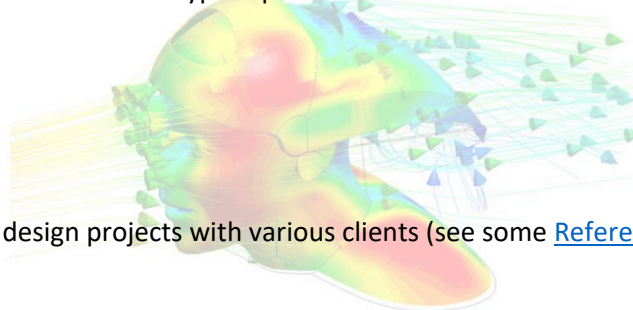


CFD and Thermal Fluid Analysis Capability for Product Design

I, Chris Kriel, am a Freelance CFD & Thermal Analysis Specialist with more than 20 years' experience in this field and I operate through my company FlowSim Pty Ltd. I assist product designers with the design of products that involves fluid flow and/or heat transfer. Typical products include:

- Electronic Enclosures
- LED luminaires
- Medical devices
- Consumer goods etc.



Over the years I've been working on many design projects with various clients (see some [References](#) below). Some clients include:

[Outerspace Design](#) - [Ingenuity Design Group](#) - [Tricycle Developments](#)

[Synera Design](#) - [Vitrafy Life Sciences](#) - [Vitruvian](#) - [Hone PD](#)

References

Jesse McLachlan – Director and CTO at Ingenuity Design Group

I have had the pleasure of working with Chris on a number of projects where he has provided his expertise in both CFD and Thermal simulations and has provided comprehensive and insightful analysis to assist with some complicated phenomena. He was able to promptly and efficiently deliver his results to us where other consultants struggled. I've no hesitation in recommending Chris and look forward to the next opportunity to work with him.

Rodney Brown – Engineering Manager at Outerspace Design and Director of Engineering at Vitruvian

We have contracted Chris numerous times to setup and run CFD simulations. His attitude, work and attention to detail is fantastic. I would thoroughly recommend Chris to contract for all forms of CFD.

Brent Owens – Co-Founder & Chief Research and Development Officer at Vitrafy Life Sciences

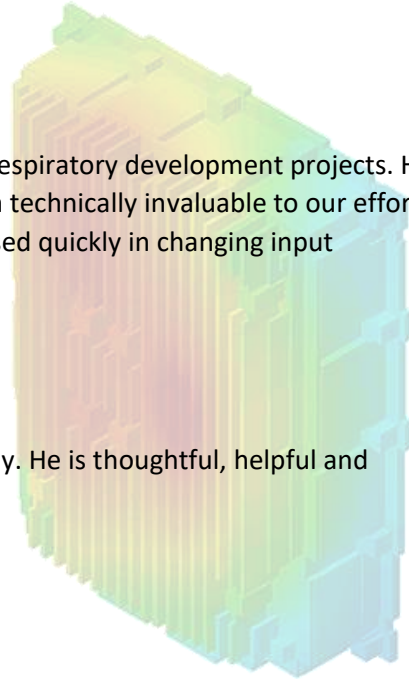
Chris has been great to work with. He provides an incredibly high quality service and value for money. Very responsive, great depth of knowledge and detail in all results.

Fred May – Senior Design Consultant at Synera Design

Chris Kriel has consulted with our group on a number of Medical Respiratory development projects. His understanding of CFD, and his outstanding analysis skills made him technically invaluable to our effort. Chris worked well in remote or team environments and synchronised quickly in changing input scenarios.

Rod Hendricks – Engineering Manager at Emissionless

Chris provides exceptionally good quality work and value for money. He is thoughtful, helpful and provides great advice. His software is world leading.



Why CFD?

Simulate – Understand – Optimize – Troubleshoot – Reduced Time to Market

Optimize

- Quickly evaluate design options prior to product testing to save time and money while demonstrating product viability and performance.

Understand

- Ability to evaluate implications of changes in design or process variables to rapidly gain a wider knowledge base.
- The ability to see the flow patterns within your device over a broad range of operating conditions gives you the ability to determine the direction for your design changes.

Troubleshoot

- Understand and diagnose problems quickly prior to physical testing
- CFD can uncover the source of problems and guide the direction for resolving them.

Reduce time-to-market

- Speed product development by modeling multiple scenarios, thereby ruling out unsuccessful attempts before conducting time-consuming product testing.
- Use CFD to direct the development path and support the experimental testing.

Typical Application Areas

- Identify flow restrictions, i.e. tortuous flow paths, too small vent openings (I see this a lot) as well as unwanted flow recirculation, i.e. exhausts too close to fresh air intakes etc.
- Virtually test product in abnormal environments that is difficult to achieve in experimental testing.
- Evaluate effect of changing design parameters, i.e. materials, geometry, coatings, fan and heat sink size etc.
- Estimate semi-conductor junction temperatures (CPU's, LED luminaires).
- In essence anything involving flow of gas/liquid with or without heat transfer.

Why use Me?

- 20 years' experience in this field, on a wide variety of applications.
- Flexible, easy to work with.
- Efficient and willing to walk to extra mile to meet deadlines.

Call/email me if you have any questions. I am happy to give honest advice on whether I believe my skills can add value/not for your project.

Please forward this flyer to your colleagues/other people you know who may have a need for this.

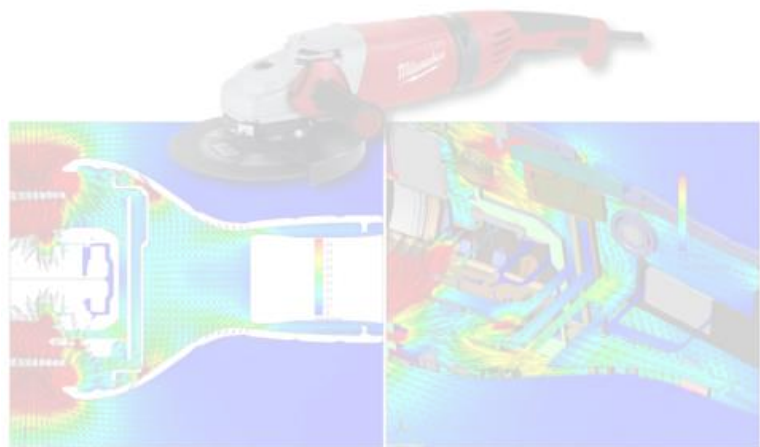
Kind Regards

Chris Kriel

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Email: chris@flowsim.com.au



Note that some images used are not my work, but for illustration purposes only.

It however is typical of the type of work I do.