



Investment Casting Institute Casting Contest Entry Form

Entry in the casting contest is open to only Institute regular members and universities. Return this form, along with supplementary information, photos and the original part to the address the bottom of the page.

1. Name of part	<u>2020 WORLD CONFERENCE SOUVENIR</u>	Name:	<u>KEITH ORLEBECK</u>
2. Size of part	_____	Signature:	<u>Keith B. Orlebeck</u>
3. Part is used in (product)	<u>2020 WORLD CONF. GIVEAWAY</u>	Company:	<u>INTREPID AUTOMATION</u>
4. Function(s) of the part	<u>THE PART WAS A DESIGN SUBMITTED TO ICI. DESIGN MODIFIED TO BE MANUFACTURED. PATTERNS 3D PRINTED CASTED BY MEMBER FOUNDRY.</u>	Address:	<u>7867 DUNBROOK ROAD</u>
5. Material used (composition of metal or alloy):	_____	City:	<u>SAV DIEGO</u>
6. Is the part currently in production?		State/Country:	<u>CA.</u>
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<u>RUN OF 1000 PCS COMPLETED</u>	Zip:	<u>92126</u>
7. Was the part ever made by another metalworking method?		Phone:	<u>858-354-8983</u>
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Fax:	_____
If so, what method?	_____	E-mail:	<u>KEITH@INTREPIDAUTOMATION.COM</u>
8. Are any secondary operations performed?		<i>Entry gives permission for information and photos to be published in INCAST or other publications. Photos or castings sent remain the property of the Institute.</i>	
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		<i>NOTE: Casting contest participants are responsible for all shipping and associated tariffs and fees.</i>	
If yes, what kind?	_____		

On a separate sheet of paper, please include the following information if applicable.

9. How does your customer benefit from using this part i.e. replace an assembly of several parts, reduced cost by x%, improved product reliability, performance?
10. What makes this part unique?
11. State any special design requirements and/or process requirements.
12. For universities: Principles demonstrated by the entry.
13. For universities: Challenges faced by the students.
14. Please feel free to furnish additional information not covered in the above questions.

Return this cover sheet, supplemental information, photos and/or casting to:



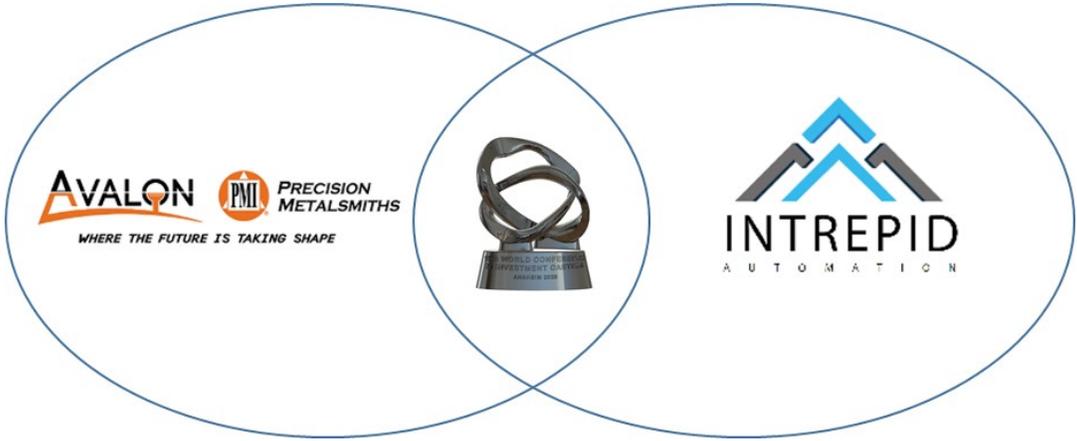
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2020 World Conference Souvenir



EXECUTIVE SUMMARY

Avalon Precision Metalsmiths, a world-class foundry, and Intrepid Automation, a 3D printing technology and downstream automation company, formed a partnership through a chance meeting through the ICI. This partnership was to fulfill a request from the ICI to deliver the 2020 World Investment Casting Conference souvenir the organization had planned to giveaway. The initial design for the souvenir was supplied by the ICI through a contest they had previously conducted. Intrepid Automation quoted the project and was accepted by the ICI. Intrepid began to work with Avalon Precision Metalsmiths as the foundry of choice due to their capabilities, quality, price, and common relationships.

The first task was to make the initial design manufacturable. Intrepid VP of R&D spent time up front working the design to not change the idea or flavor of the design yet make it such that it could be investment casted in a quality fashion. Avalon and Intrepid passed the design back-and-forth until both the design and manufacturability were capable to produce a high-quality part. Avalon was creative in the treeing of the parts for a maximum number to keep the costs down.

Prior to the design being locked down, Intrepid had passed Avalon 3D printed samples in an Intrepid proprietary resin (e.g. not wax) to test the casting process. Avalon had 1st pass success on the initial samples which told us Avalon had no issues using the Intrepid 3D printed resin patterns in their process. We discovered additional design issues with the lettering being raised too high. This caused initial castings to have voids within the lettering and not the quality we were trying to achieve. A redesign to lower the lettering greatly improved the quality of the lettering and we were on our way.

Once the design was locked down and the Avalon and Intrepid teams were happy with the quality, a schedule was developed to deliver 3D printed patterns from Intrepid to Avalon for casting. From January to April the two companies completed the order of 1000 pieces.

Through this unique collaboration project between Avalon Precision Metalsmiths and Intrepid Automation, they were able to deliver a ICI manufacturable design with challenging casting features which included the complex design, thicker to thin wall sections and small slots making it more difficult to process through the ceramic dipping process. This project has demonstrated a collaboration of two ICI member companies exercising their unique expertise. Avalon and Intrepid have continued their relationship into other projects which benefit both companies.