

TEST REPORT

Comparison of Thermal Grease and
THERMFLOW® T705/T710
on a Leading Manufacturer's Tower PC

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Summary: We have compared the thermal performance of thermal grease and our THERMFLOW T705 and T710 phase change materials. The results show that there is no significant difference between the thermal grease used on the PC and T705 or T710.

Procedure:

Temperature measurements. Thermocouples were made of 36 gauge Type T precision thermocouple wire and were calibrated at 0° and 60 °C. The case temperature was measured by attaching a thermocouple to the center of the plastic underside of the package with a 0.2 x 0.2 inch Chomerics THERMATTACH T412 tape. The heat sink temperature was measured by attaching a thermocouple to the center of the base of the sink under the spring clip with THERMATTACH tape. The ambient temperature was measured by a third thermocouple wound around the fan housing so that the bead was in the air stream.

A test consisted of attaching the interface material to the sink, attaching the heat sink to the processor with the clip, closing the case, recording temperatures, turning on the PC and from Windows 3.1 starting DOS Edit and pulling down the Edit window. Temperatures were recorded until equilibrium was reached, generally after 50 minutes. The final equilibrium data were recorded and are shown in the Table 1 . The sink was then removed and carefully cleaned with MEK before the next test material was applied.

Results:

The results are shown in the Table 1 . Case, sink and ambient temperatures were recorded and the case/sink and case to ambient temperature differences were calculated.

TABLE 1

Material	T_{case}	T_{sink}	T_{amb}	$\Delta T_{case-sink}$	$\Delta T_{sink-amb}$	
Dry joint		61.4	47.7	24.0	13.7	23.7
PC grease		54.0	49.7	24.9	4.4	24.8
PC grease, repeat		54.8	50.3	25.2	4.5	25.1
D.C. DC340		53.6	49.5	23.7	4.1	25.8
D.C. DC340 repeat		53.8	50.0	24.5	3.8	25.5
D.C. DC340 repeat		52.8	49.3	23.6	3.5	25.7
T705		54.4	50.6	25.1	3.8	25.5
T705 repeat		53.4	49.6	23.6	3.8	26.0
T705 PSA		53.8	49.4	24.3	4.4	25.1
T705 PSA repeat		55.0	50.5	25.5	4.5	25.0
T710		55.5	50.2	24.4	5.3	25.8
T710 repeat		55.2	50.7	25.4	4.5	25.3
T710 PSA		54.3	50.3	25.1	4.0	25.2
T710 PSA repeat		54.8	49.8	24.4	5.0	25.4
T710 PSA repeat		55.9	50.8	25.0	5.0	25.8

Discussion:

The results show that THERMFLOW phase change materials perform essentially the same as thermal grease. We were unable to confirm the report that THERMFLOW material outperformed grease by 2-3 degrees. Our only explanation for the poorer showing of grease would be that the grease is more difficult to consistently apply than THERMFLOW material. These results are consistent with a large body of test results which show that THERMFLOW products perform essentially the same as thermal grease.

These results indicate that THERMFLOW T705 and T710 interface pads provide the same thermal performance as thermal grease but are more user friendly and their application is much more consistent.

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