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Report of "Time Saver" Surface Finish Tests
on Czech Steel Samples*

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At the request of the ATLAS collaboration at the last engineering meeting, Argonne, CERN, and Barcelona were asked to duplicate surface finishes and bonding tests on a set of samples furnished from the Czech steel. These tests were for the purpose of evaluating the "Time Saver" process for finishing the plates, and to subsequently bond these samples to optimize the bond strength. Argonne has completed these tests.

The following results are reported on the "Time Saver" finishing of large steel samples furnished by CERN.

Steel Sample #	Abrasive Grit Size	Mean Thickness Before Finishing	Mean Thickness After Finishing	Thickness Change
15	100	4.03125 mm	4.02700 mm	.00425 mm
16	80	4.02337 mm	4.01962 mm	.00375 mm
17	120	4.00937 mm	4.00150 mm	.01412 mm
18	120	4.00987 mm	3.99575 mm	.01412 mm

These are the large samples with two holes drilled in each sample. They were measured before and after finishing. Four different procedures were used on these plates. First three different grit sizes were used on the abrasive belts, second each plate was run through the machine for each side,

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and third the final samples were run through the machine at approximately 30° angles twice to reproduce the crossed pattern. This crossed pattern was repeated on the opposite side as well. These patterns were all repeated on the bond samples, and measurements of these samples were also measured for thickness both before and after finishing. The results of the thickness measurements are reported as follows.

**SUMMARY OF THICKNESS MEASUREMENTS BEFORE AND AFTER
FINISHING USING "TIME SAVER" MACHINE**

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Sample Piece Number	Abrasive Grit Size Used	Thickness Before Finishing Mean Value	Thickness After Finishing Mean Value	Difference in Thickness
07 A	80	4.00900 mm	3.99966 mm	.00934 mm
07 B	80	4.03500 mm	4.02216 mm	.01284 mm
08 A	80	4.02416 mm	4.01750 mm	.00666 mm
08 B	80	4.01066 mm	4.00550 mm	.00516 mm
09 A	80	4.02016 mm	4.01583 mm	.00433 mm
09 B	80	4.01200 mm	4.00650 mm	.00550 mm
20	80	4.03916 mm	4.03000 mm	.00916 mm
02 A	100	4.02983 mm	4.02516 mm	.00467 mm
02 B	100	4.03300 mm	4.03066 mm	.00234 mm
03 A	100	4.03233 mm	4.03016 mm	.00217 mm
03 B	100	4.02233 mm	4.01933 mm	.00300 mm
11 A	100	4.01116 mm	4.00783 mm	.00333 mm
11 B	100	4.04283 mm	4.03683 mm	.00600 mm
22	100	4.03333 mm	4.02466 mm	.00867 mm
04 A	120	4.04016 mm	4.03083 mm	.00933 mm
04 B	120	4.01183 mm	4.00583 mm	.00600 mm
05 A	120	4.02966 mm	4.00950 mm	.02016 mm
05 B	120	4.02933 mm	4.01633 mm	.01300 mm
06 A	120	4.03716 mm	4.01766 mm	.01950 mm
06 B	120	4.03183 mm	4.01183 mm	.02000 mm

*01 A	120	4.00900 mm	3.99083 mm	.01817 mm
*01 B	120	4.00850 mm	3.98533 mm	.02317 mm
*14 A	120	4.03533 mm	4.01833 mm	.01700 mm
*14B	120	4.03250 mm	4.01400 mm	.01850 mm
19	120	4.00883 mm	4.00666 mm	.00217 mm
21	120	4.01783 mm	4.00833 mm	.00950 mm

* Crossed pattern.

These same samples (except for the large samples) were then bonded using the CIBA GIEGY Araldite adhesive and the results are summarized below.

Sample Number	Finish	Abrasive Grit Size	Breaking Load (kG)
7	7.56 μ m	80	> 22
8	8.03 μ m	80	1148
9	7.79 μ m	80	1136
2	2.93 μ m	100	920
3	2.53 μ m	100	1022
11	2.45 μ m	100	1284
4	4.27 μ m	120	1068
5	4.36 μ m	120	1261
6	4.72 μ m	120	1238
1	4.45 μ m	120X	966
14	4.60 μ m	120X	909

Conclusions

The conclusions that can be drawn from these tests indicate that a grit size of 100-120 with a finish of 3 to 4 μ m provides a proper surface for bonding. These finishes are all achievable with a single pass on the "Time Saver" machine. These finishes also are almost identical to those achieved with sand blastings.