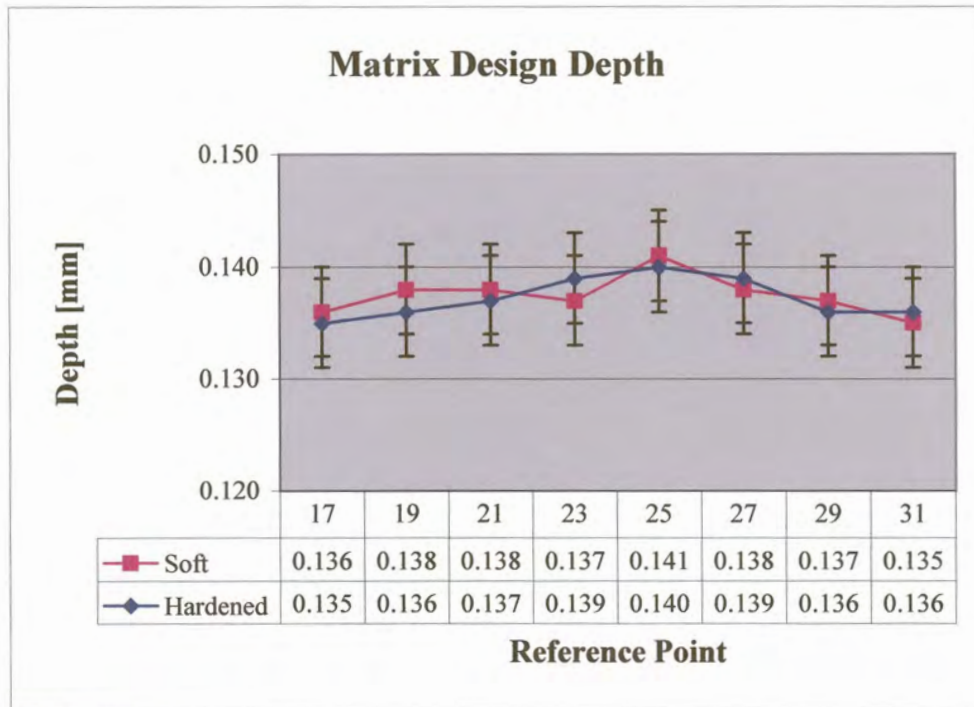
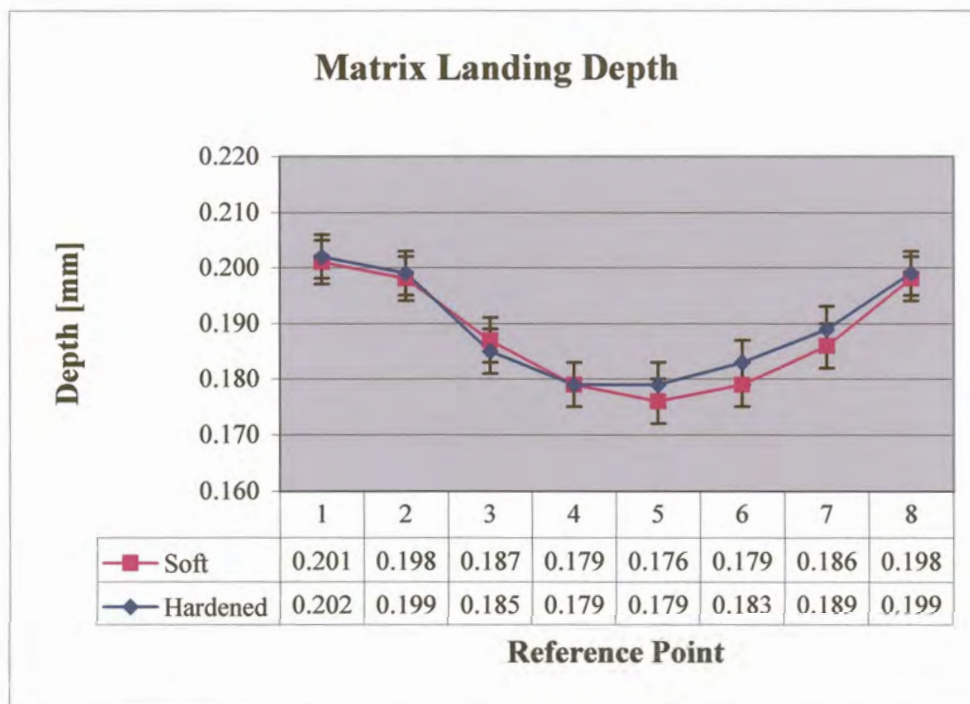


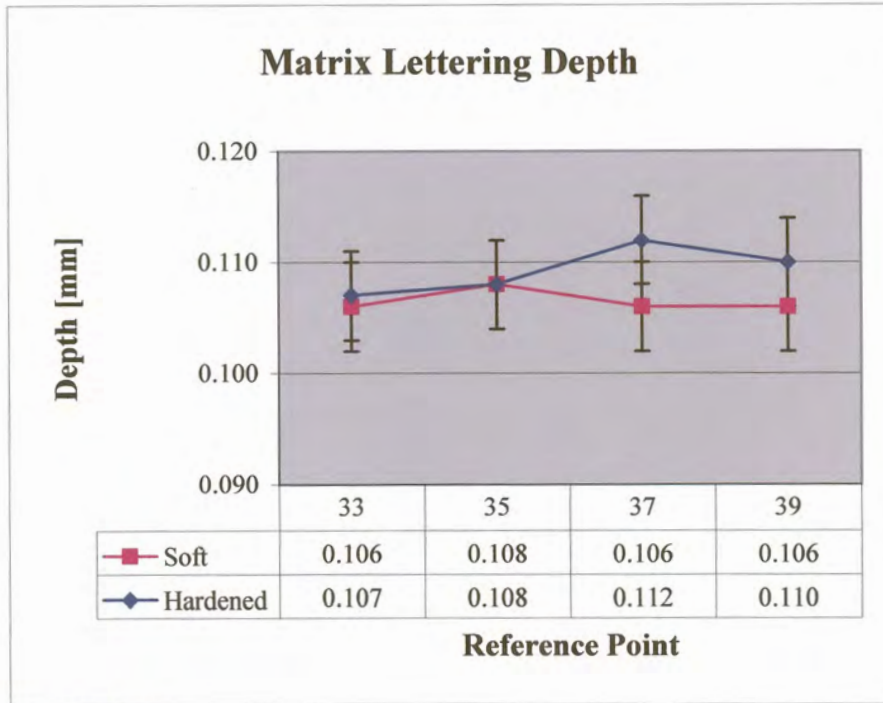
FIGURE F 2



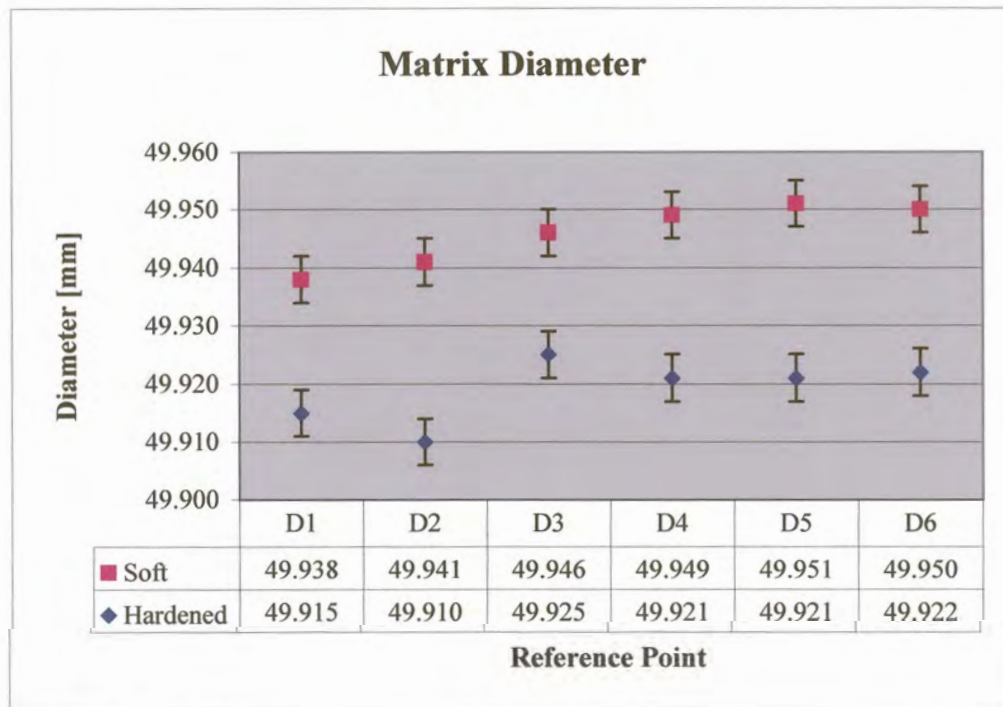
**FIGURE F 3**



**FIGURE F 4**



**FIGURE F 5**



**FIGURE F 6**





## Master Punch 20.1   Soft

\* All measurements are in millimeters

<u>Measurements</u>			
<i>Ref. Point</i>	<i>Height</i>	<i>Ref. Point</i>	<i>Height</i>
1	65.716	26	65.727
2	65.716	27	65.593
3	65.723	28	65.729
4	65.728	29	65.590
5	65.733	30	65.724
6	65.729	31	65.583
7	65.723	32	65.715
8	65.717	33	65.544
9	65.535	34	65.651
10	65.532	35	65.549
11	65.542	36	65.658
12	65.555	37	65.571
13	65.567	38	65.679
14	65.567	39	65.563
15	65.558	40	65.672
16	65.546	41	20.534
17	65.577	42	20.530
18	65.709	43	13.157
19	65.572	44	13.167
20	65.708	45	65.731
21	65.576	46	65.540
22	65.713	47	65.560
23	65.584	48	65.570
24	65.720	49	65.553
25	65.592		

<u>Landing</u>	
<i>Ref. Point</i>	<i>Depth</i>
1	0.181
2	0.184
3	0.181
4	0.173
5	0.166
6	0.162
7	0.165
8	0.171
<b>Average</b>	<b>0.173</b>

<u>Design</u>	
<i>Ref. Point</i>	<i>Depth</i>
17	0.132
19	0.136
21	0.137
23	0.136
25	0.135
27	0.136
29	0.134
31	0.132
<b>Average</b>	<b>0.135</b>

<u>Lettering</u>	
<i>Ref. Point</i>	<i>Depth</i>
33	0.107
35	0.109
37	0.108
39	0.109
<b>Average</b>	<b>0.108</b>

### Dome

0.046

### Diameter

<i>Ref. Point</i>	<i>Diameter</i>
D1	40.045
D2	40.044
D3	40.015
D4	40.016
D5	40.000
D6	39.999





## Master Punch 20.1 Hardened

\* All measurements are in millimeters

### Measurements

<i>Ref. Point</i>	<i>Height</i>	<i>Ref. Point</i>	<i>Height</i>
1	65.685	26	65.690
2	65.684	27	65.559
3	65.693	28	65.695
4	65.698	29	65.556
5	65.702	30	65.691
6	65.699	31	65.548
7	65.693	32	65.680
8	65.685	33	65.510
9	65.500	34	65.617
10	65.497	35	65.514
11	65.507	36	65.620
12	65.522	37	65.538
13	65.534	38	65.648
14	65.534	39	65.532
15	65.526	40	65.640
16	65.512	41	20.520
17	65.541	42	20.521
18	65.675	43	13.145
19	65.536	44	13.147
20	65.673	45	65.688
21	65.540	46	65.505
22	65.677	47	65.527
23	65.547	48	65.538
24	65.683	49	65.520
25	65.556		

### Landing

<i>Ref. Point</i>	<i>Depth</i>
1	0.185
2	0.187
3	0.186
4	0.176
5	0.168
6	0.165
7	0.167
8	0.173
<b>Average</b>	<b>0.176</b>

### Design

<i>Ref. Point</i>	<i>Depth</i>
17	0.134
19	0.137
21	0.137
23	0.136
25	0.134
27	0.136
29	0.135
31	0.132
<b>Average</b>	<b>0.135</b>

### Lettering

<i>Ref. Point</i>	<i>Depth</i>
33	0.107
35	0.106
37	0.110
39	0.108
<b>Average</b>	<b>0.108</b>

### Dome

**0.036**

### Diameter

<i>Ref. Point</i>	<i>Diameter</i>
D1	40.034
D2	40.035
D3	40.003
D4	40.003
D5	39.987
D6	39.989





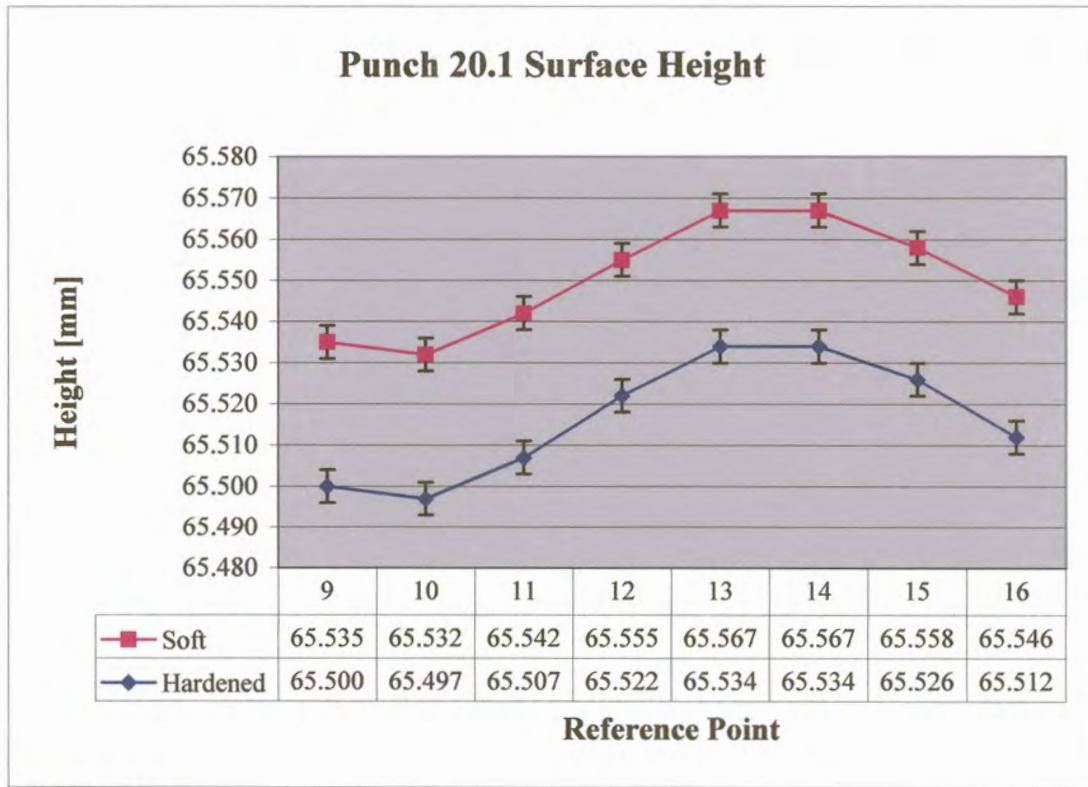


FIGURE F 7

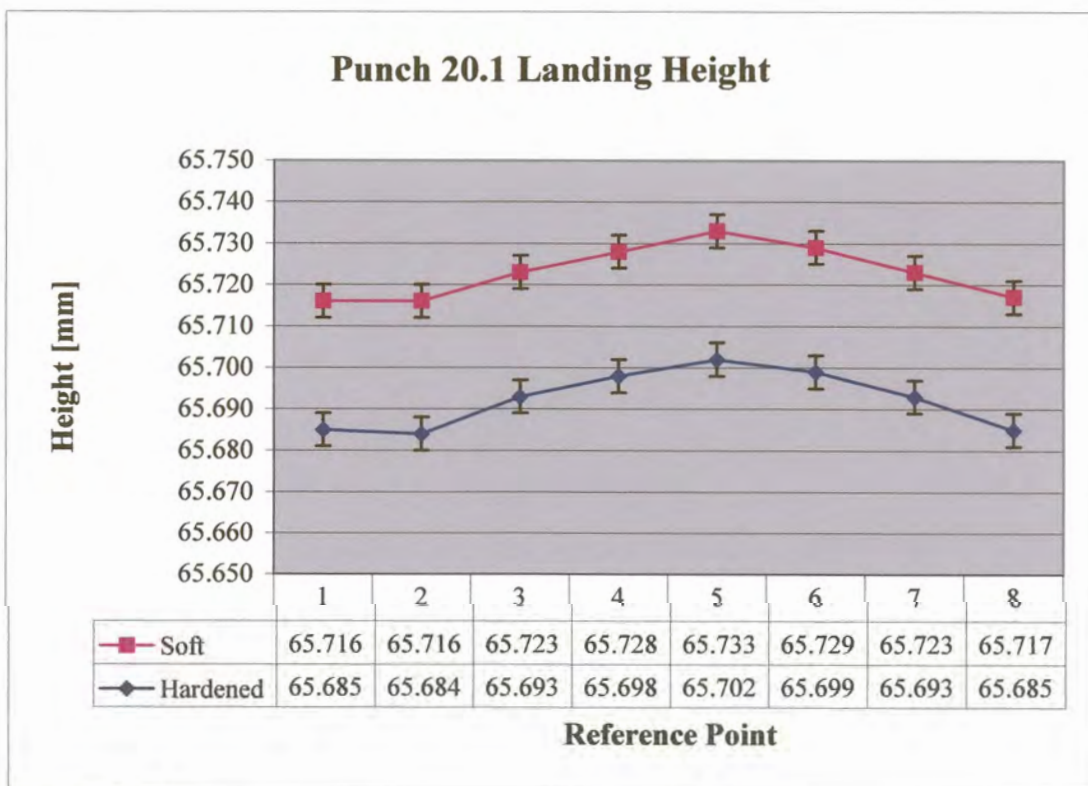
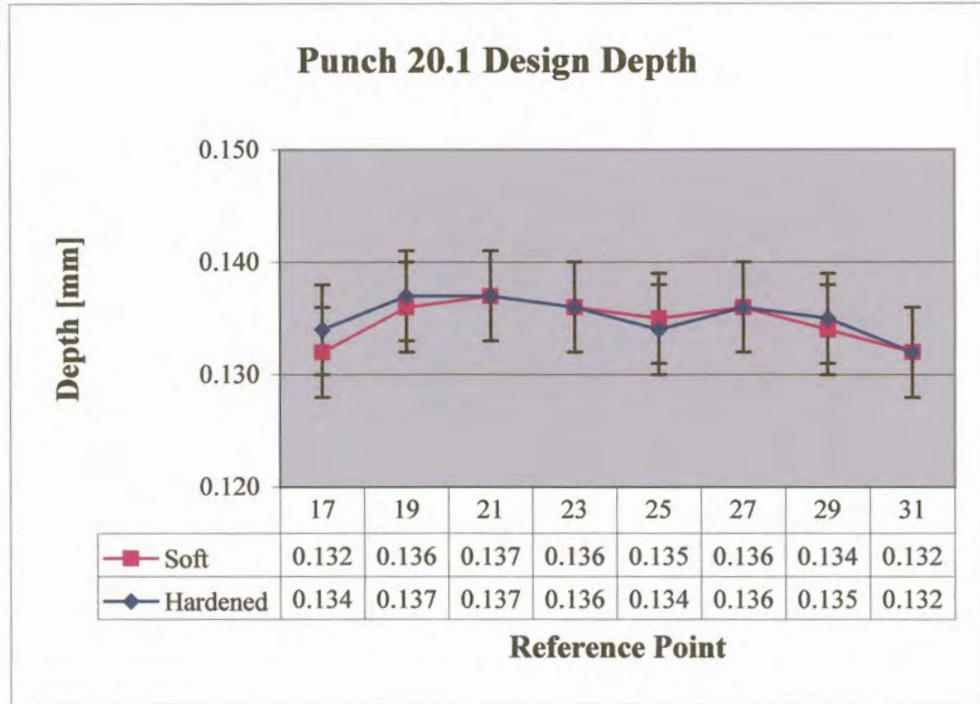
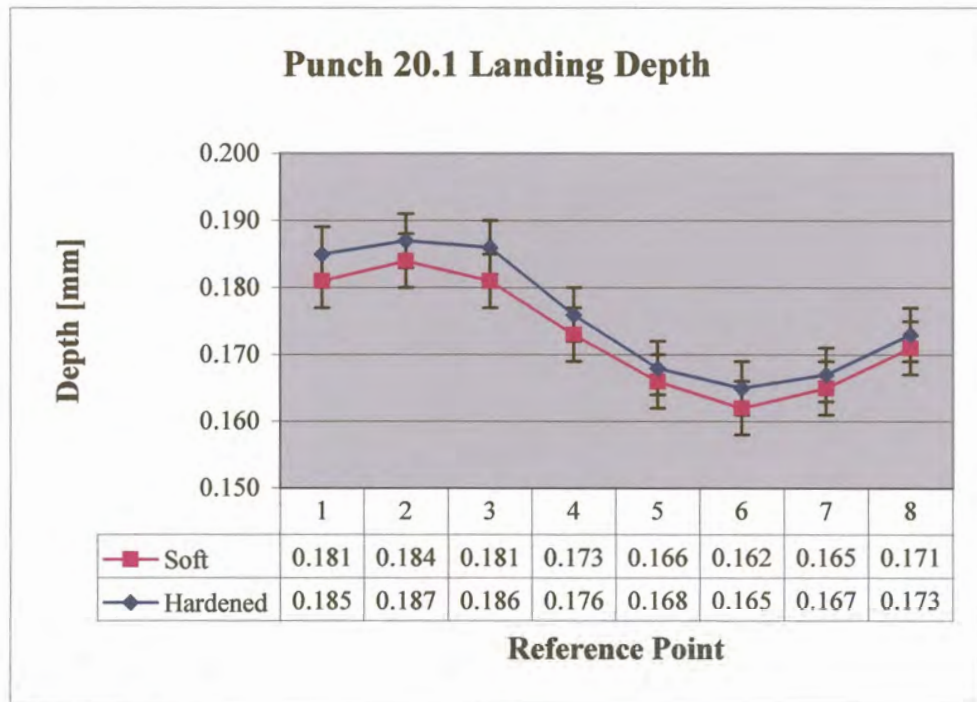


FIGURE F 8



**FIGURE F 9**



**FIGURE F 10**

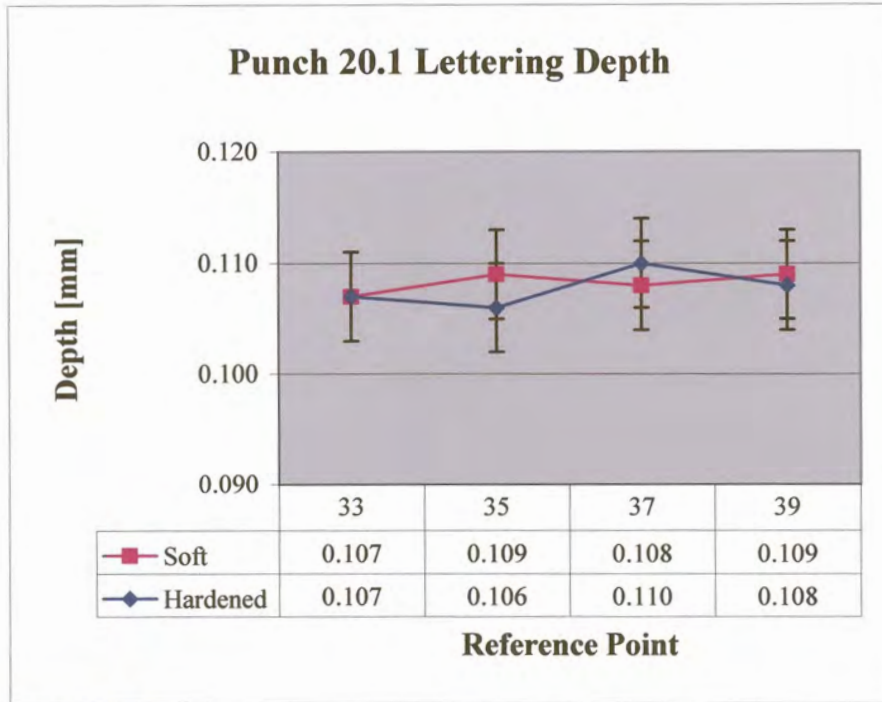


FIGURE F 11

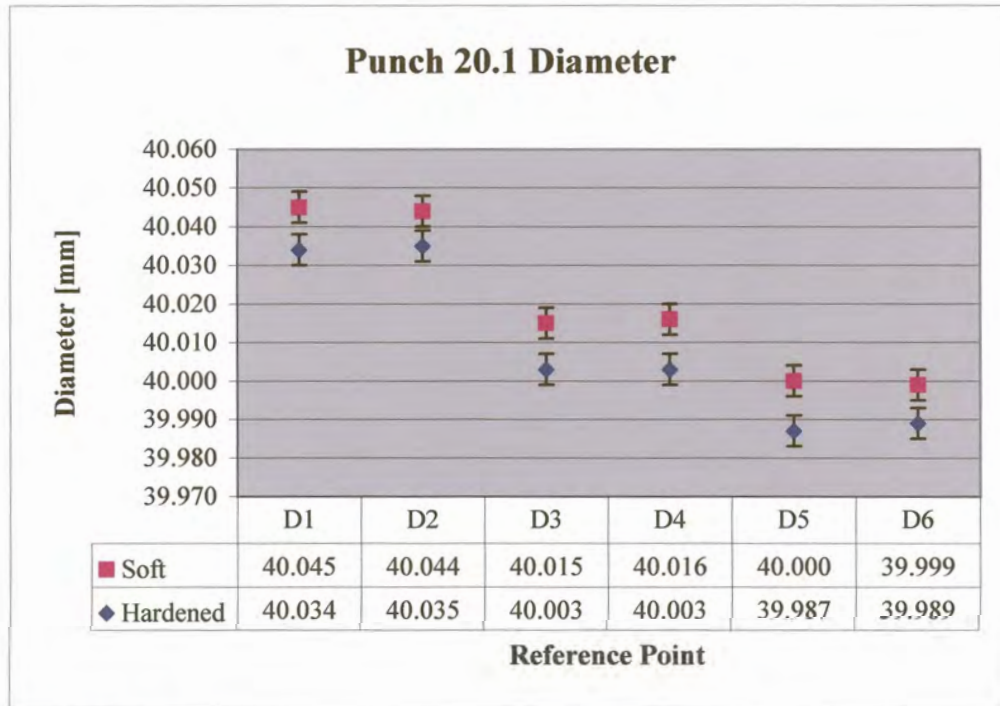


FIGURE F 12





**Master Punch 20.2 Soft**

\* All measurements are in millimeters

**Measurements**

Ref. Point	Height	Ref. Point	Height
1	65.641	26	65.640
2	65.639	27	65.505
3	65.641	28	65.641
4	65.643	29	65.503
5	65.645	30	65.640
6	65.644	31	65.501
7	65.643	32	65.633
8	65.641	33	65.463
9	65.455	34	65.570
10	65.450	35	65.461
11	65.456	36	65.572
12	65.468	37	65.482
13	65.478	38	65.591
14	65.478	39	65.480
15	65.475	40	65.589
16	65.468	41	20.529
17	65.496	42	20.527
18	65.628	43	13.162
19	65.489	44	13.163
20	65.627	45	65.648
21	65.490	46	65.456
22	65.629	47	65.473
23	65.498	48	65.482
24	65.632	49	65.475
25	65.503		

**Landing**

Ref. Point Depth

1	0.186
2	0.189
3	0.185
4	0.175
5	0.167
6	0.166
7	0.168
8	0.173
<b>Average</b>	<b>0.176</b>

**Design**

Ref. Point Depth

17	0.132
19	0.138
21	0.139
23	0.134
25	0.137
27	0.136
29	0.137
31	0.132
<b>Average</b>	<b>0.136</b>

**Lettering**

Ref. Point Depth

33	0.107
35	0.111
37	0.109
39	0.109
<b>Average</b>	<b>0.109</b>

**Dome**

<b>0.046</b>
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**Diameter**

Ref. Point Diameter

D1	40.010
D2	40.011
D3	39.975
D4	39.974
D5	39.962
D6	39.963



## Master Punch 20.2    Hardened

\* All measurements are in millimeters

### Measurements

<i>Ref. Point</i>	<i>Height</i>	<i>Ref. Point</i>	<i>Height</i>
1	65.622	26	65.619
2	65.620	27	65.484
3	65.624	28	65.621
4	65.625	29	65.483
5	65.627	30	65.618
6	65.626	31	65.480
7	65.624	32	65.611
8	65.623	33	65.445
9	65.436	34	65.553
10	65.431	35	65.444
11	65.437	36	65.553
12	65.448	37	65.461
13	65.459	38	65.570
14	65.460	39	65.461
15	65.456	40	65.569
16	65.447	41	20.528
17	65.474	42	20.524
18	65.607	43	13.148
19	65.469	44	13.151
20	65.605	45	65.615
21	65.470	46	65.439
22	65.608	47	65.453
23	65.476	48	65.462
24	65.612	49	65.453
25	65.482		

### Landing

*Ref. Point*    *Depth*

1	0.186
2	0.189
3	0.187
4	0.177
5	0.168
6	0.166
7	0.168
8	0.176
<b>Average</b>	<b>0.177</b>

### Design

*Ref. Point*    *Depth*

17	0.133
19	0.136
21	0.138
23	0.136
25	0.137
27	0.137
29	0.135
31	0.131
<b>Average</b>	<b>0.135</b>

### Lettering

*Ref. Point*    *Depth*

33	0.108
35	0.109
37	0.109
39	0.108
<b>Average</b>	<b>0.108</b>

### Dome

**0.033**

### Diameter

*Ref. Point*    *Diameter*

<b>D1</b>	40.009
<b>D2</b>	40.009
<b>D3</b>	39.972
<b>D4</b>	39.973
<b>D5</b>	39.957
<b>D6</b>	39.960





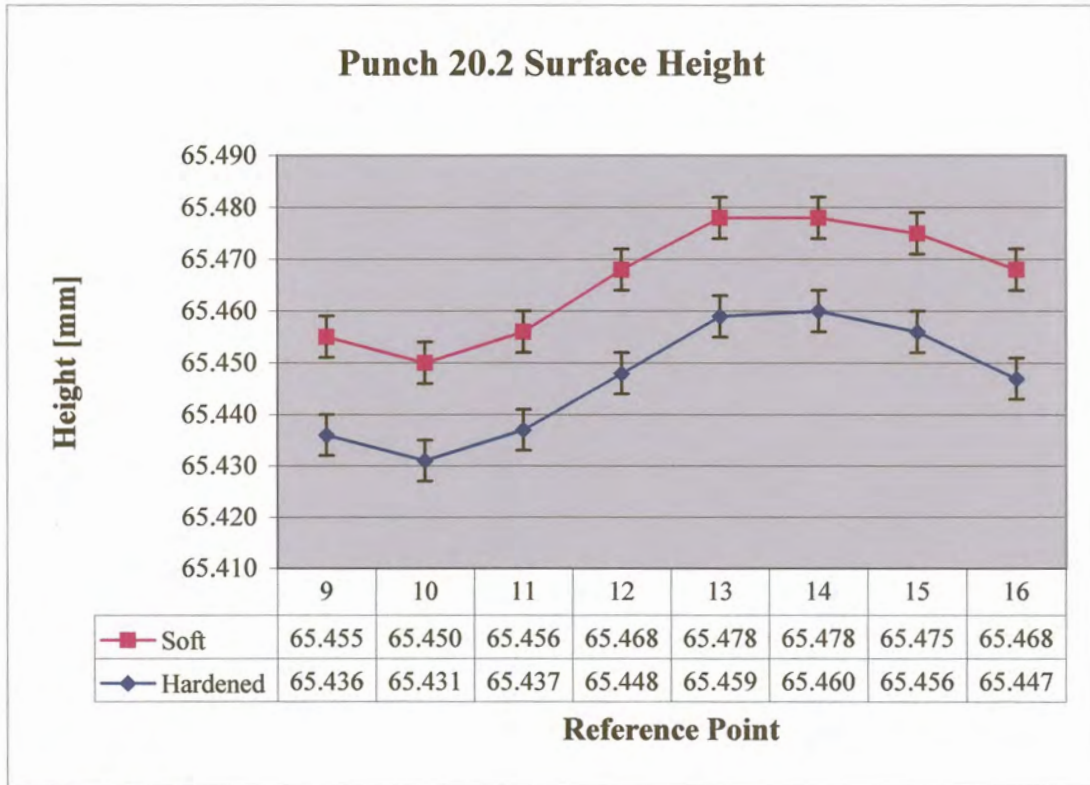


FIGURE F 13

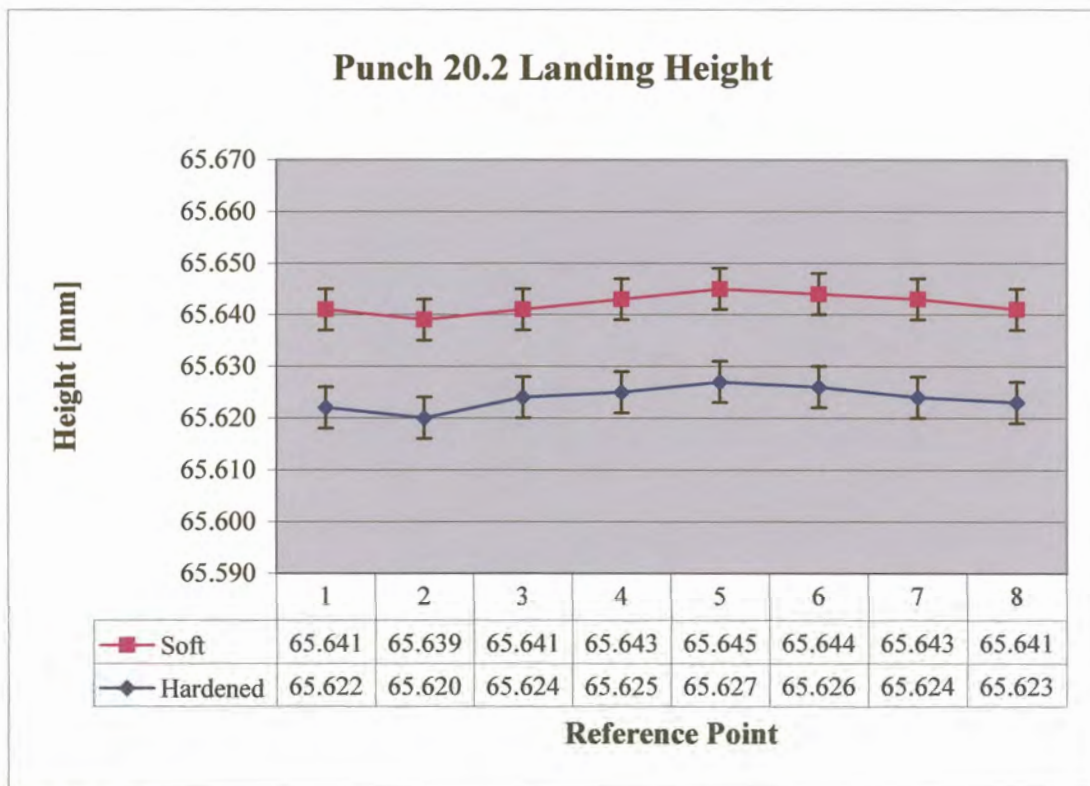
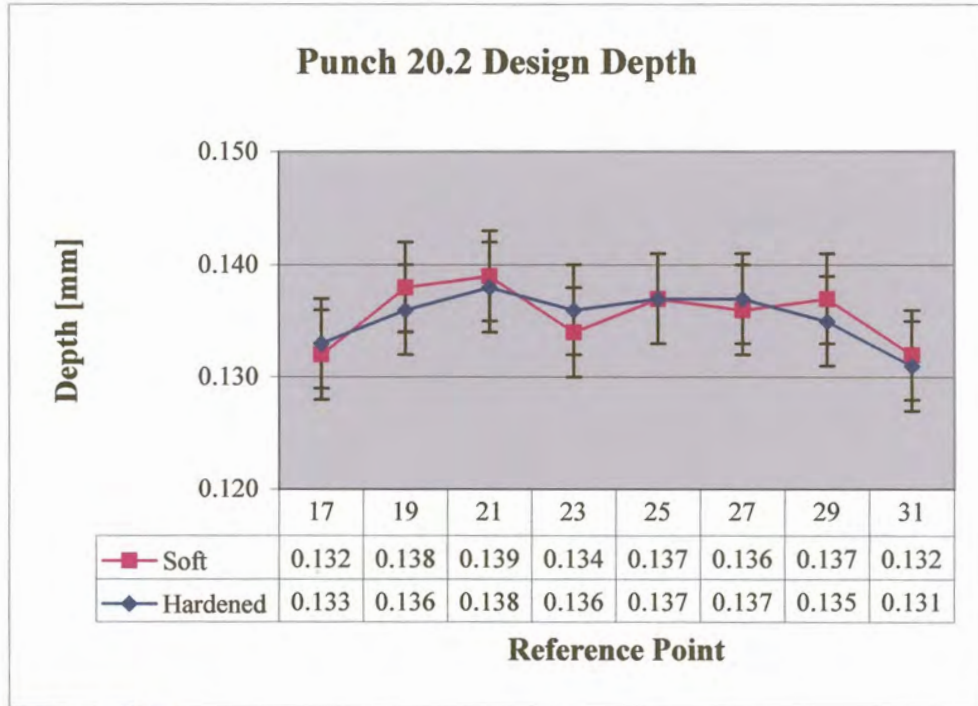
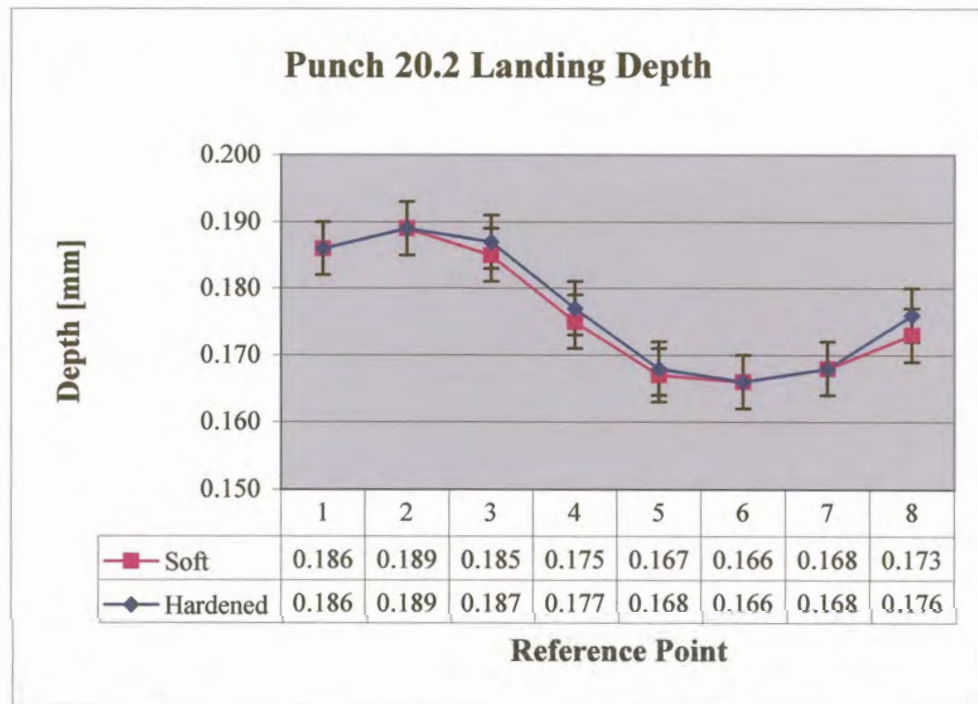


FIGURE F 14





**FIGURE F 15**



**FIGURE F 16**

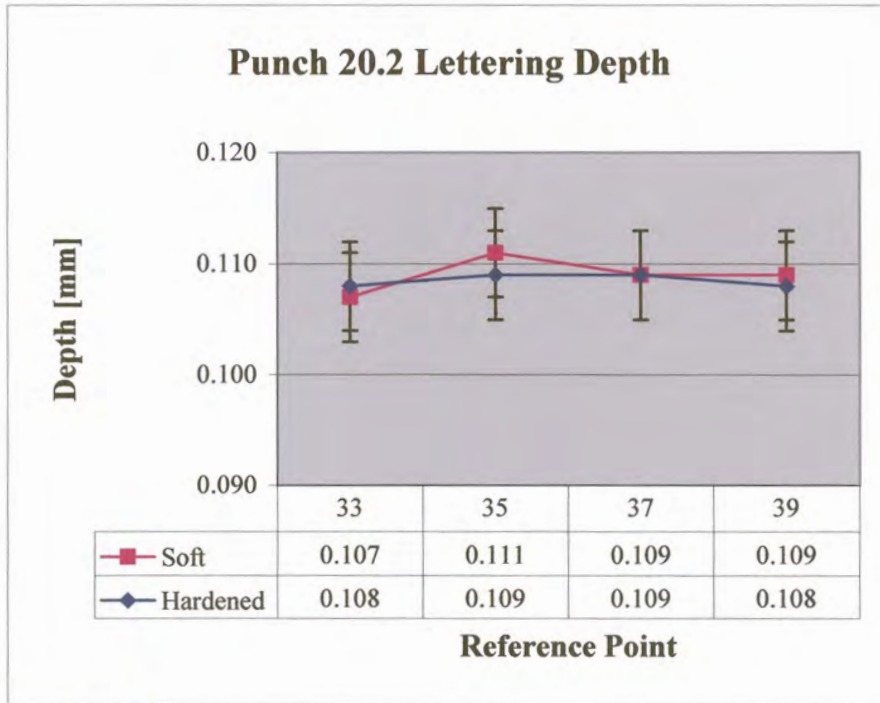


FIGURE F 17

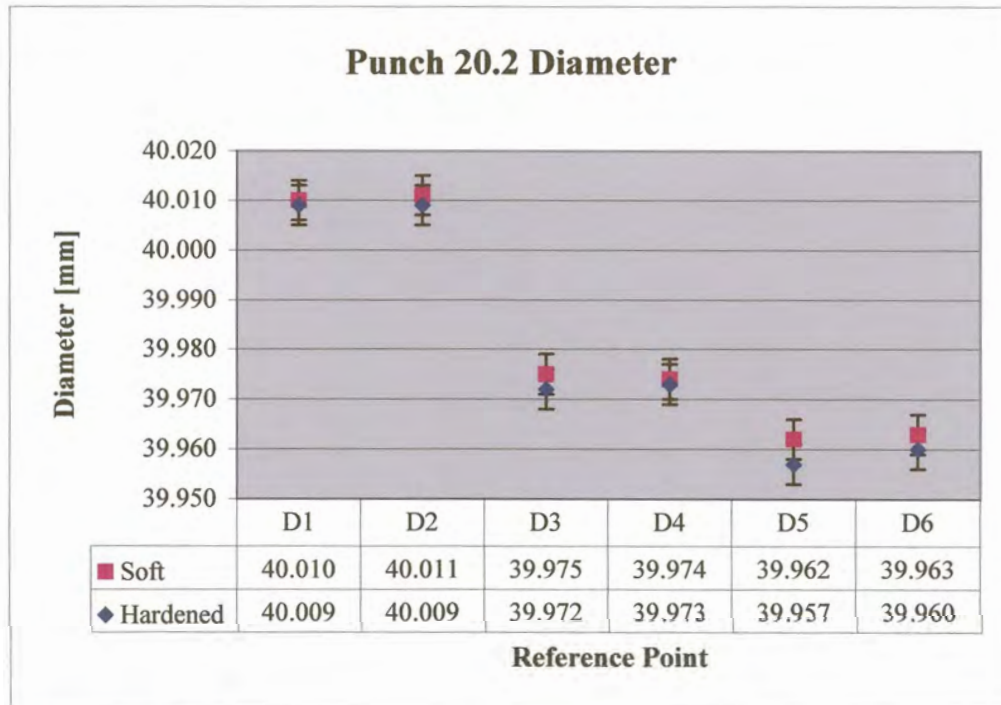


FIGURE F 18



## Master Punch 25.1 Soft

\* All measurements are in millimeters

### Measurements

<i>Ref. Point</i>	<i>Height</i>	<i>Ref. Point</i>	<i>Height</i>
1	64.541	26	64.545
2	64.538	27	64.411
3	64.540	28	64.550
4	64.542	29	64.413
5	64.547	30	64.548
6	64.550	31	64.407
7	64.548	32	64.539
8	64.544	33	64.367
9	64.358	34	64.476
10	64.349	35	64.365
11	64.355	36	64.473
12	64.368	37	64.387
13	64.382	38	64.494
14	64.386	39	64.391
15	64.382	40	64.498
16	64.372	41	20.537
17	64.401	42	20.528
18	64.532	43	13.155
19	64.393	44	13.160
20	64.530	45	64.553
21	64.392	46	64.360
22	64.531	47	64.375
23	64.399	48	64.391
24	64.536	49	64.381
25	64.408		

### Landing

<i>Ref. Point</i>	<i>Depth</i>
1	0.183
2	0.189
3	0.185
4	0.174
5	0.165
6	0.164
7	0.166
8	0.172
<b>Average</b>	<b>0.175</b>

### Design

<i>Ref. Point</i>	<i>Depth</i>
17	0.131
19	0.137
21	0.139
23	0.137
25	0.137
27	0.139
29	0.135
31	0.132
<b>Average</b>	<b>0.136</b>

### Lettering

<i>Ref. Point</i>	<i>Depth</i>
33	0.109
35	0.108
37	0.107
39	0.107
<b>Average</b>	<b>0.108</b>

### Dome

<b>0.048</b>
--------------

### Diameter

<i>Ref. Point</i>	<i>Diameter</i>
D1	40.076
D2	40.075
D3	40.045
D4	40.047
D5	40.051
D6	40.047







## Master Punch 25.1     Hardened

\* All measurements are in millimeters

### Measurements

<i>Ref. Point</i>	<i>Height</i>	<i>Ref. Point</i>	<i>Height</i>
1	64.535	26	64.531
2	64.531	27	64.399
3	64.532	28	64.537
4	64.532	29	64.400
5	64.536	30	64.536
6	64.539	31	64.397
7	64.539	32	64.530
8	64.538	33	64.358
9	64.349	34	64.468
10	64.341	35	64.354
11	64.345	36	64.465
12	64.356	37	64.374
13	64.368	38	64.484
14	64.373	39	64.377
15	64.371	40	64.487
16	64.366	41	20.534
17	64.390	42	20.531
18	64.523	43	13.148
19	64.381	44	13.150
20	64.520	45	64.530
21	64.382	46	64.350
22	64.519	47	64.363
23	64.388	48	64.378
24	64.525	49	64.370
25	64.396		

### Landing

<i>Ref. Point</i>	<i>Depth</i>
1	0.186
2	0.190
3	0.187
4	0.176
5	0.168
6	0.166
7	0.168
8	0.172
<b>Average</b>	<b>0.177</b>

### Design

<i>Ref. Point</i>	<i>Depth</i>
17	0.133
19	0.139
21	0.137
23	0.137
25	0.135
27	0.138
29	0.136
31	0.133
<b>Average</b>	<b>0.136</b>

### Lettering

<i>Ref. Point</i>	<i>Depth</i>
33	0.110
35	0.111
37	0.110
39	0.110
<b>Average</b>	<b>0.110</b>

### Dome

<b>0.035</b>
--------------

### Diameter

<i>Ref. Point</i>	<i>Diameter</i>
D1	40.076
D2	40.079
D3	40.044
D4	40.047
D5	40.032
D6	40.033



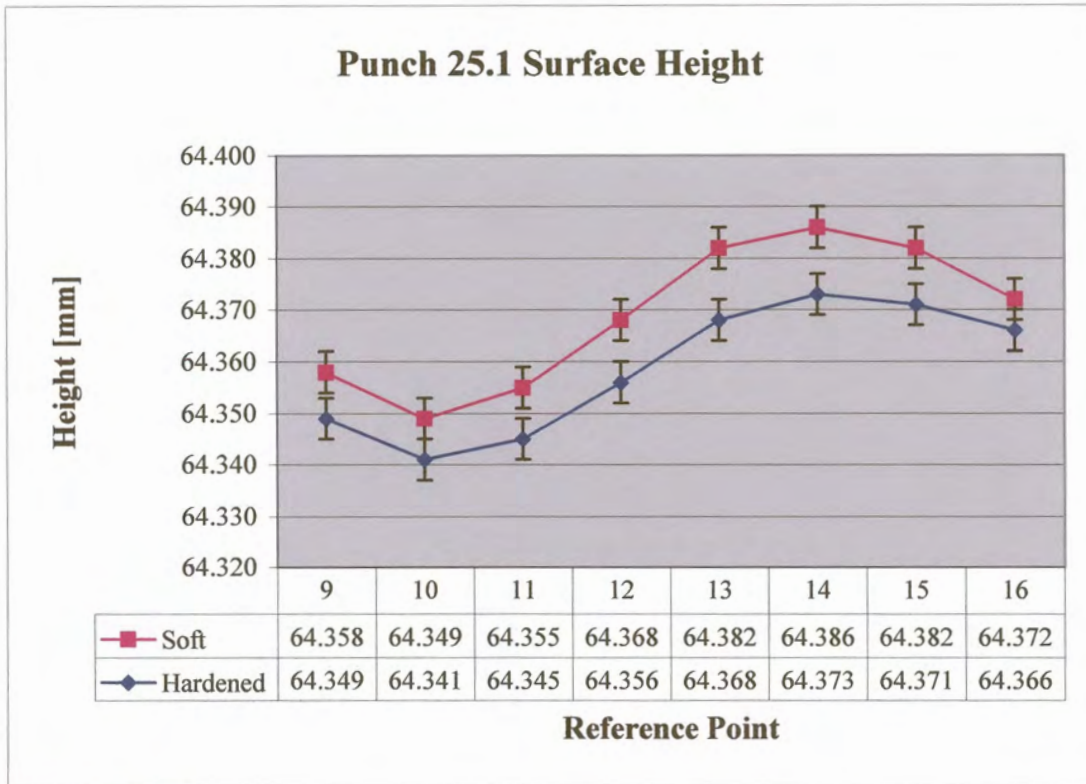


FIGURE F 19

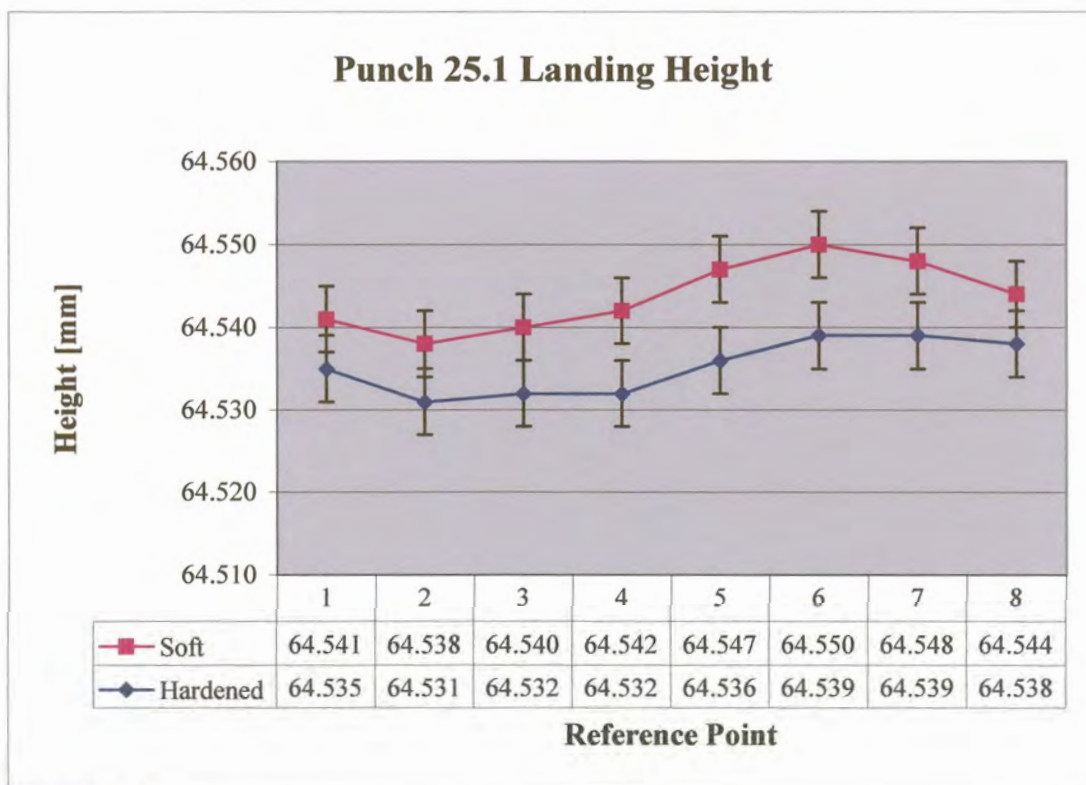
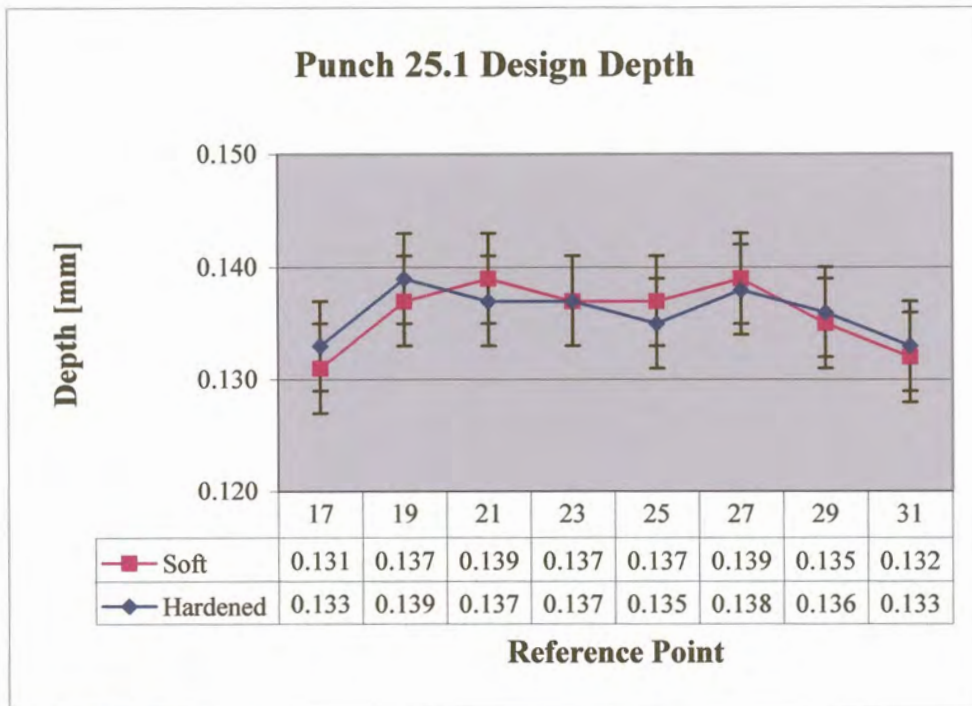
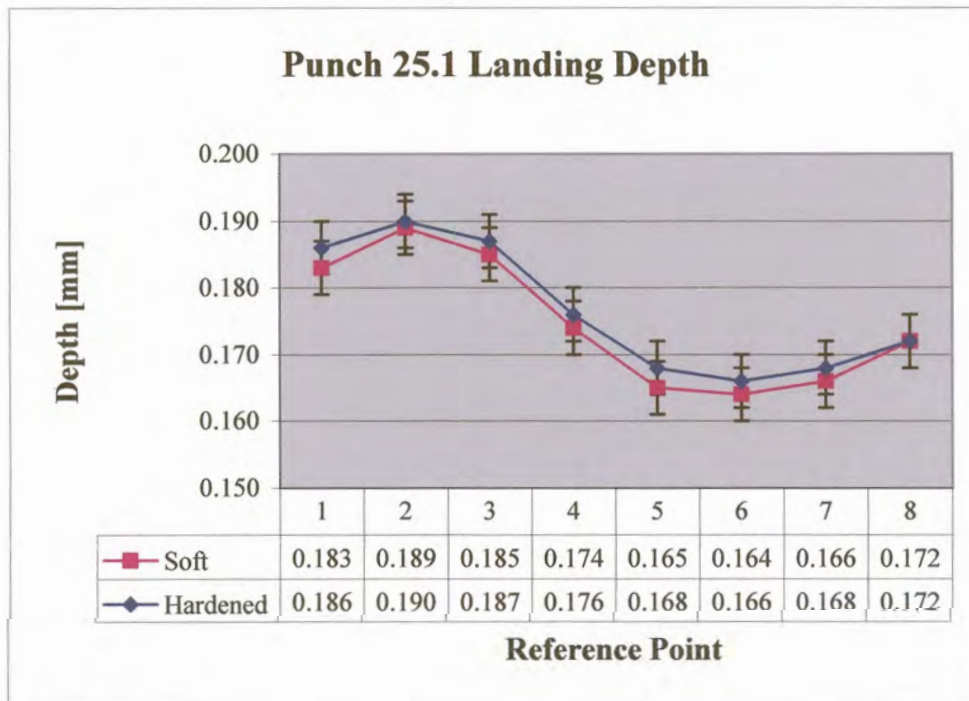


FIGURE F 20

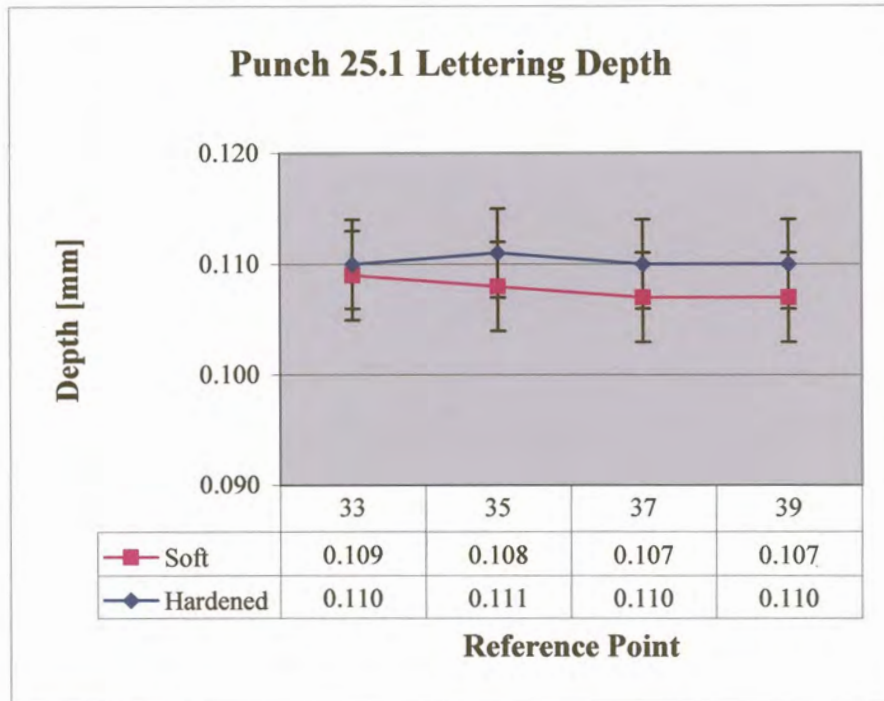


**FIGURE F 21**

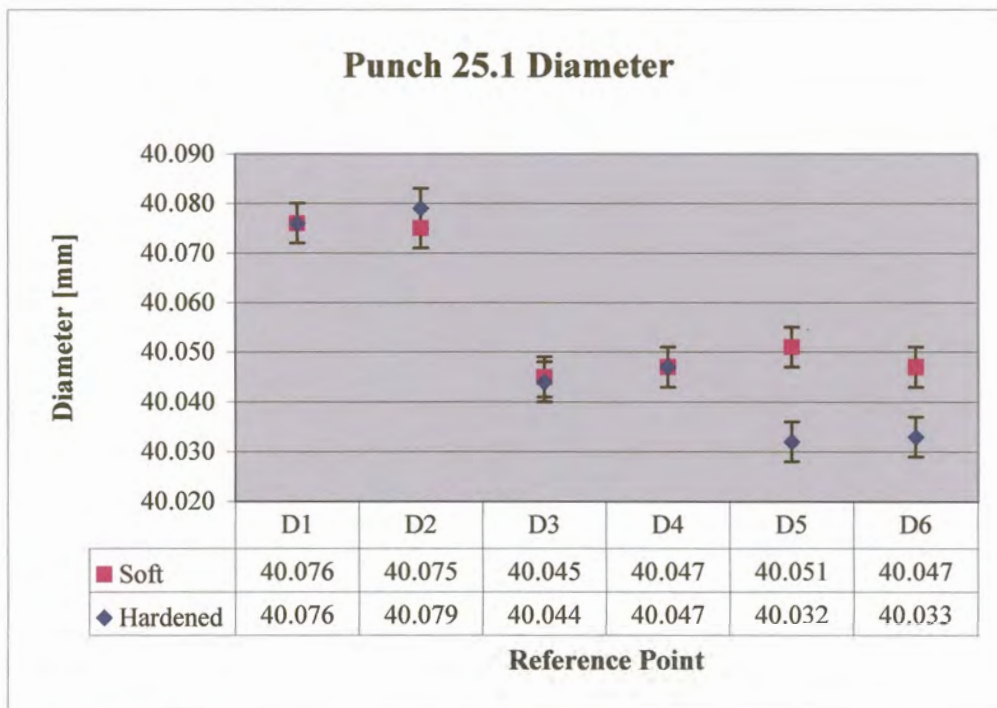


**FIGURE F 22**





**FIGURE F 23**



**FIGURE F 24**



**Master Punch 25.2 Soft**

\* All measurements are in millimeters

**Measurements**

Ref. Point	Height	Ref. Point	Height
1	64.714	26	64.715
2	64.719	27	64.579
3	64.726	28	64.716
4	64.723	29	64.577
5	64.720	30	64.710
6	64.713	31	64.572
7	64.707	32	64.703
8	64.707	33	64.535
9	64.528	34	64.645
10	64.530	35	64.546
11	64.538	36	64.653
12	64.548	37	64.557
13	64.554	38	64.666
14	64.549	39	64.548
15	64.541	40	64.656
16	64.533	41	20.532
17	64.569	42	20.538
18	64.702	43	13.160
19	64.567	44	13.162
20	64.704	45	64.721
21	64.570	46	64.536
22	64.710	47	64.552
23	64.577	48	64.553
24	64.713	49	64.542
25	64.580		

**Landing**

Ref. Point	Depth
1	0.186
2	0.189
3	0.188
4	0.175
5	0.166
6	0.164
7	0.166
8	0.174
Average	0.176

**Design**

Ref. Point	Depth
17	0.133
19	0.137
21	0.140
23	0.136
25	0.135
27	0.137
29	0.133
31	0.131
Average	0.135

**Lettering**

Ref. Point	Depth
33	0.110
35	0.107
37	0.109
39	0.108
Average	0.108

**Dome**

0.046
-------

**Diameter**

Ref. Point	Diameter
D1	40.050
D2	40.051
D3	40.029
D4	40.027
D5	40.019
D6	40.019







**Master Punch 25.2 Hardened**

\* All measurements are in millimeters

**Measurements**

Ref. Point	Height	Ref. Point	Height
1	64.708	26	64.711
2	64.711	27	64.575
3	64.715	28	64.712
4	64.715	29	64.574
5	64.714	30	64.708
6	64.709	31	64.570
7	64.706	32	64.702
8	64.706	33	64.537
9	64.524	34	64.644
10	64.522	35	64.540
11	64.531	36	64.649
12	64.540	37	64.555
13	64.549	38	64.664
14	64.547	39	64.549
15	64.540	40	64.657
16	64.533	41	20.534
17	64.565	42	20.536
18	64.698	43	13.150
19	64.559	44	13.153
20	64.699	45	64.708
21	64.563	46	64.533
22	64.703	47	64.548
23	64.569	48	64.552
24	64.706	49	64.543
25	64.575		

**Landing**

Ref. Point	Depth
1	0.184
2	0.189
3	0.184
4	0.175
5	0.165
6	0.162
7	0.166
8	0.173
<b>Average</b>	<b>0.175</b>

**Design**

Ref. Point	Depth
17	0.133
19	0.140
21	0.140
23	0.137
25	0.136
27	0.137
29	0.134
31	0.132
<b>Average</b>	<b>0.136</b>

**Lettering**

Ref. Point	Depth
33	0.107
35	0.109
37	0.109
39	0.108
<b>Average</b>	<b>0.108</b>

**Dome**

0.036

**Diameter**

Ref. Point	Diameter
D1	40.056
D2	40.056
D3	40.029
D4	40.029
D5	40.018
D6	40.020





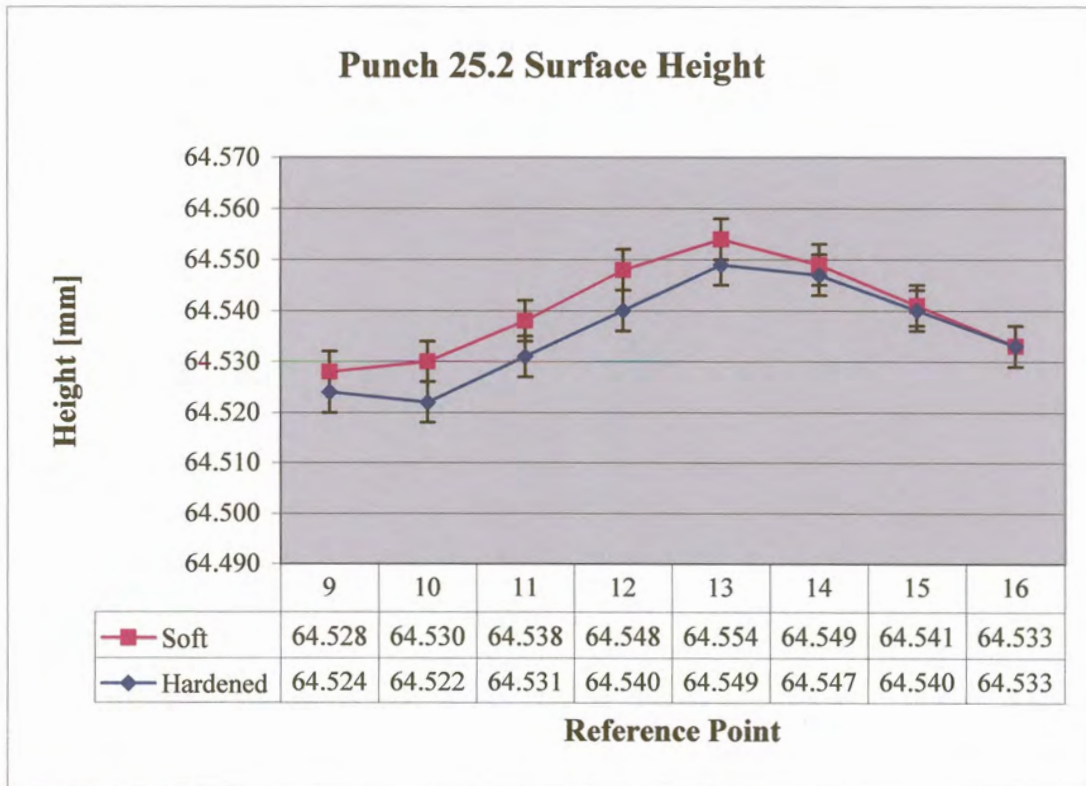


FIGURE F 25

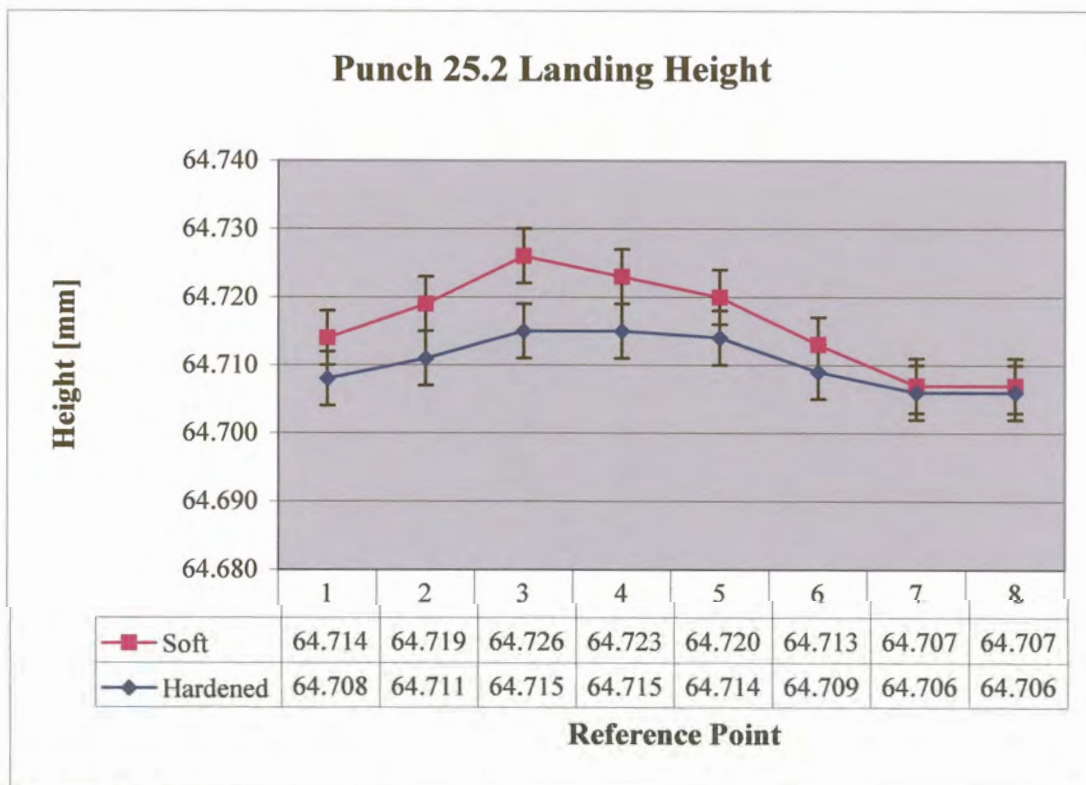
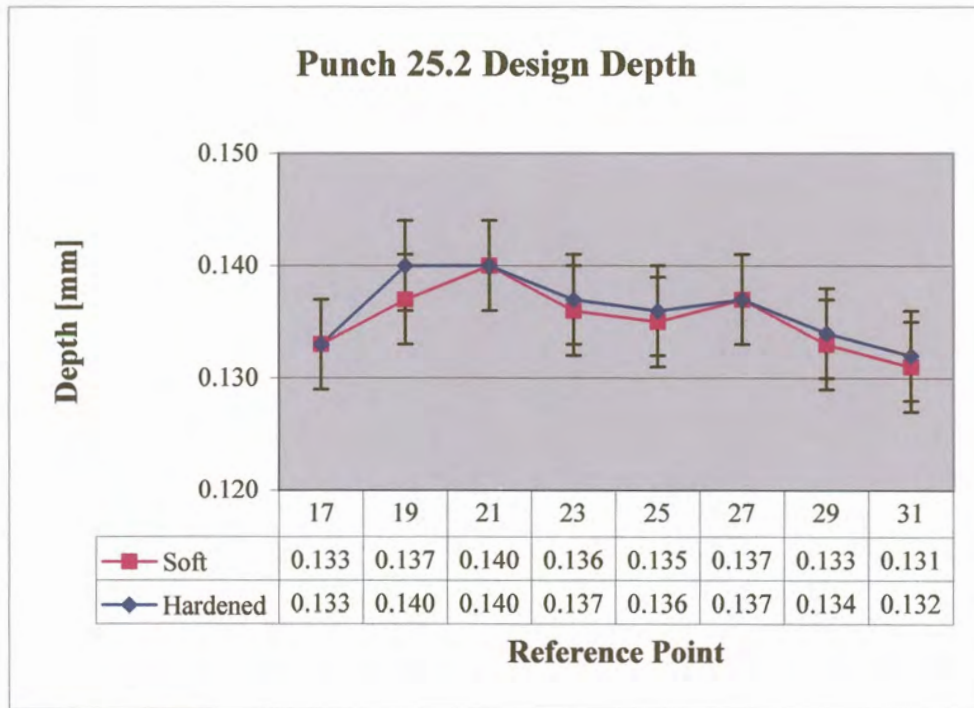
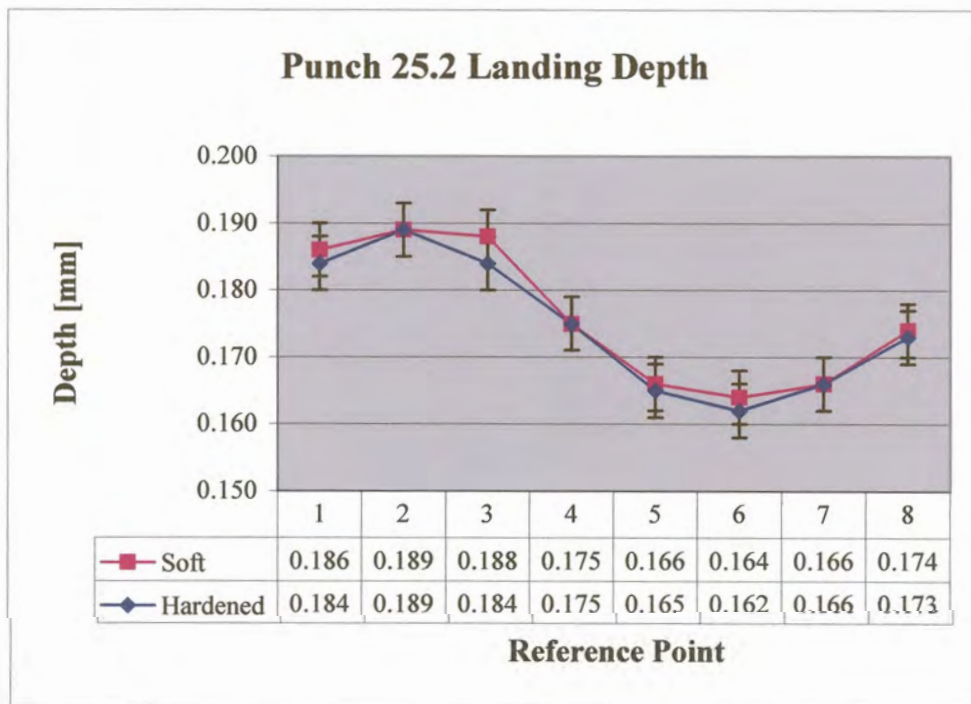


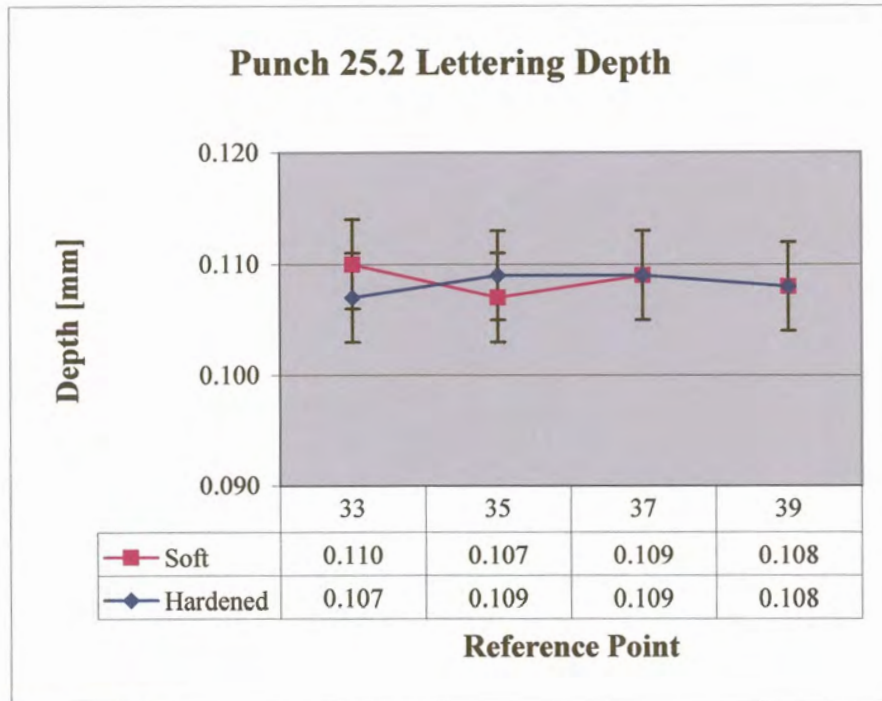
FIGURE F 26



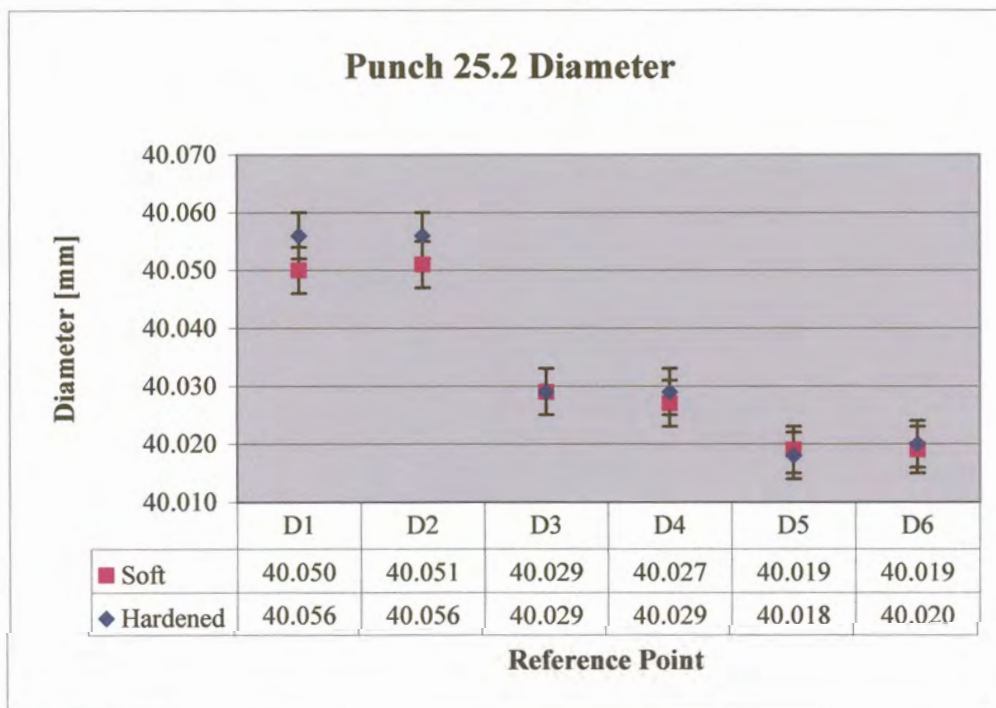
**FIGURE F 27**



**FIGURE F 28**



**FIGURE F 29**



**FIGURE F 30**





**Master Punch 30.1 Soft**

\* All measurements are in millimeters

**Measurements**

Ref. Point	Height	Ref. Point	Height
1	63.031	26	63.032
2	63.031	27	62.901
3	63.032	28	63.037
4	63.033	29	62.900
5	63.034	30	63.035
6	63.036	31	62.897
7	63.035	32	63.028
8	63.033	33	62.858
9	62.850	34	62.967
10	62.845	35	62.859
11	62.850	36	62.967
12	62.860	37	62.875
13	62.870	38	62.985
14	62.875	39	62.877
15	62.871	40	62.985
16	62.864	41	20.543
17	62.890	42	20.546
18	63.022	43	13.153
19	62.883	44	13.160
20	63.021	45	63.040
21	62.887	46	62.853
22	63.024	47	62.867
23	62.891	48	62.879
24	63.028	49	62.870
25	62.897		

**Landing**

Ref. Point	Depth
1	0.181
2	0.186
3	0.182
4	0.173
5	0.164
6	0.161
7	0.164
8	0.169
<b>Average</b>	<b>0.172</b>

**Design**

Ref. Point	Depth
17	0.132
19	0.138
21	0.137
23	0.137
25	0.135
27	0.136
29	0.135
31	0.131
<b>Average</b>	<b>0.135</b>

**Lettering**

Ref. Point	Depth
33	0.109
35	0.108
37	0.110
39	0.108
<b>Average</b>	<b>0.109</b>

**Dome**

<b>0.044</b>
--------------

**Diameter**

Ref. Point	Diameter
D1	40.023
D2	40.025
D3	39.995
D4	39.993
D5	39.976
D6	39.978





**Master Punch 30.1     Hardened**

\* All measurements are in millimeters

**Measurements**

<i>Ref. Point</i>	<i>Height</i>	<i>Ref. Point</i>	<i>Height</i>
1	63.010	26	63.013
2	63.007	27	62.878
3	63.008	28	63.018
4	63.011	29	62.878
5	63.014	30	63.016
6	63.016	31	62.874
7	63.013	32	63.009
8	63.011	33	62.836
9	62.824	34	62.946
10	62.817	35	62.833
11	62.822	36	62.944
12	62.835	37	62.853
13	62.846	38	62.964
14	62.852	39	62.856
15	62.847	40	62.967
16	62.839	41	20.535
17	62.867	42	20.538
18	63.001	43	13.149
19	62.861	44	13.153
20	63.000	45	63.012
21	62.862	46	62.830
22	63.001	47	62.843
23	62.869	48	62.858
24	63.006	49	62.847
25	62.874		

**Landing**

<i>Ref. Point</i>	<i>Depth</i>
1	0.186
2	0.190
3	0.186
4	0.176
5	0.168
6	0.164
7	0.166
8	0.172
<b>Average</b>	<b>0.176</b>

**Design**

<i>Ref. Point</i>	<i>Depth</i>
17	0.134
19	0.139
21	0.139
23	0.137
25	0.139
27	0.140
29	0.138
31	0.135
<b>Average</b>	<b>0.138</b>

**Lettering**

<i>Ref. Point</i>	<i>Depth</i>
33	0.110
35	0.111
37	0.111
39	0.111
<b>Average</b>	<b>0.111</b>

**Dome**

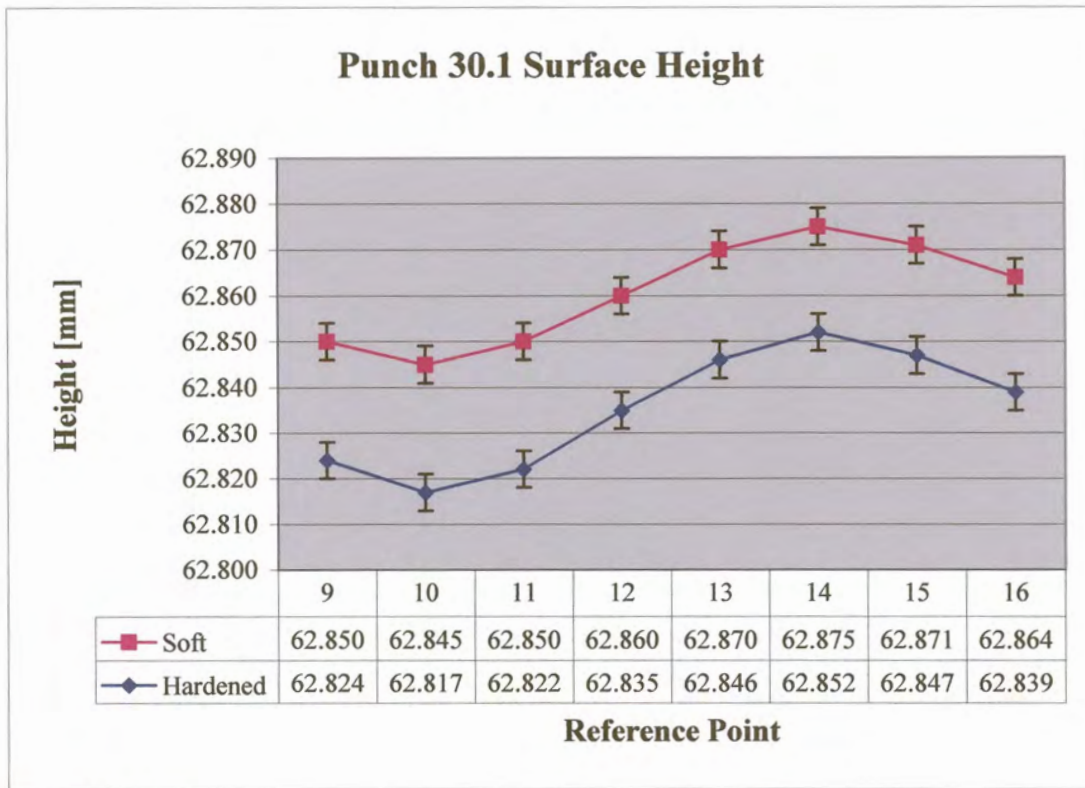
**0.039**

**Diameter**

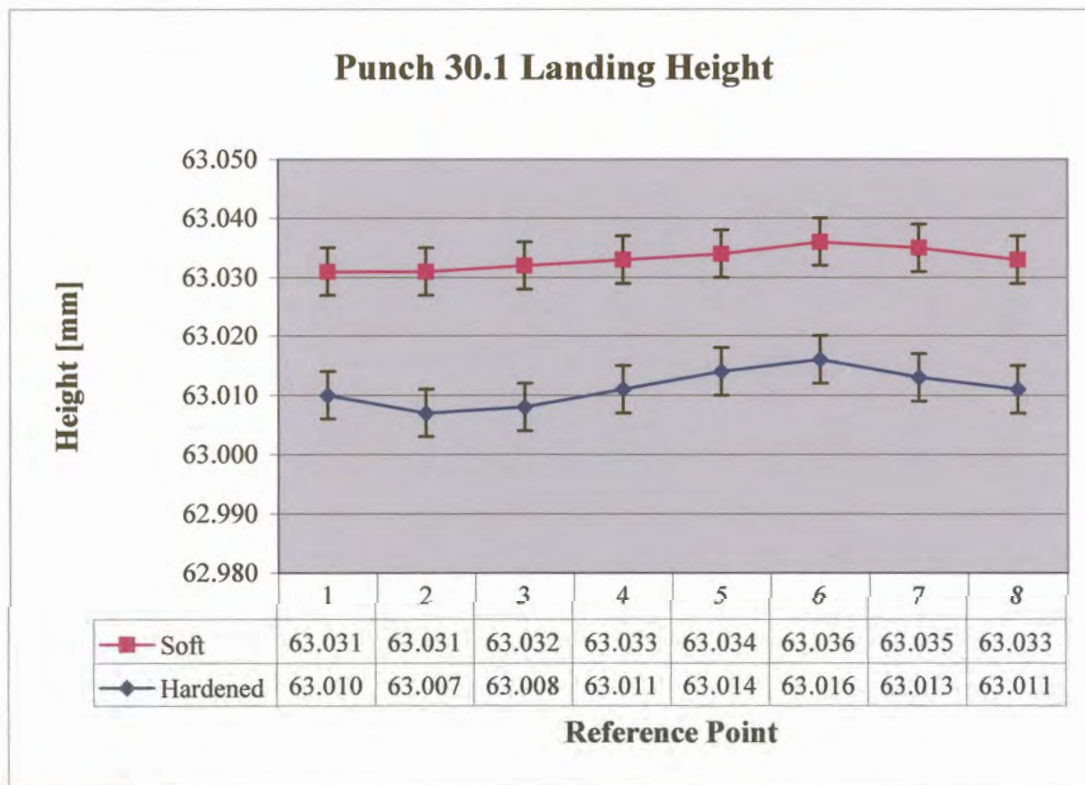
<i>Ref. Point</i>	<i>Diameter</i>
D1	40.015
D2	40.019
D3	39.983
D4	39.984
D5	39.966
D6	39.966





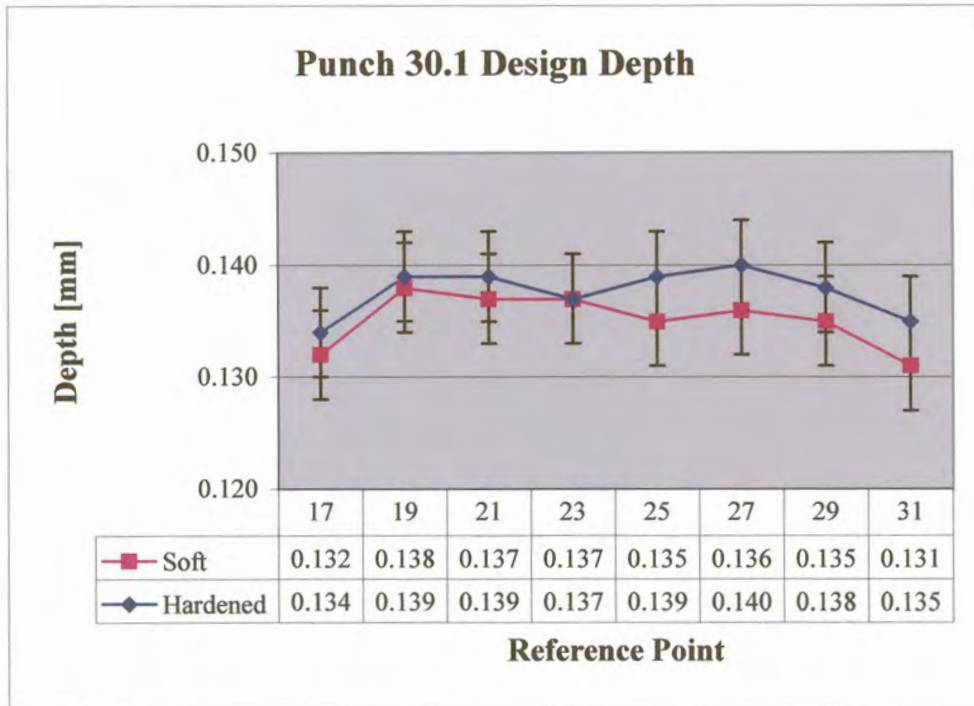


**FIGURE F 31**

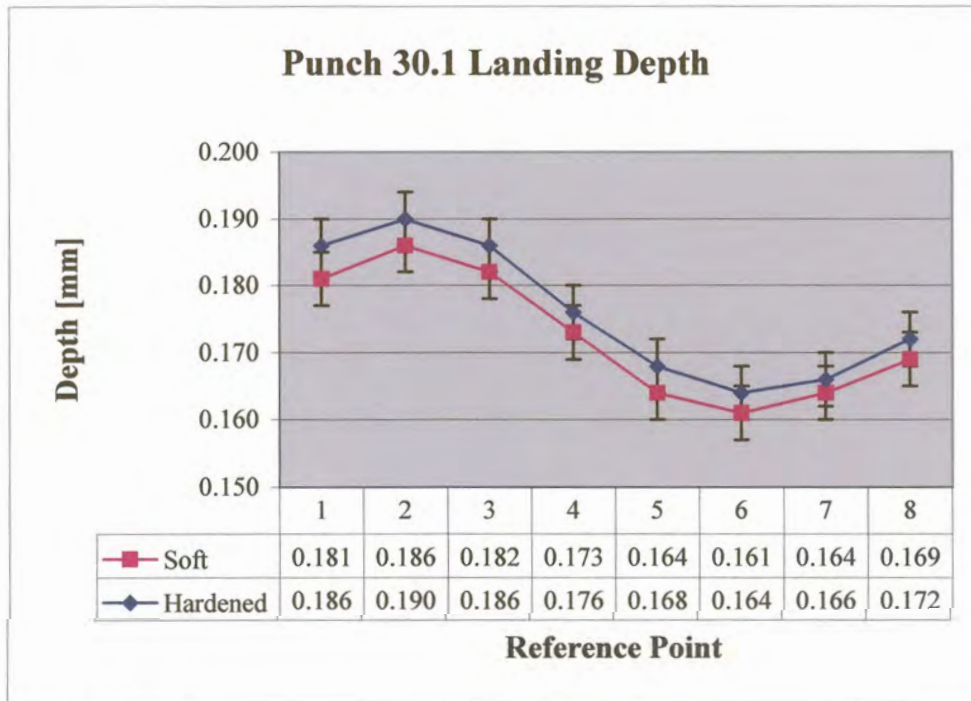


**FIGURE F 32**

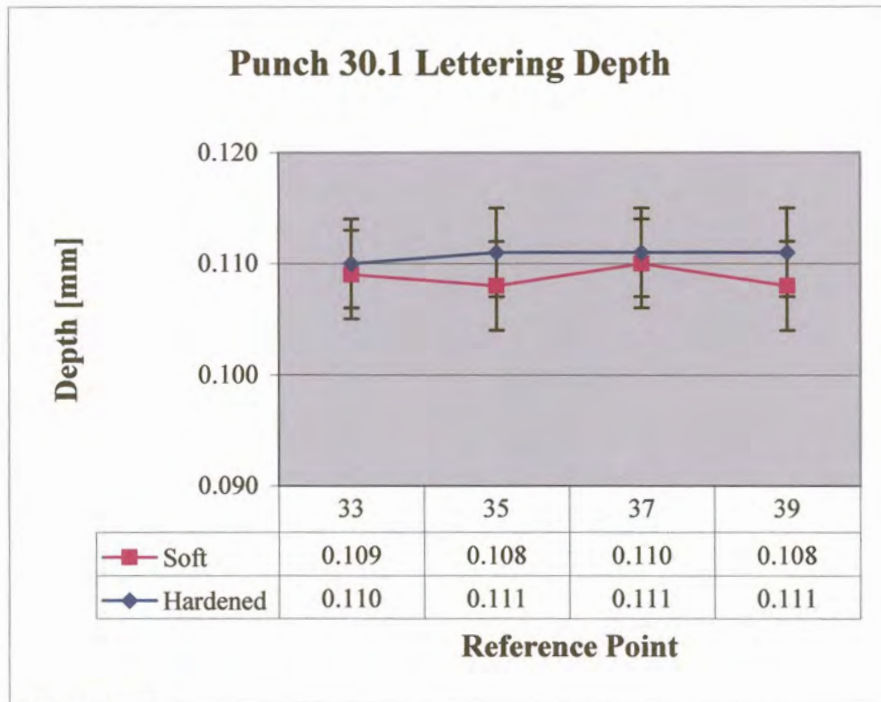




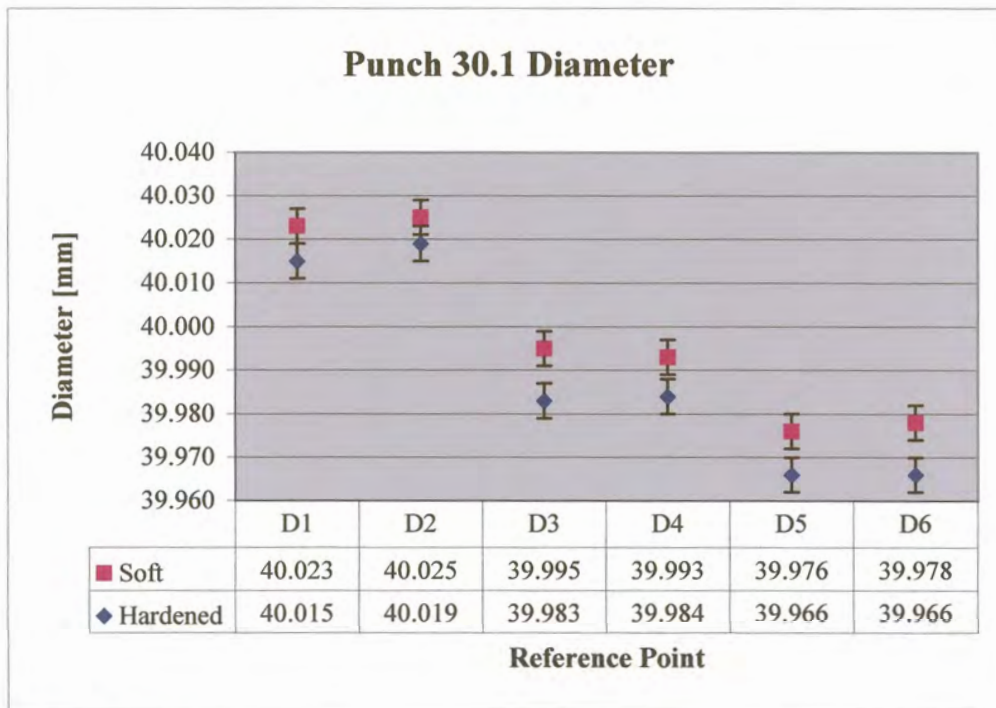
**FIGURE F 33**



**FIGURE F 34**



**FIGURE F 35**



**FIGURE F 36**