

(RT)

(RP)

ii

i

(RT)

(RP)

(Stereolithography)

(RTV)

(Epoxy Molding)

Examination of RP and RT Technologies in Production of Turbine Blades IC Wax Patterns

J. Zamani.; M. Forotan

ABSTRACT

The introduction of Rapid Prototyping and Rapid Tooling (RP&RT) Technologies in past two decades has caused great changes in manufacturing and production procedures. Investment casting as a process for production of complex metal parts from various alloys is one of the areas that application of RP and RT should be concerned. Gas turbine blade as an investment cast part with geometrical and dimensional complexity and close manufacturing tolerances has been investigated in this research,. As a result 3D-CAD model that has been evolved from reverse engineering of a blade, was used in Stereolithography for manufacturing of the master models. Then, Epoxy and RTV rapid mould tooling used for wax production mould making. At last the results of application of these methods and application of metal die for wax model production has been assessed and compared based on parameters such as time, cost, surface roughness, and dimensional accuracy.

KEYWORDS

Rapid Prototyping, Stereo lithography, Rapid Tooling, Epoxy Molding, Vacuum Temperature Vulcanizing, Gas Turbine Blade.

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ii

(Horaček)

[](Lubos)

[](Yalagadda)

(Hock)

Polyurethane)

H

(RTV mould)

(mould

(RT)

(RP)

(RP)

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(Stereolithography)

(Master Model)

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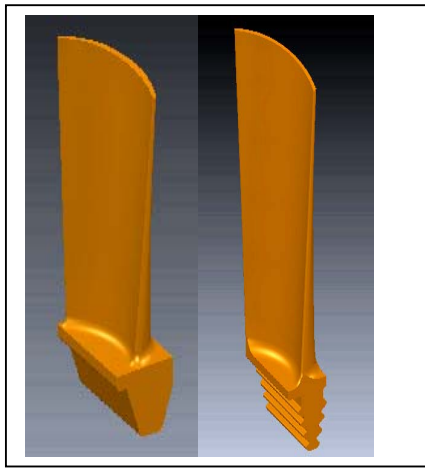
RTV

(Epoxy Molding)

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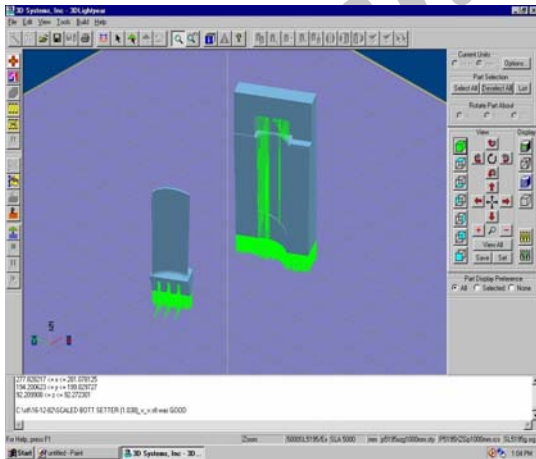
(RP)

(RT)

STL

STL

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SLA5000

(Power

shape)

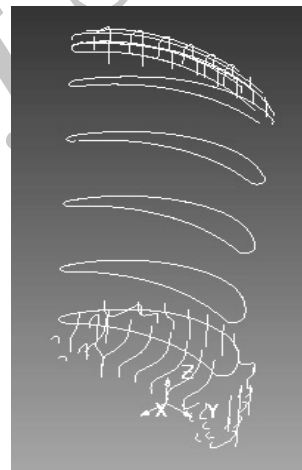
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(CMM)



CMM

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(Pure Model)

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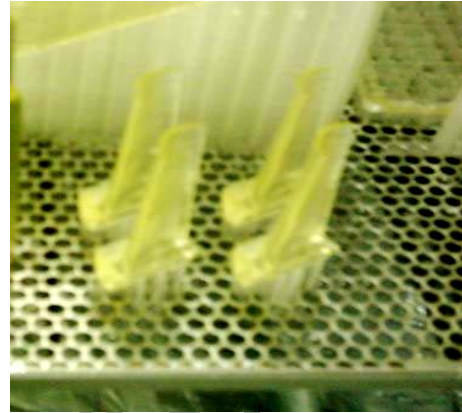
(RTV)

EP310

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SLA

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(RTV)

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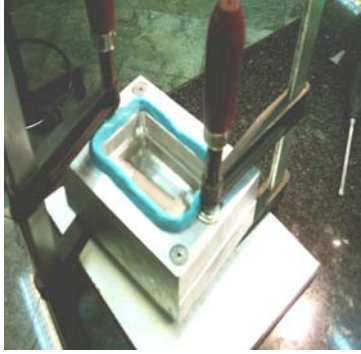
RTV

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بعد از اضافه شدن مواد مذاب مومی،
 کل قالب در شرایط خلاء قرار داده شد تا حباب‌های هوا تخلیه گردد.
 شکل ۱۰، حالت نهایی قالب و قطعه آماده شده را نشان می‌دهد.



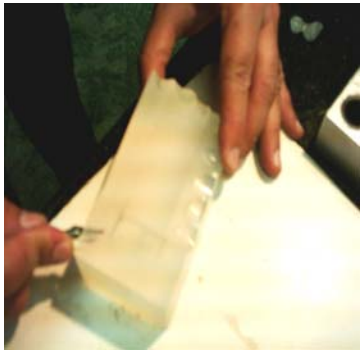
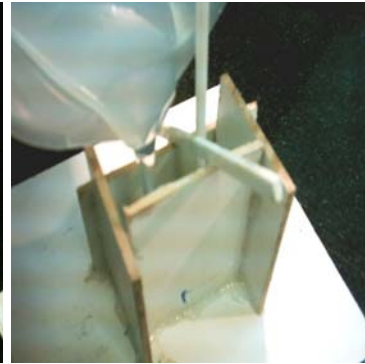
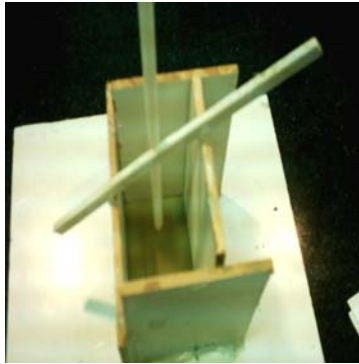
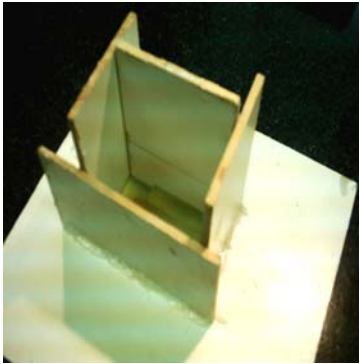
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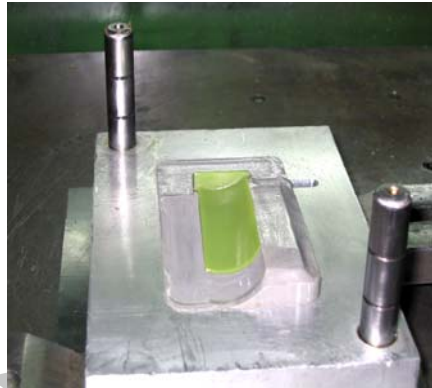
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RTV

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Taylor Hobson

ATOS 3D Scan III

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Archive 03

EDM

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(Alignment)



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R_a	/	/

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RTV

RTV

(Alignment)

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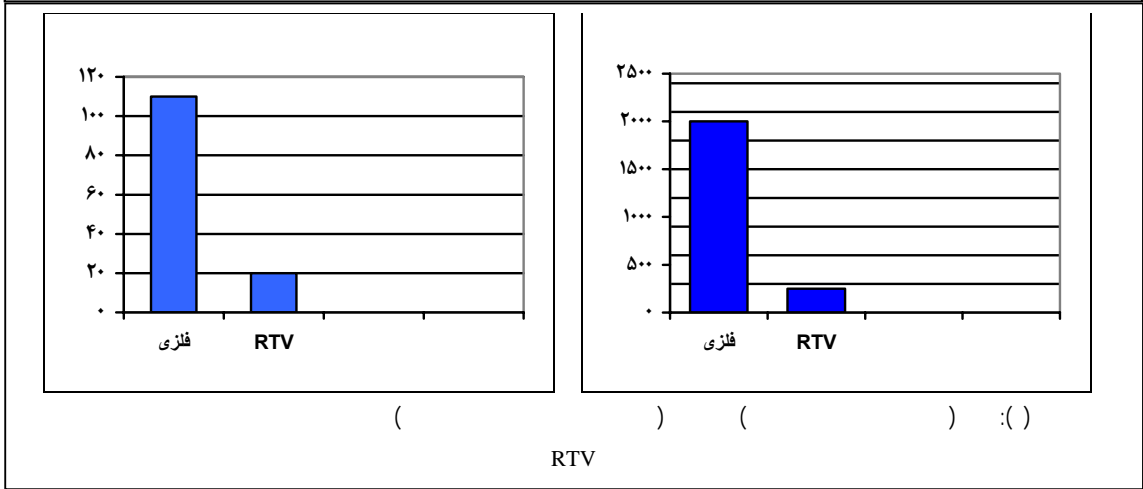
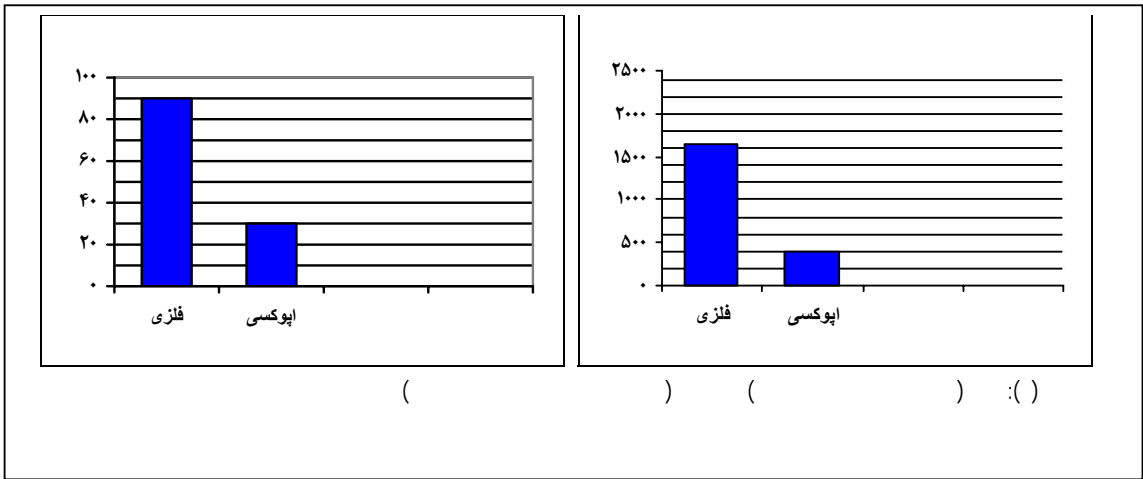
RTV

(Stair Stepping)

مقایسه نیز همانند مواردی هستند که در قسمت قبل

ذکر گردید

Archive of SID



Archived

RT RP

RTV

RTV



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