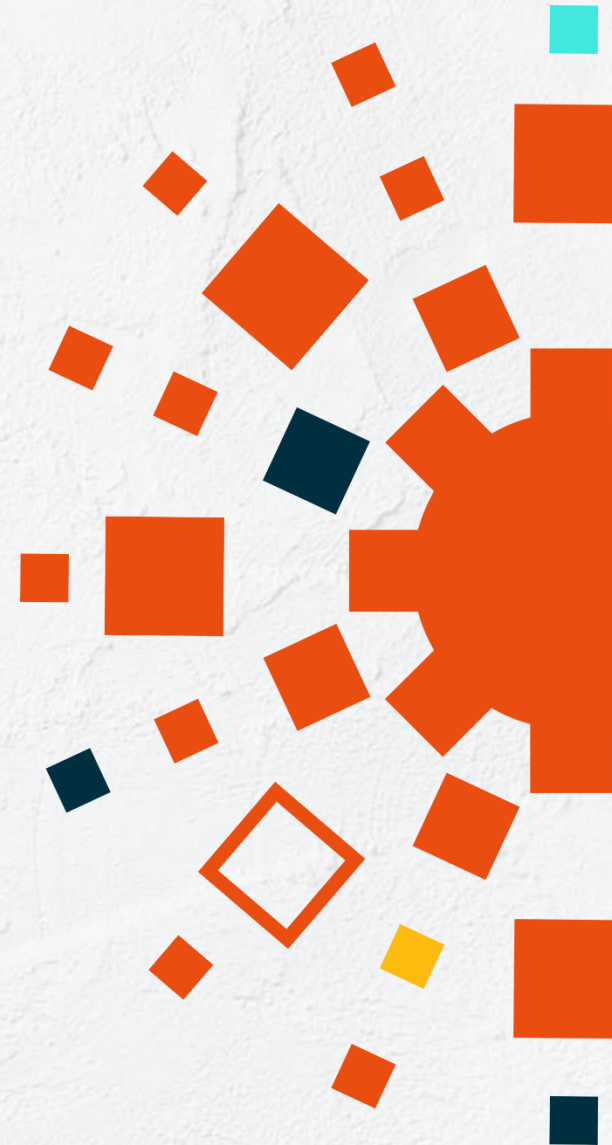


NOGen

Formnext

Nov 7-10, 2023

Frankfurt, Germany



Formnext – About the event

Event type: Additive Manufacturing

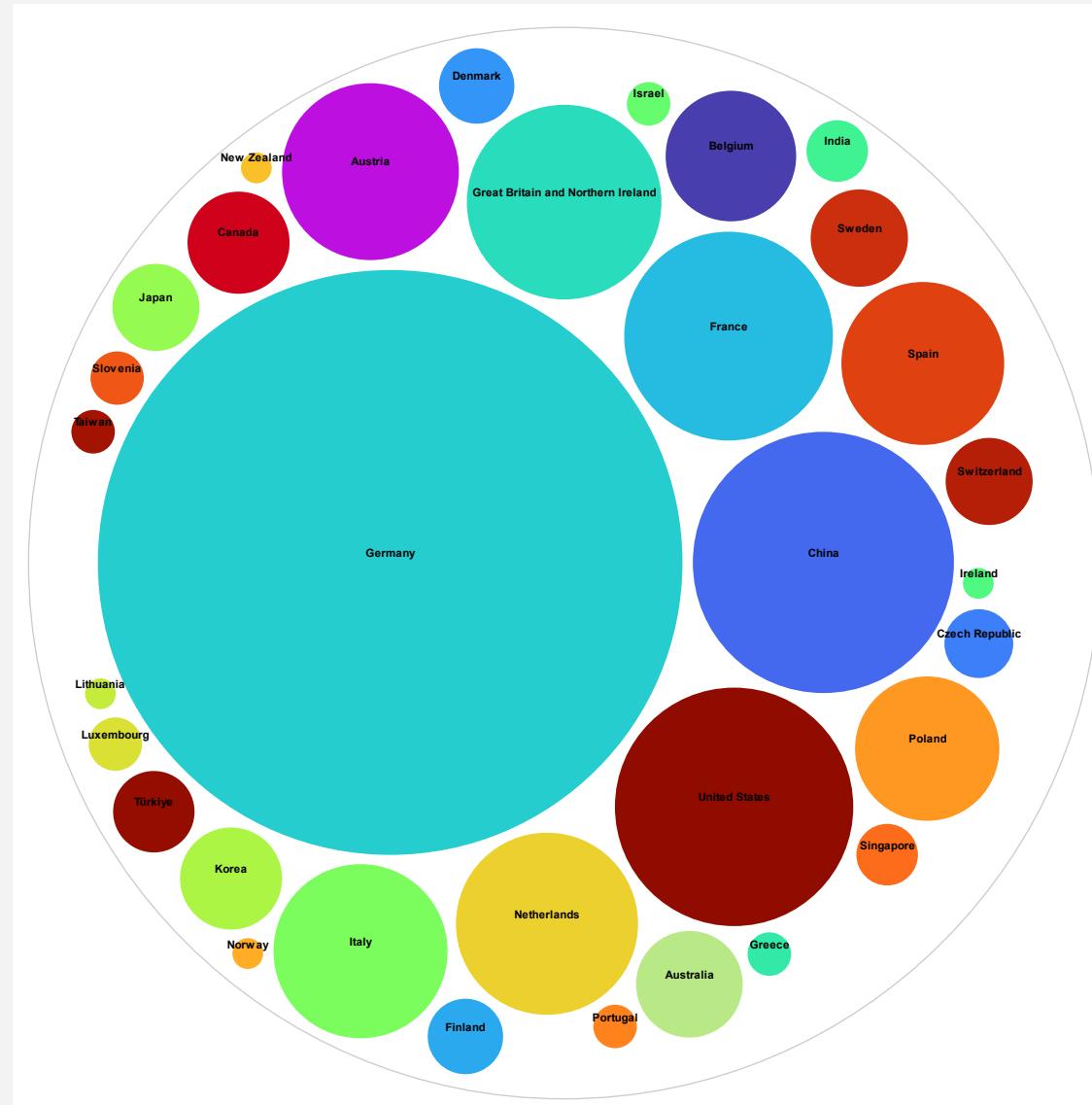
Location: Frankfurt, Germany

Description and years in operation: Held every year, since 2015. Now launching show in USA as well. Next show in Frankfurt is Nov 12-15, 2024. Formnext USA trade show will be April 8-10, 2025 in Chicago.

Event sector focus: Global trade fair dedicated to Additive Manufacturing and industrial 3D Printing

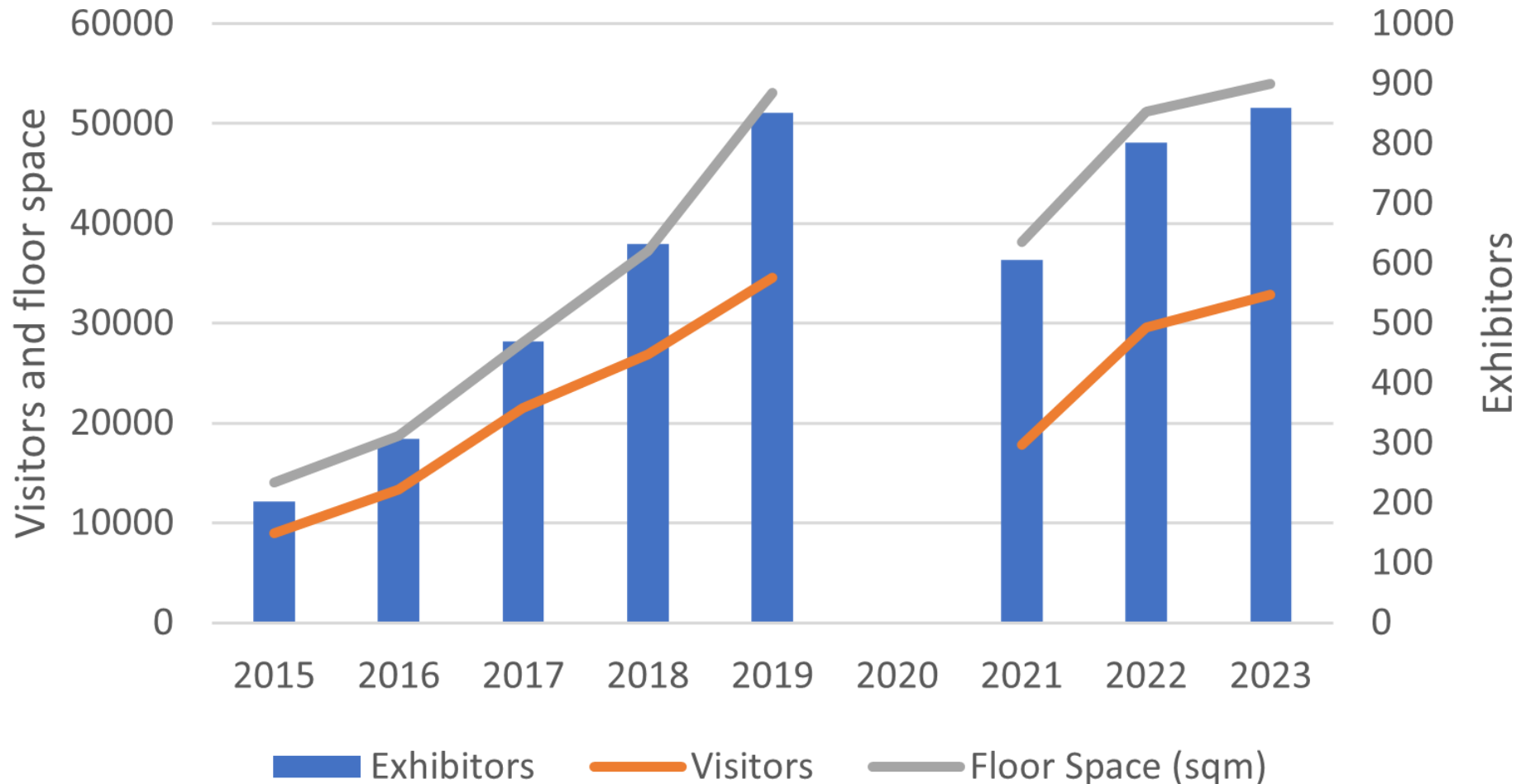
Number of exhibitors: 859 exhibitors – see distribution graphic - German companies dominant with 361 exhibitors

Number of visitors: 32,851 (50% international)



Formnext – History

Formnext growth



Formnext - Canadian exhibitors

Next Generation Manufacturing Canada

AP&C Advanced Powders & Coating Inc.

Tekna

Centre de métallurgie du Québec

Nanogrande Inc.

Dyze Design Inc.

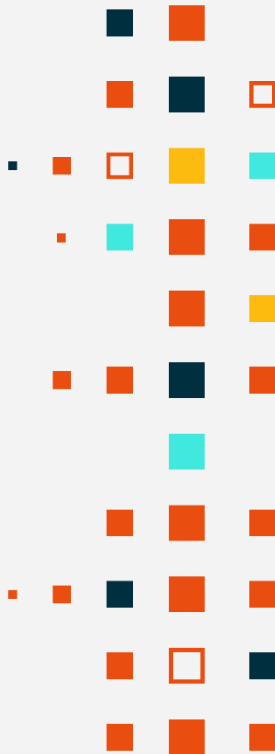
Polycontrols Technologies Inc.

Equispheres Inc.

University of Waterloo | Multi-Scale Additive Manufacturing Lab

Metafold Inc.

Mosaic Manufacturing Ltd.



Formnext – NGen Media

7 video interviews conducted with Canadian companies exhibiting at Formnext.

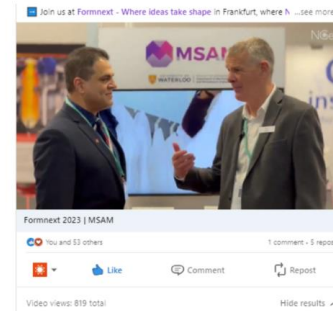
Custom Prototypes helmet also featured on Formnext TV.



Rossnag Engineering Tour 2023
You and 24 others
2 comments · 2 reposts
Video views: 522 total
Hide results

Video performance		
522		
Total views		

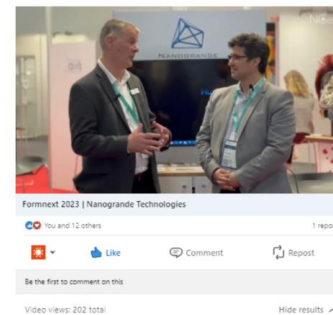
Post performance		
1,501	84	5.6%
Impressions	Engagements	Engagement rate



Formnext 2023 | MSAM
You and 53 others
1 comment · 5 reposts
Video views: 819 total
Hide results

Video performance		
819		
Total views		

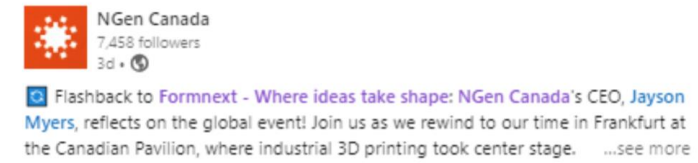
Post performance		
2,338	153	6.54%
Impressions	Engagements	Engagement rate



Formnext 2023 | Nanograde Technologies
You and 12 others
1 repost
Video views: 202 total
Hide results

Video performance		
202		
Total views		

Post performance		
544	28	5.15%
Impressions	Engagements	Engagement rate



Flashback to Formnext - Where ideas take shape: NGen Canada's CEO, Jayson Myers, reflects on the global event! Join us as we rewind to our time in Frankfurt at the Canadian Pavilion, where industrial 3D printing took center stage. ...see more

Auto captions have been added to your video [Edit]

Frank Defalco and 7 others · 3 reposts

Like Comment Repost

Be the first to comment on this

Video views: 452 total
Hide results

Video performance		
452		
Total views		

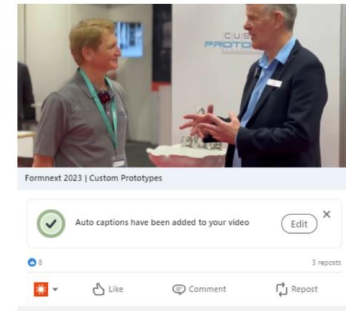
Post performance		
615	17	2.76%
Impressions	Engagements	Engagement rate
6	0.98%	8
Clicks	Click-through rate	Reactions
0	3	
Comments	Reposts	



Formnext 2023 | Polymatrix Technologies
Brieger Botin and 18 others
1 comment · 2 reposts
Video views: 809 total
Hide results

Video performance		
809		
Total views		

Post performance		
1,211	55	4.54%
Impressions	Engagements	Engagement rate



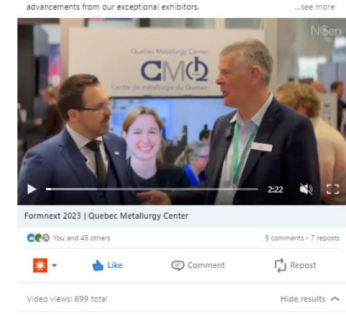
Formnext 2023 | Custom Prototypes
Auto captions have been added to your video [Edit]

Be the first to comment on this

Video views: 280 total
Hide results

Video performance		
280		
Total views		

Post performance		
advancements from our exceptional exhibitors.		



Formnext 2023 | Quebec Metallurgy Center
You and 45 others
5 comments · 7 reposts
Video views: 699 total
Hide results

Video performance		
699		
Total views		

Post performance		
1,920	135	7.03%
Impressions	Engagements	Engagement rate

Rosswag tour – takeaways for Canada

formnext

The Canadian delegation visited Rosswag, a 5th generation family run business. Rosswag started 110 years ago as a forging business, then added more value with machining, including CNC in the 80's. After seeing early laser powder bed fusion machines from SLM, Sven Donisi decided in 2014 that additive manufacturing should be his bold 5th generation contribution to Rosswag's growth.

The family expected little growth from forging coupled with increasing competition from off-shoring. However, the war in Ukraine, and cooling of trade with China have meant Rosswag's core business has far from collapsed, and the business now employs 200, with sales around \$60m CAD.

Additive manufacturing presented a number of challenges – for example there were only a handful of metals available, vs the 400 materials Rosswag work with for forging and machining. To address this barrier to adoption Rosswag invested in its own powder production capability and developed the parameters (recipe) for new materials. Their powder facility produces prototype quantities of powder, and Rosswag can demonstrate and de-risk new applications.



Rosswag tour – takeaways for Canada

Rosswag has developed parameters for many new materials, at different technology readiness levels (TRL), and claims its qualification process can give results in just 4 weeks.

To further stimulate adoption Rosswag has created an online marketplace for material parameters, AddiMap, allowing anyone from the additive ecosystem to offer their process data. The price point for the data depends on its completeness, as well as uniqueness, but AddiMap provides a ready-made platform for the industry to get a return on investment that might otherwise be wasted.

Rosswag was a very interesting reference point for Canada’s manufacturers, many of which are also small, family-run businesses. While Rosswag did not appear to have yet hit a “home-run” with its additive division, their proactive, energetic approach to removing barriers to adoption was inspiring.

Teamwork was evident throughout the operation, especially in the hot forging work. The 6th generation has yet to stake its claim at Rosswag, but investment in AI and machine learning would seem likely pillars for future expansion on their picturesque hilltop in Pfintzal.



Material	Process Data Completeness	Technology Readiness Level (TRL)	Price
Surface Roughness... AISI10Mg M 290	91%	1-3	8,200.00 €
Density 420 SLM 280 2.0	88%	1-3	7,000.00 €
Density CuSn10 AL3D-Metal 200-5...	62%	1-3	1,000.00 €
Density Invar 36 SLM 280 2.0	90%	1-3	7,500.00 €
Density Waspaloy SLM 280 2.0	89%	1-3	3,000.00 €
Productivity 316L SLM 280 2.0	93%	4-6	10,000.00 €
Density 309 / 1.4828 SLM 280 2.0	82%	4-6	8,000.00 €
Mech. Properties 42CrMo4 SLM 280 2.0	92%	1-3	7,500.00 €
Productivity 42CrMo4 SLM 280 2.0	98%	1-3	5,000.00 €
Density 1.4521 Waspaloy	-	-	-

MATERIALS FOR SERIES APPLICATIONS

- Iron-based: 1.4404 | 316L, 1.4828 | AISI 309, 1.3912 | Invar 36, 1.2709 | M3000, 42CrMo4 | AISI 4140, Special® | M350
- Nickel-based: Inconel 625, Inconel 718, Hastelloy X
- Other materials: AISI10Mg, Ti6Al4V, CuCr28Mn6

MATERIALS FOR PROTOTYPES

- Iron-based: 1.3964, 1.4462, 1.4021
- Other materials: AlMg9y 80

MATERIALS IN THE QUALIFICATION

- Iron-based: 1.4521, 1.4901, 1.4906, 1.4923, 1.3343
- Nickel-based: Waspaloy

TRL 7-9 (on a part), TRL 4-6 (on a part), TRL 1-3 (on a part)

Formnext – Event announcements

formnext

Memorandum of Understanding signed between Canada Makes and MGA



International cooperation to stimulate awareness and adoption is a theme NGen has encouraged whether for more sustainable, circular economies or specific technologies like additive manufacturing. The signing of an MOU at Formnext between CanadaMakes and leading German organization Mobility Goes Additive(MGA) is an example of such cooperation.

“3D Printing is a global technology, used in diverse industries and across borders – so to advance AM, we need to also look across the pond. That is why at the formnext in Frankfurt, MGA signed an MoU with Canada Makes - 3D/AM Network , Canada’s premier AM network.

In this partnership, we aim to drive international collaboration by leveraging shared competencies, network and foster close cooperation.

Our members will have the chance to connect with Canadian companies through shared online platforms of both networks and we are set to increase information and knowledge transfer. “



Formnext – Impressions of event

formnext

The Canadian delegation had several opportunities to hear developments from global players in additive. For example, DMG Mori divulged that they are now using their own LaserTec machines to produce drawbars for many of their machine tools. This combination of CNC machining plus hard material cladding done on one machine has dramatically reduced lead times (from weeks to hours) for these complex but commodity machine components.

GE showed dramatically improved surface finish from their Electron Beam Machines, enabled by a new pulse melting strategy. EBM has always been fast, and often “support-free”, but surface finish has historically been inferior to laser powder bed. A renaissance is occurring in EBM technology with the expiration of patents, and new entrants such as Wayland and Freemelt alongside GE.

Nikon-SLM showed a dizzying array of technology ideas, from laser finish machining of laser powder bed parts, to perhaps a more practical marriage of LPBF and DED for rocket structures. Language barriers were evident on the Nikon stand, which made understanding the concepts presented that much harder for the Canadian delegates.

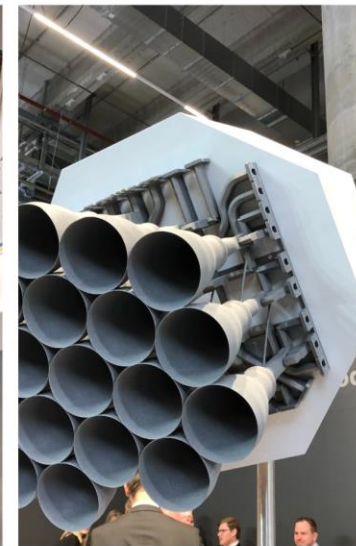
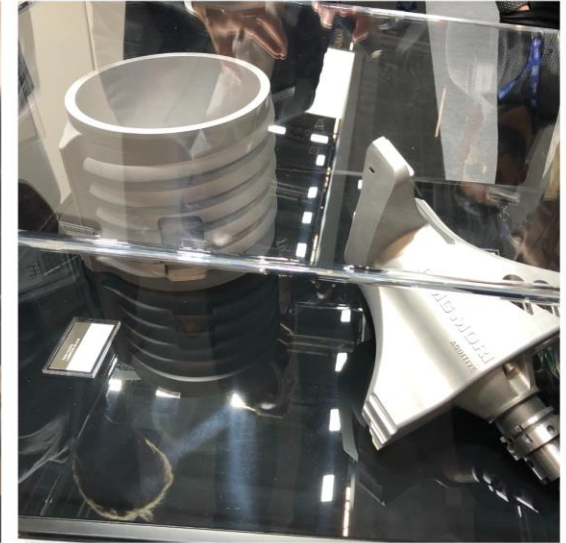


Formnext – Impressions of event

Touring the EOS stand gave the Canadian delegation a chance to learn about advancements in SLS productivity and economics, now reaching a tipping point where Lego believes printing its iconic building bricks might make good business sense. This is perhaps an application many people can relate to and shows how printing is finally eating some share of traditionally tooled markets.

Electric vehicle applications were teased on many stands, including DMG, where a cooled housing sat alongside a custom 3d printed tool for boring the part to size. Sandvik (and others) have been printing some of their own tools for several years now. Seeing “exemplar” applications is one of the values of shows such as Formnext, where often this is a sneak peek at real industrial use cases, suitably disguised by the machine suppliers.

Productivity was a theme, whether it was Renishaw’s Tempus technology allowing lasers to continue scanning while the recoater spreads powder, or high-power shaped beams reaching an astonishing 430cc/hr with a single laser from Aconity and Equispheres. Chinese machines offer more and more lasers, with bigger build volumes, and at significantly lower price points than some of their Western competitors.



Formnext – Conclusions

Well organized, comprehensive and focused industrial 3d printing event. Critical relevance for understanding global technology trends and selecting/benchmarking machine suppliers. Offers early insight into new application areas and industry users.

Canadian delegation uniformly positive in value of attending, and jointly dissecting all elements of the ecosystem. Useful customer and supplier meetings and impact enhanced by having a dedicated Canada stand, complete with crowd pleasing exhibits such as Custom Prototypes award winning helmet.





NGen

