

Application Note

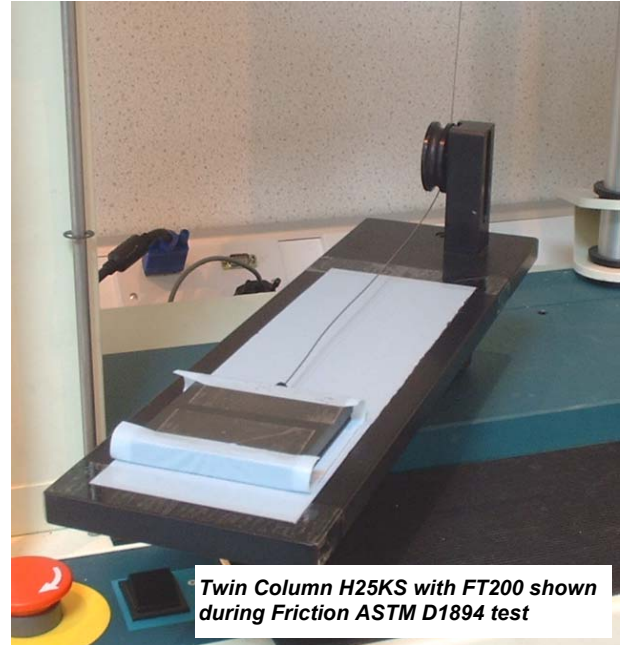
TENSILE, COMPRESSION, IMPACT, MELT FLOW, BRINELL, SHEAR, STRETCH RECOVERY, PUNCTURE, HEAT DISTORTION (VICAT), BEND/FLEXURE, SEAM STRENGTH, TORSION

Plastic Film Testing (Friction ASTM D1894, Tensile ASTM D638)

Five separate samples were received. Each sample was required to be tested in 'tension' as well as in 'friction'. The method chosen for the



Twin Column H25KS with HT55 shown during Tensile ASTM D638



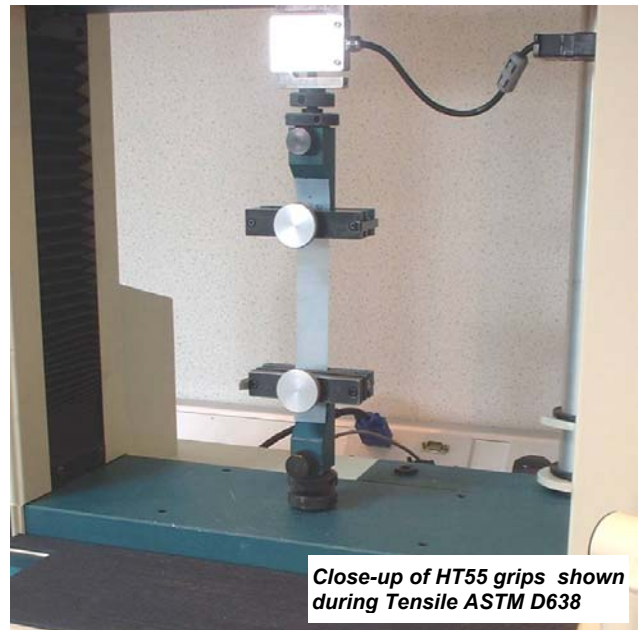
Twin Column H25KS with FT200 shown during Friction ASTM D1894 test

tensile test was ASTM D 638 and for the frictional test, ASTM D 1894 was chosen. Two specimens for both tensile and friction tests were made from the samples provided. Each

specimen was tested using a twin column Tinius Olsen H25KS, although it would be possible to reproduce the same results using an extended H5KS or T. The results have been attached on the following pages.

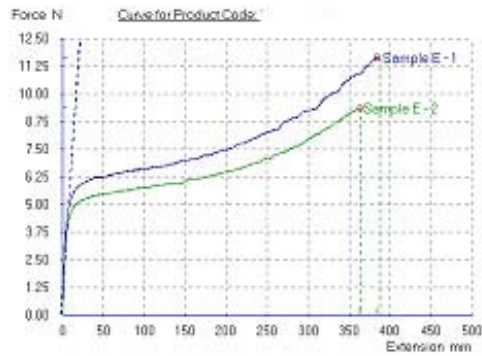
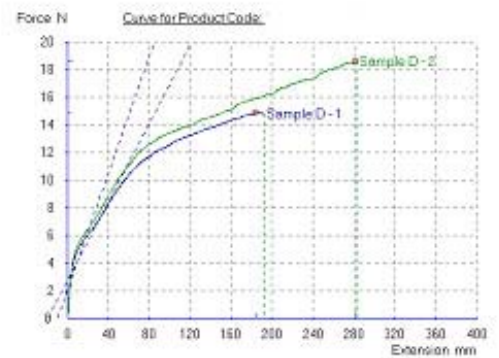
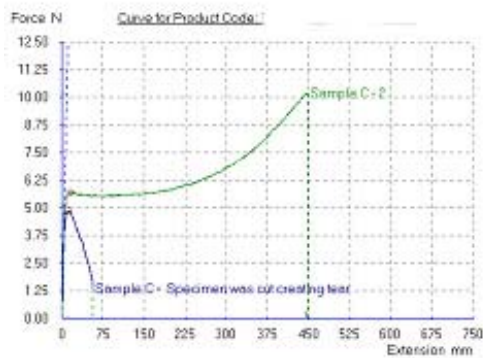
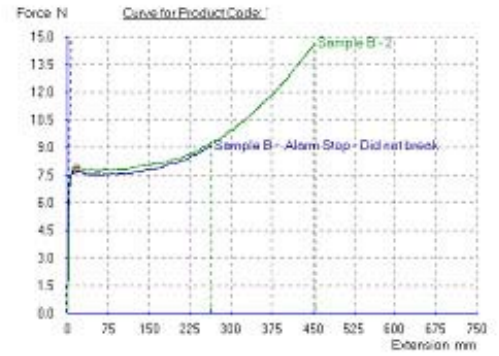
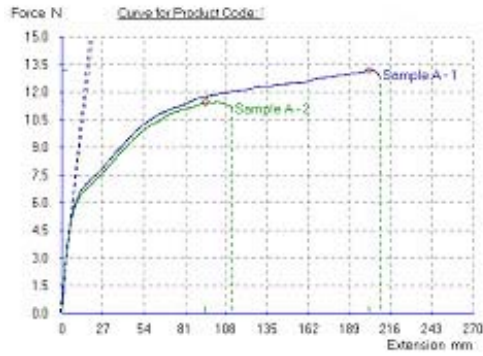
Recommended System for discussion;

- H5KS extended or H5KT extended
- 50N Loadcell
- HT55 Rubber faced vice grips *for tensile tests as per ASTM D638*
- FT200 Friction Test Attachment *for friction tests as per ASTM D1894*
- QMAT Pro data analysis software
- Options (PC, Laser Printer, Sample Cutters, Thickness Gauge)



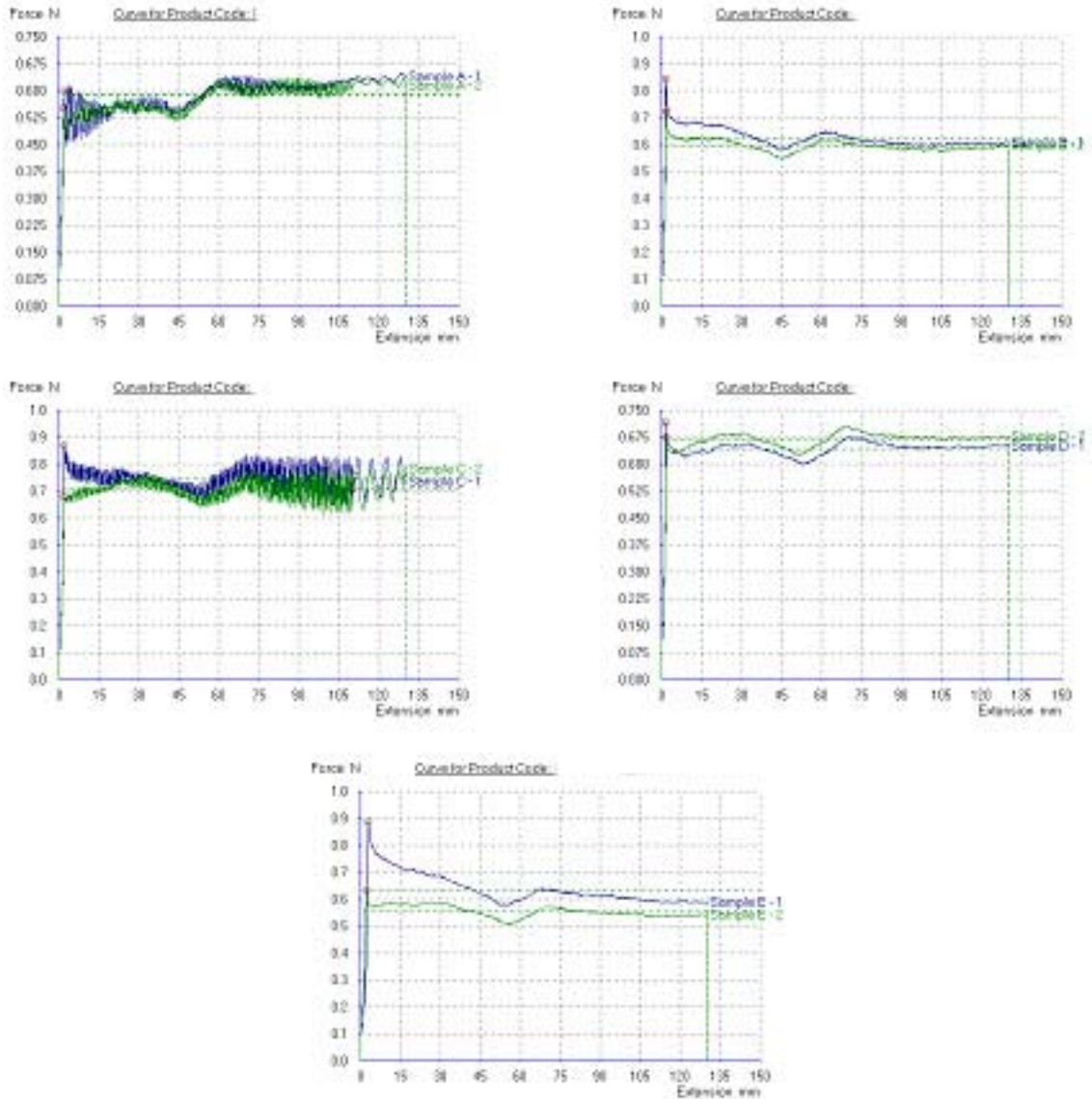
Close-up of HT55 grips shown during Tensile ASTM D638

Tensile test Results – Tests performed as per ASTM D638



| Batch Reference | E.Mod MPa | Yield Str. MPa | Yield Ext. % | Brk. Factor N/mm | Max Stress MPa | Brk. Stress MPa | Brk. Ext % | TEA J | Thickness mm | Width mm |
|-----------------|--------------|-------------------|-----------------|---------------------|-------------------|--------------------|---------------|----------|-----------------|-------------|
| Sample A - 1 | 97.00 | 17.00 | 201.80 | 0.53 | 17.00 | 166.00 | 209.00 | 2.30 | 0.03 | 25.00 |
| Sample A - 2 | 106.00 | 14.80 | 94.50 | 0.46 | 148.00 | 143.00 | 112.10 | 1.04 | 0.03 | 25.00 |
| Sample B - 1 | 513.10 | 11.50 | 14.80 | 0.36 | 13.48 | 13.48 | 263.20 | 2.07 | 0.03 | 25.00 |
| Sample B - 2 | 310.20 | 11.76 | 16.00 | 0.59 | 21.73 | 21.73 | 454.00 | 4.34 | 0.03 | 25.00 |
| Sample C - 1 | 170.60 | 7.21 | 10.60 | 0.19 | 7.21 | 1.89 | 56.80 | 0.20 | 0.03 | 25.00 |
| Sample C - 2 | 177.90 | 8.44 | 15.50 | 0.41 | 15.09 | 15.09 | 448.00 | 2.97 | 0.03 | 25.00 |
| Sample D - 1 | 29.30 | 18.60 | 183.80 | 0.60 | 18.60 | 18.45 | 192.00 | 2.17 | 0.03 | 25.00 |
| Sample D - 2 | 20.60 | 23.28 | 280.80 | 0.74 | 23.28 | 23.25 | 282.00 | 3.88 | 0.03 | 25.00 |
| Sample E - 1 | 78.20 | 15.53 | 383.60 | 0.47 | 15.53 | 15.42 | 388.00 | 3.05 | 0.03 | 25.00 |
| Sample E - 2 | 83.70 | 12.48 | 363.20 | 0.37 | 12.48 | 12.43 | 364.00 | 2.40 | 0.03 | 25.00 |
| n | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 |
| Mean | 158.66 | 14.06 | 156.46 | 0.47 | 29.24 | 43.07 | 276.91 | 2.44 | 0.03 | 25.00 |
| Std. Dev. | 150.39 | 4.83 | 148.09 | 0.15 | 41.98 | 59.26 | 136.71 | 1.23 | 0.00 | 0.00 |

Friction test Results – Tests performed as per ASTM D 1894



| Batch Reference | Static Friction | Dynamic Friction | Average of Static Friction | Average of Dynamic Friction |
|-----------------|-----------------|------------------|----------------------------|-----------------------------|
| | μ S | μ D | μ S | μ D |
| Sample A - 1 | 0.3009 | 0.2968 | 0.2887 | 0.29485 |
| Sample A - 2 | 0.2765 | 0.2929 | | |
| Sample B - 1 | 0.4227 | 0.3123 | 0.3924 | 0.30495 |
| Sample B - 2 | 0.3621 | 0.2976 | | |
| Sample C - 1 | 0.4362 | 0.3736 | 0.3882 | 0.364 |
| Sample C - 2 | 0.3402 | 0.3544 | | |
| Sample D - 1 | 0.3583 | 0.3221 | 0.3478 | 0.32855 |
| Sample D - 2 | 0.3373 | 0.335 | | |
| Sample E - 1 | 0.4437 | 0.3165 | 0.3802 | 0.29685 |
| Sample E - 2 | 0.3167 | 0.2772 | | |
| n | 10 | 10 | | |
| Mean | 0.3595 | 0.3178 | | |
| Std. Dev. | 0.0577 | 0.0297 | | |