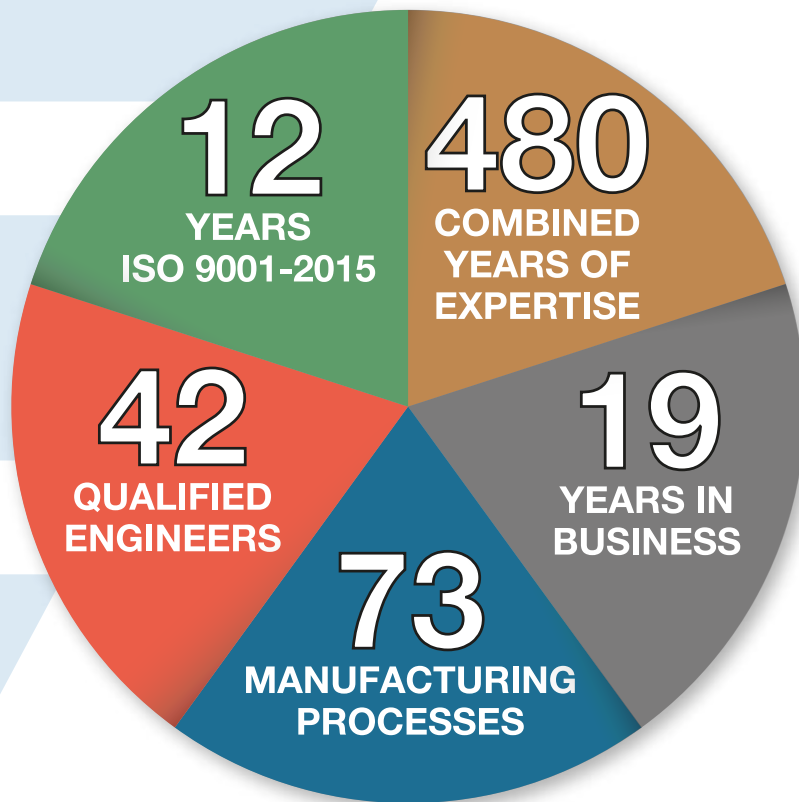




# **OMNIDEX** CASTINGS

**Quality Metal Casting  
Redefined for 2022 and Beyond**



## About us

Omnidex is an ISO 9001 certified full-service manufacturing company with over 19 years of experience in metal casting. Led by professional engineers and industry experts, the company has pioneered the Omnichannel Manufacturing method, a tried and trusted formula to produce high quality casting products for customers from 11 countries, including the US, UK and Australia. The Omnidex Casting Team has been working with top-tier corporates and manufacturers on numerous projects with great successes over the years.

## Omnichannel Manufacturing

Today's manufacturing project can be incredibly complex, with unique parts, high precision components and customized castings that can only be produced by specialized manufacturers. It is difficult to maintain a supply line when most service providers that can only offer one or a few areas of expertise and have a limited capacity.

Omnichannel Manufacturing is a new manufacturing approach pioneered by Omnidex, which helps businesses adapt to an evolving manufacturing ecosystem. Combining the capabilities of our in-house facilities located in Scotland and South-East Asia, and a sub-contracting network of over 200 service providers, we are able to provide 73 different manufacturing processes with unparalleled capacity to our customers.

# The Omnidex Casting Value Statement



## Innovation

The Omnidex Casting Team maintains a positive and open attitude towards new ideas and we seek innovation in every aspect of our services. Manufacturing is constantly evolving and we intend to stay on top of industry trends.

## Productivity

We are constantly pushing for higher productivity. From supersized casting up to 15 tones, to large-scale orders up to a million units, we are able to fulfil literally any order in a real-world scenario.

## Reliability

We produce products that are trusted by leaders in the Mining, Automotive, Oil & Gas, Technology, Medical and Heavy Industries. Our castings are not just about looks, but functionality and reliability as well.

## Customer Satisfaction

We value our every customer and your satisfaction is our utmost priority. We always strive to exceed your expectation and we want you to be our ecstatic customers.

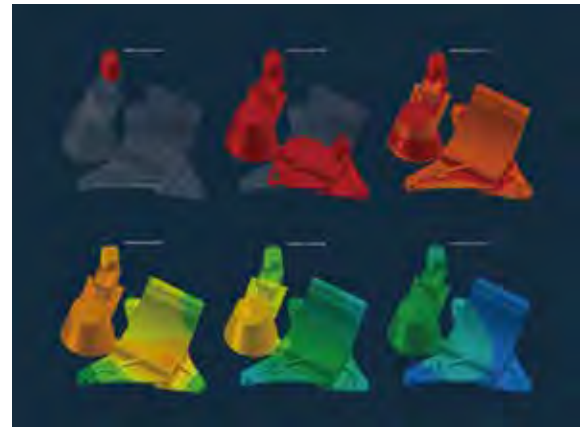
## Efficiency

Our professional services and processes are optimized for maximum efficiency. We aim at providing quick and economic solutions to customers and speed up their project cycle with our expertise.

## In-house Knowledge and Expertise

### Porosity Free Casting

The Omnidex Casting Team are experts in porosity free casting. We are very familiar with the best practices and potential issues in every casting process. We use a full suite of specialized CAT and simulation software to optimize our casting designs. Every mold and casting component are meticulously designed and precisely machined to specification. All casting processes are done in top-performing specialized foundries with our casting specialists supervising on-site.



### Product Design and Engineering

Our Engineering Department consists of more than 42 professional engineers. We provide so much more than just the raw manufacturing capabilities, because engineering and design are just as important to the success of your project.



## IP Protection



## Our Quality Commitment

Omnidex has been ISO 9001 certified for more than 12 years. Accepting your order means that we have full confidence in meeting all of your specification and quality objectives as per the agreement. We strive to uphold the highest performance and quality standard, because customer delight is of utmost importance to us.

## Our Casting Services

Omnidex offers various metal casting processes, including sand casting, permanent mold gravity casting, die casting, investment casting, lost foam casting and shell mold casting, all of which are done in highly specialized foundries and supervised by our team of industry experts. With 19 years of experience in metal casting, we are committed to provide our customers with the most comprehensive casting solutions.



# Sand casting

Sand casting has always been a mainstay of our operation, and we are very proud of our work. We have been working with specialized foundries in China and Vietnam for many years to produce high quality sand castings (weighing up to 15 tons). Our extensive knowledge in sand casting combined with our total commitment to quality is what makes us stand out from the crowd.

## Quality sand casting is what we do

As experts in Sand Casting, we understand your concerns over casting quality. Issues such as shrinking defects and porosity can be prevented if sand casting is done in the right way. Here is how we ensure the quality of our sand casting products:

### Impeccable patterns

All Omnidex patterns are CNC machined with specialized equipment. Accuracy is paramount at this stage as any inaccuracy in the pattern will lead to inaccurate castings.

### World-class sand casting engineering

All shrinkage allowances, draft angles and other factors are accurately calculated by our engineers. Placement of removable cores, feeds, uprisers, chill blocks are also carefully thought out to produce the perfect results.

### State-of-the-art simulation tests

After all the calculations, every new design has to go through simulation tests. These tests allow our engineers to estimate the likelihood of porosity, so they can move, increase or decrease the feeds and uprisers or add chill blocks as required.

### Supervised by experienced craftsmen

Our process is supervised by the most experienced sand casting specialists. We will take into account the metal flow in the sand mold, material cooling and many other issues such as uneven shrinkage or surface distortion to produce castings of the highest quality possible.

### Excellent pre-treatment and finishing

Ferrous castings are pre-treated with zinc phosphate which provides a high level of corrosion protection, and finished with anti-rust coatings, zinc plating, powder coatings or spray painting.





## Materials

We offer sand casting with both ferrous and non-ferrous materials, including aluminium alloys, brass alloys, bronze alloys, steel, carbon steel, high tensile steel, stainless steel, grey iron, spheroidal graphite iron.

## Tolerances

Sand casting tolerance is influenced by the casting material and its structure, the grade of the Sand Casting tolerance will be CT9 ~ CT11.

### Sand casting vs Investment casting

Normal dimension (mm)		Linear dimensional tolerances (ISO8062)		
>	≤	CT9	CT10	CT11
-	10	1.5	2	2.8
10	16	1.6	2.2	3
16	25	1.7	2.4	3.2
25	40	1.8	2.6	3.6
40	63	2	2.8	4
63	100	2.2	3.2	4.4
100	160	2.5	3.6	5
160	250	2.8	4	5.6
250	400	3.2	4.4	6.2
400	630	3.6	5	7
630	1000	4	6	8
1000	1600	4.6	7	9
1600	2500	5.4	8	10
2500	4000	6.2	9	12

Normal dimension (mm)		Linear dimensional tolerances (ISO8062)		
>	≤	CT4	CT5	CT6
-	10	0.26	0.36	0.52
10	16	0.28	0.38	0.54
16	25	0.3	0.42	0.58
25	40	0.32	0.46	0.64
40	63	0.36	0.5	0.7
63	100	0.4	0.56	0.78
100	160	0.44	0.62	0.88
160	250	0.5	0.7	1
250	400	0.56	0.78	1.1
400	630	0.64	0.9	1.2
630	1000		1	1.4
1000	1600			1.6



## Permanent mold gravity casting

Permanent mold gravity casting may seem like a straightforward process, but a high level of skill is required to maintain the quality of products. We follow a series of strict procedures to ensure our products can always meet your expectations.

### Pre-casting preparations

To ensure smooth metal flow and minimal casting defects, we must first pre-heat the casting mold to between 150°C (300°F) and 260°C (500°F). We then apply a ceramic coating to the mold cavities to extend the mold's working life and make it easier to remove the casting parts.

### Impeccable craftsmanship

It is worth noting that unskilled pouring may leave visible flow marks on the finished parts. That is why we have our own casting specialists supervising the entire process, ensuring the molten metal is poured into the mold at the right speed. After the casting is done, all sprues and runners are accurately trimmed, then cleaned and painted (if required) by an experienced crew of workers.

### Guaranteed quality for our casting processes

Our gravity casting process can produce porosity-free parts ranging from 50 grams to 70 kilograms with good dimensional repeatability and a smooth finish. All material specifications, dimensions and tolerances closely monitored and maintained by our QC specialists.



## Die casting

As die casting specialists, the Omnidex Casting Team offers a full range of services well-exceeding the capabilities of a typical foundry. From die making to production engineering and QC, we can have the entire production line set up for you.



### **Close connections with the top-performing die casting factories**

We have been working with some of the best die casting factories for many years. These factories can produce top quality products with highly accurate dimensions and tolerances. Also, you are not limited to the capacity of just one manufacturer, giving you more choice on materials and casting methods.

### **Advanced simulations and engineering support**

We use the very latest software to simulate molten metal flow during the Die Casting process so that we can highlight feed points and identify areas where improvements can be made.

### **Expert in die design and making**

The die is the most important component in the process. Any problem in the die design may lead to inaccuracy or quality issues in the products. As an expert in Die Casting, we will provide you with the best die designs possible to ensure the success of your project.

### **Top-notch die casting finishing**

Our production offers impeccable surface finishes through detailed final cleaning and specialized painting. We also guarantee clean sprue removal and keep waste to a minimum.

### **Rigorous QC standards**

Issues such as flash, unfilled sections and hot tearing may occur in Die Casting. Our QC specialists will make sure the product is free of these problems, and the dimensions and properties are up to the agreed specification throughout the entire production run.





## Materials

Non-ferrous alloys such as aluminium, magnesium, zinc, brass and copper alloys are best for die casting.

## Tolerances

Die Casting tolerance is based not only on the material used, but also the length, shape and location of each feature. Die casting tolerance is usually in the range of CT4 ~ CT6.

### Die casting vs Permanent mold gravity casting

Normal dimension (mm)		Linear dimensional tolerances (ISO8062)		
>	≤	CT4	CT5	CT6
-	10	0.26	0.36	0.52
10	16	0.28	0.38	0.54
16	25	0.3	0.42	0.58
25	40	0.32	0.46	0.64
40	63	0.36	0.5	0.7
63	100	0.4	0.56	0.78
100	160	0.44	0.62	0.88
160	250	0.5	0.7	1
250	400	0.56	0.78	1.1
400	630	0.64	0.9	1.2
630	1000		1	1.4
1000	1600			1.6

Normal dimension (mm)		Linear dimensional tolerances (ISO8062)		
>	≤	CT7	CT8	CT9
-	10	0.74	1	1.5
10	16	0.78	1.1	1.6
16	25	0.82	1.2	1.7
25	40	0.9	1.3	1.8
40	63	1	1.4	2
63	100	1.1	1.6	2.2
100	160	1.2	1.8	2.5
160	250	1.4	2	2.8
250	400	1.6	2.2	3.2
400	630	1.8	2.6	3.6
630	1000	2	2.8	4
1000	1600	2.2	3.2	4.6

## Investment casting

Compared to other processes, investment casting is more expensive and has a longer production cycle, but its tighter tolerances, smooth as-cast finish and freedom of design also give it an edge over other casting processes, making the process ideal for producing small to medium-sized products with complex shapes.



### **Professional casting operation orchestrated by qualified engineers**

Our engineering team utilizes the latest technology to help you design the best investment casting solution, and supervises the entire production process in our sub-contractor's facilities.

### **Combined strength of multiple foundries**

We have been working with a number of highly experienced investment casting foundries to offer you more choice and flexibility. We offer different core types (such as waxless cores, soluble wax cores and urea wax cores) and specialized waxes (including low temperature wax, medium temperature wax and low temperature wax with polymer additives).



## Full range of investment casting finishing services

We also offer a wide range of post-casting services, including machining (with CNC lathe or CNC milling), material testing (including tensile, hardness and elongation testing and more), pressure testing (we typically offer hydrostatic testing for hollow parts) and polymer impregnation (mainly for aluminium investment casting).

## Freedom of design

The use of wax patterns and one-time ceramic molds give a lot of flexibility to the design of investment casting parts. Wax patterns are relatively easy to make, allowing finer details on the final product, and can be attached to a wax runner system to create molds that can cast multiple parts at a time. The use of one-time ceramic shell molds (broken after use) may seem complicated at first glance, but this also enables the process to create intricate forms, make one-piece parts with undercuts, and eliminate parting lines and draft angles on castings.





## Lost foam casting

Omnidex has been working with some of the best lost foam casting foundries to produce exceptional products over the years. We are very familiar with the challenges in this type of casting and we take extreme care in every step to ensure the best result.

### High-tech lost foam casting

Our engineers have extensive experience in designing lost foam casting patterns, and we have an arsenal of technology, including computer simulations, specialized foam materials and automated machines to help you achieve the best results possible.

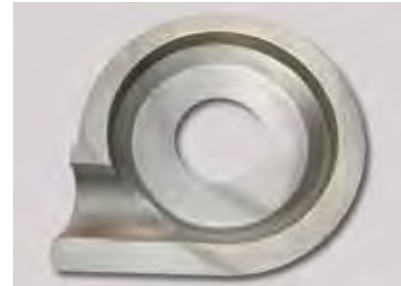
### Excellent lost foam casting craftsmanship

Lost foam casting is a delicate process. Patterns made from foam can easily be damaged or distorted, therefore all foam patterns and molds must be handled with care. In the pouring stage, the molten metal must reach temperatures of above 1000°F in order to fully ‘dissolve’ the foam pattern and produce a complete casting piece. We make sure only the right amount of molten metal is poured into the mold, and the casting is thoroughly cooled in a controlled environment before the mold can be broken.

### Strengths of lost foam casting

Lost foam casting shares many of the advantages with lost wax investment casting, but it is generally more economical than the latter. Lost foam casting involves fewer steps and uses cheaper materials. Foam is also easier to shape (can be glued and carved), which further aids the freedom of design. All these features help keep waste levels down and lower per-unit production cost. This process is ideal for high quality single casting, small volume production or particularly complex and large parts (from 0.5 kg up to 10 tons).





## Materials

Lost foam casting can be used with all types of ferrous and non-ferrous materials, including aluminium alloys, nickel alloys, steels, cast irons, copper alloys, stainless steels.

## Tolerances

Lost foam casting tolerance is influenced by the casting material, size, geometry and structure. In general, a casting tolerance standard of CT8 ~ CT9 can be achieved for this process.

### Lost foam casting vs Shell mold casting

Normal dimension (mm)		Linear dimensional tolerances(ISO8062)	
>	≤	CT8	CT9
-	10	1	1.5
10	16	1.1	1.6
16	25	1.2	1.7
25	40	1.3	1.8
40	63	1.4	2
63	100	1.6	2.2
100	160	1.8	2.5
160	250	2	2.8
250	400	2.2	3.2
400	630	2.6	3.6
630	1000	2.8	4
1000	1600	3.2	4.6
1600	2500	3.8	5.4
2500	4000	4.4	6.2

Normal dimension (mm)		Linear dimensional tolerances(ISO8062)	
>	≤	CT8	CT9
-	10	1	1.5
10	16	1.1	1.6
16	25	1.2	1.7
25	40	1.3	1.8
40	63	1.4	2
63	100	1.6	2.2
100	160	1.8	2.5
160	250	2	2.8
250	400	2.2	3.2
400	630	2.6	3.6
630	1000	2.8	4
1000	1600	3.2	4.6
1600	2500	3.8	5.4
2500	4000	4.4	6.2

## Shell Casting

Omnidex has been providing shell casting services to our business customers for many years. We work with the industry's best to bring you a range of high quality shell mold solutions. If you are looking for an efficient sand mold casting method with high consistency, our Shell Casting process can definitely meet your needs.

### Unique advantages of the shell casting process

Shell casting can be used to make complex parts with fine details and very thin sections. It also offers excellent surface finish and tight tolerances. But this is not the full extent of its capabilities.

What makes shell casting stand out from most other processes is that it can be fully mechanized and automated, and it has lower skill requirements for workers. That means this process can have reach a higher production rate and can be easily scaled for mass production. These advantages make shell casting the ideal solution for large-scale production of small to medium-sized high-precision parts. This process is often used in the manufacture of camshafts, crankshafts, gear housings and many more.





# Want to know more? Just get in touch and we'll do the rest...

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**Hong Kong Office:**  
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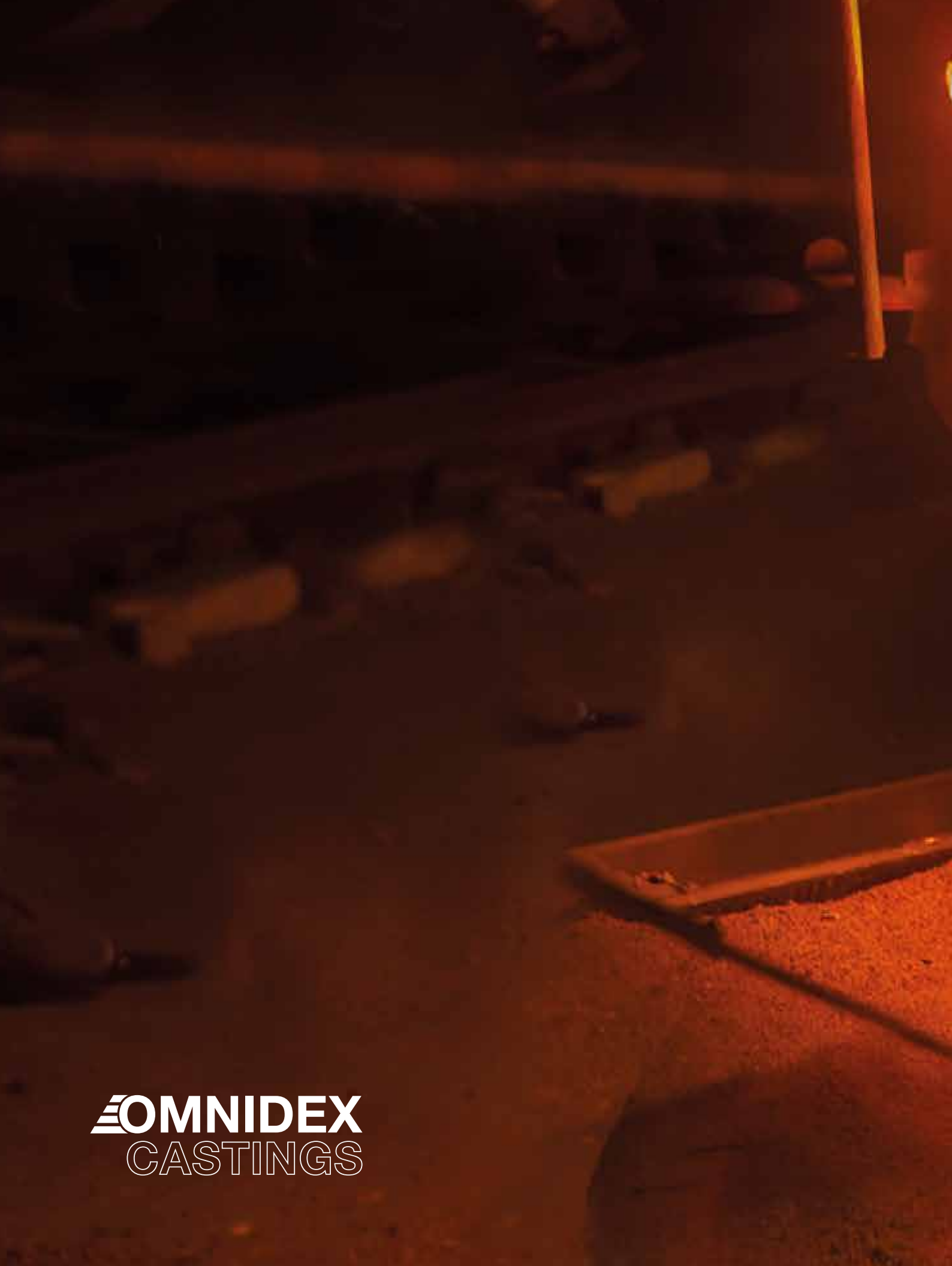
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