

Spectrum Scientific, Inc

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MESA STEP Summer Internship

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Introduction

- SSI is a manufacturer of holographic diffraction gratings, including blazed and standard types; mirror surfaces including parabolic, on and off axis, ellipsoidal and hollow cube retroreflectors.
- Spectrum Scientific's proprietary blazing technique yields 10x lower stray light and significantly higher efficiency than ion-etched blazed holographic gratings, UV as low as 120nm, as well as VIS/NIR applications. Contact: sales@ssioptics.com;
- Solid Works is used to design in house fixtures.
- Engineering drawings are then stored, catalogued and organized for easy accessibility.
- These drawings are then converted into customer sales drawings and implemented into website design.



Purpose

Goals of this Internship are to:

- create new fixtures to hold optical masters more securely and safely.
- catalog and organize engineering drawings.
- use organized drawings to display products, specifications and drawings for website customers.

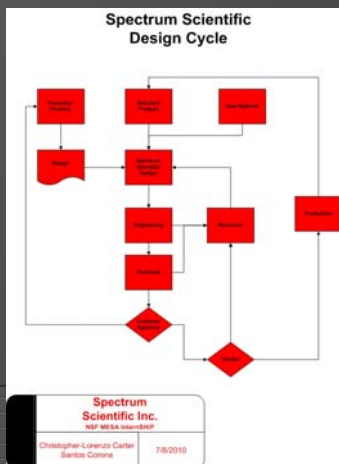
Fixture Design Process



- Utilize Solid Works to custom design fixtures that securely hold the optical pieces and allows more pieces to be integrated.
- Analyze how the fixtures would withstand the wear and tear of the actual optical process.
- Design fixtures for ease of use by the production team.



Product Design Chart

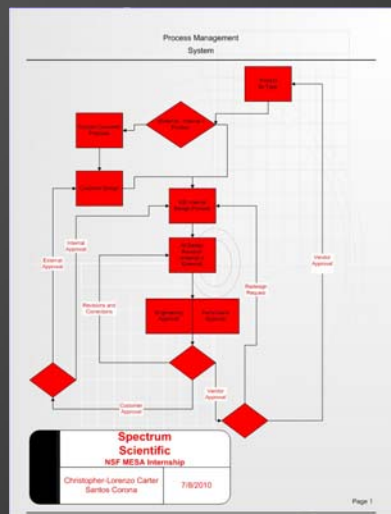


Method

Internal Product Organization

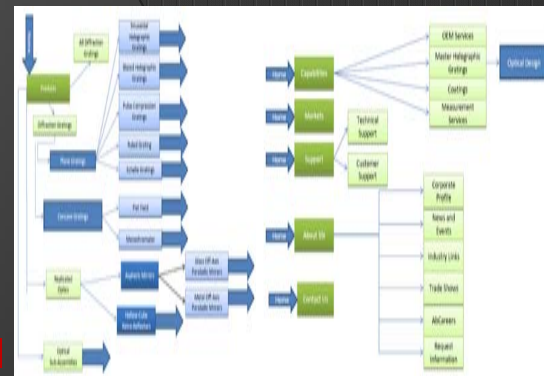
- Examined existing corporate rules and protocols along with ISO 9000 standards.
- Met with engineers to create a format to organize engineering drawings and files.
- Organized a universal structure to standardized the locations of files and documents.
- Met with the Senior Principal Engineer and the General Manager to present our proposed structure.
- Implemented the new structure to meet both their immediate and future needs.

Process Management Chart



- Integrated internal corporate documentation and ISO 9000 standards to track products from design to distribution.
- Created an internal product organizational structure for drawings, fixtures and parts.
- Created product line categories for sales and marketing.
- Prepared the existing product line for the establishment of web based sales.

Website Design Structure



- Website **Top Down Design** based on universal product structure.
- Internal and external documentation system uses same structure.

Results

- The new fixtures allowed SSI to safely and securely mount more optical pieces for grating.
- The organization of files allowed SSI to readily access all files.
- The universal file system for SSI assisted engineers and customers by providing a single search path for document and product retrieval.

Conclusion

The internship opportunity provided:

- a learning experience in parts design that incorporated the design needs of the production team.
- a more in depth understanding of the inter-workings of an engineering firm.
- an insight into how to analyze a problem, propose a solution, present and implement the solution.

Acknowledgements

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- Special thanks to the MESA Directors and staff, which creates and administers these opportunities for students.