Elan Technology, Inc. announces the Glass-to-Metal Sealing course, which has graduated over 850 engineers to date worldwide.

**Dates:** Tuesday October 25th – Friday October 28th, 2022

**Instructor:** Dr. Eric Skaar, Ph.D and P.E.
- Associate Professor, Gilbert C. Robinson Department of Ceramic and Materials Engineering, Clemson University.
- Over 20 years of experience in the field of ceramic and materials engineering.
- Author of over 70 technical publications.
- Principal Investigator responsible for numerous government and corporate sponsored research project.

**Cost:** $800 per student (prepaid non-refundable: covers instruction, text, on-site luncheon, and dinner on 1st and 3rd evenings.) **The hotel is not included in this price.** Registration is considered accepted once payment via credit card is received.

**Location:** Elan Technology – in person
169 Elan Court
Midway Georgia 31320

**Hotel:** TBD
Airport: Savannah/Hilton Head International Airport (SAV)

To Enroll: Please contact:
Lacey M. Weimer                912.880.3072, lacey@elantechnology.com

Course Schedule and Lecture Topics

**Tuesday** - New Realm Brewing

6:00 – 8:00 PM
Introduction of Elan staff and attendees: Meet at New Realm Brewing, 120 Whitaker St, for cocktails and heavy hors d’oeuvres

**Wednesday** – at Elan Technology

8:30 – 9:30 AM
Introduction to Materials, and the Glassy State.
   Lecture 1 – Introduction to Materials
   Lecture 2 – The Glassy State
9:30 – 10:30 AM
Fundamentals
   Lecture 3 – Glass Melting and Homogenization
   Lecture 4 – Viscosity
10:30 – 10:45 AM
Break
10:45 – 11:30 PM
Fundamentals (Cont’d.)
   Lecture 5 – Thermal Properties
12:00 – 1:00 PM
Lunch – on premises

1:00 – 2:45 PM
Glass to Metal Seals
   Lecture 6 – Glass to Metal Seals
   Lecture 7 – Glass to Metal Seals – Design Parameters
2:45 – 3:00 PM
Break
3:00 – 3:30 PM
Glass to Metal Seals (Cont’d.)
   Lecture 8 – Recommended Glass – Metal Combinations
3:30 – 5:00 PM
Stress
   Lecture 9 – Stress in Glass to Metal Seals
   Lecture 10 – Stress in Glass
5:00 PM
Class Adjourned

Thursday– at Elan Technology

8:30 – 9:30 AM
Considerations in Manufacturing
   Lecture 11 – More Glass to Metal Seals
   Lecture 12 – Furnace Conditions
   Lecture 13 – Relevance of Water to Sealing
9:30 AM – 9:45 AM
Break
9:45 AM – 12:00 PM
Glass Properties
   Lecture 14 – Some Other Important Glass Properties
Glass Ceramics and Other Specialty Glasses
   Lecture 15 – Sealing with a Glass Ceramic
   Lecture 16 – Special Sealing Glasses
Glass Processing Techniques
   Lecture 17 – Spray Drying
12:00 – 1:00 PM
Lunch – on premises
1:00 – 2:15 PM
Group Photograph
   Elan Plant Tour
2:15 – 4:00 PM
Glass Processing Techniques
   Glass Melting
4:30 – 7:00 PM
Outdoor Dining at Sunbury Crab Co, 539 Brigantine Dunmore Rd,
   Midway 31320

Friday– at Holiday Inn Express

9:00 AM – 12:00 PM
   199 E Bay St, Savannah
   Azalea room, Holiday Inn Express, 199 E Bay St
Interactive session for design, production and troubleshooting with
Dr. Eric Skaar and the Elan engineering staff.
   Course Evaluations
   Diplomas
12:00 PM
Class Adjourned
This short course is designed for persons with either a technical or non-technical background that are working in the field of glass to metal seals. In addition to learning about the manufacture, properties and use of sealing glasses through lectures and an extensive set of handouts---which each person receives at the beginning of the course---you will observe several laboratory demonstrations important to sealing glasses and tour the extensive manufacturing facilities at Elan Technology where you will observe the manufacturing of powder preforms.

A valuable part of this course is the informal exchange of information that is encouraged and promoted among the class participants and which occurs during the breaks and other times. Previous classes have indicated this exchange of information has been one of the best parts of class so we hope you will find this useful also. You are asked to bring 2 or 3 examples of the glass to metal seals which the class can observe. Furthermore, you are asked to bring along something that you can share with the class---how you solved a problem, useful “tricks” you have learned from experience, testing techniques----anything which you could share with your classmates that you feel they would find interesting.

If you have a specific topic or problem you would like discussed, time is set aside toward the end of the class for that purpose. It is helpful if you would contact Dr. Skaar at ecskaarl@gmail.com or Andrew Kanjanapant, Elan Technology’s Operations Manager at andrew@elantechnology.com so that we have some advance notice of your topic or problem.