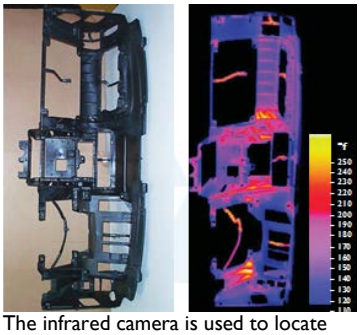
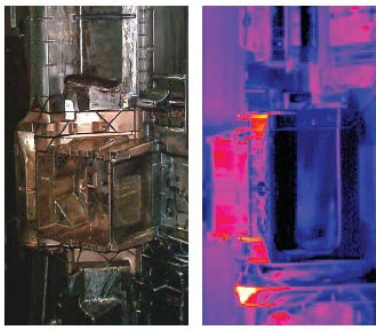
MATERION

CASE STUDY

Central core insert of MoldMAX XL. This tool has over 350,000 shots and has been a trouble free workhorse for Textron.



The infrared camera is used to locate hot spots in the Instrument Panel which may represent problem areas



The infrared camera is used to identify where the mold itselfe is retaining the most heat.

MOLDMAX® APPLICATION:

INSTRUMENT PANEL MOLD

PROFILE: TEXTRON AUTOMOTIVE COMPANY

Textron Dashes Tolling Paradigms: Textron Automotive has aggressively assimilated new technology that dramatically increases the efficiency of the injection molding process. Faced with a difficult-to-cool Instrument Panel (IP), innovative in its own right for eliminating the need for any additional metal support, Textron chose to use Materion Performance Alloys' MoldMAX® XL for the central core. Experience with P-20 tools had shown that this area of the part was difficult to cool and limited production not only of the IP, but the entire work cell that assembled the IP into a module ready for installation into the vehicle.

APPLICATION DATA

Component	Instrument Panel
Mold Style	Single cavity, injection mold
Volume	200,000 annually
Material	Dylark
Cycle Time	55 seconds (from 76 seconds)
Reduction	28%
Cost Savings	In excess of $1,000,000 over tool life

Due to the improved cycle time by using MoldMAX® XL, Textron created additional molding capacity without buying additional machines and tooling. Greater tooling productivity also eliminated the need for additional floor space and personnel. Textron has also taken advantage of Performance Alloys' infrared camera analysis. The infrared camera used to locate the part is consistent across the entire surface, thus substantially improving part quality. The mold is running 28% faster using MoldMAX XL than P-20. Before MoldMAX, the tool steel had many hot spots and a sporadic heat pattern that caused lengthy cycle times and part distortion.

Having substantially more conductivity than P-20, MoldMAX XL allowed the cycle time to be reduced approximately 28% with improvement in part quality. Payback on this investment was less than one month, and the savings generated by the use of MoldMAX XL will exceed $1,000,000 over the life of the tool.

Injection molds are basically heat exchangers. Using steel in the core inhibits the heat transfer process, resulting in hot spots which increase cycle time and cause part distortion. MoldMAX alloys were designed to solve these problems. MoldMAX XL, is a copper-nickel-tin spinodal alloy developed to provide the strength of P-20 with enhanced thermal conductivity, excellent corrosion resistance (which keeps water lines flowing), and exceptional machinability. This also reduces the cost to build the mold and of subsequent maintenance.

MOLDMAX®

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Product	Rockwell Hardness HRC (HBW)	Thermal Conductivity BTU/ft-hr-°F (W/m-°C)	Charpy V-Notch Impact Strength Ft-lb (J)	Yield Strength ksi (MPa)	Tensile Strength ksi (MPa)	Thermal Expansion Coefficient 10-6/°F (10-6/°C)
MoldMAX HH®	40 (370)	75 (130)	4 (5)	145 (1000)	170 (1175)	9.7 (17.5)
MoldMAX LH®	30 (285)	90 (155)	12 (16)	110 (760)	140 (965)	9.7 (17.5)
MoldMAX XL®	30 (285)	40 (70)	15 (20)	105 (725)	115 (795)	9.3 (16.7)
MoldMAX V®	28 (270)	92 (160)	4 (5)	105 (725)	125 (860)	9.7 (17.5)
PROtherm™	20 (225)	145 (250)	40 (54)	90 (620)	105 (725)	9.8 (17.6)
C18000	16 (210)	135 (235)	35 (48)	75 (515)	95 (655)	9.7 (17.5)
AISI P-20	32 (302)	17 (29)	18 (24)	130 (900)	155 (1070)	7.0 (12.6)
420 Stainless	50 (480)	14 (24)	5 (7)	200 (1380)	250 (1725)	6.1 (11.0)
H-13 Tool Steel	45 (420)	15 (26)	14 (19)	200 (1380)	250 (1725)	7.1 (12.8)
QC7 Aluminum	B88 (175)	90 (155)	30 (41)	75 (515)	78 (540)	12.9 (23.2)