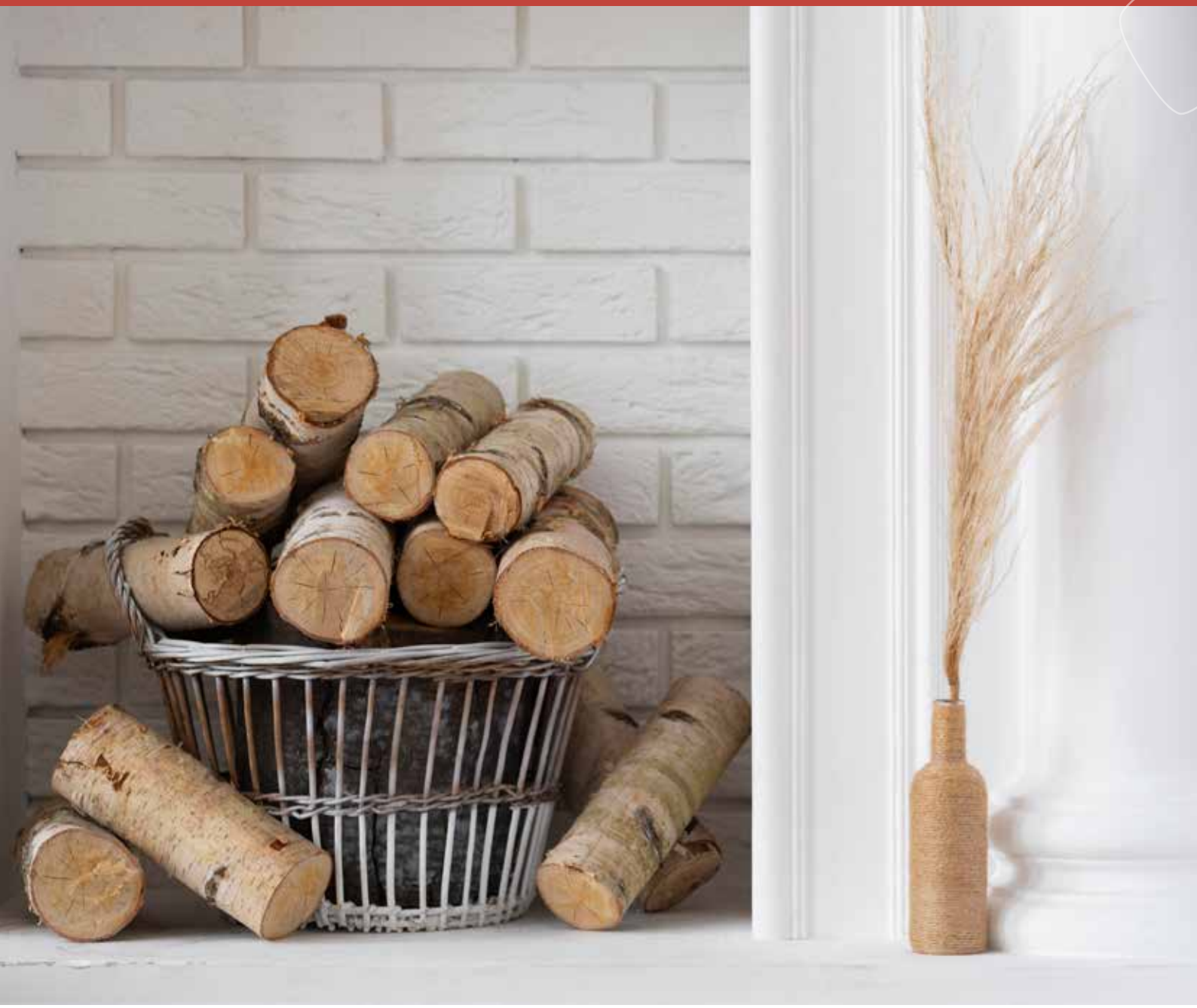
How to choose **THE RIGHT FLUE PIPE** for your stove or fireplace



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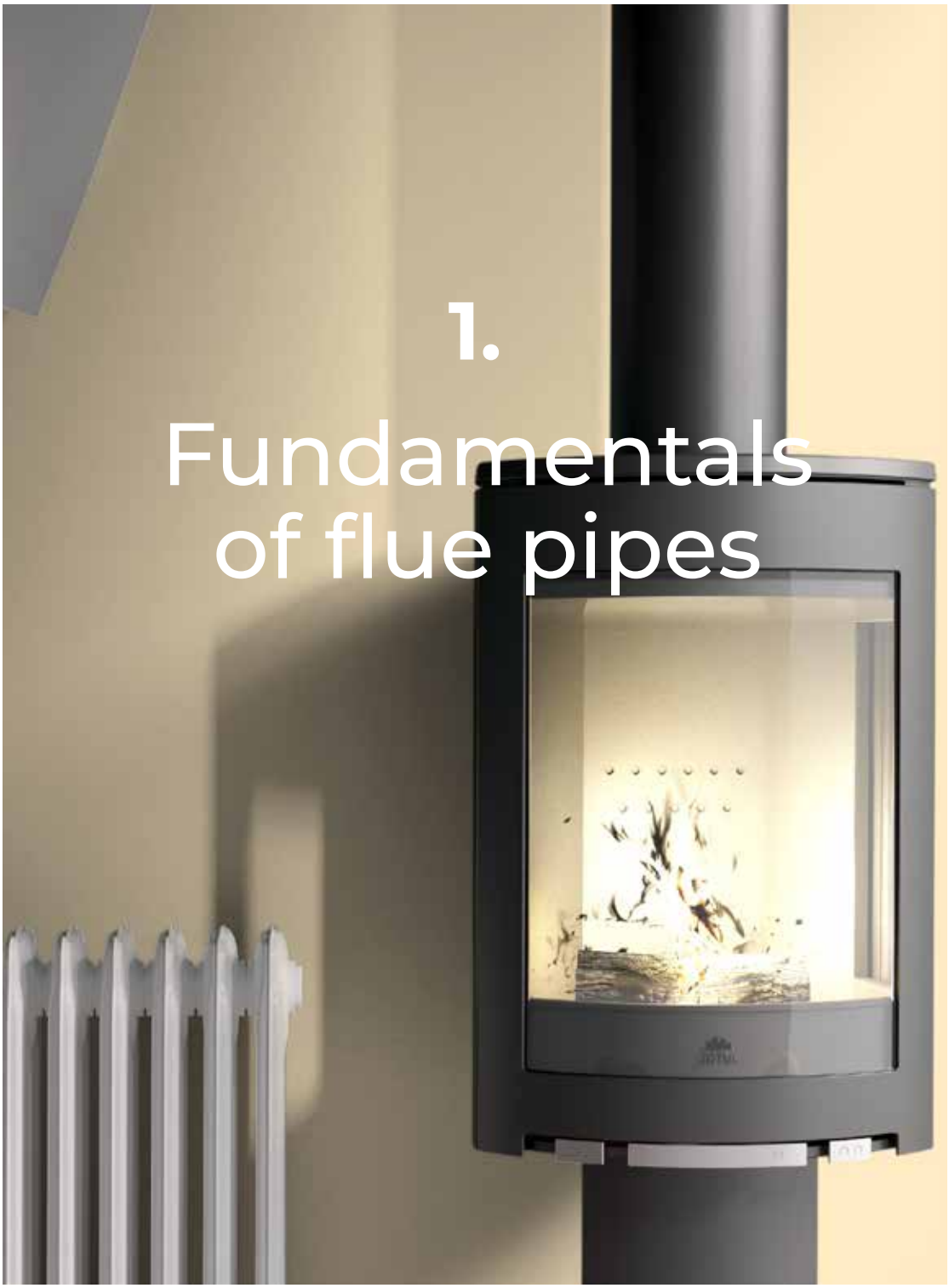
7.1 Summary of key points: pipe types, selection, installation, maintenance, and regulations

Wood and pellet stoves, inserts, and fireplaces produce heat through combustion, a process that releases gases which must be safely vented outside. To direct these gases and prevent them from accumulating inside the home, **smoke evacuation pipes,** also known as **flue pipes,** are used. Choosing the right pipe isn't just about getting the smoke out; it also affects the overall efficiency, safety, and lifespan of the entire heating system. With so many options available on the market, it's normal to have questions: What's the best material? When is it advisable to use twin-wall pipes? How can you prevent issues like corrosion or soot buildup?

Making the wrong choice can lead to serious problems — from carbon monoxide leaks and soot blockages to poor combustion that requires more wood or pellets to generate the same amount of heat. This eBook is a practical guide designed to help you choose the right flue pipe so your heating system runs safely and efficiently for years to come.

You'll discover the different types of pipes available and which ones work best for each kind of heating system, as well as the key factors to consider for **a safe and efficient installation,** and the right maintenance to avoid long-term issues. You'll also get familiar with the regulations that govern smoke evacuation and discover the most common mistakes to avoid during installation.

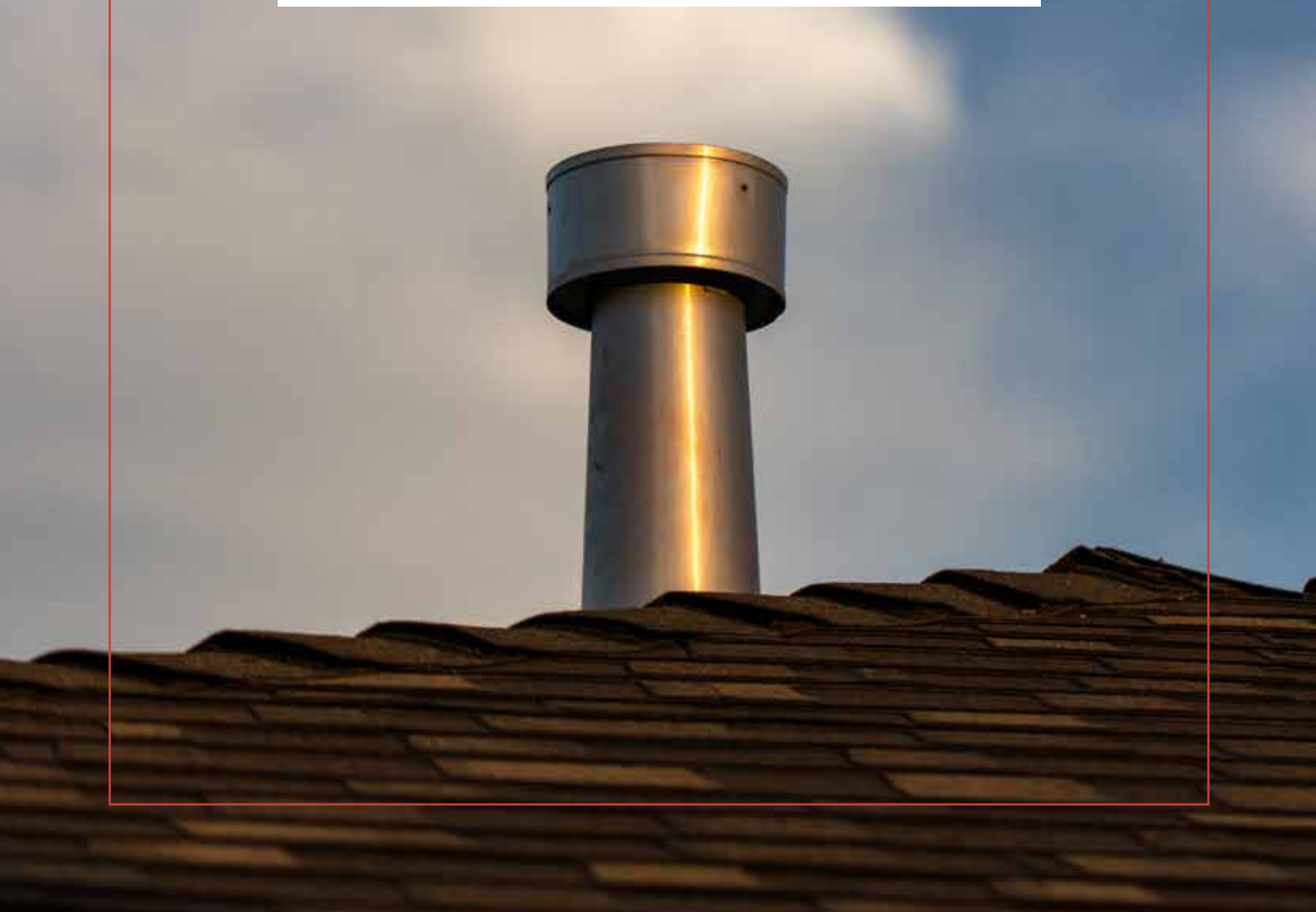


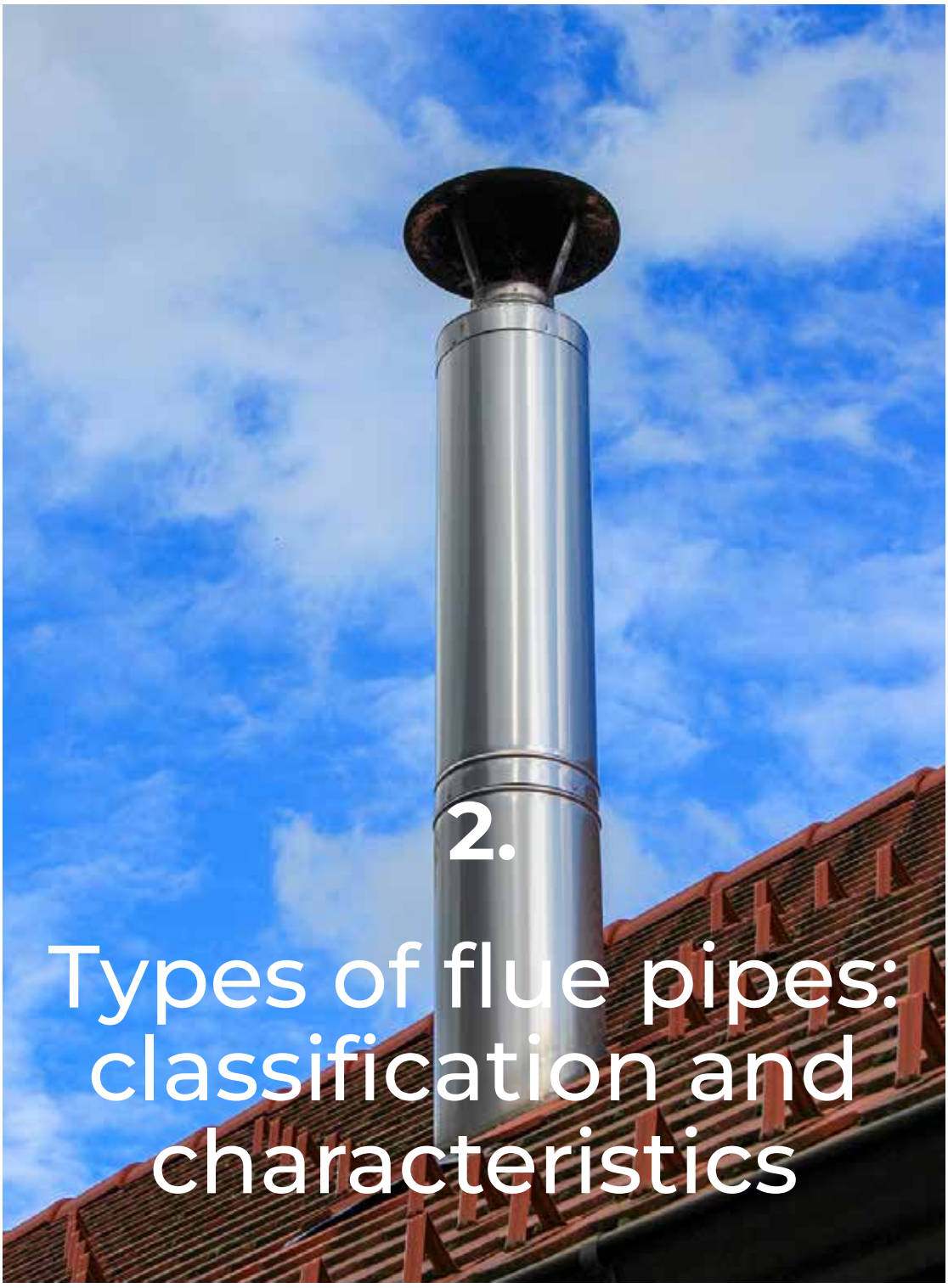
1.
Fundamentals of flue pipes

Wood-burning and pellet stoves, inserts, and fireplaces generate heat through the combustion of biomass — a process that releases gases which must be safely vented outdoors. To achieve this, it is **essential** to have an efficient and secure **flue** system that ensures the safe expulsion of these gases.

For optimal performance, flue pipes must be designed to withstand the high temperatures produced during combustion without warping or deteriorating. They should also offer **strong resistance to corrosion** caused by moisture and combustion residues. Additionally, the pipes must have the appropriate diameter and fit together tightly, using a reliable jointing and sealing system.

In the following sections, we'll take a closer look at these aspects and how they impact the performance and safety of the flue system.





2.
Types of flue pipes: classification and characteristics

Not all materials behave the same when exposed to heat, corrosion, or the passage of time. That's why it's essential to understand the differences between them before making a decision. In this chapter, we'll take a closer look at the **three pipe types that are most commonly used** for venting smoke from wood and pellet stoves, inserts, and fireplaces: vitreous-enamelled pipes, galvanised pipes, and stainless-steel pipes.

2.1

Vitreous-enamelled pipes

Vitreous-enamelled pipes are made from carbon steel and coated with a vitrified enamel layer that enhances their resistance to heat and corrosion. This coating is applied through a high-temperature firing process, resulting in a smooth, non-porous surface that improves smoke evacuation and reduces soot buildup.

They are available in glossy black and matte black finishes. Glossy black offers a **bold, elegant look,** while matte black tends to match most stoves, as it aligns with the typical finish of these appliances.

Advantages

- Good thermal resistance — ideal for indoor wood stoves and fireplaces.
- Reduced soot and dirt buildup thanks to the enamel-coated surface.
- More affordable than stainless-steel pipes.

Disadvantages

- Less corrosion-resistant than stainless-steel pipes.
- Not recommended for outdoor installations, as moisture can gradually damage the enamel coating.
- In high-humidity environments, the coating may deteriorate over time, reducing durability.

Practical uses

- Indoor installations in areas protected from moisture.
- Pellet stoves in homes with short exhaust paths and no prolonged exposure to humidity

Recommended models

- EXOLENA and EXOLENA PREMIUM series

2.2

Galvanised pipes

Galvanised pipes are made from carbon steel and coated with a zinc layer that acts as a barrier against moisture and certain external elements, such as salty air, and provides better corrosion resistance than that of vitreous-enamelled pipes. However, the durability of galvanised steel doesn't match that of stainless steel.
These pipes typically come in a metallic grey finish.

Advantages

- More affordable than vitreous-enamelled and stainless-steel pipes.
- Moderate corrosion resistance in indoor environments.
- Very lightweight, making them easy to handle and install.

Disadvantages

- Not recommended for wood-burning fireplaces, as they cannot withstand high temperatures like vitreous-enamelled or stainless steel pipes.
- Not suitable for outdoor installations without additional protection, such as covers or thermal insulation.
- Over time, the zinc coating can wear away due to heat and environmental exposure, reducing its corrosion resistance and shortening the pipe's lifespan.

Practical uses

- Indoor installations in areas protected from moisture.

Recommended models

- EXOGALVA series

2.3

Stainless-steel pipes

Stainless-steel pipes stand out for their high thermal resistance and excellent corrosion protection, making them the most durable option on the market. They are suitable for all types of installations, as they can withstand high temperatures without degrading.

These pipes are available in both single-wall and twin-wall versions, which help improve thermal insulation (see section 3.1 for details). They come in natural stainless-steel finishes, either bright silver or satin, and also in black enamelled versions, such as the EXOBLACK DW series.

Differences between 304 and 316L stainless steel

There are different grades of stainless steel, such as 304 and 316L, which vary in corrosion resistance and performance depending on the installation environment. Grade 304 is suitable for indoor use and dry conditions, while 316L, which contains molybdenum, offers greater resistance to moisture, salty air, and aggressive chemicals.

Advantages

- Maximum corrosion resistance.
- Superior durability, with a longer lifespan than vitreous-enamelled or galvanised pipes.
- Requires less maintenance compared to the other two pipe types.

Disadvantages

- Higher cost compared to vitreous-enamelled or galvanised pipes.
- If not twin walled, they may cause condensation in cold climates, leading to acidic liquid drips that can damage other materials, such as galvanised pipes or silicone seals.

Practical uses

- TAll types of installations, especially outdoors or in humid environments.
- Traditional fireplaces, inserts, and wood or pellet stoves.
- Locations requiring high thermal resistance and long-term durability.

Recommended models

304 stainless steel models:

EXOINOX SW 304 → Single-wall 304 stainless steel pipe, recommended for protected indoor installations.
EXOINOX DW 304 → Twin-wall 304 stainless steel pipe with insulation, suitable for protected outdoor installations or indoor setups requiring better thermal insulation

316L stainless steel models:

EXOINOX SW 316L → Single-wall 316L stainless steel pipe, ideal for outdoor installations or areas with high humidity.

EXOINOX DW 316L → Twin-wall 316L stainless steel pipe with thermal insulation, perfect for harsh environments or humid climates (coastal areas, high condensation, etc.).

EXOFLEX INOX → Flexible pipe made of 316L stainless steel, ideal for flues with complex layouts or to improve airtightness in smoke evacuation systems.

Modelos con combinación de acero 304 y 316L:

EXOBLACK DW → Twin-wall black enamelled pipe with an outer wall made of 304 stainless steel and an inner wall made of 316L stainless steel, offering high corrosion resistance and an enhanced aesthetic.

3.
Key concepts for flue pipe selection

While selecting the appropriate pipe material is crucial to ensure effective and safe smoke evacuation, considering other key factors that influence the system's performance, safety, and longevity it is equally important.

3.1

Twin-wall pipes: what they are, how they work, and when they're essential

What are they?

A twin-wall pipe consists of two concentric layers of metal (usually stainless steel), with thermal insulation — typically rock wool or ceramic fibre — between them. This design helps reduce heat loss and minimises condensation inside the pipe.

When are they essential?

In outdoor installations → They prevent the cold from cooling the combustion gases, reducing the risk of condensation and corrosion.

When passing through combustible walls or ceilings → The double wall protects the building structure from excessive temperatures.

In cold or damp climates → They help prevent the build-up of acidic moisture inside the flue, improving durability.

To enhance indoor safety → The double wall lowers the surface temperature of the pipe, reducing the risk of accidental burns.

How do they work?

The inner layer carries the combustion gases, maintaining a high temperature to prevent soot and residue formation.

The outer layer shields the pipe from external conditions, reducing the risk of overheating nearby surfaces.

The thermal insulation between the two layers minimises thermal shock, preventing condensation in cold climates. It also helps retain heat and improves energy efficiency.

Recommended models

EXOINOX DW 304 / EXOINOX DW 316L → Suitable for protected indoor areas (such as inside homes or buildings) and outdoor installations in moderately humid environments.

EXOBLACK DW → Ideal for installations requiring enhanced aesthetics and high thermal resistance — for example, a wood-fired grill in a restaurant.

3.2

Choosing the right pipe diameter

Selecting the correct diameter for the flue pipe is essential to ensure proper draught and avoid performance issues in stoves and fireplaces. The pipe diameter must match the specification provided in the appliance's technical datasheet, as the system is designed to operate with that specific size. Any variation can negatively impact its performance. In fact:

- Reducing the diameter can cause a "choking" effect, making it harder for smoke to exit and leading to soot build-up.
- Increasing the diameter too much may slow down smoke evacuation, reducing efficiency and affecting combustion quality.

Only in exceptional cases — such as structural constraints or complex installation paths — should a diameter adjustment be considered.

3.3

Key accesories

To ensure a safe, airtight, and long-lasting installation, it's crucial to use the right accessories.

Reduction/expansion adaptors

Used when the pipe diameter needs to be adapted to match the appliance outlet or the rest of the flue system.

There are reducers (to decrease the diameter) and expanders (to increase it), allowing compatibility between different components.

Example: If a stove has an 80 mm outlet but the diameter of the flue system is 100 mm, an 80-to-100 mm expansion adaptor is used.

Fixing clamps

These ensure that the pipes are securely fastened and properly aligned, preventing movement or misalignment over time.

They are essential for vertical flue systems or outdoor installations exposed to wind.

Sealed joints

These ensure a secure joint between pipe sections, preventing gas leaks and loss of efficiency.

Options include high-temperature silicone gaskets or locking systems with safety clamps.

3.4

Cowl types and when to use them

Cowls are a key accessory in smoke evacuation systems. They help ensure efficient airflow and protect the installation from external elements such as wind, rain, and debris. Depending on the climate conditions and type of installation, different cowl designs may be required.

Conical Cowl

Designed to direct smoke flow in a single direction, reducing airflow resistance. Recommended for standard installations with stable natural draught.

» **Compatible models:**

Vitreous-enamelled and stainless-steel pipes for indoor use, such as EXOLENA and EXOFLEX.

Anti-wind cowl

Improves chimney draught in strong wind conditions. Recommended for installations in exposed areas, such as mountainous or coastal regions.

» **Compatible models:**

Twin-wall and high-resistance stainless-steel pipes, including EXOINOX DW, EXOBLACK DW, and EXOGALVA.

Anti-downdraught cowl

Prevents smoke from re-entering the home by blocking wind and water from entering the flue. Especially useful in areas prone to air currents and rainfall, ensuring stable draught and efficient evacuation of combustion gases.

» **Compatible models:**

Stainless-steel and vitreous-enamelled pipes, such as EXOGALVA, EXOINOX SW, EXOINOX DW, and EXOLENA PREMIUM

Cowl with mesh guard

Protects against the entry of debris such as leaves, twigs, and small animals. Recommended for installations in rural, wooded, or dust-prone areas.

» **Compatible models:**

Stainless-steel and galvanized-steel pipes, such as EXOPELLET and EXOINOX SW.

4.
Technical specifications and practical applications table

This section outlines the technical specifications for each series of smoke evacuation pipes available at **Paratureforma.com**, including details on materials, accessory compatibility, wall structure, available diameters, and recommended uses.

Series	Material and finish	Compatible cowls	Twin wall	Available diameters (mm)	Recommended applications
Galvanised	Galvanised steel, matte grey	Anti-downdraught and anti-wind	No	80, 100, 120	Indoor pellet stoves in protected areas. Short-distance installations
Pellet	AISI 304 stainless steel, polished or satin finish	With mesh and anti- wind	No	80, 100	Indoor or protected outdoor pellet stoves. Moderate-length installations
Single wall Stainless Steel	AISI 304 or 316L stainless steel, polished or satin finish	Anti-downdraught, anti-wind and with mesh	No	100, 120, 150, 180, 200	Protected indoor installations. High thermal resistance.
Twin wall Stainless Steel	AISI 304 or 316L stainless steel, polished or satin finish	Anti-downdraught, anti-wind and with mesh	Yes	100, 120, 150, 180, 200	Outdoor installations in humid or coastal climates. Enhanced thermal insulation.
Glossy black vitreous enamelled	Vitreous enamelled steel, glossy black	Standard and anti-wind	No	120, 150, 180	Indoor wood-burning stoves and fireplaces. Visible installations with elegant aesthetics.
Matte black vitreous enamelled	Double layer of vitreous enamel, matte black	Anti-downdraught and anti-wind	No	120, 150, 180	High-temperature wood-burning fireplaces. Increased resistance and durability.
Twin-wall matte black vitreous enamelled	Outer wall in AISI 304, inner wall in AISI 316L, matte black finish	Anti-downdraught and anti-wind	Yes	100, 120, 150	Visible installations in homes or commercial spaces. High thermal resistance and improved aesthetics.
Flexible	Flexible AISI 316L stainless steel, satin finish	Standard and anti-wind	No	80, 100, 120	Complex routes or where adjustments are needed. Improves evacuation sealing.

5. Installation and maintenance

To ensure the flue system operates correctly and lasts for many years, **proper installation and regular maintenance are essential.** Both processes affect the performance of your stove or fireplace, as well as the safety of your home or premises, helping to prevent issues such as smoke leaks, condensation, or soot build-up.

5.1
Installation

Flue pipes must be installed with great care and according to a well-thought-out plan. Before you begin, make sure to:

- Check that the pipes are compatible with your stove or fireplace.
- Plan the route of the flue, keeping bends and long horizontal sections to a minimum.
- Ensure the flue outlet has the correct diameter to avoid draught problems.
- Confirm that safe distances from combustible materials are respected

Getting ready

Before starting the installation, make sure you have the following tools at hand:

- **Tape measure and spirit level** → to ensure accurate alignment and measurements.
- **Metal saw or angle grinder** → in case pipe lengths need adjusting.
- **High-temperature sealant (silicone rated to 1200 °C)** → to ensure airtight joints.
- **Screwdriver or drill** → to secure fixings and brackets.
- **Support clamps** → to stabilise the system.
- **Protective gloves and safety goggles** → to prevent injury during assembly.

Connecting and Securing

To achieve a sealed and efficient system, follow these steps:

- **Fit the pipes in the correct direction:** male ends should point downwards to prevent condensation leaks.
- **Apply heat-resistant sealant at the joints** to improve airtightness.
- **Secure each section with safety clamps** to prevent movement or vibration.
- **Use insulated wall or ceiling sleeves** to avoid overheating nearby combustible structures.
- **Check that the insulation in twin-walled pipes is intact** before locking the joints.

Checking performance and detecting leaks

Once installation is complete, it's important to check the system is sealed and functioning properly. Here are some effective methods for detecting leaks:

- **Light the stove or fireplace at low power and observe the smoke outlet.**
- **Pass a flame near the joints (without direct contact).** If the flame flickers, there may be a leak.
- **Check for soot build-up after the first few hours of use.** Excessive accumulation may indicate a draught issue.
- **Watch for smoke returning into the room,** as this suggests poor evacuation.

If a leak is detected during these checks, it is important to fix it before using the system. To do so, it is advisable to:

- **Re-tighten connections and clamps** to ensure a firm seal.
- **Apply high-temperature sealant** to any joints showing signs of leakage.
- **Double-check pipe direction:** male ends should always face downwards to prevent condensation leaks.
- **Replace any damaged components showing signs of corrosion or wear.**

Common mistakes and how to avoid them

- **Using an incorrect diameter:** If the diameter is too small, it affects the draught; if too large, it may cool the combustion gases.

  Solution: Always follow the manufacturer's recommendations. See point 4 to determine which pipe to choose based on diameter.

- **Installing pipes in the wrong direction:** Reversing the direction of the joints can cause condensation to leak through the connections.

  Solution: Ensure the male end always points downwards.

- **Too many bends or curves:** These hinder the flow of gases and may cause internal turbulence.

  Solution: Design the flue path to be as straight as possible.

- **Poorly sealed joints:** This can lead to smoke leaks.

  Solution: Apply thermal sealant to all connections.

- **Not respecting safety distances:** This can pose a fire risk to nearby combustible materials.

  Solution: Always maintain the distances recommended by regulations.

5.2

Preventive Maintenance

Proper maintenance improves energy efficiency, prevents blockages, and extends the lifespan of the flue pipes.

Internal and External Cleaning

Soot and residue build-up inside the flue can reduce its effective diameter, impairing performance and increasing the risk of downdraught. In severe cases, it may even cause a fire. To clean the flue pipes properly, it's best to use suitable tools.

Flexible brushes allow for internal cleaning without damaging the pipe. Ash vacuums help remove debris without spreading dust. Externally, stainless-steel or enamelled pipes should be cleaned with microfibre cloths and appropriate cleaning products to protect the finish. For stubborn build-up, special soot brushes may be used.

Cleaning frequency depends on the type of installation:

- Wood-burning fireplaces should be cleaned every two months during frequent use, and always at the end of the season.
- Pellet stoves require **more frequent cleaning**—at least every fifteen days—as fine residues can quickly clog the flue.
- Outdoor flue systems should be checked every six months, as they are exposed to the elements and may accumulate dirt or corrosion.

Visual inspection for wear, corrosion, and connection faults

Regular inspection is important, depending on usage and environmental conditions. Check for:

- Cracks or deformations in the pipes.
- The condition of sealing joints to ensure they are free from splits.
- Soot build-up that may reduce system draught.
- Corrosion or wear in galvanised pipes, especially in damp environments.

Replacing damaged components or deteriorated insulation

Parts should be replaced if any of the following are detected:

- Visible corrosion that may compromise pipe strength.
- Loss of insulation in twin-walled pipes.
- Wear in sealing joints that could cause smoke leaks.
- Cracks or deformations in the flue.

Don’t wait for the system to fail. Preventive replacement of worn components helps avoid bigger problems down the line.

6. Applicable Regulations

To ensure that flue systems meet the required standards for efficiency and safety, it's essential to understand and **apply the relevant regulations.**

6.1

RITE (regulations for thermal installations in buildings): key points on flue systems

The regulations for thermal installations in buildings (RITE) set out the minimum requirements to guarantee energy efficiency and safety in thermal systems for homes and commercial premises. Regarding flue systems, they specify that:

- Flues must be designed with the correct dimensions to ensure proper draught and prevent combustion gas leaks.
- Materials used must be **resistant to high temperatures** and corrosion, meeting durability and safety standards.
- Installations must be inspected regularly to detect any deterioration or faults in the system.
- Safety distances must be strictly observed to ensure pipes do not come into contact with flammable materials.
- Installations must be carried out exclusively by **qualified professional installers** to ensure safe and high-quality results.

6.2

UNE-EN 1856-1: Regulations for metal chimneys and twin-wall systems

The UNE-EN 1856-1 standard is the European reference for metal chimneys and flue pipes. It outlines the technical requirements these products must meet in terms of:
Maximum operating temperature: Specifies the temperature the pipes can endure without structural damage.Sealing and safe evacuation of combustion gases: Pipes must be leak-free to ensure system safety.

- **Mechanical strength and stability:** Pipes must withstand the temperatures and mechanical stress they are exposed to without deforming.
- **Corrosion resistance:** Different levels of resistance are defined depending on the material (e.g. stainless steel, galvanised steel, enamelled steel).

Resistance	Material	Recommended uses	Corrosion
V1	AISI 316L stainless steel	Installations in humid environments, outdoors, coastal areas, or with acidic gases	High corrosion resistance.
V2	AISI 304 stainless steel	Protected indoor installations and pellet stoves	Good corrosion resistance, but lower than in 316L.
V3	Vitreous-enamelled steel	Indoor installations for fireplaces and wood-burning stoves	Moderate resistance. May deteriorate over time in humid environments.
V4	Galvanised steel	Dry indoor installations, low-temperature pellet stoves	Low resistance. Zinc may wear off in humid or corrosive conditions.

» **Maximum operating temperature:** Specifies the temperature the pipes can endure without structural damage.

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Temperature code	Material	Maximum operating temperature (°C)	Recommended applications
T600	AISI 316L stainless steel	Up to 600°C	Wood-burning fireplaces, high-temperature systems
T450	AISI 304 stainless steel, vitreous enamelled	Up to 450°C	Wood-burning stoves and fireplaces with medium-high temperatures.
T300	Galvanised steel	Up to 300°C	Pellet stoves and low-temperature applications.

» **Sealing and safe evacuation of combustion gases:** Pipes must be leak-free to ensure system safety.

Complying with this standard ensures that the pipes used in the installation are suitable for their purpose and meet European safety requirements.

6.3

Importance of CE marking on products

The CE marking is a mandatory requirement for flue pipes sold within the European Union. This label indicates that the product has passed the necessary tests to comply with European regulations and has been manufactured under strict quality controls.
To carry the CE mark, a pipe must:

- Be manufactured in accordance with UNE-EN 1856-1.
- Pass thermal and mechanical resistance tests.
- Ensure safe evacuation of combustion gases without leaks.
- Meet the safety standards required by RITE and other local regulations.

A pipe without CE marking does not guarantee adequate safety or performance, and its use is not recommended in certified installations.

7. Conclusion

Throughout this eBook, we've explored the different types of flue pipes available on the market, their specific applications, and the regulations governing their use, providing a comprehensive guide to help you make informed decisions.

7.1

Summary of key points

- Types of pipes and their applications: There are three main types—enamelled, galvanised, and stainless steel—each with specific characteristics that make them more suitable for certain uses. Additionally, twin-wall pipes offer superior thermal insulation, which is essential in some installations.

- Choosing the correct diameter: Selecting the right pipe diameter is crucial to optimise smoke evacuation and avoid draught issues or soot build-up. Reducers and expanders are available to adapt to different systems.

- Essential accessories for a safe installation: Cowls, clamps, and thermal sealants help improve system efficiency and ensure airtight connections.

- Proper installation and maintenance: To reduce risks and improve efficiency, it's important to follow the correct installation steps, avoid common mistakes, and carry out regular maintenance—including internal cleaning and inspection for wear.

- Regulatory compliance: Adhering to RITE, the UNE-EN 1856-1 standard, and using CE-marked pipes ensures that the installation meets the required safety and efficiency standards.

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