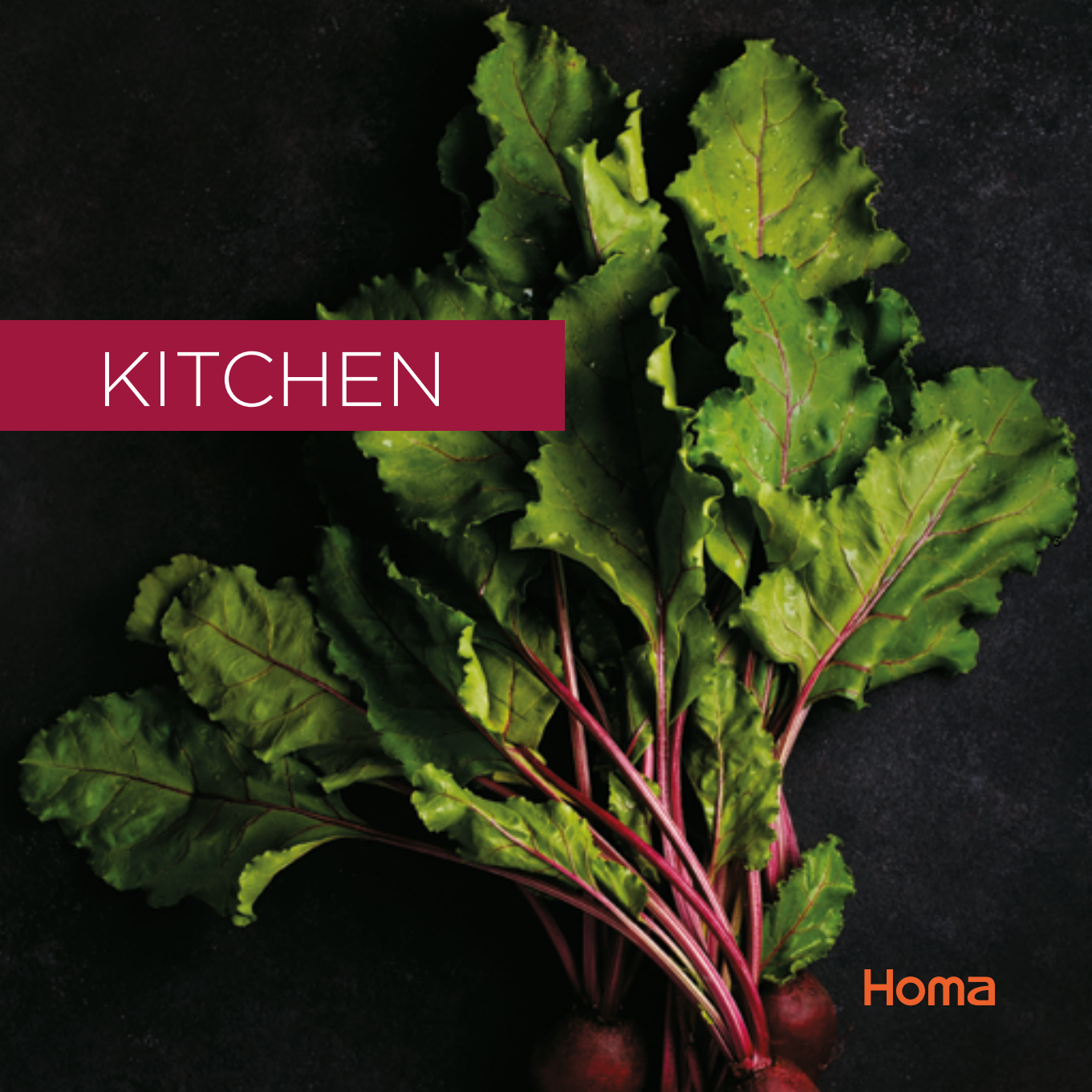

KITCHEN
Homa

Homa

WE TAKE CARE OF YOUR DREAMS

FORE-WORD

Michael Yao, CEO and Co-founder, Homa Appliances

In this issue of Homa's White Papers series, we take a closer look at the evolution of the kitchen, intended both as the physical, functional place where meals are prepared and as the emotional space where memories are built and quality time is spent with family and friends. Of course we kept a focus on appliances, as a beacon in our exploration, but also broadened our horizon for a more comprehensive understanding of the current and future state of the industry, as a way to ignite discussion and share insights and thoughts about our business.

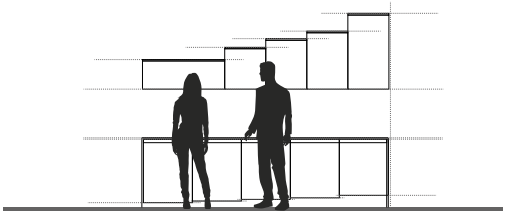
In particular, we deliberately concentrated on the concept of the fitted kitchen and its built-in appliances, and tackled the subject from different angles. With insights from known personalities in manufacturing, design, and architecture, we explored the nuts and bolts of this specific segment. This included examining the manufacturing process, the design principles, and, initially, how these concepts are developed with both current and emerging societal trends in mind. Concerning the latter, for a clearer understanding of the kitchen's evolution through the modern era to the present day, we took a step back and conducted a fascinating historical study of the fitted kitchen.

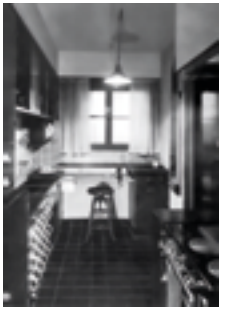
Also in this issue, we discover Italy's unique furniture districts, which may hold the key to the success of the country's thriving furniture and, indeed, kitchen manufacturing industry. These regions are home to globally renowned brands that have become synonymous with impeccable style and extraordinary refinement.

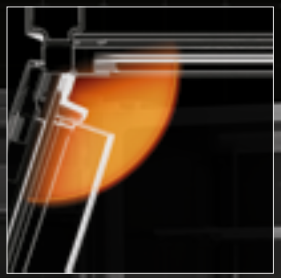
Finally, we are thrilled to introduce Homa's latest innovation, the 'Perfect Slot-In,' which brings a whole new perspective to the notion of integrated appliances and marks the establishment of a new product category in its own right.

May the pages ahead spark as much interest and satisfaction as we have experienced in bringing them to life. We wish you an enlightening journey through this white paper, and may it enrich your understanding as profoundly as it has ours in its creation. Enjoy the read!

CONTENT





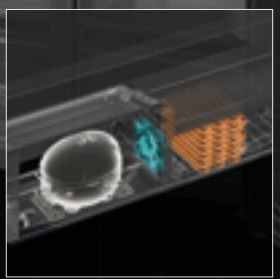


SPECIAL HINGES

+10%
volume

MORE INTERNAL SPACE

COOL SIDEWALLS



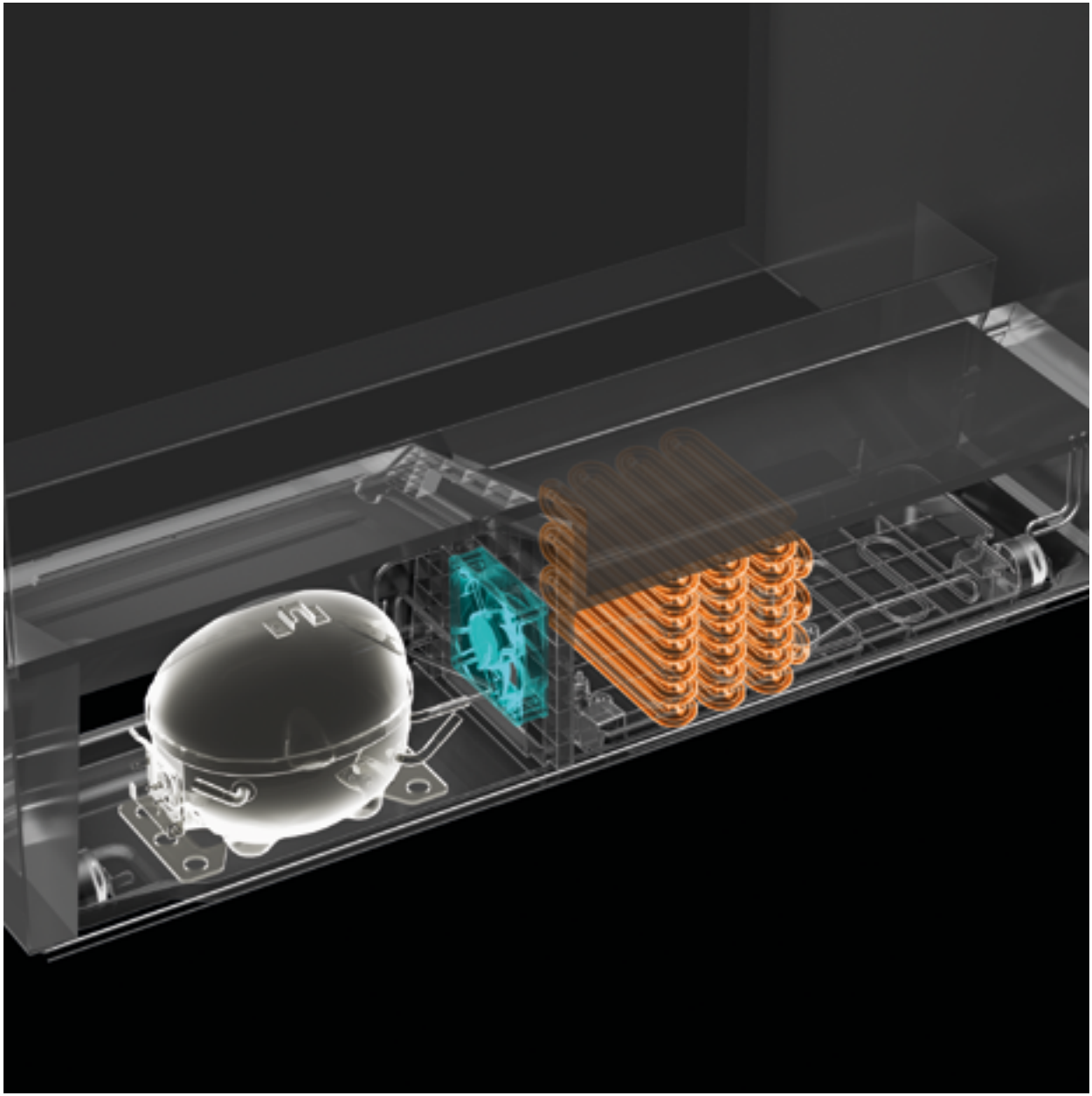
NEW-CONCEPT COOLING CYCLE

PERFECT SLOT-IN TECHNOLOGY. COOLEST TECH-REVOLUTION!

Homa's new four-door free-standing refrigerator can be perfectly encased into a fitted kitchen. What technological innovations led to the creation of a whole new product segment and what are its advantages? Let's find out together.

Imagine buying a large freestanding refrigerator and seamlessly integrating it into your stunning new kitchen. By seamlessly, we mean achieving a flawless blend with no discernible gap between the appliance and the adjacent cabinetry, ensuring a seamless and visually harmonious continuity. Impossible, you might say. The refrigeration system of the appliance requires keeping a few centimetres' gap on both sides and at the back to avoid overheating. Well, maybe in the past. Now, this is possible thanks to a new type of freestanding refrigerator created by Homa: the Perfect Slot-In.

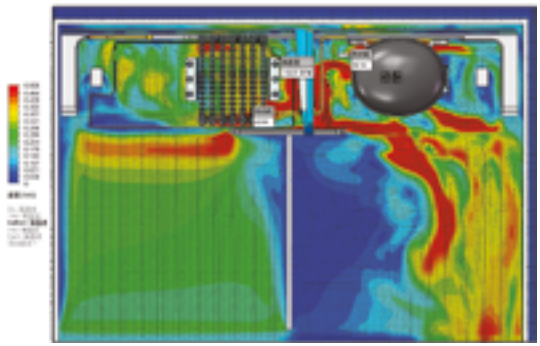
What is it all about? We are talking about a new segment of freestanding cool specifically designed for the world of built-in. It's a revolution that fulfils the increasingly widespread desire to have a large, fully aligned, and seamlessly integrated refrigerator in one's modular kitchen, with no unsightly protrusions. Currently, the Perfect Slot-In is available in the 90 cm four-door version (read dedicated article on page 20, Ed.). However, the company's future plans include the development of further four-door models with more compact dimensions, as well as French doors and 60 cm combined units.



AT THE HEART OF THE PERFECT SLOT-IN

What technological innovations have made this new type of free-standing refrigerator possible? The answer lies in the position of the condenser.
In a traditional No-Frost refrigerator, the condenser is placed inside the appliance's side panels, and the heat from the condensation piping transfers to the sides of the appliance and into the air mainly through static natural convection. For this reason, when the refrigerator is running, the side walls heat up. Consequently, to facilitate the ventilation of the appliance and avoid overheating, it is necessary to leave a gap of a few centimetres on the sides, between the fridge and the adjacent furniture, and at the back.

The condenser of a Perfect Slot-In refrigerator is instead integrated into a compartment located at the bottom of the unit and has a specifically designed cooling chassis that further increases the heat transfer power.
The heat is transferred to the outside by forced convection with an axial fan inverter. With 1,000~2,000 rev/min, the heat transfer power is four times greater than that of a side panel condenser.
A very useful feature in high ambient temperature conditions.

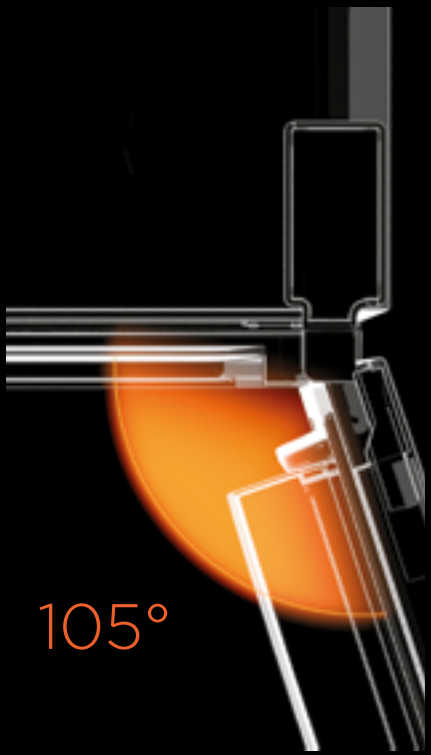


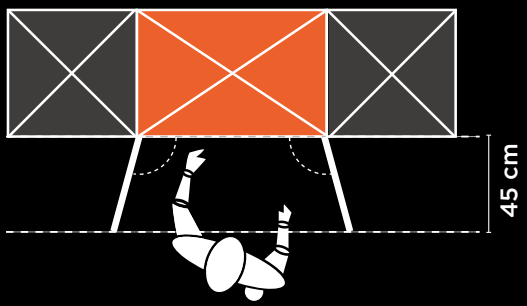
In the thermodynamic simulation diagram, the higher the temperature, the redder the color. The lower the temperature, the bluer the color.

Thanks to this solution, combined with a depth of only 60 cm, the refrigerator does not require to be placed at a distance from the walls of the cabinetry, on the contrary it can be seamlessly integrated, without protruding from the furniture.

BEYOND 90° DOOR OPENING

Once the Perfect Slot-In refrigerator has been integrated into the kitchen, the door opening angle of up to a maximum of 105° allows the freezer compartment drawers to smoothly slide out.
Again, this is the result of another innovation: a new hinge that was specially designed to avoid the door getting in the drawer's way when opened.





The unobstructed opening of the freezer drawers, resulting in an enhanced user experience, combines with the high ergonomic usability typical of four-door models, due to the compact dimensions - only 45 cm - of the doors.

MANY BENEFITS ASSURED

01

Easy installation: the back of the refrigerator can be fixed to the wall, with the only constraint being the main control panel. Its installation is undoubtedly simpler (and faster) compared to a traditional built-in refrigerator.

02

Permanent elimination of risks and inconveniences related to the cladding of the doors (from the breakdown of the wooden panel traction system to the mechanical malfunction of the appliance) since its **doors do not need to be panelled.**

03

Elimination of discomfort when touching the appliance due to the overheating of the sidewalls.

04

The integration of the condenser into the product's chassis and the absence of side spaces **simplify cleaning operations,** avoiding unpleasant odours generated by the overheating of dust, and the accumulation of dust and cobwebs on the condenser.

05

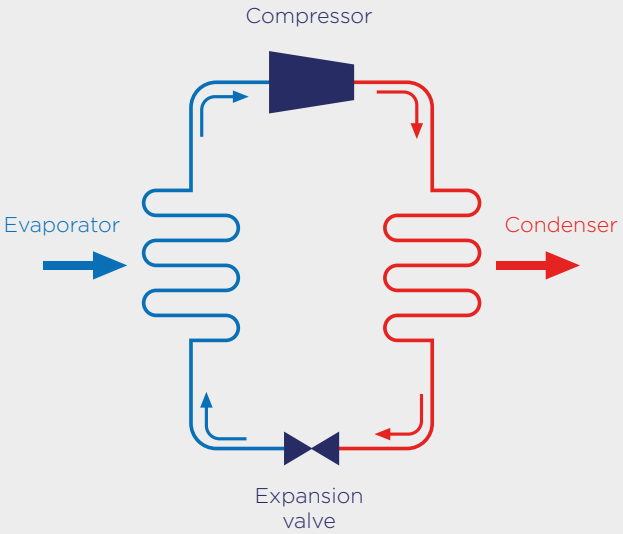
Not having to distance the product from the surrounding furniture allows for the reclaiming of **ten valuable centimetres,** which can be used to design wider cabinets or drawers for increased storage room.

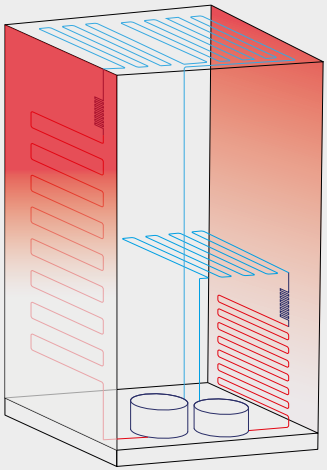
06

Ultimately, **this technological innovation makes for a greater variety of built-in and freestanding refrigerator types,** not just the traditional combined model.

REFRIGERATION CYCLES COMPARED

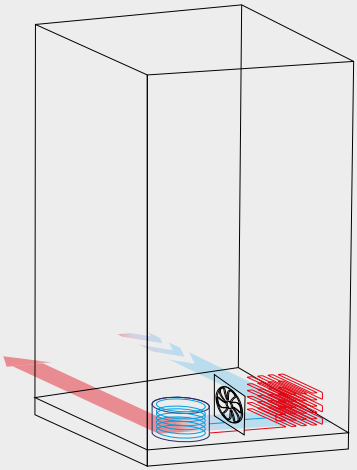
The refrigeration cycle consists of four main processes: compression, condensation, expansion and evaporation. The compressor increases the pressure of the refrigerant fluid, thus its temperature. It then condenses in the condenser and dissipates heat. It condenses into a two-phase gas-liquid flow at low temperature and high pressure, goes through the capillary tube, transforming into a low temperature and low pressure liquid. The conditions for being a truly refrigerant fluid have now been reached, so the fluid moves into the evaporator, transitioning to a gaseous state at low temperature, absorbing heat from the system to be cooled, i.e. the refrigerator cavity. Finally, it is drawn by the compressor, pressurised and discharged to complete the refrigeration cycle.





Traditional cooling cycle

In a no-frost traditional refrigerator the condenser is placed at the back or on the sides of the refrigerator, thereby releasing heat through the appliance's sidewalls.



Slot-In cooling cycle

In a Perfect Slot-In refrigerator, the condenser is integrated into a compressor compartment with cooling ribs.
The heat generated is forcefully expelled from the bottom of the appliance with an Inverter fan.

UNVEILING HOMA'S SLOT-IN FACTORY

An exclusive preview of the Cutting-Edge Manufacturing Hub in Homa's No-Frost District

Let's take a sneak peek at the Slot-In production site, part of Homa's new No Frost district, where Homa's FF4-65 Slot-In refrigerator came to life and is currently being manufactured. The complex comprises a riverside campus offering recreational facilities, reflecting Homa's Work Live Play philosophy, in addition to living quarters for employees.

Situated in Nantou Town, Zhongshan City, Homa's New No-Frost District is a modern, efficient, and sustainable factory, marking a milestone in Homa's history. Construction began in 2021, completing in 2023, and officially starting production in August 2023. Spanning 72,000 square meters and located 4 kilometres from Homa's headquarters, the facility covers 280,000 square meters, housing a warehouse for 170,000 units and boasting an annual production capacity of 3 million units.

The new Slot-In refrigerator factory has been designed for flexibility, allowing for seamless improvements and expansions in the coming years. It includes cutting-edge technologies such as an automatic VIP (Vacuum Insulation Panel) panel assembly machine, an extendable foaming machine, and a panel bending machine with enhanced accuracy. This is a significant step forward in enhancing mass production while maintaining the ability to customise products to meet specific demands.

In terms of production line enhancements, the factory is equipped to handle the special requirements of Slot-In refrigerators, which differ from traditional models. In particular, it features an automatic assembly line for VIP panels and has the capability to assemble the integrated condensers. Moreover, sustainability has been a key focus, with the factory deploying LED lighting, maximising natural light, and installing solar panels to ensure energy-efficient operations. Also, the new factory features advanced air and noise control systems to significantly improve working conditions, prioritising worker safety and comfort. Supporting increased production demands, the factory is complemented by a nearby plastic parts production line to guarantee timely supply of components, while also reducing the carbon footprint associated with their transportation.

DOOR SHEET METAL FORMING LINE

BACK PANEL FORMING

ROBOT APPLICATION

FOAMING TECHNOLOGY AREA

SIDE PANEL FORMING LINE

FULLY AUTOMATIC PACKAGING LINE

FF4-65 PERFECT SLOT-IN FOUR-DOORS REFRIGERATOR

Perfectly flush-fitting in a niche just over 90 cm wide, the doors, sporting a total-flat aesthetics and a highly trendy colour, seamlessly integrate in both designer and traditional-style kitchens. Let's discover the product that will revolutionise the world of built-in appliances.

+10%
INCREASED
INTERNAL
CAPACITY

FULL WIDTH
SHELVES

TOTAL
NO-FROST

MULTI-FLOW
AIR DUCT

MULTICLIMATE
SYSTEM

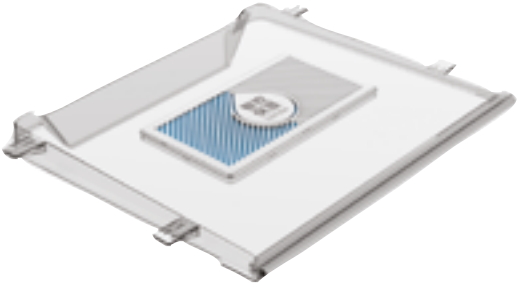
REAL ADVANTAGES

Renewed design interiors

All the interiors were redesigned. In particular, the new full-width fruit and vegetable crisper features a steel air duct, while the freezer drawers were embellished with decorative clips.

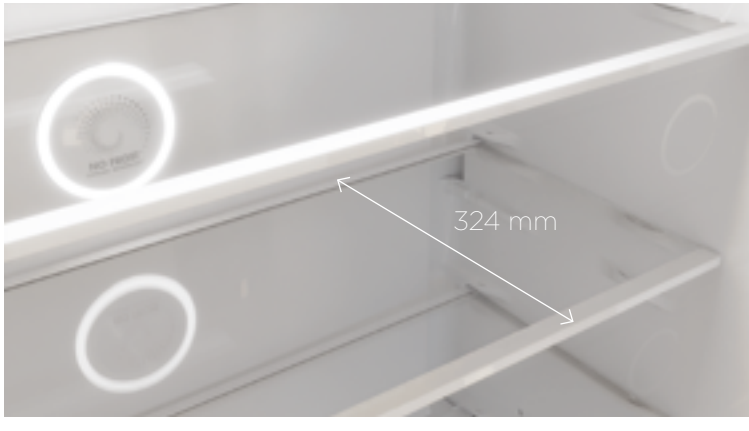
Deeper, bigger shelves

Thanks to a new air distribution system and the reduced thickness of the side panels, the glass shelves are wider and deeper (800x324 mm). This allows for the storage of larger food items, such as cakes or large trays. The shelf positioned above the fruit and vegetable crisper drawer can store dishes or particularly voluminous vegetables with dimensions of up to a maximum of 520 mm, making the most of the space between the front of the refrigerator compartment and the internal door.

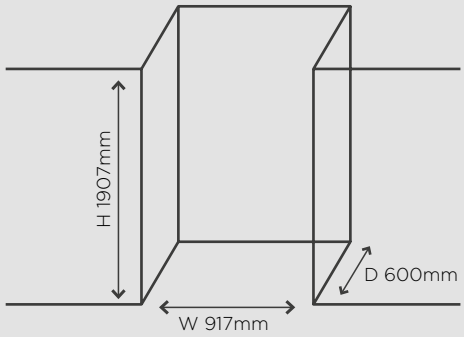


Moisturising membrane

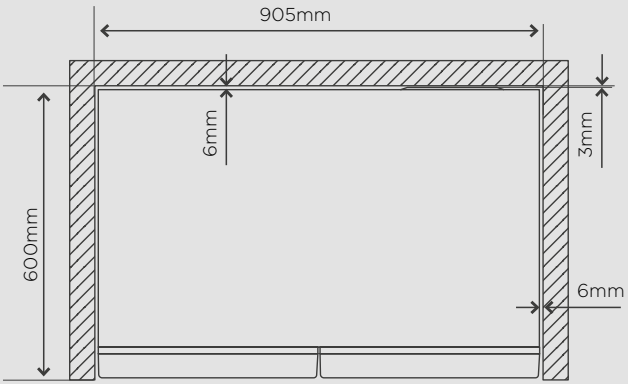
The high-end version is characterised by the presence of a hydrating drawer equipped with a water-permeable membrane, positioned on top of the drawer, which further optimises food hydration.
The premium configuration also offers a chiller drawer for meat and fish.



INSTALLATION NOTES



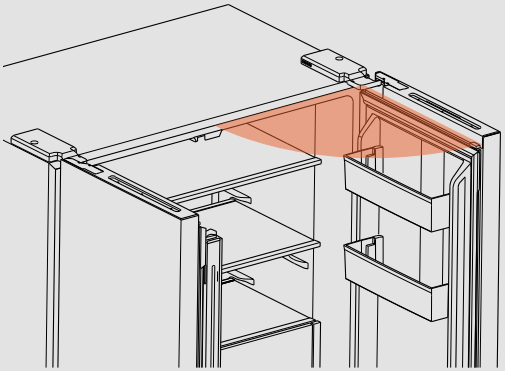
The cabinet
The cabinet in which the Perfect Slot-In refrigerator is inserted needs to have an overall width of 917 mm: i.e. the exact width of the refrigerator (90.5 cm) plus a minimum clearance of 6 mm on each side. This model is designed for flush installation.

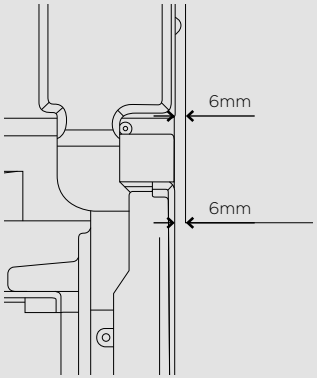


Door clearance for flush installation.
The installation must include some clearance from the cabinet walls.
The door opens at an angle of up to 105°, but it can be adjusted to 90° if clearance for the 105° opening is insufficient.

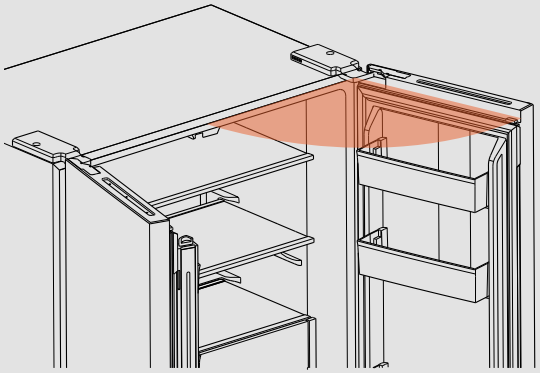
The refrigerator does not have protruding handles but recessed ones; therefore, no additional depth should be added to the dimensions already indicated for the correct clearance.

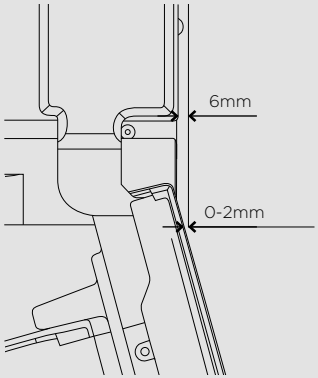
DOOR OPENING AT 90°



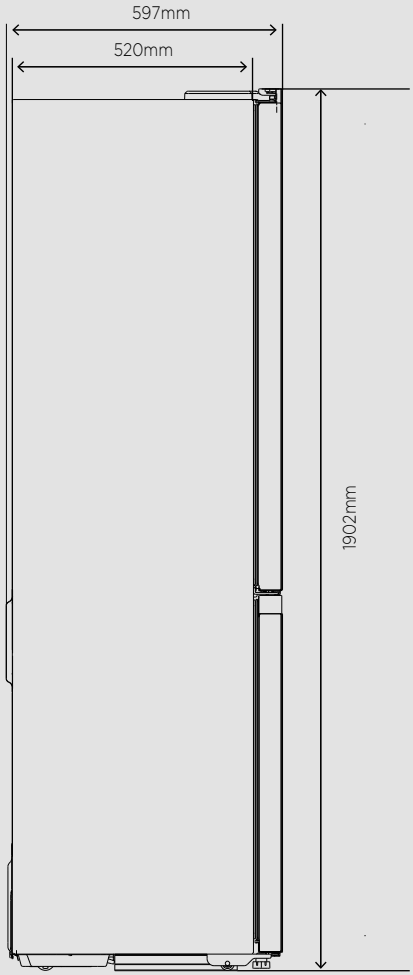


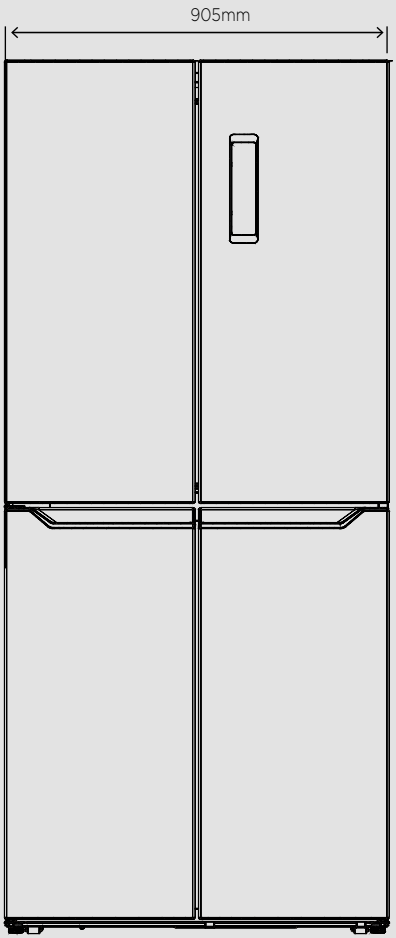
MAXIMUM DOOR OPENING AT 105°





FF4-65 PERFECT SLOT-IN FOUR-DOORS REFRIGERATOR





FF4-65	
Volume/Capacity	
Volume Total	503 L
Volume Fridge	326 L
Volume Chiller	20 L
Volume convertible compartment	81 L
Volume Freezer	76 L
Cooling System	
Compressor Type & Number	inverter/ 1
Fan Type & Number	inverter/1
Refrigerant (R600a/R134a)	R600a
Defrost system	No frost
Air flow system	Multi & dynaCool
Foaming Agent	C-Pentane
Condensor Type	Dynamic
Condensor Fan Type & Number	inverter/1
Evaporator Type	Finned (with inverter fan)
Energy Class	E (316kw·h/year) D (255kw·h/year)
Climate Class	SN-N-ST-T
Freezer Rating	4 Star
Freezing Capacity	12 kg/24h
Noise Level dB(A)	37
RoHS/Reach compatible	•
General Feature	
Current(A)	1.5A
Power Input (watt)	150w
Defrost power input	150w
Number of Doors	4
Control System	Electronic
Display & Control Panel	LED touch color screen
Anti-bacteria & Deodorization	Optional (activated carbon filter inside air duct)
Quick Cooling Function	•
Quick Freezing Function	•
Eco Function	•
Holiday Function	•
Fridge Closed Function	/
Door Opened Over Alarm	•
Kids Lock	•
Top Cover	/
Reversible Door	N/A
Door lock	N/A
Handle Type & Material	Recessed/ABS
Door Type	Flat
Door Panel Material & Color	Metal: Inox/black/white
Glass: black/white	
Cabinet Color	Dark Grey/black/white
Fridge Compartment	
Defrost	No frost
Interior Light (Type/no.)	LED/2
Foldable Bottle Rack	N/A
Chiller	•
Natural box /NO.	2 (ONE IS Automatically adjust humidity)
Adjustable Shelf type /No	Toughened glass/2
Crisper Cover Type / No	Toughened glass/1
Crisper Drawer Material / Number / Color	PS+HIPS / 2 or 3/ cool gray or clear grey face optional
Door Balcony Material /Number /Color	PS / 6 / cool gray or clear grey optional
Butter and Cheese Compartment	N/A
Egg Tray	Optional
Beverage Bottle Bin	2.0 L
Freezer Compartment(including convertible compartment)	
Defrost	No frost
Adjustable Shelf type /No	/
Slide Drawer Material / Number / Color	PS+HIPS / 4 / cool gray or clear grey face optional
Slide tray Material / Number / Color	PP/2/White or HIPS/2/White with silver decorative strip (optional)
Door Balcony Material /Number /Color	/
Twist Ice Cube Maker	Optional
Dimension	
Dimension Product (mm)	W905 x D597 x H1905
Dimension Package (mm)	W972 x D634 x H1993
40'HC Quantity (piece)	54
Weight (kg) Net / Gross	94/103
Approval	CE /CB/ GS

A NEW NARRATIVE FOR THE KITCHEN SPACE

Internationally acclaimed designer **Andrea Federici** reveals how Slot-In appliances will change the way we conceive our kitchens

Discover the future of kitchen design with Andrea Federici as we explore with him the innovative world of Slot-In appliances. From revolutionising aesthetics to enhancing functionality, Federici sheds light on the evolving landscape of kitchen technology.

What are the main advantages and disadvantages of Slot-In appliances compared to traditional models?

The Slot-In refrigerator represents an interesting innovation within the world of household appliances. It has the ability to combine the advantages of a freestanding product, such as the advanced technical features, with the possibility of integrating seamlessly into a kitchen that has rationalised and defined dimensions. Essentially, it merges the aesthetic and technical advantages of a freestanding refrigerator while being able to fit within the standard dimensions of a kitchen. Therefore, it's an excellent alternative and, in my opinion, a significant novelty.

What are the current trends in kitchen design and how do Slot-In appliances fit into this context?

At the moment, there are multiple trends in kitchen design. One of the strongest trends is the disappearance of protruding handles in favour of groove handles. This minimalist trend merges with another trend, focussing on side columns and cabinetry, that constitutes a resumption of "bold", solid handles. So, it's a sort of mixed trend where the handle is revived and intersects with the preference for groove or recessed openings. This represents a revival of the professional values of the kitchen, including those found in professional kitchens and restaurant kitchens. In this context, the opportunities to use the Slot-In refrigerator aesthetics are numerous.

How do Slot-In appliances influence the flexibility and functionality of the kitchen space?

In terms of kitchen space configuration and design, Slot-In appliances certainly represent an additional lever for differentiation, all to the benefit of the consumer. From my perspective, Slot-In appliances offer somewhat different, unhidden aesthetics. Until now, we have always used panelled, built-in appliances, so in a way, Slot-In appliances become a customisation and characterisation element to play with.

What are the opportunities offered by the concept of Slot-In?

From my perspective, there are many. For instance, the possibility of working with front panels which are not integrated into the kitchen, in the sense that they are not in the same finishes as the kitchen, but having some freedom both in terms of aesthetics and materials, makes the Slot-In theme very interesting. In perspective, it could represent a type of appliance capable of changing the narrative of the kitchen space.

What are the most common challenges of integrating Slot-In appliances into a kitchen design project, and how can they be addressed?

As the use of Slot-In appliances in the kitchen advances, there will be several challenges to face. Choosing finishes and materials will be crucial, as they will need to fit into an already developed industry context that has its own trends. So, the Slot-In will have to find its way to blend in with these finishes and materials. Additionally, becoming the predominant aesthetics within the kitchen, the Slot-In will also need to consider a dialogue with other appliances that are present, such as ovens, which are already visible, or other technological devices. The main challenges, in my opinion, will be related to the ability to aesthetically integrate with the currently existing devices.

How can Slot-In appliances adapt to the different needs and lifestyles of users?
We must consider that this new type of appliance, a new refrigerator, and all the aesthetic implications that will come into play within the design of a kitchen, will obviously have their impact on the style and way of life in the kitchen.

For example, the front panel, the external skin of the refrigerator, will occupy a considerable surface area from a visual perspective, so this must be absolutely taken into consideration when integrating this appliance into the design of a kitchen.

Origina Kitchen by FEBAL CASA

Also, the handles, opening mechanisms, or visible technical and technological details, such as displays, and the lighting component will all become themes that must be subject to careful design and consideration by the kitchen designer. Essentially, with the introduction of the Slot-In, we will revolutionise what has been the archetype of the refrigerator in the kitchen up to now.
We have always seen two predominant types: the Built-in, which has always occupied the most important part of kitchen sales, and the freestanding. From this moment on, they will be summarised within a single device, so in some way, the revolution brought about by this new archetype will need to be the subject of careful design.

How will the adoption of Slot-In appliances influence the design and construction of kitchens in the next decade?
What awaits us in the future is extremely interesting because the challenge of revolutionising the usage and installation of refrigerators is decidedly exciting. Until now, Built-in seems to have taken the lead over freestanding, yet in recent years, the latter has become increasingly important. Today, with the Slot-In, we add a new type of appliance, and the advantages that this new technology brings about are considerable. In the same space designated for and with the same measurements as the Built-in refrigerator, we can integrate a new appliance with a visible "skin," therefore with a customisable, characterising finish. This brings on the advantages related to differentiation and customisation, all in favour of the consumer. Furthermore, this allows for better and greater use of spaces. We could have different types of handles. We could have visible devices like displays that integrate different functions, not only related to the refrigerator but why not, also to other appliances. The new Slot-In could become a sort of coordinator of all visible appliances, ovens, wine coolers, blast chillers.

I like to think that in the future, our work as kitchen designers will be significantly influenced by this new type of appliances. This will certainly make our work more interesting from various perspectives because the rules will change, and some approaches will change. Some design schemes that have been tied to a certain type of mindset for years will necessarily undergo changes.

Therefore, I look forward to the future of appliances with great interest and also with the idea that we designers will have a decisive role in shaping the evolution of this type of appliance, and above all, we will have a role in integrating it into our new kitchen projects.

Origina Kitchen by FEBAL CASA

BIO

Andrea Federici, 43, earned a Master's degree in Industrial Design from Milan's Politecnico. He founded Andrea Federici Consulting, a strategic consulting firm specialising in design, architecture, and photography. With a strong focus on collaboration, the studio works with some of Italy's most prestigious furniture and component brands on various projects, including product design, exhibit and showroom design, graphics, and photography. Notable collaborations include Arredo3, Effeti Cucine, Falper, Febal Casa, Laminam. Driven by an international mindset, Federici's studio has undertaken artistic direction for leading companies in both the furniture manufacturing and architecture fields in countries such as China, the United States, Saudi Arabia, and the United Arab Emirates. His work has earned him many awards and accolades, including the Elle Deco International Design Award, Red Dot Design Award, If Design Award and Good Design Award, underscoring his commitment to excellence and innovation in design

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THE EU LEADS THE WAY ON SUSTAINABILITY

In the framework of the European Green Deal, the EU is rewriting the rules of the circular economy, with the intent to make products more environmentally friendly, and ultimately standardising norms within the single market. At the heart of this program lies the eco-friendly design of products, which gives rise to the "digital product passport" that will trace the origin of all materials and components used in the production process of consumer goods.

In line with the Sustainable Development Goals (SDGs) defined by the United Nations and ratified by all 193 member states in 2015 with the objective to improve the global system, the European Union has adopted the European Green Deal, a strategy for sustainable growth aimed at transforming the Union into a fair society with a modern, competitive, climate-neutral, and circular economy. In addition, it has the ambitious goal of achieving zero climate impact by 2050. In the global transition towards sustainability, the production system

and the entire life cycle of consumer goods play a central role, upon which the European Union is focusing its strategies. The directive on energy labelling (EU Regulation 2017/1369) measurement and evaluation parameters have been standardised, facilitating the use of a comparative scale to assess products distributed within the EU based on their specific energy consumption, among other factors. The directives regarding waste management, starting with 2008/98/EC, have established a legal framework for waste treatment across the European Union, paving the way for a comprehensive chain of waste collection, recycling, and recovery in the context of a circular economy. Specific attention has been paid to products deemed "potentially harmful to the environment," which contain recoverable raw materials like lithium, cobalt, magnesium, and others. These products primarily include electronic devices and appliances. The WEEE directive 2002/96/EC targets these product categories, introducing the concept of Waste of Electric and Electronic Equipment (WEEE). Subsequent amendments have facilitated the establishment of a collection, treatment, and recycling chain for end-of-life products. Overall, the standard promotes the design, production, and utilisation of products that prioritise resource efficiency, durability, repairability, reusability, and upgradeability. Currently, there is a lack of shared regulations to ensure that "all products marketed in the Union become progressively more sustainable and meet circular economy criteria." Therefore, building on the positive experience of energy labelling, the European Commission is working on a pioneering regulation to harmonise the application of eco-design and the adoption of a digital product passport throughout the Union.

To learn more:

SUSTAINABLE PRODUCTS? DESIGNED TO LAST AND BE REPAIRED

The proposal for a regulation on the eco-design of products (ESPR, Ecodesign for Sustainable Products Regulation) is the cornerstone of the Commission's strategy on sustainability and circularity of the EU economy. The aim is to establish eco-friendly design standards for various categories of products, to promote and enhance the transition to a circular production system, optimising energy performance and other aspects closely related to environmental sustainability. This is a complex task, as it must take into account the specificities of each category, the "potential for improvement" in relation to their actual effectiveness in ensuring greater energy and resource efficiency, prolonging the product life cycle, optimising the intrinsic use of materials, reducing pollution, and overall environmental impact. Areas such as durability, repairability, upgradeability, ease of maintenance and recovery, among others, will be regulated.
European regulations address a global production landscape that has increasingly leaned towards solutions and economies of scale to meet a growing demand for competitiveness skewed towards prices, a condition that evidently requires the constant minimising of production costs.
As a result, product design in general has focused on solutions that are not exactly in line with concepts of repairability and recyclability.

ECO-FRIENDLY PRODUCT DESIGN

Depending on the different product categories, the specifications contained in the regulation on eco-friendly product design (ESPR, Ecodesign for Sustainable Products Regulation) will regard:

- **DURABILITY AND RELIABILITY OF PRODUCTS**
- **REUSABILITY OF PRODUCTS**
- **POSSIBILITY OF IMPROVEMENT, REPAIRABILITY, MAINTENANCE, AND REFURBISHMENT OF PRODUCTS**
- **PRESENCE OF SUBSTANCES OF CONCERN IN PRODUCTS**
- **ENERGY EFFICIENCY OF PRODUCTS AND RESOURCE EFFICIENCY**
- **CONTENT OF RECYCLED MATERIALS IN PRODUCTS**
- **REMANUFACTURING AND RECYCLING OF PRODUCTS**
- **CARBON FOOTPRINT AND ENVIRONMENTAL FOOTPRINT OF PRODUCTS**
- **ANTICIPATED WASTE GENERATED FROM PRODUCTS**

Source: European Parliament and Council's proposal for a Regulation establishing the framework for the development of specifications for the eco-design of sustainable products, repealing Directive 2009/125/EC (30.03.2022)

PRODUCTS' DIGITAL PASSPORT

The regulation on eco-design of products (ESPR) not only establishes the groundwork for harmonising sustainability information on products, enabling more informed purchasing decisions for consumers, but also fosters a collaborative environment for pre-competitive best practices among producers and stakeholders. Every durable good - from washing machines, furniture, and shoes to clothing and fabrics - will be equipped with a digital passport or product ID accessible through an online platform via QR Code. Depending on the product, the information will adhere to eco-design directives and include essential data such as energy efficiency, recycled material content, presence of hazardous substances, durability, repairability, spare parts availability, and recyclability.

The introduction of this ‘pioneering’ solution, alongside existing European regulations, presents an opportunity to share additional useful information regarding product use, maintenance, and other consumer-relevant content. Harmonising and structuring information on the environmental sustainability of products, making them public through the digital passport, as envisioned by the Commission, will assist businesses in the value chain - manufacturers, importers, distributors and retailers, repairers, re-manufacturers, and recyclers - in accessing useful information. Circular practices should indeed promote new activities related to repairability and the second-hand market, thus increasing the collection, recovery, and recycling chain as an industrial system for the production of secondary raw materials.

It will also make it easier to monitor the presence of substances of concern throughout the entire product lifecycle, facilitating their treatment towards the EU’s “zero pollution” goals. Furthermore, the digital passport will be a reliable and objective source of information for consumers who increasingly seek elements to shop in a conscious manner.

BUILT-IN: THE FACTORY SIDE

Production technologies and processes involved in the manufacturing of refrigerators, in particular built-in, like for all white goods, has significantly evolved over the years. DM talked to Manuel Rossi, a seasoned veteran of global scale manufacturing operations in the household appliances industry.

From the advent of lean manufacturing to digitalisation, to ever more stringent environmental and energy constraints, the production of white goods, in particular refrigerators, and even more specifically built-in models, has radically evolved since the times of "campaign production" with batches progressively shrinking from tens of thousands of units to just a few units, and ideally single-unit batches. Flexibility is the name of the game, with assembly lines instantly adapting, with "zero changeover", to market demands. This is especially true for built-in refrigerators, since it is all about supplying every individual client with a product that's different and unique. To make it work, manufacturers turned to the automotive industry for inspiration, and now production is very much organised around modules, common production platforms spanning across different models and even brands. While automation is increasingly gaining ground on the shopfloor, the human factor remains invaluable in instilling a soul into products that will shine in the heart of our homes.

In your opinion, in what ways did the manufacturing processes of refrigerators evolve in recent years?

From my point of view, I have witnessed two strands of transformation in that context. One has to do with the principles of lean manufacturing, which nearly everyone is pursuing as an approach to getting rid of the non-value-adding parts of their processes. This in order to improve the overall performance of their operations. It applies at different levels: productivity of course, in terms of costs, but also quality, safety levels and environmental impact. This is something that all companies are doing. The other strand has to do with what we call Industry 4.0, with the digital management of data and processes. So, on one side cleaner, leaner and better organised factories, and on the other side an increasing automation of production together with data gathering that will help management but also shopfloor in order to improve factory performance.

Manuel Rossi isn't your typical plant director. To start with he looks surprisingly young and casual, though he's actually 50. Don't be fooled, in 25 years of manufacturing excellence on a global scale, Rossi is possibly one of the most experienced industrial operations leaders in this part of the world. Also, he will never turn down an opportunity for a casual chat about how to improve things on the shopfloor. The closer the person to the assembly line, the more attentively he will listen. His personal style of leadership has always been that of active engagement, through respect, care and a true interest in solving the problems of men and machines. Rossi always had a real passion for all things industrial. Ever since he graduated in Management Engineering from Milan's Politecnico in 1998, he engaged in the pursuit of manufacturing excellence through a hands-on, personal style of management. He started his professional career at Whirlpool Corporation in 1999 through the company's fast track management program and began a tour of Whirlpool's industrial operations in Poland, France and Italy, holding posts of increasing responsibility: successively project leader in Wroclaw, Poland, Production Manager in Amiens, France, and Operations Manager in Cassinetta, Northern Italy. In 2008 he became director of Whirlpool's Siena, Italy, plant, before moving to the European Headquarters just North of Milan where he led the company's Productivity for Growth regional effort in EMEA. In 2012 he took on the direction of Whirlpool's plant in Trento before moving back to Cassinetta where he took responsibility of 5 production plants. By the time he left the company, late last year, he had served a total of 24 consecutive years with Whirlpool Corporation. Rossi is presently continuing his journey into manufacturing with BDR Thermea as the Group's Manufacturing Director.

What about Built-in, so far the true cash-cow of the household appliances industry? Simple technology, simple design, and high margins. How did this segment evolve, if at all?

Built-in has always represented some sort of exception in our industry.
To start with, access to market is very different from all other white goods categories, typically going through relatively small kitchen manufacturers when compared to the large retail organisations other products go through. Human contact and personal relationships are important in this specific context. Take, for instance, a kitchen manufacturer having to sell a maybe 70K€ kitchen but is missing a 300€ cooktop to finalise the sale. The cost of the single appliance is not the critical factor in the overall picture, while what really counts here is the timeliness of delivery, the reliability of service, and the human rapport. This makes built-in very different from freestanding. Now, how does that translate back in the factory? With a higher level of quality, and a different level of service, which

Built-in always represented some sort of exception in our industry: what really counts here is the timeliness of delivery, the reliability of service, and the human rapport.

means supplying every individual client with a product that's different from the others, in some way unique, and guaranteeing problem-free service. The more we can help clients achieve their own objectives, the more we will become their preferred suppliers.

In general terms, how does the inevitable imperative of sustainability impact your work, both from a process and product perspective?

Sustainability can be declined in many different ways, but they normally boil down to two main topics: CO2 emissions, with the ambition of achieving carbon neutrality, and zero-waste-to-landfill. This clearly has an impact on both product and processes. People who design the products are ever more attentive to choosing materials that can be recycled. The legislation is also very much pushing in that sense. For instance by trying to ban EPS (Expanded PolyStyrene) packaging and replacing it by recyclable materials. In the factory, this has very much to do with the way we manage waste, and principally waste sorting, and there's a lot more to it than we might think. When we started addressing the issue, we realised that 80% of the waste destined to landfill could have been sorted. It's a matter of discipline and organisation. Regarding the factory itself, there are other areas of attention such as fumes, waste water, noise, with the objective of minimising the impact on the environment.

In terms of CO2 emissions, or Carbon Footprint, energy consumption is the main topic. The issue is threefold: the first aspect is reducing our consumption by eliminating waste. Some measures can be as simple as switching the lights off when not needed, or better managing central heating. Then there's a more technological side, investigating production processes.

Factories that typically use gas for heating and for primary processes are now switching to electricity for those processes, which is more efficient and is also friendlier to the environment. The third aspect regards the sourcing of energy, which needs to be sustainable.

The world is becoming increasingly electrified, and today everything runs on electricity, so the way we generate it will become the critical factor in the future.

Does innovation on the shopfloor stem more from new technological possibilities, or from specific needs on the part of consumers as interpreted by designers?

The truth lies somewhere in the middle. In the world of household appliances there are several driving forces coming into play. One of them is certainly the pressing demand for ever more energy efficient products. In the case of refrigerators, this led to constant innovations, such as better performing insulation foams, which in turn required new, innovative machinery. Another example is the fact that appliances are becoming more and more connected, which brought an entirely new technology into the factories. Also, this industry is typically extremely competitive, so there is a constant focus on trying to improve factory performance in that sense. This very often brings on process innovation, which at times may reflect on product, too. We are continuously looking at processes and technologies that haven't yet been used in our industry, but which may already have been successfully applied in more advanced contexts such as, for instance, the automotive.

How do you decline the concept of "mass customisation" into a factory , which concept is fundamentally that of "mass production"?

In effect, factories were originally born to do exactly the inverse of "customisation", yet markets have immensely evolved since the industrial revolution, and nowadays consumers are ever more sophisticated and brands pay much attention to their precise positioning. This led to the need for variety. After all even Ford cars aren't all black any more. Change here occurred both in product design and industrial process. To make it work, Product Design now tends to be modular, with families, platforms and other sub-groups that derive from

the same principal industrial process. Customisation can then be introduced by adding differentiating elements, typically design features such as bodywork, colours, accessories, but also extra functionalities. The automotive industry led the way here, with makers typically using the same platforms for a variety of models, and even brands. We are applying the same principle of modularity to our industry. What we have observed is a drastic reduction of production batches. We have moved from thousands or hundreds of units, all exactly the same, to batches of 10-20 units. To achieve this level of customisation we need, on one hand, more flexible assembly lines where changeover is lighter, ideally "zero-changeover". Technology advances play a role, here. On the other hand, logistics is also fundamental: components must no longer come in their thousands or hundreds, but maybe 10-20 at a time, ideally even one. Carefully thinking out logistics within a factory is becoming increasingly important, starting from the assembly line and working backwards all

the way up to the supplier.
Once again our role model here is the automotive industry, were factories now stand at the center of a “campus” of suppliers, ready to send in components in the exact sequence for a day’s scheduled production.

What was the impact, over the years, of the geopolitical problems that have affected maritime transportation, on your model of production?
In the past, I’m talking of the late 1980’s right up to the early 2000’s, bulk sourcing in “best-cost” countries was all the trend. The objective was to go for the lowest possible cost of components, and these countries could offer much better prices than our suppliers at home. More recently, the Covid epidemics, together with the worsening of the geopolitical situation in some critical regions of the world have heavily impacted maritime transportation, hence a general increase in the costs of logistics for long-haul. Companies started calculating what’s known as the “total cost of ownership”

of a component as part of the equation, adding up purchasing price, transportation costs, cost of capital, waste and losses, level of service, and anything relevant that can be measured in order to find the best solution. When the Covid epidemics broke out and it became objectively difficult to move goods around, the first reaction to that was to adopt dual sourcing, so alongside a company’s traditional best-cost

partner from the other side of the world, companies would also have a local supplier to act as a back-up or safety net for flexibility.

Let's now consider another trending topic: automation. What impact did it have on the human factor?

It is certainly a significant one. On one hand, machines can, and indeed do, replace humans in certain tasks, hence the disappearance of certain jobs. On the hand, machines are still stupid and need a human to tell them what to do, hence the creation of new jobs to manage machines. At the end of the day, the impact it has had was a redefinition, an upgrading of jobs with the need for human resources to develop new skills in order to use, manage and maintain machines, drawing precious information from them at the same time. In the field of household appliances, for what I know, this journey has only just begun.

What are the necessary skills to lead a factory, by all means a small community?

I can only give you my personal take on how I interpreted my role in all these years. Factories are made of people, who have the same intellectual potential as managers, only we must have the humility to engage them and make the most of this true treasure of experience. I often say that technology can be bought, or copied: anyone can buy the same machinery as the competition, and copy their products. What you can't buy

nor copy, is what people can achieve together: this you need to build day by day. It's a question of trust, and respect. For me, the key priority has always been to engage people. Besides, I like talking to people, there's always something new to learn, and I've always invested time and efforts in this.

How do you deploy a successful work/life balance policy in a production context?

It's certainly a challenge in this particular environment. Workloads are undoubtedly heavy. So one needs to attentively look for ways to preserve the work/life balance. We try and make sure people get the breaks and holiday periods they need and are entitled to, sometimes almost forcing them to take some paid vacation. Often times it's the small things: a simple "thank you", or stopping over and engaging in a little chat, just to find out how things are going, maybe in front of an "aperitivo". There's no universal recipe apart from truly caring.

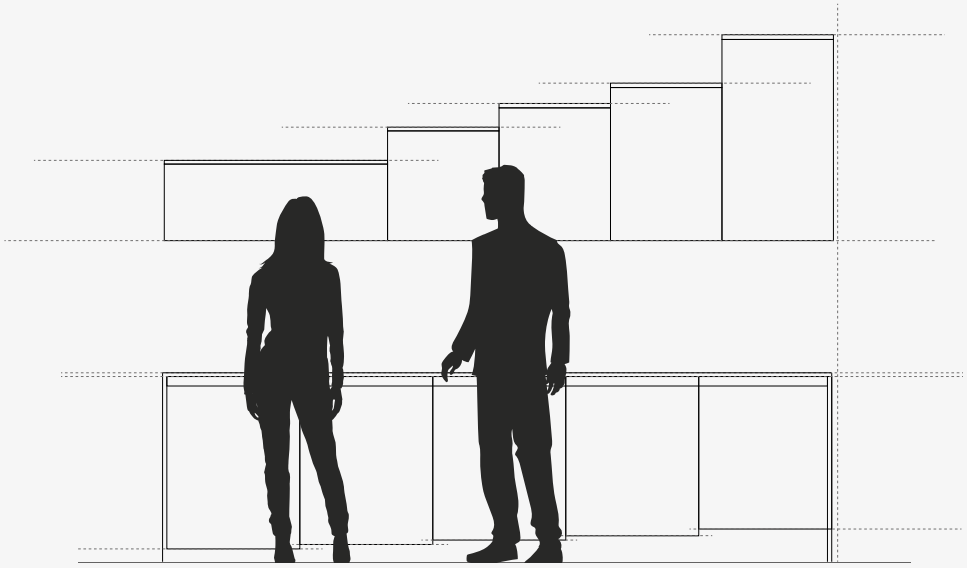
How do you build in emotions on the assembly line?

Emotions are what define people, and to me they're fundamental. It's the only true competitive advantage a company can build. All the rest someone will copy from you sooner or later. Motivated people, who go out of their way to achieve their objectives, who take pride in their work and who speak up when problems arise, maybe with a possible solution already in mind, is what really makes the difference.

Manufacturing is where everything gets together, where customer needs and engineering design get heart and soul

Manuel Rossi
Manufacturing Group Director at BDR Thermea

THE ABC OF BUILT IN



Creating a functional kitchen is essential for every home, as it makes the environment beautiful to live in. Designing a kitchen is a complex exercise that requires careful choices under many aspects. Today, kitchens are made up of modules installed side by side and joined together, but it is good to know that since the times when the concept of “modular kitchen” was introduced, this important space is defined by the union between the “furniture” aspect, with its crucial aesthetic role and the “appliance” aspect considered as essential in performing activities linked to the preparation of meals.

What is a fitted kitchen?
It consists of modules with standard dimensions that are perfectly suited to the shape and size of dishwashers and other built-in appliances. In Europe, the transition from an “improvised” kitchen, where the elements were combined in a poorly organised way, to the concept of modularity took place in the 60s.
Designed to solve the problems of space and flexibility, modular furniture can change in shape and function according to needs, with the addition of further elements. They are defined in relation to a basic set of measurements that constitute “the module”, and all the elements of the modular series are equal or multiples of that module. The use of standard measures in furniture dates back to 1922 thanks to Ernest Neufert, who established that books, documents and files must all have a modular size, in order to facilitate the printing, transport and storage of paper based materials. However, if the standard paper sizes inspired the size of some furniture, for the rest of the house it was human ergonomics that guided the design.
For the kitchen environment in particular, the dimensions were defined according to the average height of an individual in relation to specific actions, such as opening and closing the oven door or a cabinet door. In 1926 Margarete Schütte-Lihotzky patented the prototype of the Frankfurter Küche, the ancestor of the modern fitted kitchen, whereby she proposed a new distribution of the units using the famous U-shaped scheme, in order to allow freedom of movement to those who had to use the various elements of the kitchen.
The Frankfurt kitchen reached the United States where the so-called “American kitchen” took up a large portion of the house because it was considered a social hub. The modular kitchen found its consecration in being granted such a large space, but with the basic ideas and functionality features of the kitchen designed by Margarete Schütte-Lihotzky, with the worktops all at hand and at the same height and ideally lit by the natural light of a window. In the 1950s, the American kitchen would become the pioneer of modular kitchens that spread in Italy and in the rest of Europe. For more information on the history of the kitchen, read the article on p. 68.

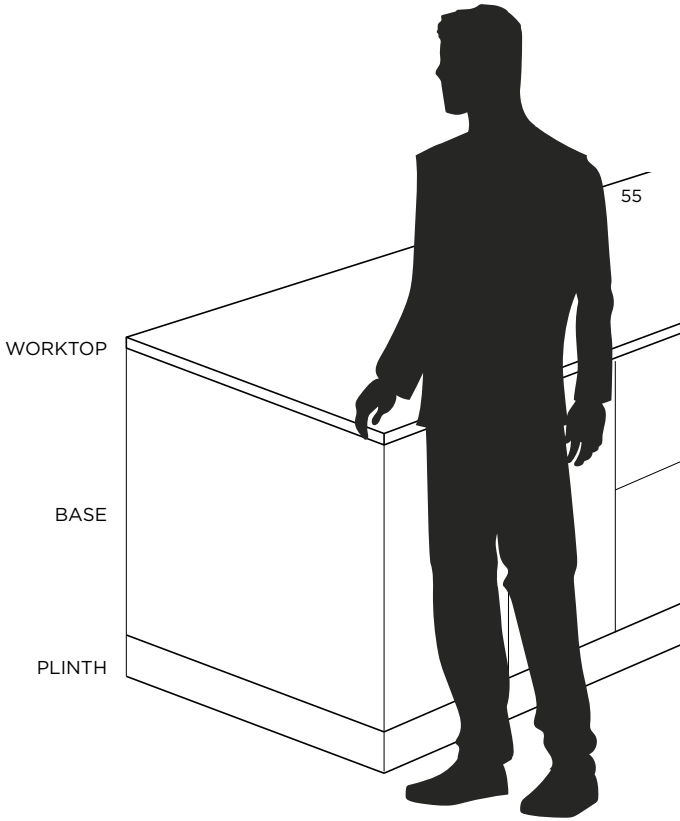
The European fitted kitchen and its standard dimensions

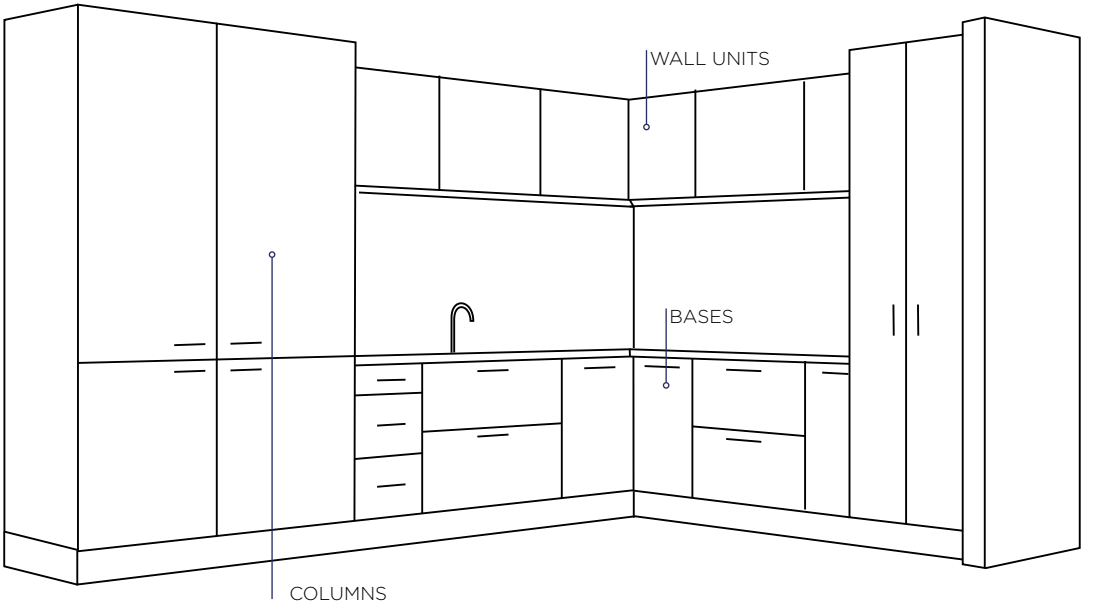
A modular kitchen consists of a series of elements with modular dimensions that are multiples of 15 centimetres. The modular elements, including cabinets and wall units, have standard widths of 15, 30, 45, 60, 90 and 120 cm. Taking advantage of the versatility of these modules, one can create different configurations to adapt them to the size of the room and to individual preferences.
The most common widths used for modules in a modular kitchen are those starting from 45 cm. Modules with widths of 15 and 30 cm are often used instead to fill narrow spaces with the maximum precision possible.
Some producers have introduced modules of 40 and 80 cm to offer greater flexibility in the design.
These additional dimensions allow one to create tailor-made solutions that best suit specific needs.

Below are the standard measurements of the individual components of a kitchen cabinet:

The **worktops** have a standard height of 85 to 90 cm from the floor. This height allows one to work comfortably while standing, reducing tension on the back and shoulders. The height can vary, however, to adapt to the final layout and customer preferences. The kitchen cabinets are raised in order to avoid any damage due to water leaks from the sink or the dishwasher.

The standard height of a kitchen cabinet is 90 cm, based on the average height of a person considered as being between 160 and 174 cm. The height is defined by the sum of the base, the plinth and the worktop, considering that the base can be 72 cm to 78 cm high, the plinth can measure 6, 8, 10, 12 or 15 cm while the thickness of the counter can vary from 2 to 6 cm (there are also special models that reach 9 cm). Their combination should allow one's entire forearm to rest on the worktop in a natural, straight position. The increasing attention to functional design results in a worktop generally placed at between 88 and 91 cm from the floor. This figure is obtained from the sum of a 12 cm plinth, a 4 or 6 cm top and a 72 cm base. It is the measure that best suits the needs of most users, taking into account the average height of an individual.

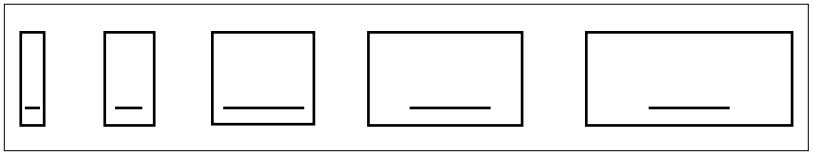




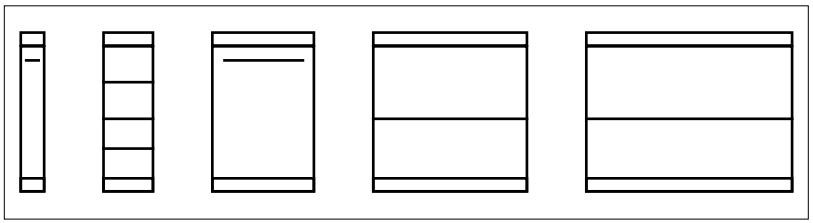
Columns and bases have a standard width of 60 cm, with a height of 85 cm and a depth of 60 cm. Along with the new, more spacious refrigerators, now there are also 75 cm wide columns, and 34 cm deep bases, useful to exploit smaller spaces or to combine in order to create peninsulas or islands. Narrower furniture (15 and 30 cm) comes with a removable trolley, useful to hold bottles, while larger widths allow for drawers, baskets or even a door. 90 or 120 cm bases feature two doors instead of one.

Wall units' depth is always lower than that of the bases: the standard is 35 cm, just over half the depth of the base. They have a width of 30, 45 or 60 cm and height can vary between 70 and 90 cm. There are also wall units that reach just under the ceiling, featuring a double row of cabinets. This solution is very useful to make the most of spaces.
The standard distance between cabinets and wall units is usually between 50 and 60 cm.

WALL UNITS WIDTH

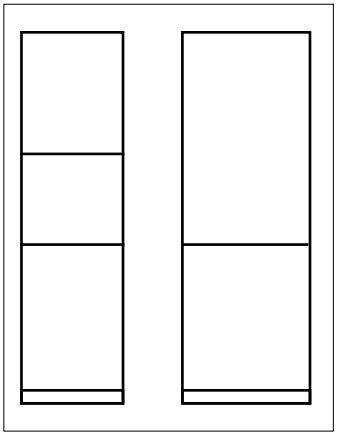


BASES WIDTH



15 30 60 90 120

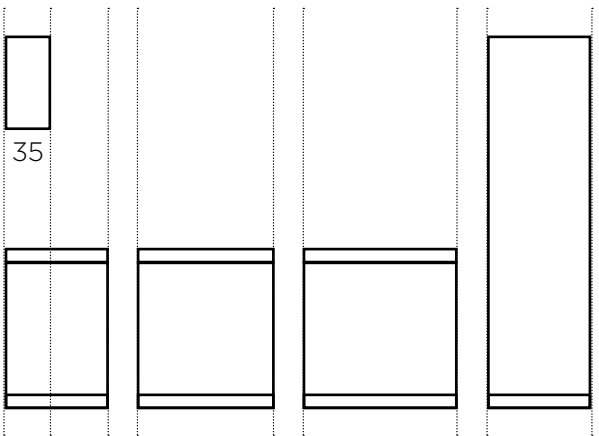
COLUMNS WIDTH



60 75

The standard depth of the **top** is 60 cm, but it may be greater for islands or peninsulas, usually at least 80-90 cm, to provide additional space. Island kitchens require more space. The island should be at least 90 cm wide and 150/200 cm long (if it also includes hob and sink), while there should be at least 100 cm clearance around it to allow free movement and the opening of the cabinets' doors.

SIDE VIEW - UNITS DEPTH



ELEMENTS OF THE KITCHEN CABINET AT A GLANCE

The cabinet of a fitted kitchen consists of three elements:

Top

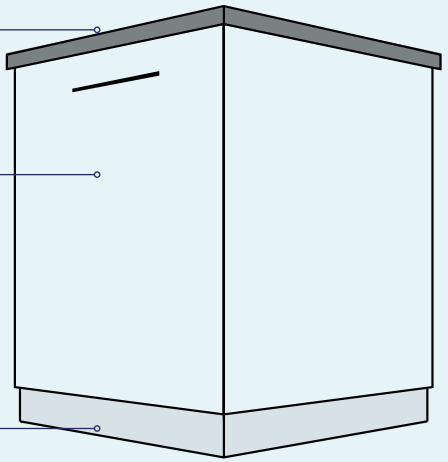
The height can vary from 2 to 6 cm, but there are also models that reach 9 cm.

Furniture base

It can be 72 to 78 cm high, with a standard width and depth of 60 cm.
The modules also include columns with a height of 85 cm, standard width and a depth of 60 cm, in line with the new more capacious refrigerators. Now 75 cm wide columns are also found.

Hoof

From 6, 8, 10 12 to 15 cm.



DIMENSIONS OF EUROPEAN KITCHEN CABINET BASE:

- Standard module widths: 15, 30, 45, 60, 90 and 120 cm
- Height without worktop: 72-78 cm
- Height with worktop: 88-91 cm
- Depth (from front to wall) without worktop: 59 cm
- Depth with worktop: 60-65 cm

The American module

American kitchens are known for their modern and functional style, which makes them the focal point of the modern home. The central island is one of its distinctive elements: it not only offers additional space for food preparation, but can also serve as a dining area or a bar for guests. They are often equipped with high-end appliances, which offer advanced features.

The American kitchen with a central island is not only intended for large environments but also for smaller ones: structuring the island as a block that performs different functions, appliances and storage compartments are nicely huddled together, thus leaving much of the perimeter space free where there are doors, windows and other furniture. American kitchens are practical, functional and welcoming, and furniture

and appliances are integrated to create an elegant, original space, yet arranged according to very precise space-saving logics. The first islands had a wood finishing, a tiled metal top and were equipped with a hob, central hood and coffee table. In the 60s wood was replaced by formica, used both for the kitchen doors and for the worktop. Also, the first built-in appliances appeared and the fitted kitchen began to take on its current appearance.
In the 70s, with the cultural revolution and the emancipation of women, the kitchen became a service environment for cooking and eating fast meals.
The model of the American kitchen, the one with the big island was also very successful in Italy. Occasionally the peninsula replaced the central island: it was designed to connect the operational part of the kitchen to the dining area or to create a point of union between the kitchen and the living area. And in both cases you could decide to equip the peninsula with hob and sink, or choose to use it exclusively as a snack counter and work surface.

The dimensions of the kitchen modules in America:
even in America, the modules of the bases, wall cabinets and tall elements have their own standard dimensions.
The standard widths of the basic kitchen furniture are 12, 18, 24, 30, 33, 36 and 48 inches. The standard widths of kitchen cabinets range from 12 to 36 inches and the standard heights are of 30, 36 and 42 inches.
Tall furniture has a standard height of 84", a 24"width, and a 12"depth.

The **basics**:
The basic kitchen furniture has a uniform depth of 24 inches and a height of 34 and a half inches. Specifically, the standard depths of the countertop range from 24 to 25.5 inches from wall to board or from edge to edge throughout the island: most bases measure 24 inches deep, with a ledge of one and a half inches for the countertop, making the overall depth 25.5 inches.

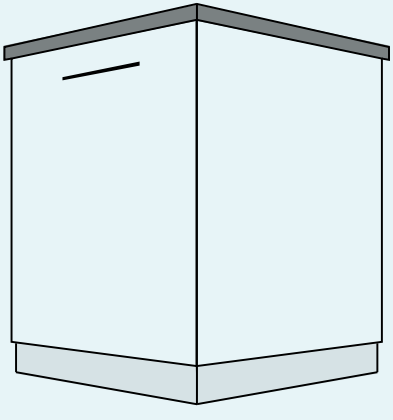
Height of the kitchen **countertop**:
Most kitchen countertops are 36 inches

high: the base is 34.5 inches high with a worktop thickness of 1.5 inches, so the full measure is 36 inches or 3 feet (1 foot corresponds to 12 inches). It is important to know that these standard measurements are based on the average height of women (5’4) and men (5’9) in the United States. When designing a kitchen for people taller than 5’9” or shorter than 5’4”, one should consider custom heights.

CM TO INCHES CONVERSION

To convert European into American measurements and vice versa it is good to know that an inch is equivalent to 2.4 cm, so to convert a measure from inches to centimetres one simply needs to multiply it by 2.54.

For example:
12 inches = 30.48 cm
24 inches = 60.96
36 inches = 91.44 cm



DIMENSIONS OF THE AMERICAN KITCHEN CABINET BASE:

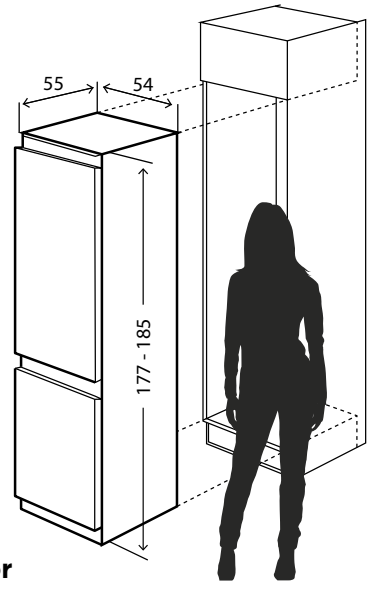
- Standard widths: 12, 18, 24, 30, 33, 36, 48 inches
- Height without worktop: 34-1/2 inches
- Height with worktop: 35 to 36 inches
- Depth (from front to wall) without worktop: 24 inches
- Depth with worktop: 25 to 26 inches

ALL YOU'LL EVER NEED TO KNOW ABOUT INSTALLING BUILT-IN APPLIANCES

Built-in appliances are a great choice for those who have little space or an open space as they help create continuity between the living room and the kitchen. Hidden inside the furniture they are "invisible" but functional because they help making even the smallest kitchen perfectly complete and efficient.

When talking about built-in appliances, we refer to all those appliances that are integrated into the kitchen cabinetry. They differ from freestanding appliances, which can instead be placed anywhere in the house, standing on their own with respect to the furniture.
Quite simply, installing a built-in appliance means placing it inside the kitchen cabinets, so that it's hidden away and doesn't stand out too much from the rest of the furniture.

In European kitchens, almost all are built-in: in particular the oven (which can be placed under the hob or in a column), the dishwasher (completely hidden behind a panel) and the hob. The refrigerator and the microwave oven can be both built-in or freestanding.
Attention needs to be paid to the space in which appliances are placed: in addition to the actual dimensions of the appliance, some technical specifications for the installation must also be considered.



Refrigerator

The built-in version is hidden inside the kitchen columns, while a freestanding fridge remains visible. For the same dimensions, the freestanding is slightly more spacious (about 15% more than a built-in fridge).

The most widely used built-in refrigerator model is the so-called “combined” one, with the refrigerator standing above the freezer, for added convenience. If you have available space, you can opt for built-in single-door refrigerators and freezers to be placed side by side. Alternatively, you can choose a side-by-side appliance with double doors.

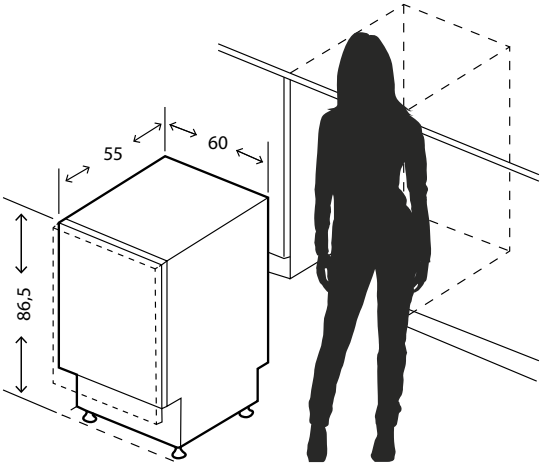
For a built-in refrigerator, keep in mind that it must be at least 2 or 3 centimetres smaller than the compartment in which it is placed. It is indeed important to remember that, for proper operation and complete safety, the refrigerator should always have, on the sides and especially at the back, an empty space in relation to the wall and adjacent furniture, sufficient to ensure ventilation for the compressor, which emits a lot of heat. Additionally, it is advisable to choose a model with a reversible door opening.

Typically, a compact built-in refrigerator model has a height ranging from around 177 cm to 185 cm. Regarding the width, it is usually 54 cm to fit into a 60 cm column. The same applies to the depth, which is approximately 55 cm.

Now, built-in refrigerators with a width of 75 cm are also available, providing approximately 15% more capacity. It is advisable to check whether the kitchen manufacturer has included the provision for a 75 cm wide refrigerator column; otherwise, it may be necessary to have one custom-made.

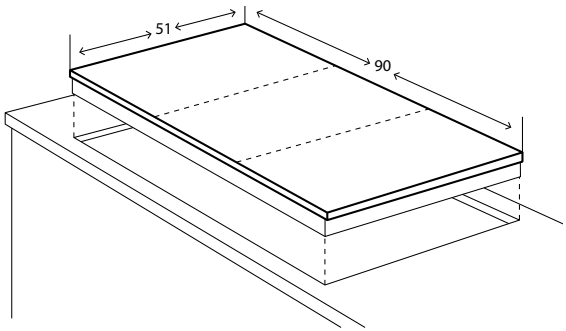
Dishwasher

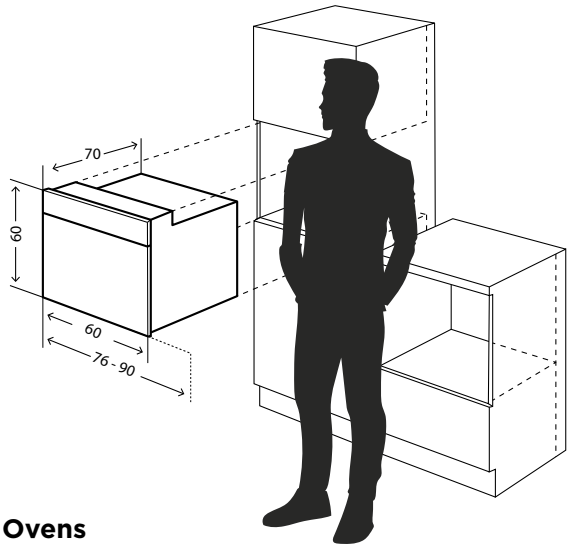
The built-in dishwasher has a raw, unfinished door to which a panel made of wood or other material is attached, matching the rest of the modular kitchen. The fully integrated built-in dishwasher is completely concealed within the cabinet, with controls located inside the top part of the door. On the other hand, in dishwashers with a front panel, controls are visible externally. When referring to dishwasher dimensions, the focus is primarily on the width. Standard built-in dishwashers are 60 cm wide, while slim ones have a width of 45 cm. These measurements align with the dimensions of modular kitchens. Both types have a minimum depth of 55 cm and a height that can reach up to 86.5 cm. The latter is particularly important, and all dishwashers come with height-adjustable legs.



Cooktop

There are cooktops of different sizes and materials, powered by gas or induction. They can be installed with various types of embedding: traditional with an edge protruding by about 8 mm on the countertop, semi-flush with a protrusion of 3 mm, flush-mounted without any perimeter edge, where the surface of the cooktop is integrated with the kitchen top, and undermount, mainly used with stone, synthetic materials, glass, or wood tops. The depth is standard (51 cm), while the width can vary from 30 to 90 cm depending on the number of cooking zones or burners. Even in standard 60 cm compartments, cooktops of 70-75 cm can be embedded.





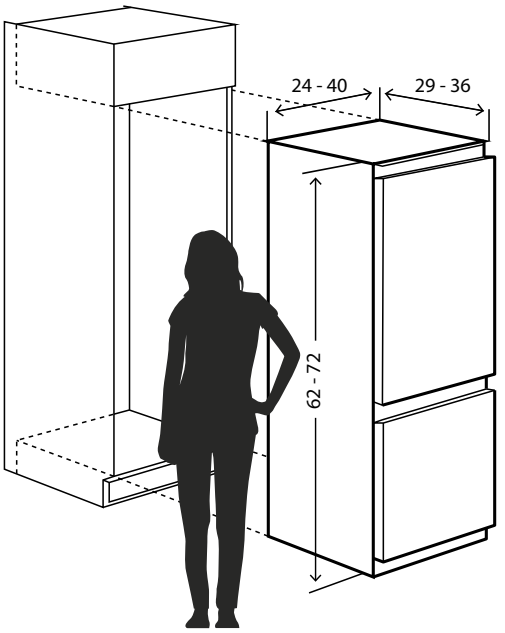
Ovens

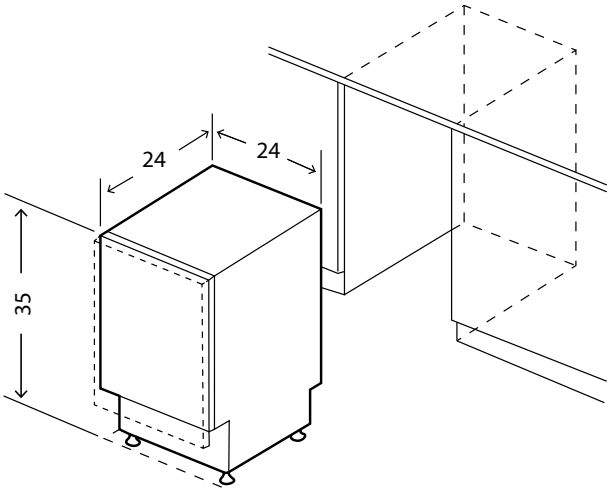
Generally, the traditional oven is located under the cooktop or in a column structure at eye level to enhance ergonomics, ease-of-use and safety, especially when there are children in the house. The built-in microwave is placed in a column above the traditional oven. Compared to the freestanding version, it has larger dimensions and offers the significant benefit of not taking up space on the countertop. This way, it does not occupy space on the kitchen surface. Standard European ovens have a width of 60 cm, while the American model has a width of 76 cm, with larger models going up to 90 cm.

Standard size of American kitchen appliances

American kitchens are often equipped with high-end, state-of-the-art appliances that offer advanced functionality and superior performance. Double-door refrigerators, convection ovens, induction cooktops, and ultra-modern dishwashers are just a few of the appliances that make life in the kitchen even easier and more enjoyable.

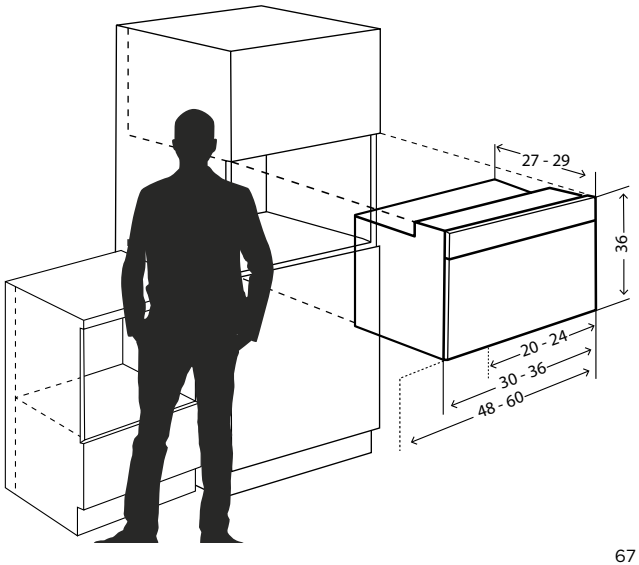
Refrigerators are available in various capacities and sizes. The standard dimensions of a refrigerator range from approximately 24 to 40 inches in width, 62 to 72 inches in height, and 29 to 36 inches in depth.



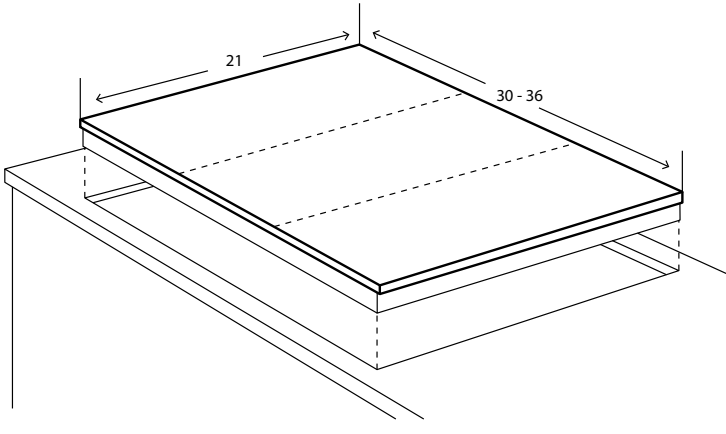


The standard size of a **dishwasher** is typically 24 inches wide, 24 inches deep, and 35 inches high. The cabinet openings in many home kitchens today are made to accommodate these standard dishwasher dimensions.

The standard size of the **oven** is approximately 30 inches in width, 27-29 inches in depth, and 36 inches in height. Oven widths range from 20 to 24 inches for compact models, 30 to 36 inches for standard ones, and 48 to 60 inches for extra-large models.



The standard size of a **cooktop** is usually between 30 inches and 36 inches, although other sizes such as 15, 24, 45, and 48 inches are available. It is important to consider the number and sizes of the burners, the quantity of finishes, and the countertop space when selecting the size.



FROM "FIREPLACE" TO FITTED KITCHEN

Technological innovations, social changes and new trends in residential architecture lay the foundations for the study of a different, more ergonomic and functional way of conceiving the organisation of the room dedicated to the preparation of meals. As such, the 'Frankfurt Kitchen' sets the criteria for modern kitchen design.

Since mankind's discovery of fire and the possibility of cooking food prior to eating it, the hearth has been at the center of our everyday life: a source of heat and an emblem of nutrition, in one way or another it always gave the room containing it a predominant role. For centuries, in fact, the kitchen has been the heart of the house, changing its configuration over time and the relationship with the rest of the living space, following the changes and the different social and economic conditions of the historical eras it spans across. For a long time a fundamental problem of this room has been the management of the fire for the fumes it gave off and for the dangers it represented. Cooks had to juggle skilfully with the live, non adjustable flames, which obviously conditioned recipes and dishes. A first evolution in this field came in the seventeenth Century, with the use of the "potager" (from the French potage: soup), a primitive stone hob, with square holes and grids on which to lay embers taken from the hearth (nothing new actually, the system was already in use by the Romans). With the potager you could manage the intensity of the flames and cook several dishes at a time; the appearance of the first recipes date back to this period, with indications about the sequences and processes: these are the primal stages of modern culinary art. But the wood stove was the innovation that really improved life in the kitchen. The first example of a wood stove came in 1735 thanks to François de Cuvilliés: the Castrol Stove was defined as "economical" because burning a single log also produced heat for the room and provided hot water, an oven that was always hot and a plaque on which to bake. With the industrial revolution came coal stoves (especially for heating), the most famous being that of Benjamin Franklin, and appliances for cooking such as the cast iron wood stove designed by Philo Stewart in 1834. This appliance came in different shapes and finishes, could withstand temperature changes and had exhaust pipes for fumes, with some models equipped with an oven and a water boiler. The gas stove by James Sharp, in the first

half of the nineteenth Century, made of enamelled sheet metal, light and with a better aesthetic, was a real innovation; together with sinks, it was one of the free standing pieces of the 'modern kitchen'. In the first decade of the 1900s the design of the gas stove took on the appearance it was to keep for a long time: two stoves on top and an oven and grill underneath.

Finally, at the end of the 19th Century, electricity brought about the electric oven invented by Thomas Ahearn, while the first electric cooker was produced in the early 20th Century in the United States. Meanwhile another very important innovation in the kitchen world of the future was advancing: the electric "frigidaire" or refrigerator, replacing the icebox, a wooden cabinet with a coating of tin or insulating zinc, using blocks of ice to keep food fresh. In 1913 Fred W. Wolf marketed the first domestic electric refrigerator, under the name of Domelre, domestic electric refrigerator. In 1915, General Motors introduced the first domestic refrigerator working with a compressor. In Europe in 1923 the first absorption refrigerator appeared. The company that produced it was acquired by Electrolux in 1925. These innovations made it possible to conceive the room dedicated to cooking in a whole new way.

THE FRANKFURT KITCHEN

The project that would forever change the concept of the most important room in the house was the Frankfurt kitchen, a true archetype of a modern fitted kitchen, conceived in 1926 by Margarete Schütte-Lihotzky, one of the first women to study architecture in Vienna and to practice the profession. In 1921, the designer collaborated with Adolf Loos, considered one of the pioneers of modern architecture, on the project of the Siedlung Fridensstadt, a residential complex for the disabled and World War I veterans in the 13th district of Vienna. In the 1921-24 period Loos worked on projects of residences and kindergartens and developed his own prototypes of kitchens and homes, including the Kernhaus (core house), the Siedlungen council houses and the Winarskyhof residential estate, one of the most important projects for social housing in Vienna. “We architects” said Margarete in those years “have the damned, sacred duty and obligation to rack our brains on what must be done in housing to facilitate life for women and men”.

In 1926 she was called to the Frankfurt am Main Building Office by urban planner Ernest May, where she continued to experiment with the rationalisation

“We architects have the damned, sacred duty and obligation to rack our brains on what must be done in housing to facilitate life for women and men.

Margarete Schütte-Lihotzky

of domestic work and new residential types. The assignment forced the designer to rethink living spaces according to fundamental functions such as eating, sleeping, cooking and living. These were the foundations of the project of a prototype kitchen for social housing, which would develop into the famous “Frankfurter Küche” - the Frankfurt kitchen -, one of the most significant products of functionalism, the architectural current inspired by the “form follows function” principle, and of the Existenz minimum concept of essential housing, which was also the title of the 1929 International Congress of Modern Architecture in Frankfurt. Discussion at the congress focused on the organisation of domestic spaces by analysing morphological, dimensional and distributive elements. The purpose was to create housing made to meet the material and spiritual needs of inhabitants. The functional and efficient kitchen of Margarete - Grete - Schütte-Lihotzky achieved just that: it created a space which met the needs of women and also benefited families, while reducing costs. In this project, ergonomics and movements were studied in detail, according to a principle of functionality and production efficiency associated by some to the emerging theories of Taylorism (1911), the method of scientific organisation of work based on the rationalisation of production processes. The Frankfurt kitchen is a milestone of the modern fitted kitchen. Those installed in social housing included a stool, an adjustable-height lamp, a retractable ironing board and aluminium containers for the most common staples. The refrigerator was not yet integrated into the kitchen, but there was an air intake communicating with the outside to keep food cool.

“

The question of rationalising the work of women in the home is equally important for all social classes. Both middle-class women, who often have no help at home, and those of the working class, who also have to work outside the home, are so stressed that there will be serious consequences for public health in general.

Margarete Schütte-Lihotzky in Das neue Frankfurt, 5/1926-1927

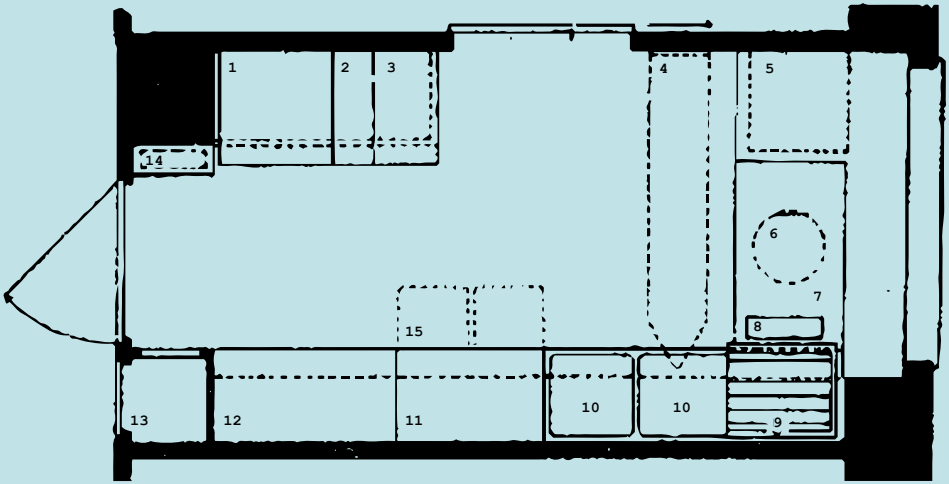
THE “U” SCHEME

The design work of Margarete Schütte-Lihotzky is the result of the rationalisation of spaces and of the sequence of activities, according to the principles of domestic economy. The distribution of the elements necessary and useful for work in the kitchen is arranged according to a “U” scheme to allow freedom of movement to those who work in a space calculated to be sufficient for one person, maximum two. Having everything you need at hand reduces movement and fatigue: every detail is carefully designed to perform precise tasks. All elements are organised according to two cycles of work, one for the preparation and cooking of meals, the other - in the opposite direction - to clear the workstation, wash drain, dry and arrange dishes. The materials, mainly glass, aluminium, wood and ceramics, were chosen according to aesthetics, economic and hygienic considerations. The light blue color, for example, was functional to ward off flies. In 2010 the Frankfurt Kitchen was the focus of an exhibition at New York’s Moma entitled “Counter Space: Design and the modern Kitchen”. In an interview, curator Juliet Kinchin stated, among other things:

“For centuries, in fact, the kitchen has been ignored by design professionals, also because those occupying the kitchen space tended to be women or lower-class servants. Kitchens were located in rooms often poorly ventilated, in the basement or in the annex, and working there involved a lot of effort. Designer Margarete Schutte-Lihotzky was passionately concerned about women’s quality of life.

She felt that without alleviating the hard work they were burdened with, they would never have time to develop themselves professionally”.

FRANKFURT KITCHEN: STRUCTURE



1. GAS STOVE
2. COUNTERTOP
3. COOK BOX
4. FOLD-DOWN IRONING BOARD
5. FOOD CUPBOARD
6. SWIVEL STOOL
7. WORK SURFACE
8. GARBAGE DRAWER
9. DRAINING BOARD
10. SINK
11. ALUMINUM STORAGE BINS
12. CUPBOARD FOR POTS AND PANS
13. BROOM CLOSET
14. HEATER
15. PULL-OUT BOARD

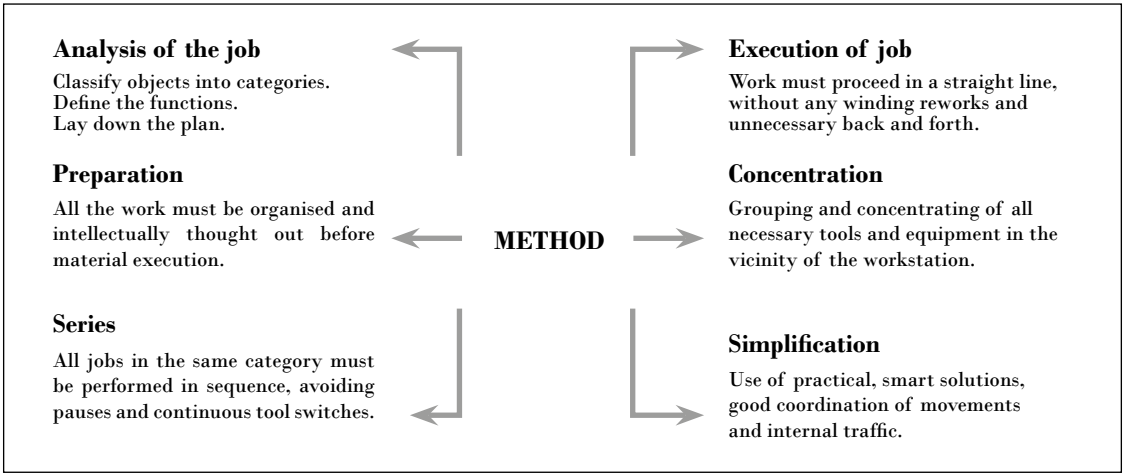
"The Frankfurt Kitchen was equipped with a metal table, easily washable, a folding ironing board combined with an electric iron and a tilting sink with drainer.
For cooking it was equipped with a double gas stove and the sideboard for the food had a system of small drawers with a curved handle and spout to dose and pour the correct amount of ingredients directly into the pot. Some swivel stools could be used when preparing food at the table, as well as at the stove".

ITALIAN RATIONALISM

In the 1930s Italy contributed to the rational evolution of the kitchen environment. These were years in which the country promoted the role of women, not in current modern terms, but as “guardians of the hearth”, queens of the house. These presuppositions favoured a search aimed at simplifying their domestic life. The appearance of the first household appliances, stoves, ovens, refrigerators, dates back to these years; the 1930 edition of Milan’s Triennale (held that year in Monza) marked the start of an experimentation path on the kitchen that was to last until the 1960s. The “Electric House” prototype by architects Figini and Pollini was presented: inspired by Giò Ponti and developed by Group 7, this project was not only a model of home inspired by the principles of rational architecture, but it also was a showcase for the most modern appliances, incorporated in the rooms as an integral element of architectural design.

The “Casa Elettrica”, curated by Piero Bottoni for kitchen and bathroom interiors, was a futuristic project that showcased the best technology available at the time: about 40 appliances distributed throughout the house, first of all in the kitchen, where furniture and appliances were arranged according to the principles of rationality and functionality to ease the life of their users. The prototype also constituted a spectacular preview of appliances, many of which - vacuum cleaner, electric oven and coffee machine - were still quite unknown at the time.

In 1944 Marco Zanuso, considered one of the founding fathers of Italian industrial design, created a pamphlet called ‘The kitchen’ for prestigious Italian magazine Domus. The study defined the modern kitchen as a place for the efficient and organised preparation of food, and provided an in-depth analysis of the projects carried out by his predecessors, including that of Margarete. Zanuso acknowledged the method by which issues around cooking were addressed and solved, that is, by taking what



Marco Zanuso, "the organisation scheme"

he himself called "a scientific outlook on the study of this room", applying methods of analysis and organisation typical of industrial production to the domestic space. The "ultimate plan for the solution of the problem", according to Zanuso, was represented on one hand by the cycle of preparation and cooking of food and on the other hand by the cycle of washing and draining. In this booklet, Zanuso described how the kitchen project should be based on some key concepts, including the analysis of the tasks to be performed, the definition of the order in which they must be performed, the concentration of similar activities, etc . giving this model an objective graphic form with "the organisation scheme". In 1966 Zanuso created the E5, a modular model for Elam Cucina: this is the first example of a modular kitchen in a 'livable' environment, i.e. integrated in a concept of living area, and one of the most representative examples of Italian industrial design of the twentieth Century and revolutionary furniture in the domestic environment of the 60s.

THE AMERICAN KITCHEN… AND THE “MADE IN ITALY” KITCHEN

In post-war United States, from 1948 though to 1955, the concept defining the kitchen as the living space in the house took root: a place of conviviality where families spent most of the time devoted to domestic activities. Thanks to the studies and experimentation of European and American architects, the time was ripe for the kitchen to achieve industrial standardisation. In the 1920s,

Germany had asserted its avant-garde role in urban planning, technology and design, but was penalised in the following years by the rise of Nazism; the United States took a head start and excelled in the production of kitchen furniture. Manufacturers focused on the search for module units that made the various elements compatible, with economies of scale and speed of assembly, in anticipation of mass production for a growing market. The growing availability of appliances, increasingly indispensable status objects, posed the problem of how to insert them in the furniture modules. The stove was formally integrated into the rest of the furniture, forming a line against the wall, and adjusted in height to align with countertops. The refrigerator, because of its bulk, remained for many years a free-standing element. In the 50s, American industry dominated the international market of

these furnishings. In Europe it imposed itself with the “American kitchen”, as it was called. In general, they were pieces of furniture all of the same height, shape and colours, that made up a unique set in the room. In 1954, on the occasion of Milan’s international Triennale event, one of the first examples of fully modular Italian kitchen was presented: it was a project by Augusto Magnaghi, in collaboration with Italian manufacturer S.A.F.FA: a sort of scaled-down version of the American kitchen, more suitable for the spaces of Italian houses.
The concept of a modular kitchen conquered Italians, and started the era of the industrial development of “made in Italy” kitchens.

Modular Italian kitchen by Augusto Magnaghi
Courtesy of: Archivio storico fotografico Fondazione ADI Collezione Compasso d’Oro

A JOURNEY INTO ITALY'S AMAZING KITCHEN DISTRICTS

A pervasive production model, a network of small and medium-sized enterprises deeply rooted in the history, cultural heritage, and artisanal expertise of the communities they belong to: this is the closely guarded secret behind the global success of Italian-made furniture and kitchens. Case Study: Aran Cucine.

Italy's furniture and kitchen industry is globally celebrated for its excellence. Notably Milan, a cosmopolitan metropolis known as one of the world's fashion and design capitals, hosts one of the most prestigious and anticipated trade events in the field - the Salone del Mobile. The furniture sector is one of the most representative industries of Italian-made craftsmanship worldwide, with significant exports to the USA, France, Germany, and China. There are 13 major wood and furniture geographic industrial districts, together representing about three-quarters of Italy's sectoral exports: Brianza Wood-Furniture, Treviso Wood-Furniture, Pordenone Furniture, Udine Chairs and Furniture Components, Murgia Upholstered Furniture, Bassanese Furniture, Forlì Upholstered Furniture, Pesaro Kitchens, Abruzzo Furniture, Quarrata Upholstered Furniture, Alto Tevere Valley Furniture, Bovolone classic and period Furniture, and Alto Adige Wood-Furniture. In 2021, the wood-furniture supply chain comprised approximately 70,000 companies, accounting for 15% of Italian businesses, with a workforce of over 290,000, 7.7% of Italy's total.

THE MOST IMPORTANT INDUSTRIAL DISTRICTS OF FURNITURE MANUFACTURING

Furniture Industrial Districts: 2021 trade balance
(6.8B€ current, 82% of the sector's overall balance)

Source: Insights by Intesa Sanpaolo based on Istat data

REGIONAL INDUSTRIAL DISTRICTS: ONLY IN ITALY

Italy's model of the industrial district, although not exclusive, is certainly unique in the way it evolved and specialised. The specialisation and concentration in specific regional areas is one of the fundamental elements of its uniqueness, to which many scholars have added a further aspect to explain such a singular trajectory, that of the Renaissance effect, or the influence that the important historical, artistic, and cultural heritage has on professional activities. Living in a country that boasts arguably the richest artistic heritage in the world certainly helps develop particular creative skills and sensitivity to beauty and craftsmanship, in other words, Made-in-Italy in all its splendour. However this aspect, though undeniably the most evident, is not sufficient on its own to support the incredible development - and success - of Italy's industrial districts, such as those in the wood-furniture sector. Strong organisational and entrepreneurial skills are needed for the effective and efficient management of such enterprises, "without which it is unthinkable that so many small businesses can compete for market shares and succeed in open and global markets."

(Treccani encyclopaedia - Industrial Districts).

The industrial district is therefore the result of the strong synergies between different elements: solid territorial roots in a specific socioeconomic area, and high specialisation in a certain type of production due a considerable density of small and medium-sized enterprises highly experienced in various phases of that specific production cycle. In addition to this, many analysts identify an important preliminary condition for the development of a district: the presence of a tightly-knit local community that shares a common system of values and visions. That common cultural heritage is handed down often through generations through the social framework of reference: family, school, work. It is a concept that Italian economist Giacomo Becattini, an expert in the history of Italian districts, summarises in the expression 'population of enterprises', emphasising how a localised concentration of enterprises highly specialised in the different phases of the same production process, is capable of fostering strong professional and personal interaction.

> Every production unit operating within a district must be considered simultaneously as an entity having its own history, which in principle is disconnected from its regional origin, and as a specific component within a specific district.

Giacomo Becattini,
Italian economist, 1990.

THE SECRET OF SUCCESS

In Italian districts, therefore, social and economic factors converge to determine their uniqueness. People - and their small to medium-sized enterprises - residing in a certain territory typically characterised by a craft vocation, establish collaborative relationships and share productive knowledge, services, and expertise, thereby collectively developing technological innovation. Professional relationships, but often personal ones as well, serve as a cohesive element of a network deeply rooted in the community. Generally, districts express one or more leading companies that drive the entire supply chain. Design and innovation are the main drivers of the furniture industry, which now counts with a new asset, that of sustainability. 98% of companies adopt sustainable materials in their processes, over 58% focus on recyclability, and in the past three years, approximately 70% of companies have made investments in energy efficiency.

> From the 1930 IV International 'Triennale' Exhibition of Modern Decorative and Industrial Arts in Monza, with the presentation of the futuristic 'Electric House', a period of experimentation began that would last until the late 1960s. During that time, the first kitchen industries emerged in some furniture districts. These were crucial years for the transformation of the kitchen space in Italy.

SOME HISTORY

Between the late 1940s and the early 1950s, in Scandinavian countries and France there were series productions of kitchen units that included elements for washing (dishes and laundry), cooking, and storage; they were part of standardised furnishings with fixed worktops (instead of tables) and spaces underneath used for drawers and cupboards. The trend was to provide kitchens with appliances already integrated into the furniture. At that time, while kitchen standardisation was developing in Europe, in Italy, the possibility of industrially producing (like mass-produced cars) rational kitchen furnishings encountered considerable difficulties. It was the economic boom, and the widespread dissemination of household appliances that spurred the development of kitchen industries in districts that were traditionally skilled in furniture production. During that period, companies and brands that would shape the history of Italian-made kitchens flourished: names like Dada, Boffi, Scavolini, Snaidero, Veneta Cucine, just to name a few. In the 1970s, new industrial players emerged, while still benefiting from the presence of a specialised supplier network typical of the industrial district. Among these are Modulnova, Poliform, Valcucine, Aran Cucine, and others.

ARAN CUCINE, ITALIAN-MADE FOR THE WORLD

The story of Aran Cucine is closely linked to that of Renzo Rastelli, today its owner and CEO. In the 1980s, Rastelli was a twenty-year-old with a career in professional football and an interest in the kitchen industry, which eventually led him to become the owner of Aran. The combination of innovation, focus on the international market, and respect for the local heritage helped Aran Cucine to emerge as an icon of Italian-made design in more than 120 countries, participating in the furnishing of some of the world's most

prestigious skyscrapers. The mission of the Abruzzo-based company is to create not only functional kitchens but true meeting places and conviviality hubs; the design is developed with a functional approach that integrates design, ergonomics, and technology. This evolution required a more flexible and personalised production organisation, aiming to meet customer needs with a variety of materials and finishes, which called for the efficient management of production processes in order to ensure high quality and innovative design.

Beyond the undeniable values of Italian-made, it was the ingenious solution of the 'flat pack' that determined Aran's success: it made for significant logistics optimisation, with up to fourty kitchens stacked in a single container, thus reducing shipping costs and the risks of damage and breakage during transportation.

From the outset, Rastelli's approach was global, while maintaining production in the industrial area of Atri, in Abruzzo, within that furniture district deeply rooted in the towns and villages along the Adriatic coast, with its highly specialised wood processing artisan workshops. This strategic choice contributed to a quick and effective growth, also at international level: "Roots are important," says Rastelli, "our company is located in a land rich in history, art, and breathtaking landscapes, and traditions, and excellent food and wine. These are all elements that inevitably influence our work." The close connection with the land and the community increases awareness around environmental and social responsibility: for example, Aran Cucine was involved in the establishment of the 'Wood Technologies' technical institute, in collaboration with the European Design University of Pescara, in the context of interior design.

SUSTAINABLE ENGAGEMENT

Aran's sustainable approach reflects in various aspects of its operations, starting with design, materials, and technologies. From a design standpoint, the company strives to create models that are both aesthetically pleasing and functional, encouraging durability and adaptability over time. This means that the design solutions adopted - modular and flexible - allow users to personalise and modify kitchen spaces without having to replace the entire structure. On the materials front, Aran favours the use of sustainable and recyclable raw materials, minimising the environmental impact throughout the product's lifecycle. This includes employing wood from sustainably managed forests, using recycled and recyclable materials, implementing low-impact production processes. These elements represent a great potential for the company. "To better leverage the opportunities and drive the development of foreign markets," explains Rocco Pellegrino, the company's Export Retail Director, "we are investing significant resources in the development of international distribution networks and in promoting our brand abroad."

arancucine.it

Ph ©Andrea Straccini

"Thinking globally while acting locally has helped me in my journey as an entrepreneur and as a person. Keeping the entire production in the industrial area of Atri, in Abruzzo, remains a cornerstone for me. Aran is 100% Italian, a steadfast commitment that serves as a guarantee for the market and a source of pride for us."

Renzo Rastelli,
CEO Aran World

The Oasi kitchen, designed for Aran Cucine by Stefano Boeri Architetti, anticipates the conceptual vision of Milan's famous skyscraper "Bosco Verticale", though in the field of industrial design, developing the theme of the coexistence between humans and forests through a piece of furniture.

Presented at EuroCucina 2016, the Sipario kitchen designed by Makio Hasuike & Co is meant as a place for social gathering and partaking.
The "sipario" - Italian for "stage curtain" - is a cantilevered single-block, compact and equipped for meals preparation and cooking. The "curtain" itself is a single-door wall unit featuring glass shelves with an integrated fumes extractor and lighting. The "scene" is completed by columns and an island counter as complements.

KITCHENS AND APPLIANCES, THE INSEPARABLE DUO

What are the implications of designing a kitchen and what needs and requirements does the creation of this domestic environment have to meet? What role do appliances play within what is now a true integrated furnishing system? DM talked to Italian architect and designer **Giuseppe Bavuso**.

Practicality and functionality. Warmth and hospitality. Comfort and elegance. The modular nature of the kitchen offers solutions for designing spaces that best suit different aesthetics and convenience styles, with designer kitchens tailored to fit every habitable space and lifestyle need. The kitchen is also the realm of

appliances, both large and small, which must be carefully thought out and selected to complement the furniture: colours, materials, and design thus become distinctive elements that mustn't be overlooked, especially when it comes to their functional features.

Beyond performance, quality, and technology, it is important for an appliance to indeed complement the style of the kitchen environment. Ever since the concept of modular kitchens was introduced, back the 1960s, it was immediately apparent that the combination between the "furniture" aspect, i.e. the aesthetic content, and the "appliance" aspect, i.e. the functional side, was fundamental. This connection played a vitally important role: finding solutions to define the coexistence between the world of furniture and that of appliances was the crucial point, and has been ever since.
This has been particularly true for the refrigerator, typically the absolute star of the kitchen environment. The refrigerator, while being technological and efficient, is also characterised by refined details, elegant lines, and an unmistakable style.
No longer merely a built-in, concealed appliance, but increasingly a prominent front-stage character.

What does it mean, then, to design a kitchen? What ergonomic, aesthetic, and functional requirements must it meet? How do appliances, particularly the refrigerator, fit into the equation? We asked Giuseppe Bavuso, a prominent Italian architect and designer, for several years Art Director at Ernestomeda, a leading company in the high-end design kitchen market founded in 1996. From a design perspective, the kitchens conceived by Bavuso stand out for their high formal and aesthetic value, yet the functional aspects are being given considerable attention too as it is increasingly important for appliances' performance levels to be very close to professional standards.

What does it mean to design a kitchen?
At the core of my design philosophy lies the concept of home as a place of relationships and social interaction. I consider the kitchen to be the focal point and heart of domestic and family life, the main catalyst in the evolution of the way we come together. The kitchen is no longer seen as a closed workplace but as a true extension of the living area, a "special" space dedicated to conviviality. My projects start from this idea: the kitchen as a place of social interaction, where we prepare and enjoy meals, and engage in dialogue, a true hub of meetings and relationships.

In the 1960s, we transitioned from an "unplanned" kitchen to a modular one. What impact did this concept shift have on appliances?
The kitchen evolved from a collection of free-standing elements, each with its specific function, to a fully integrated furnishing system, inevitably involving the design of appliances that are, by their own nature and intended use, an essential part of it, making them increasingly refined and sophisticated from a design perspective.

What is the difference between the American modular kitchen and its European counterpart?
In America, the kitchen environment holds a significant importance within the home, while in terms of use it's pretty much the same as in Europe. However, there remains a certain difference in the design of appliances: American ones are much larger than their European counterparts, with a more imposing appearance, much closer to that of certain industrial appliances.

What ergonomic, aesthetic, and functional requirements must a modern kitchen meet? What do today's consumers want when designing a kitchen space?
Our kitchens are designed to offer a high formal and aesthetic value without neglecting functionality, where it's increasingly important for

performance levels to approach those of professional equipment. In my work, technological innovation is never an end in itself but serves an idea, extending to every detail. The desire to innovate stems from our utmost respect for the people who will use the kitchen, from observing changes in lifestyles and in the way that space is used and enjoyed, reflecting contemporary living.

What are the demands in the kitchen: aesthetic? Functional? Sociable?

There isn't a unique trend; it all revolves around highly subjective aesthetic and functional choices. This is why extreme versatility in terms of dimensions and equipment is required when designing a kitchen furniture system, allowing for the best possible design response with consistent and high-level design.

What evolution do you see for the kitchen of the future?

It is important for designers to consider sustainability, as we all must realise that the Earth's resources are not unlimited. Designers have a growing responsibility to prioritise materials that are easily recyclable or environmentally friendly, like aluminium, glass, and select ceramic materials, which we've been incorporating into our designs wherever feasible for years. At the same time, we should encourage the industry to produce high-quality products to extend their lifespan, using materials that generate no waste or can be easily reinserted into the production cycle, with a design vision based on the principles of responsibility and sustainability.

There is talk about Slot-In free-standing refrigerators. What could be the architectural/design advantages resulting from this new type of perfectly integrated appliance?

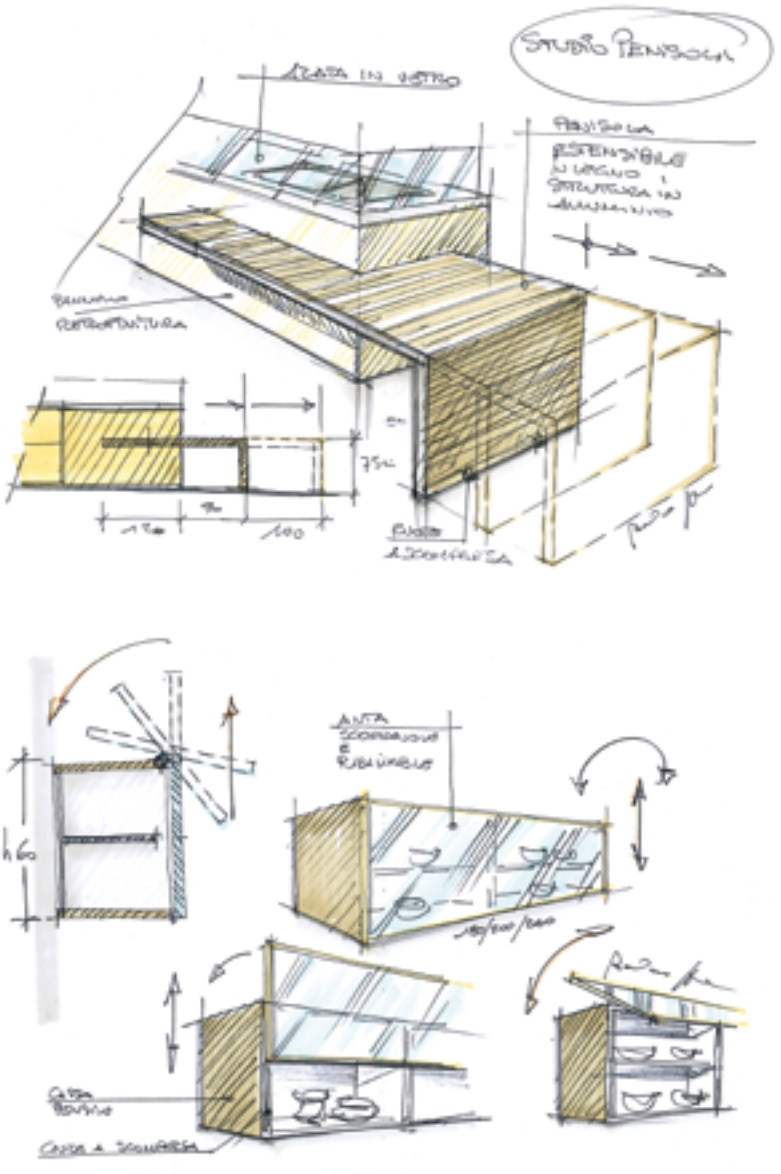
In my opinion, the advantage lies precisely in the seamless integration of the appliance into an increasingly articulated and aesthetically homogeneous furnishing system.

BIO

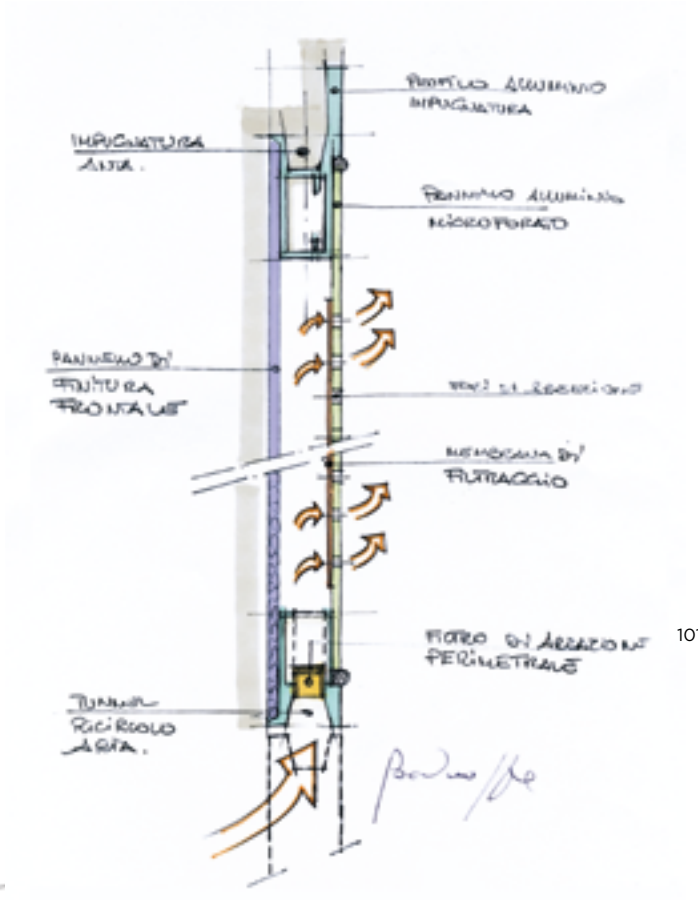
Giuseppe Bavuso (1959) is an Italian architect and designer. His projects are distinguished by the fusion of minimalist rigour with meticulous technical expertise through the use of technological and innovative materials. In the furnishing sector, he collaborates with several globally renowned companies, including Rimadesio, Poliform, Alivar, Lapalma and Ernestomeda, where he currently serves as the Art Director, overseeing the product in its entirety, from conception to engineering, to visual communication.

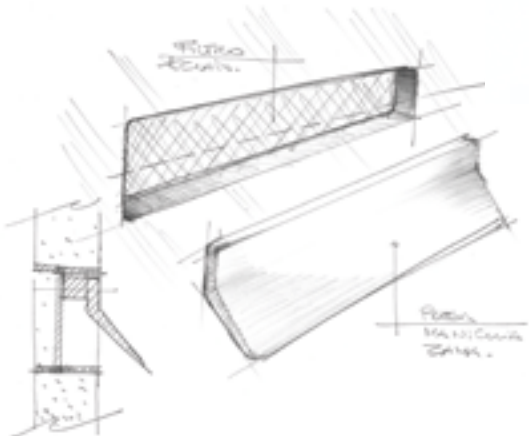
bavuso-design.com

The Icon kitchen, presented by Giuseppe Bavuso for Ernestomeda in 2012, is marked by technological solutions in every aspect, starting from the various opening/closing systems that define most of the kitchen elements. “Embarking on a new design project doesn’t solely entail providing aesthetic solutions, but rather seeking to always marry formal innovation with technical and performance innovation of a product. Especially when it comes to a product like the kitchen, which by its intended use must meet high technical requirements.” Attention is also paid to materials because “It’s the duty of the designer to use recyclable or eco-friendly materials, such as aluminium, glass, and some ceramic materials.”



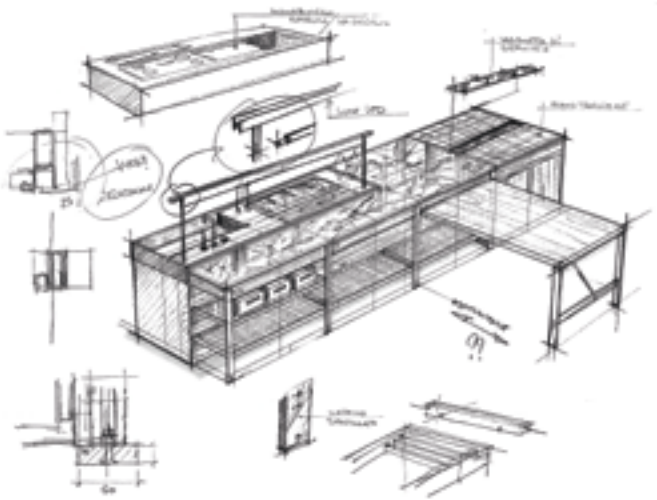
The kitchen environment must be conceived in perfect balance between functionality and aesthetics” The Air cabinet door of the Icon kitchen is a technical yet design element, and implies a technology capable of enhancing the kitchen’s performance in preserving items and food inside the compartments. It is equipped with an air filtration system, on the non-visible side, and holes in the internal panel of the door. Thanks to a filter, the air entering the compartment is cleaner. A gasket allows for the airtight sealing of the door, preventing the entry of dust and other unwanted elements.





The concept of functionality and aesthetics is also revisited in 2014 with the Tag Filter metal handle of the Soul kitchen, equipped with a ventilation system that allows air renewal inside the cabinet for perfect food preservation.

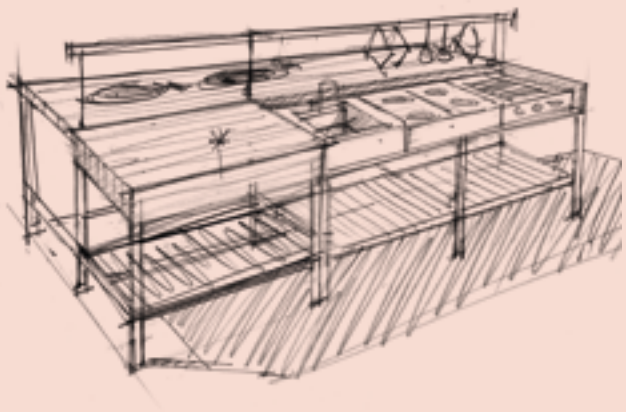
The 2018 K-Lab project is characterised by solutions with a strong aesthetic impact and, at the same time, sober elegance, adopting an informal style language. K-Lab features an open shelving system with a brushed metal structure, inspired by the large workbenches of industrial shopfloors. The skilful alternation of solid and void volumes meets functional needs and adds dynamism to the entire project.



With Sign, designed by Giuseppe Bavuso for Ernestomeda in 2022, the kitchen is no longer seen as a simple closed workspace but rather as a true extension of the living area, the focal point of the home dedicated to conviviality.

Sign pays close attention to materials and features a blend of chromatic tones. The elegant a giorno wooden panelling together with the shelves and display cabinets of the Daylight system create areas around which open compartments and integrated storage solutions can be positioned.

"The kitchen environment must be conceived in perfect balance between functionality and aesthetics, which translates into the search for concrete solutions for those who use the kitchen as a workspace, but also as a space for socialising." - Giuseppe Bavuso



KGarden is the new Ernestomeda kitchen Giuseppe Bavuso is presenting at EuroCucina, on the occasion of the 2024 edition of Milan's Salone del Mobile, taking place on April 16 to 21 at the Fiera Milano district, in Rho.

GLOSSARY

Fin condenser
/fɪn kənˈdɛnsə/

A type of compact condenser used in refrigeration systems where heat exchange occurs through finned surfaces, increasing efficiency.

Floor-ventilation
/flɔː-ˌvɛntɪˈleɪʃᵊn/

A system allowing air to circulate at floor-level, used for ventilation and heat exchange as part of a refrigerator's functioning.

Flush-mounted
/flʌʃ-ˈmaʊntɪd/

Installed in a manner where the front panel is aligned with surrounding cabinetry, countertops, or walls, rather than protruding outward or sitting recessed. This integration creates a cohesive and streamlined look in the kitchen design.

Forced convection
/fɔːst kənˈvɛkʃᵊn/

Utilising fans to actively circulate air, enhancing heat transfer and improving cooling efficiency within refrigeration systems.

Golden waistline
/ˈgəʊldᵊn ˈweɪstlaɪn/

Refers to the ideal height at which key elements, such as countertops, work surfaces, and storage units, are positioned to optimise ergonomic efficiency and user comfort. This measurement is crucial for ensuring that activities like food preparation, cooking, and cleaning can be carried out comfortably and safely.

Hinges
/ˈhɪnʤɪz/

Mechanical devices that allow doors to swing open and closed on a fixed axis, facilitating movement and functionality.

Integrated
/ˈɪntɪgreɪtɪd/

A seamless combination of multiple components or systems into a unified whole, often providing a cohesive and efficient solution.

Moisturising membrane
/ˈmɔɪstʃᵊraɪzɪŋ ˈmɛmbreɪn/

A specialised lining designed to regulate moisture levels and maintain optimal hydration for stored foods. This membrane helps to preserve the freshness and quality of fruits, vegetables, and other perishable items by creating a controlled microclimate that minimises moisture loss and prevents dehydration, thus extending their shelf life.

Recessed handle
/rɪˈsɛst ˈhændᵊl/

A type of handle that sits within a recess or cavity in the surface of the appliance door. When the handle is not in use, it is flush with the surrounding surface, helping to maintain a clean and streamlined appearance.

Seamless
/ˈsiːmləs/

Smooth and uninterrupted, without visible joins or interruptions, often used to describe integration or transitions between components or systems.

Skin condenser
/skɪn kənˈdɛnsə/

A type of condenser used in refrigeration systems where the heat exchange occurs through the outer surface of the condenser. It is typically positioned on the side or back walls of refrigerators.

VIP
/viː-aɪ-piː/

Vacuum Insulated Panel, a cutting-edge technology designed to enhance insulation and energy efficiency. These panels employ a vacuum-sealed enclosure to minimise heat transfer, ensuring optimal temperature control and reduced energy consumption.

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