



How to best identify pipes?

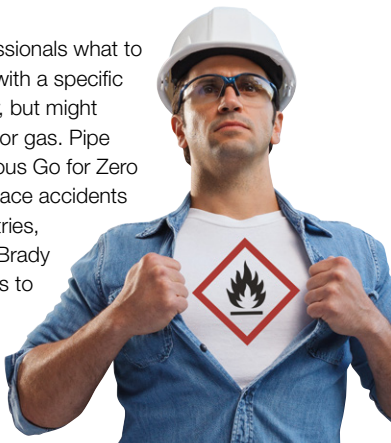
Pipe Identification Guide Book

Why this guide?

Pipe markers show important information when and where it matters. They can make a plant visually compliant and dramatically increase the safety of both employees and contractors. They can act as a live blueprint for a plant, assisting engineers in deciding where and when to intervene. Should a leak occur, well implemented pipe markers will highlight potential leak sources for a quick and adequate reaction.

Go for Zero

Pipe markers immediately inform professionals what to expect, even when they are unfamiliar with a specific plant. A simple tap could contain water, but might just as well hold pressurised steam, oil or gas. Pipe markers are indispensable in an ambitious Go for Zero programme that aims to reduce workplace accidents to an absolute minimum. In most countries, pipe markers are also required by law. Brady offers durable professional pipe markers to achieve compliance with any standard and to support companies on their journey towards world-class safety at work.



This pipe identification guide book offers insight in the advantages of clearly identified pipes, refers to the legal requirements and various norms for pipe markers, highlights factors that determine pipe marker durability and design and includes tips on how to best apply pipe markers.

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The benefits of pipe marking

The purpose of pipe marking is to ensure quick recognition of pipe contents, flow direction and their associated risks. Pipe marking is most successful when used in combination with proper work methods, instructions and accident prevention measures and training. These can teach the right response after recognising pipe contents in case of a leak for example.

Well identified pipes offer a number of benefits. They can

- **Save lives** - Unmarked pipes and valves can endanger employees, contractors and first responders
- **Cut costs** - Well identified pipes can help to avoid costly errors
- **Increase productivity** - Pipe markers immediately inform employees when and where to intervene
- **Increase efficiency** - Pipe markers increase the efficiency of maintenance teams and external contractors
- **Increase compliance** - Colour coded pipe markers increase pipe content recognition speed and compliance with ISO 20560, national, or company standards

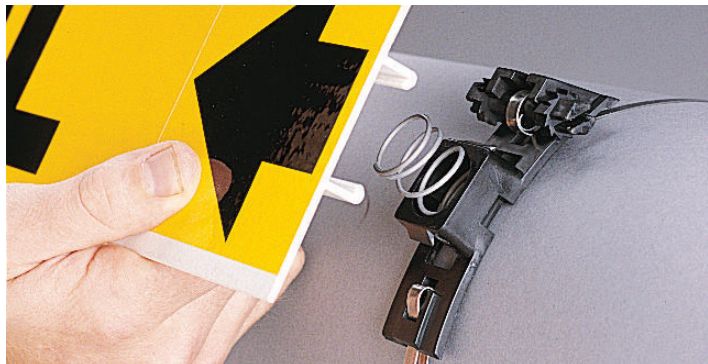


Pipe markers versus pipe paint

Identifying pipe contents with printed pipe markers has a number of advantages over painting pipes with dangerous contents.

Printed pipe markers are

- more durable
- faster to apply
- less expensive in labour cost
- easier to adjust or remove for plant changes, maintenance or repairs
- safer for personnel applying the marking
- easier to comply with laws and norms



A man in a dark suit, light blue shirt, and red tie is pointing his right index finger at a list of items on a screen. The list consists of five square icons, each followed by a text label. The labels are 'Regulations', 'Compliance', 'Specifications', 'Standards', and 'Policies'. The text is in a bold, sans-serif font. The background is a blurred image of the man's face and torso.

Regulations

Compliance

Specifications

Standards

Policies

Laws

The European Union has laid out a number of minimum requirements for the placement of signs on containers and pipes in Annex III of the Council Directive 92/58/EEC from June 24, 1992. EU Member states need to include these minimum requirements in national legislation.

- Pipe markers must be placed on visible sides
- Pipe markers must be placed at the most dangerous points and at intervals
- GHS/CLP icons must be used to identify substances or mixtures
- Pipe markers must be made out of materials suitable to the environment
- Where the level of natural light is poor, phosphorescent colours, reflective materials or artificial lighting should be used

Norms

The international norm for pipe contents identification is ISO 20560. It includes rules for the size of pipe markers, viewing distances, GHS/CLP icons, warning icons, colour coding and other.

Norms can be purchased from the official standardisation organisations in every country. Brady can supply pipe markers that are compliant with your standard of choice.



Pipe marker materials

Pipe markers can only increase productivity and reduce workplace accidents when they are firmly attached and clearly legible. The environment in which a pipe marker needs to perform plays an important role in the choice and cost of pipe marker materials, adhesives or attachment systems.

Ask yourself what your pipe markers are exposed to, how often you want to replace them and what types of adhesives, if any, your pipes can endure.

Pipe marker environment

Pipe markers need to stay attached, retain their colour code, print and integrity when exposed to relevant environmental factors which may include:

- indoor & outdoor environments
- UV radiation
- temperature
- pipe surface
- chemicals
- humidity
- salt water

The materials your pipe markers are made out of, need to be able to resist the environmental factors they will be exposed to when applied on your pipes.

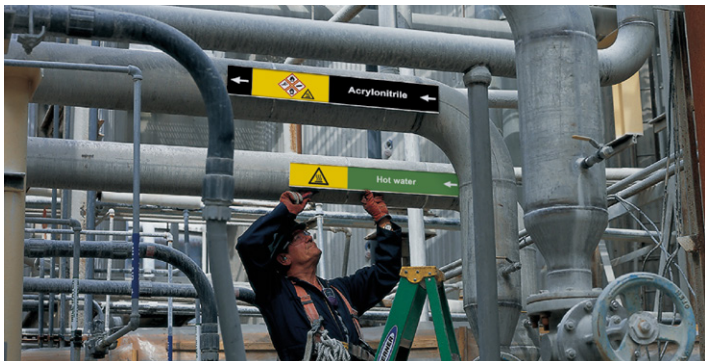


Pipe marker attachment







Depending on your environment, pipe markers can be attached with adhesives or alternative attachment systems such as pipe marker carriers.

If pipe markers are self-adhesive, the adhesive layer should be suitable for the pipe it will be applied on and not cause corrosion. If you are unsure about the corrosive nature of your pipes, pipe markers can be wrapped around pipes and attached onto themselves using an adhesive strip with a minimum overlap.

On rough, hot or extremely cold pipe marker surfaces, or if pipe contents or flow change often, a non adhesive pipe marker or a pipe marker carrier system might be a better solution. Rigid pipe marker carriers can be strapped on to pipes to keep pipe markers into place that can easily be swapped out.



Indoor, Outdoor and Outdoor+ Pipe markers

	Adhesive	Non adhesive
Indoor	 <p>B-7543P</p>	 <p>B-7560P</p>
Outdoor	 <p>B-7541P</p>	 <p>B-7561P</p>
Outdoor+	 <p>B-7529P</p>	 <p>B-7562P</p>

More information:
Technical data sheets
Samples

Single pipe marker, or 360° visibility?

Pipe markers can be ordered on sheets or on rolls. The choice is usually determined by what plants are most familiar with as the functional difference between sheets and rolls in the end, is minimal. However, sheets can be easier to use in some plants, while others will have more use for rolls.

Single pipe markers

- are usually self-adhesive
- can be used on a variety of pipe diameters
- can be used with pipe marker carriers

360° visibility pipe markers

- can be non-adhesive or self-adhesive
- must be ordered in relation to pipe marker diameter
- can be wrapped around pipes



Pipe marker design

The purpose of a pipe marker is to identify pipe contents and to have employees, contractors and first responders quickly recognise the associated risks.

To enhance recognition, a plant's pipe markers should all have the same design and follow a colour coding standard. We advise to switch to the most optimal pipe marker standard for turnarounds, for new factories or facility sections. When replacing a single pipe marker, stick to your current design.

To quickly recognise risks involved, pipe markers should include relevant GHS/CLP symbols and pipe contents flow direction. They can also include ISO 7010 warning symbols.

Optionally, pipe markers can include technical information to help maintenance teams and engineers quickly determine the origin and destination of pipe contents for example.

Example of a pipe marker design

Brady can supply any pipe marker you need, taking into account any regulations and company specifications regarding text, colour, symbols, size, layout and material. Below is an example of an ISO 20560 pipe marker design.

- **Relevant danger symbols:**

depending on the substance, in accordance with CLP regulations.



- **High quality materials:**

indoor, outdoor or outdoor+ quality to provide reliable pipe identification up to 10 years outdoors.

- **Colour code:**

substance colour code as determined by ISO 20560 or local legislation

Substance name:

wide range of legends available, to comply with the country regulations.

Source & destination:

indicate the source & destination connected by the pipe.

P&ID information:

add a custom number for identification purposes.

avy Fuel Oil

75°C



B1-9900-A1234
From E-9900 to E9901



Additional safety

information: add information to increase workplace safety.

Flow direction:

indicate which way pipe contents flows.

QR-code:

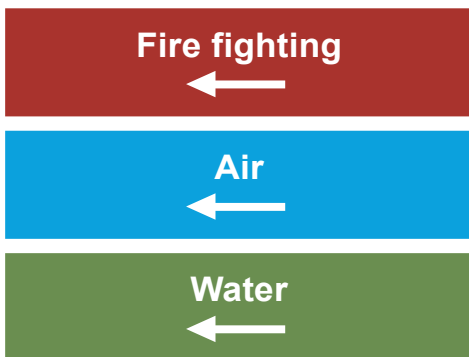
add a code that can be scanned to unlock additional information.

Colour code

ISO 20560 includes a coherent colour code for international use. Some countries may have their own colour coding standards for pipe markers. Colour codes are usually included in the national norms for pipe marking, which can be purchased from the official standardisation organisations in every country.

Pipe marker colour codes are generally not enforced by law, which means companies can teach employees and contractors a company specific colour coding for pipe markers. Potential risks should be assessed in an Evaluation of Risk procedure. In essence however, ISO 20560 has already done this work for you and can help reduce training cost for new hires and international contractors.

No matter whether you are using ISO 20560, a national or company colour code standard, it is always a good idea to create a clear legend for your colour code and any symbols on your pipe markers. This legend should be clearly visible at multiple strategic locations.



Substance name

For compliance with ISO 20560, the full name or abbreviation of the pipe contents should be clearly legible on its base identification colour. To be clearly legible, the size of the pipe contents name must take into account the required viewing distance and the pipe diameter.

If a pipe marker is wrapped around the pipe, the name of the pipe contents should be visible on each relevant side.

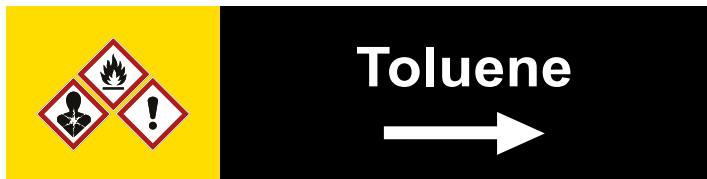
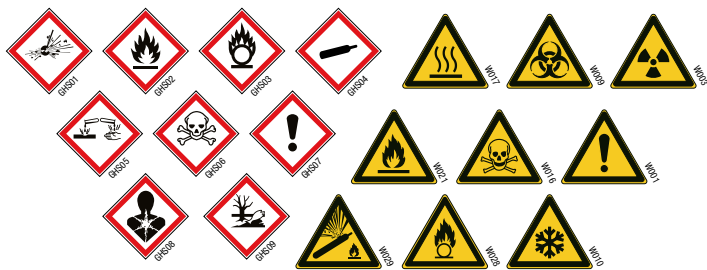
To remain legible, it is advisable to respect a minimum height for the pipe contents name of at least 7 mm. The pipe diameter should not force the substance name to be smaller. Instead a mounted pipe marker should be used to identify very thin pipes.



Warning symbols

The European Union requires dangerous substances to carry relevant GHS/CLP symbols. The Globally Harmonised System/Classification, Labelling and Packaging of substances and mixtures is a United Nations system to identify hazardous substances and inform users on these hazards. The regulation also applies to pipe markers.

Relevant GHS/CLP symbols should be grouped at one side of the pipe contents name, in roughly the same height as the substance name. Other relevant symbols can be added, such as an ISO 7010 hot surface warning symbol.



Direction of flow

Next to the pipe contents name and the relevant warning symbols the flow direction is important information to reduce workplace accidents and increase productivity. Adding flow direction quickly informs employees, contractors and first responders on where they can open or close a valve to reduce risk or continue production.

Flow direction can be indicated with an arrow when fluids or gasses dominantly flow in a single direction or with a double headed arrow when they are able to flow in either direction.



Additional information

Additional information, usually of a technical nature, can be added to pipe markers to quickly identify sections, to determine pipe contents origin and destination or to otherwise support the productivity and efficiency of maintenance teams in the field.

Technical pipe information can be added on one side of the pipe contents name, with relevant GHS/CLP symbols on the other side. To avoid confusion, technical information should always be presented on a white background for compliance with ISO 20560.

- secondary language pipe contents description
- P&ID information
- from source x to destination y
- QR code for electronic recognition

Additional or other information can be included!



Print pipe markers on-site

All pipe markers can be ordered in pre-printed form according to specifications, and indoor pipe markers can also be designed and printed at your premises using Brady Workstation apps and a printer from Brady.

The BradyJet J2000 Colour Label Printer can print compliant pipe markers for indoor use in one pass at a top speed of 15 cm per second, in widths ranging from 29 mm to 101,6 mm. The inkjet printer combines high print speed and full colour printing with a durable material range for indoor pipe markers.

You can design your pipe marker in a few steps with a computer and an app from the Brady Workstation platform. Simply enter pipe diameter and substance name and the app will present you with an editable, ISO 20560-compliant pipe marker for printing with a Brady printer.



Which pipe markers do I need?

If you need compliant pipe markers quickly, or if you are unsure about the best choice in pipe markers for your facilities in one or more countries, you can call on a Brady specialist to visit your sites.

You could discuss your identification needs with the Brady specialist while walking through one or more sites to get a high level view on the required pipe marking to make your site safe and compliant.

Once you have a high level view and feel confident about how Brady can address your needs, you have the option to order pipe markers or request a full audit by an external partner to create complete pipe marker order lists.



Pipe marker implementation

Pipe markers can only warn employees, contractors and first responders against risks associated with pipe contents when they are attached to pipes in visible places. Placing pipe markers on the visible sides of pipes, at the most dangerous points and at regular intervals is a requirement stipulated by the European Union.

On the next page, we offer some tips on how to comply with this regulation.

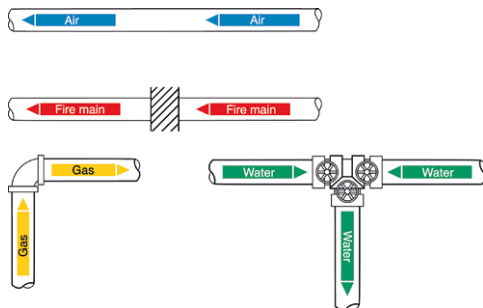


Where to attach pipe markers

Pipe contents should be identified by a clearly legible pipe marking system

- At regular intervals so it is clear from any point what the content of a pipe is
- On both sides or connection points of valves, pumps, tanks, vessels, installations, ...
- At each branching point
- On each side of walls, floors or other penetration points
- Adjacent to stairwells and platforms on elevated pipes
- At the start and end of pipe racks
- At the inlet and outlet of a process train

Indoor pipe marker intervals usually are no longer than 10 metres. For outdoor pipe markers, intervals can be longer as long as there are no obstacles and pipe markers are clearly visible and legible from any position.



Implementation partnerships

Brady can create pipe markers in durable materials, with or without adhesive, in any colour code and with the warning symbols and technical information printed on your pipe marker.

For larger pipe marking projects, Brady can call on the support of trusted partners to professionally implement your pipe markers in your facility.

In some regions, we can offer extended partnerships to take care of your entire pipe marking project, including:

- **Scoping:** an experienced engineer calls you to scope the project and our engagement and to identify priorities and challenges for the on-site audit.
- **Auditing:** our engineer observes the P&ID's on-site, walks through your plant, interviews key people and takes authorised pictures
- **Reporting:** based on the scoping call and the on-site visit, our engineer creates a comprehensive report that details the existing situation, identifies gaps with the ISO 20560 norm and global best practices and introduces our recommendations
- **Implementation:** quality products and expert placement are included in our partnership to implement pipe markers on-site.

Design your own pipe markers

To design your own ISO 20560 and other pipe markers, Brady offers the freely downloadable Brady Workstation app environment. Brady Workstation includes apps to easily design any pipe marker for printing with a Brady printer.

Once the free app environment has been downloaded, users can select the apps they need and activate a 30 day-free trial per app.

Try Brady Workstation!



Click or scan
the QR-code



Print your own pipe markers

Safety printers enable you to print durable pipe markers, safety signs and even safe work procedures on-site and on demand. On-site identification printing capabilities eliminate the need to store various pipe markers for future use. With a few consumables, you can print any pipe marker you need, when you need it.

Brady offers specialised thermal transfer and inkjet printers to create mono-, multi and full colour pipe markers and safety signs in various sizes with durable materials for both in- and outdoor use.

Discover our safety printers!



Click or scan
the QR-code





Annex

As an annex to our Pipe Identification Guide Book, we offer 3 practical reference lists:

- a list of national standardisation organisations where pipe marking standards can be purchased per country
- an example of the ISO 20560-compliant pipe markers Brady recommends using
- a pipe marker order checklist which includes a number of important options that can be considered before ordering

ISO 20560 and national pipe marker norms

Below is a list of national standardisation organisations and their websites. National pipe marking norms can be purchased from these official organisations. More national standard organisations can be found on the member page at www.iso.org.

Austria	OENORM www.austrian-standards.at	Lithuania	LST www.evsn.lt
Belgium	NBN www.nbn.be	Luxembourg	ILNAS portail-qualite.public.lu
Bulgaria	BDS www.bds-bg.org	Malta	MSA
Croatia	HZN www.hzn.hr	Netherlands	NEN www.nen.nl
Cyprus	CYS www.cys.org.cy	Norway	NS www.standard.no
Czech Republic	UNMZ www.unmz.cz	Poland	PKN www.pkn.pl
Denmark	DS www.ds.dk	Portugal	IPQ www.ipq.pt
Estonia	EVS www.evsn.ee	Slovakia	STN www.unms.sk
Finland	SFS www.sfs.fi	Slovenia	SIST http://www.sist.si
France	AFNOR www.afnor.fr	Spain	AENOR www.aenor.es
Germany	DIN www.din.de	Sweden	SS www.sis.se
Greece	ELOT www.elot.gr	Switzerland	SNV www.snv.ch
Hungary	MSZT www.mszt.hu	South Africa	SABS www.sabs.co.za
Iceland	IST	Turkey	TSE www.tse.org.tr
Ireland	NSAI www.nsai.ie	United Kingdom	BSI www.bsigroup.com
Italy	UNI www.uni.com	United States	ANSI www.ansi.org
Latvia	LVS www.samc.lv	International Maritime Organisation	IMO www.imo.org

ISO 20560 colour coding

Brady can supply any pipe marker you need, taking into account any regulations and company specifications regarding text, colour, symbols, size, layout and material. Below is an ISO 20560-compliant pipe marker colour coding.

Gases in either gaseous or liquefied conditions	Liquids and fixed materials	Acids	Alkalies	Firefighting equipment	Water	Air	Hazardous Substances
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Pipe marker order checklist

Order only the best pipe markers for your environment. Carefully consider the options below for maximum durability and return on investment. Contact Brady for more support.

Available materials:

	INDOOR adhesive	OUTDOOR adhesive	OUTDOOR+ adhesive
	B-7543P (no laminate)	B-7541P* (clear laminate)	B-7529P (UV-blocking laminate)
Outdoor durability	1 year	3-5 years	10 years
Chemical resistance	Medium	Excellent	Excellent
Abrasion resistance	Good	Excellent	Excellent
Service temperature	-40°C - 120°C	-40°C - 120°C	-40°C - 120°C
	INDOOR non-adhesive	OUTDOOR non-adhesive	OUTDOOR+ non-adhesive
	B-7560P (no laminate)	B-7561P (clear laminate)	B-7562P (UV-blocking laminate)
Outdoor durability	1 year	3-5 years	10 years
Chemical resistance	Medium	Excellent	Excellent
Abrasion resistance	Good	Excellent	Excellent
Service temperature	-40°C - 120°C	-40°C - 120°C	-40°C - 120°C

*UL approved and BS5609 certified

All colour codes available:

■ Standard Brady colours (PIT)	■ Norwegian standard NS813
■ ISO 20560	■ German Standard DIN 2403
■ American standard ASME A13.1	■ Swedish Standard SS741
■ British Standard BS1710/4800	■ Other : please provide the RAL/ Pantone colours
■ Marine ISO 14726	

Note: If you don't select a colour range we will deliver the pipe markers in Brady standard colours

Available formats:

- 360° visibility pipe markers on rolls (15m, 30m, 50m)
- Single pipe markers on sheets

Available formats:

- GHS symbols, substance name or CAS-number
- Warning symbol(s)
- Direction arrow(s)
- Proof needed

Quantity

Provide the number of pipe markers you need to receive a quote.

**We identify and protect people,
products and premises.**

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