



KONICA MINOLTA

# HOW DISTRIBUTED MANUFACTURING IS REDUCING OPERATIONAL RISK FOR MANUFACTURERS



Giving Shape to Ideas



# The rise of distributed manufacturing

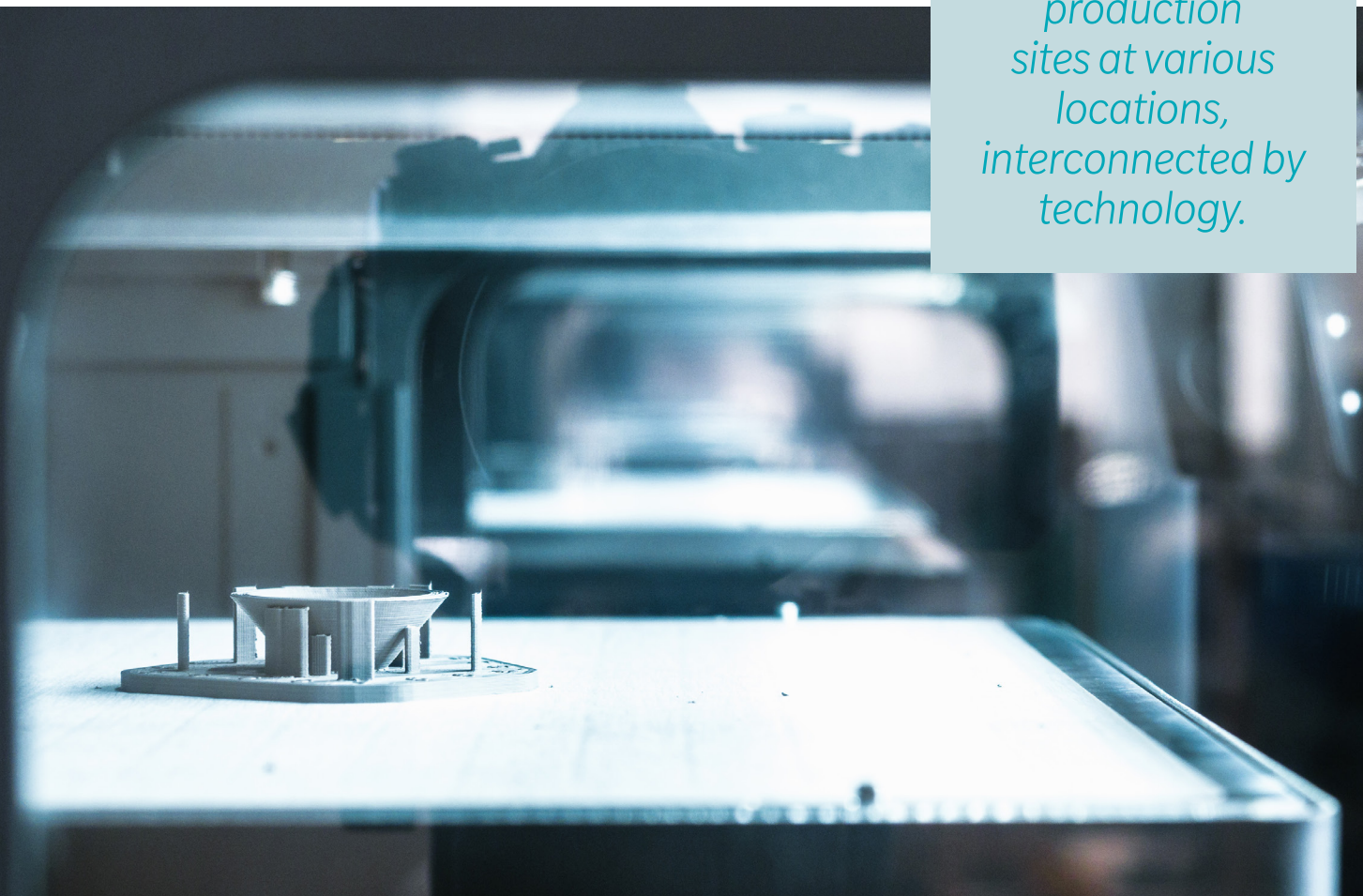
Distributed localised production has emerged as a counterpoint to globalisation, placing the production of goods close to or at the point of use. The trend towards distributed manufacturing is due to a number of factors. For example, rising fuel prices have significantly increased long-haul shipping costs, while concern over climate change has put a focus on its negative environmental effects. Simultaneously, constant trade wars and tariffs as well as pandemic-related border closures have compromised supply chains worldwide. This has created an impetus for manufacturers to move production processes nearer to the consumer.

Furthermore, the demand for customised products, faster turnaround times, and quicker delivery makes traditional, centralised manufacturing less effective. Distributed manufacturing provides producers with a higher level of flexibility and agility in comparison to more established models. This can help manufacturers compete more effectively even in a disrupted environment.

Distributed manufacturing changes the game by placing production sites at various locations, interconnected by technology. With close proximity to end consumers, manufacturers using this model can offer faster delivery times,

environmental sustainability, customisation, and support for regional markets. While largescale production will most likely continue to dominate most segments of the value chain, distributed, small-scale local manufacturing is emerging to deliver a sustainable alternative to how goods are produced and shipped.

*Distributed manufacturing changes the game by placing production sites at various locations, interconnected by technology.*





KONICA MINOLTA

# The role of additive manufacturing in keeping plants up and running

Distributed manufacturing is facilitated by 3D printing technology, commonly known as additive manufacturing. This is driving a shift away from high-volume, analogue manufacturing to on-demand, digitalised manufacturing. The benefits include:



**INCREASED CONTROL**



**SHORTER LEAD TIMES**



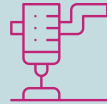
**INCREASED ABILITY TO PROVIDE CUSTOMISED SOLUTIONS**



**ABILITY TO DEVELOP PROTOTYPE PRODUCTS QUICKLY**



**NO MINIMUM ORDER REQUIREMENTS SO SHORT-RUN PROJECTS BECOME VIABLE**



**ABILITY TO CREATE REPLACEMENT PARTS ON-SITE FOR BROKEN OR DAMAGED EQUIPMENT.**

Manufacturers rely on a range of equipment to produce finished goods. Especially in high-volume or specialised industries, this creates a risk for the business because unexpected downtime caused by a broken or worn part can quickly become expensive.

To combat this, some manufacturers keep a range of parts in stock on site. This is beneficial because it reduces the downtime incurred by potentially long waits for parts to be provided, especially if those parts are coming from overseas providers. However, it also requires a significant investment in spare parts and the space to store them.

Some organisations are seeing significant productivity improvements by keeping a 3D printer and a digital catalogue of equipment parts on site. This means the business doesn't have to keep a range of spare parts in stock in case of equipment breakdown or wait for parts to be shipped from a centralised location. Instead, they can simply create that part within the facility and get back up and running within hours rather than days or weeks. This is especially valuable when it comes to parts that break or need replacing often, as well as parts that are no longer manufactured by the original maker.

One example of this is the creation of a ship engine lifter, which needs to lift a 5,000kg engine into a ship. Rather than send away for the parts,

the lifter could be created right on the ship as needed. Or, an airline maintenance team that requires a special tool that isn't often used could 3D print that tool on demand, keeping maintenance work on schedule.

Additive manufacturing is also a constantly evolving process, and design thinking principles play a significant role. As well as replicating parts on site, additive manufacturing can provide an opportunity to improve on the original part, creating a stronger, more effective part. For example, a cast iron part could be replaced with a carbon fibre part, making it both lighter and stronger for increased durability over the long term. Other design changes could reduce wear and tear or make the part work more efficiently. Likewise, manufacturers could combine multiple parts into one part, reducing complexity and increasing the part's strength.

When organisations create new part designs digitally for 3D printing, they can choose to store these in a secure library for use throughout the business. Storing the library in the cloud means facilities around the world can access the same library regardless of location. This is especially valuable for enterprises with manufacturing facilities in various geographically dispersed locations. Instead of sending heavy, expensive parts to these locations, users can simply access the file they need and 3D print their required part in hours.





## It may be time to rethink global supply chains

Supply chains have proven to be fragile during significant global disruption such as the COVID-19 pandemic. This has forced organisations to rethink their supply chains, especially when the goods they produce are perishable and have a short shelf life. For example, meat processors can't afford to have lengthy downtime due to a broken part; the result will be empty shelves in supermarkets and butchers, while the meat processors will need to dispose of perished materials that could otherwise have been turned into profit. Additive manufacturing solves this issue by making parts available in hours and getting the plant back up and running.

Moreover, organisations can create even more efficiencies when they know certain parts have a tendency to wear or break by always keeping one 3D-printed version of the part on hand. That way, it can be instantly swapped out with the broken part, resulting in minimal downtime. Meanwhile, the business can reprint that part so that it's permanently in stock and ready to go. Because they don't have to order

a minimum quantity, less space is taken up with superfluous parts. A 3D printed part could be used permanently, or it could be used as a temporary replacement while the business waits for the OEM part to arrive.

Industry bodies can potentially play a key role in this, helping each of the organisations under their remit by keeping an open parts library that any member organisation can use. For example, the Australian Meat Processing Corporation (AMPC) is working with Konica Minolta and Markforged to help red meat processors across Australia to 3D print equipment parts.

Chris Taylor, CEO, Australian Meat Processor Corporation, said, "Meat processors rely on a multitude of equipment, with multiple components. Even a small component failure can be a costly exercise. The ability to simply print a replacement part could drastically reduce downtime and minimise the need to wait for parts, reducing the chance of supply being at risk."

*Supply chains have proven to be fragile during significant global disruption such as the COVID-19 pandemic.*



KONICA MINOLTA

# Additive manufacturing is better for the environment

Additive manufacturing reduces the production of scrap waste, in some cases as much as 90 per cent compared to conventional manufacturing.<sup>1</sup> 3D printing builds a part, layer by layer, with high precision and no waste. When it comes to multi-material 3D printing, part counts are reduced further while electrical and mechanical

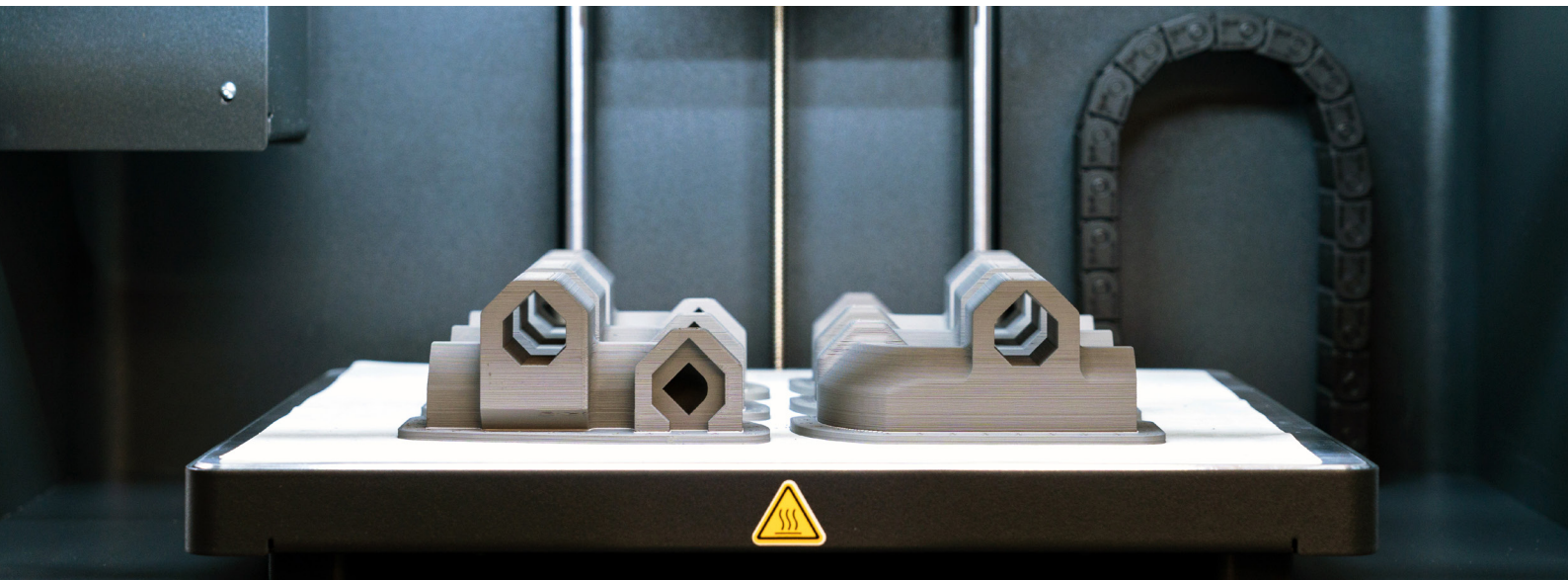
functionality is combined, establishing a streamlined, efficient, and sustainable production process.

3D printing can help to decrease CO2 emissions in the future, projected to be as much as five per cent by 2025.<sup>2</sup> The manufacturing process is more efficient with 3D printing; however, by

its nature, additive manufacturing removes the need for transport, storage, and travel that is used in traditional production methods. When compared to traditional manufacturing processes, 3D printing is much greener and more sustainable. It also holds great potential for the future because the growth possibilities are vast.

1. <https://www2.deloitte.com/us/en/insights/focus/3d-opportunity/additive-manufacturing-3d-opportunity-in-tooling.html>

2. <https://www.dimanex.com/2019/06/03/3d-printing-and-sustainability-less-waste-and-carbon-emissions-from-miles-travelled/#:~:text=Brief's%20MVP%20awards-,3D%20printing%20and%20sustainability,up%20to%205%25%20by%202025.&text=If%20you%20used%20a%20distributed,could%20save%20those%20economic%20costs>



## The way forward

Manufacturers that depend on essential equipment to continue operating will always face risks associated with the potential for that equipment to fail. Onsite additive manufacturing capabilities and a digital library of spare parts can overcome this challenge by letting manufacturers 3D print spare parts as needed. The future of productivity and competitive advantage lies with this type of distributed manufacturing.

**Find out how your organisation can start to leverage the power of additive manufacturing today. Visit Konica Minolta at**

**[www.konicaminolta.com.au/contact/sales](http://www.konicaminolta.com.au/contact/sales)  
or call 1800 789 389**