

LD-SAFE

Laser Dismantling Environmental and Safety Assessment

FINAL DISSEMINATION PLAN

DELIVERABLE D6.6

Reference: CN-LD-SAFE-12584-DEL-146705-EN

Number of Pages: 41

Distributed to: European Commission, ONET Technologies, CEA, IRSN, Vysus Group, EQUANS, Westinghouse

A	28/06/2024	Initial Release
Revision	Date	Description of Changes
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This project has received funding from the Euratom research and training programme 2019-2020 under grant agreement No 94525

TABLE OF CONTENTS

	<u>Page</u>
1. INTRODUCTION	3
2. REFERENCES	4
3. ACRONYMS.....	4
4. DISSEMINATION AND COMMUNICATION STRATEGY	5
4.1. Objectives.....	5
4.2. Topics subject to Dissemination	5
4.3. Target Audiences	6
4.4. Methodology.....	6
4.5. Roles and Responsibilities.....	7
5. DISSEMINATION AND COMMUNICATION METHODS.....	9
5.1. Visual Identity	9
5.2. Website	9
5.3. Social Networks.....	12
5.4. Organization of Technical Workshops	13
5.5. Participation in Events and Conferences	14
5.6. Publications and Dissemination Materials.....	15
5.7. Education and Training Program.....	16
5.8. Advisory Board: Expert Group, End User Group, and Support Group	16
6. ACTION PLAN	17
7. MONITORING, EVALUATION, AND STATUS	17
8. ANNEXES	20
ANNEX I – ACTION PLAN	21
ANNEX II – DISSEMINATION MATERIAL	22
ANNEX III – BRAND BOOK	25

1. INTRODUCTION

The Laser Dismantling Environmental and Safety Assessment (LD-SAFE) project aims to validate the laser cutting technology for the dismantling of most challenging components of Nuclear Power Plants (NPPs) in air and underwater, and thus, removing the last barriers for its implementation in decommissioning projects. For its success, dissemination of results is considered a key element.

For this purpose, Work Package 6 (WP6) of the project is dedicated to dissemination, exploitation, education, and training activities, and thus, aimed at generating an impact within and beyond the Consortium, and during and after the project finalization. As per the European Commission Horizon 2020, dissemination consists of sharing research results with potential users-peers of the research community, industry, and other commercial players and policymakers, and so, contributing to the progress of science in general, whereas exploitation consists of using the results for commercial purposes or in public policymaking. As such, there is usually a certain overlap between dissemination, exploitation, and communication, especially for close-to-market projects. In other words, WP6 is the link between the project and industrial and research communities, ensuring that the project is widely known, making links between on-going research initiatives, exploring, and assessing emerging application areas, and setting the foundations for further potential commercial exploitation and opportunities with End Users.

This document details the dissemination activities carried out during the project, by updating and detailing the plan contained within the LD-SAFE Proposal [Ref. 1]. For this purpose, this document outlines the dissemination strategy, by defining the following:

- Dissemination objectives, that is, the mission behind the dissemination plan.
- Dissemination topics: what is to be disseminated.
- Target audience: to who are subjects and topics to be disseminated.
- Dissemination methods: how are subjects and topics to be disseminated.
- Schedule of planned actions: when are subjects and topics to be disseminated.
- Allocation of dissemination responsibilities: who is responsible of dissemination actions.

This document represents the final version of the dissemination plan, which is submitted at the end of the project (month 48). Previous dissemination plans (D6.2, Plans for dissemination of the results) were submitted and revised in a yearly basis (months 12, 24, and 36).

Additionally, the dissemination plan was complemented by the plans for exploitation of results developed under WP6.

2. REFERENCES

- [Ref. 1] LD-SAFE Consortium, 2019. Proposal ID 945255, Laser Dismantling Environmental and Safety Assessment. Horizon 2020 European Union Program.
- [Ref. 2] LD-SAFE Consortium, 2024. D6.9: Data Management Plan.
- [Ref. 3] LD-SAFE Consortium, 2023. D6.2: Plans for dissemination of the results.
- [Ref. 4] LD-SAFE Consortium, 2023. D6.3: Plans for exploitation of the results.

3. ACRONYMS

CEA	Commissariat à l’Energie Atomique et aux Energies Alternatives
EQ	EQUANS
IRSN	Institut de Radioprotection et de Sûreté Nucléaire
LD-SAFE	Laser Dismantling Environmental and Safety Assessment
N/A	Non-Applicable
NPPs	Nuclear Power Plants
OT	Onet Technologies
R&D	Research & Development
RTOS	Research and Technology Organizations
SME	Subject Matter Experts
VG	Vysus Group
WEC	Westinghouse Electric Company
WP	Work Package

4. DISSEMINATION AND COMMUNICATION STRATEGY

4.1. Objectives

The objective of dissemination activities is to transfer knowledge and results arising from the project to selected target audiences (refer to section 4.2). Additionally, communication and engagement with target audiences is essential throughout the project, and thus, obtaining relevant feedback to align the project outcomes to the expectations of interested parties.

As an epitome, dissemination and communication activities aim to reach out to society and show the impact and benefits of LD-SAFE project, and thus, turning the LD-SAFE project new knowledge into a socio-economic viable and sustainable innovation.

This was achieved by focusing dissemination activities on the following partial objectives:

- Raising public awareness about the LD-SAFE Project and associated outcomes, managing dissemination efforts and methods based on target audience and desired impact.
- Exchanging results with the research community and the industry in the decommissioning and nuclear fields, in order to obtain synergies and avoiding duplication of efforts, thus, working towards research efficiency and maximizing its potential.
- Disseminating the results and expertise acquired during the LD-SAFE Project.
- Serving as a base for the successful exploitation of results.
- Maximizing the potential for success of the objectives of the LD-SAFE Project itself.

4.2. Topics subject to Dissemination

Subjects and topics subject to dissemination varied throughout the LD-SAFE Project:

- During the initial phase, months 0 to 12, the efforts were focused on raising awareness of the LD-SAFE Project itself by disseminating its objectives and milestones, as well as the methodology that was followed during the project and associated tasks. In this phase, the dissemination strategy aimed at creating the base of audience in relevant target groups for ensuring project outcomes are aligned to their expectative, as for which the Advisory Board played a key role.
- During the intermediate phase, months 13 to 40, the dissemination efforts were gradually shifting to the outcomes that were obtained in different stages and activities of the project.
- During the project finalization phase, months 41 to 48, the dissemination efforts were focused on the main outcomes of the LD-SAFE Project, transferring knowledge and setting the base of further research and exploitation of results. Dissemination efforts increased in this stage, by combining all dissemination methods, including an education and training program.

4.3. Target Audiences

The plans for dissemination of results were focused on specific target audiences, for which specific methods and indicators were used. For this purpose, target groups were defined based on their potential to create synergies towards common research goals, and which stakeholders may benefit the most from the project outcomes. In this regard, three target groups were considered:

- Industry and Subject Matter Experts (SME) in the nuclear and decommissioning fields.
- Research Community specialized in nuclear, decommissioning of NPPs and cross-sectional topics.
- Other stakeholders, such as policy makers, public agencies, and the public in general.

Other Horizon 2020 programs from the European Commission were specially considered within target audiences, because of their potential for creating relevant synergies regarding dismantling activities. The LD-SAFE project sought and worked towards creating strong connections with INNO4GRAPH, PLEIADES, SHARE, CLEANDEM, INSIDER, and other related H2020 projects.

Additionally, the Advisory Board was created to join relevant members of target audiences by setting the Expert Group, End User Group, and Support Group (refer to section 5.9 for further information).

4.4. Methodology

The methodology for dissemination of results was based on the combined use of different methods (refer to section 5), as to increase the impact on target audiences. Dissemination and communication were performed continuously throughout the project (refer to section 6 for schedule of performed actions) and the dissemination actions were monitored and evaluated against predefined targets (refer to section 7). Based on the indications, additional actions were taken to increase the impact on target audiences as needed.

The following figure synthetizes the dissemination methodology:

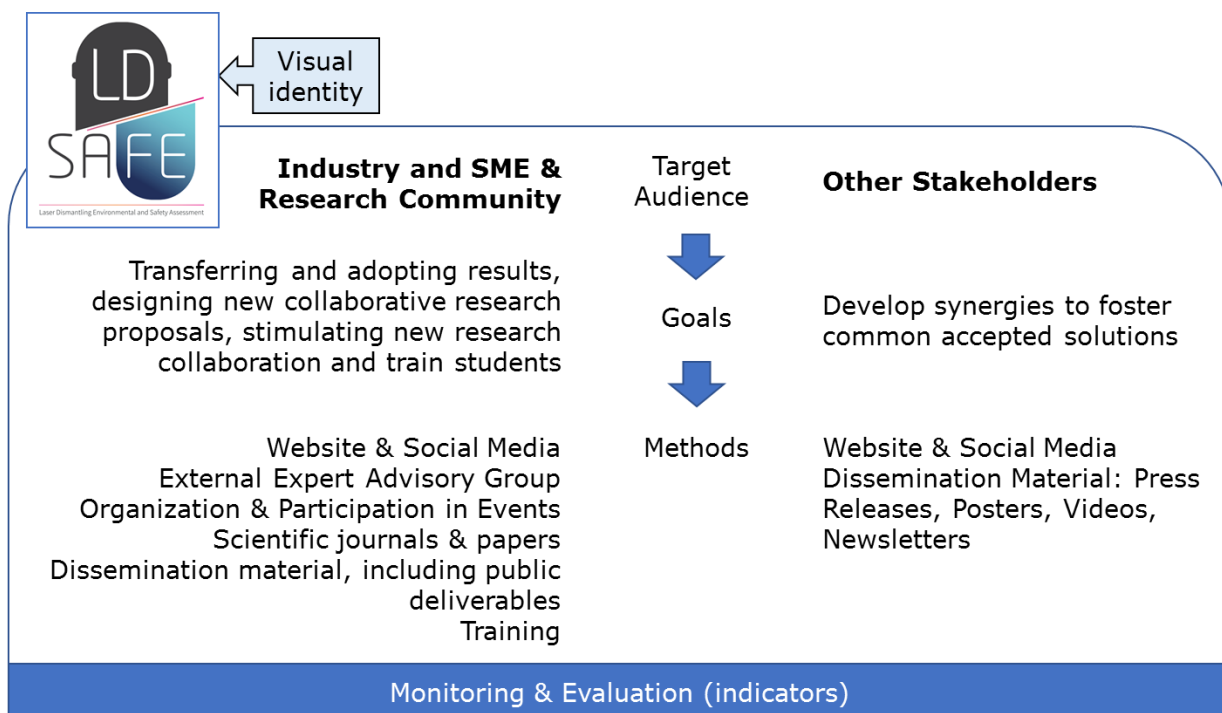


Figure 4.1. Dissemination Plan Overview

4.5. Roles and Responsibilities

The main roles and responsibilities of the Consortium members in regards of dissemination activities are summarized in Table 4.1.

Table 4.1. Roles and Responsibilities for Dissemination Activities

Dissemination Actions	OT	CEA	EQ	VG	WEC	IRSN
Dissemination Plan & Monitoring					R	
Visual Identity					R	
Website					R	
Social Networks					R	
Organization of Events	R					
Participation in Events	R	R	R	R	R	R
Flyer & Poster					R	
Press Releases	R					
Videos					R	
Newsletters					R	
Scientific Publications	All partners contributing to the dissemination action					
Deliverables	All partners contributing to the dissemination action					
Training					R	

R= Main responsible for the action

In addition to the main responsible for the action, the rest of Consortium partners contributed to the dissemination plan by seeking opportunities to disseminate project results through dissemination and communication methods, as well as creating scientific materials and acting as technical experts for defining the training program.

5. DISSEMINATION AND COMMUNICATION METHODS

Dissemination and communication methods were adjusted based on target audiences and desired results, adapting the strategy based on actual results. The following subsections describe the methods considered as dissemination and communication channels to promote the project and work towards its success. One-way communication and interpersonal two-way communication methods were used based on the intended goals.

Dissemination and access rights to the results were defined in the Consortium Agreement and are detailed in the LD-SAFE Project deliverable D6.9, Data Management Plan [Ref. 2].

5.1. Visual Identity

Creating a distinctive visual identity of the project is essential for dissemination and communication activities. Thus, branding of the project was performed during the first months of the LD-SAFE project, by completing the following:

- Brand book, defining the logo and distinctive typography and colors, as well as to provide examples of graphic resources and stationery designs (refer to Annex III).
- Report, Presentation and Letter Templates to be used by the Consortium. The templates were continuously revised and adapted throughout the project as necessary (i.e., change of partners logos).

5.2. Website

General public awareness about the project activities was increased with a public web site in English (<https://ldsafe.eu>), which was available and widely disseminated in Month 5. The website contains the following:

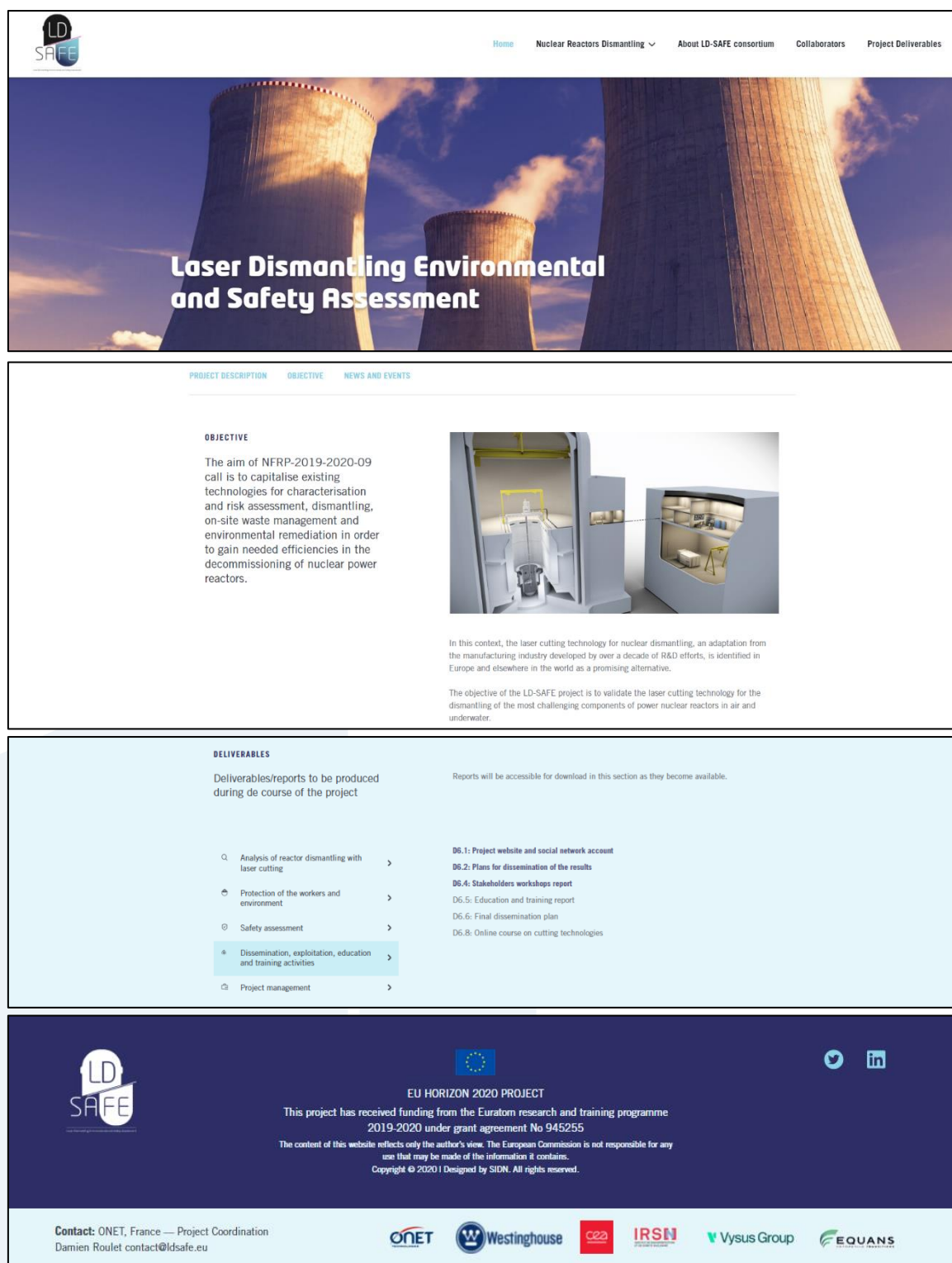
- Information about the LD-SAFE project main aspects, including objectives and milestones.
- Area for downloading public deliverables as they become available.
- Area with relevant news about the project or related to it, including LD-SAFE press releases, newsletters, and potential posters or scientific papers.
- Area with information of the Consortium and associated contact details.
- Area with information about the LD-SAFE project collaborators (Advisory Board), including End User Group, Expert Group, and Support Group members.
- Link to social networks project accounts.

The website was designed considering the following:

- Visual impact: colors and photos were selected based on the project visual identify and with the aim to create an attractive visual impact.
- Verbal communication: simple wording was selected as to engage a wide range of audience.
- User friendly: easy-to-browse webpage, with short and relevant messages, and with links to publications, social networks, etc.
- Updates and monitoring: the webpage was designed as to allow regular updates (including deliverables and news) and included a tool to monitor the visits and associated statistics.

The website was monitored throughout the project duration with detailed analytics, including number of website visits and deliverables download. Traffic monitoring also served for assessing impact on other dissemination campaigns (social networks, workshops, press releases...). As an indicator, the minimum target value at the end of the project was to obtain at least 500 website single visits. Each Consortium member may support dissemination actions through their organization websites.

The LD-SAFE project website will be maintained 3 years after the project end for supporting the project impacts.



The image displays the LD-SAFE project website, which is structured as follows:

- Header:** Features the LD-SAFE logo and navigation links: Home, Nuclear Reactors Dismantling, About LD-SAFE consortium, Collaborators, and Project Deliverables.
- Hero Section:** A large image of nuclear cooling towers with the title "Laser Dismantling Environmental and Safety Assessment".
- Project Description:** Includes a navigation bar with "PROJECT DESCRIPTION", "OBJECTIVE", and "NEWS AND EVENTS".
 - OBJECTIVE:** States the aim of NFRP-2019-2020-09 call is to capitalise existing technologies for characterisation and risk assessment, dismantling, on-site waste management and environmental remediation in order to gain needed efficiencies in the decommissioning of nuclear power reactors. It includes an image of a laser cutting process and text explaining the technology's adaptation from manufacturing and its identification in Europe and elsewhere as a promising alternative. It also states the project's objective to validate the laser cutting technology for dismantling the most challenging components of power nuclear reactors in air and underwater.
- Deliverables:** A section titled "DELIVERABLES" with a list of deliverables/reports to be produced during the course of the project. The list includes:
 - Analysis of reactor dismantling with laser cutting
 - Protection of the workers and environment
 - Safety assessment
 - Dissemination, exploitation, education and training activities (highlighted)
 - Project management
 A note states: "Reports will be accessible for download in this section as they become available."
- Footer:** Features the LD-SAFE logo, the EU Horizon 2020 Project logo, and text stating: "This project has received funding from the Euratom research and training programme 2019-2020 under grant agreement No 945255. The content of this website reflects only the author's view. The European Commission is not responsible for any use that may be made of the information it contains. Copyright © 2020 | Designed by SIDN. All rights reserved." It also includes social media icons for Twitter and LinkedIn.
- Contact:** A section at the bottom left provides contact information: "Contact: ONET, France — Project Coordination Damien Roulet contact@ldsaf.eu".

Figure 5.1. LD-SAFE Project Website Images

5.3. Social Networks

Professional social network accounts were set-up in order to maximize the visibility of the published results and partners organization/participation in international events.

The following accounts were available since Month 5:

- LinkedIn Page: LD-SAFE Project
- Twitter account: @ld_safe

The following indicators/targets were set as objectives for the end of the project:

- At least 300 followers (LinkedIn or Twitter)
- At least 36 updates (LinkedIn or Twitter)

Social network campaigns were coordinated within the Consortium, and social networks of each member were also used to increase the dissemination impact.

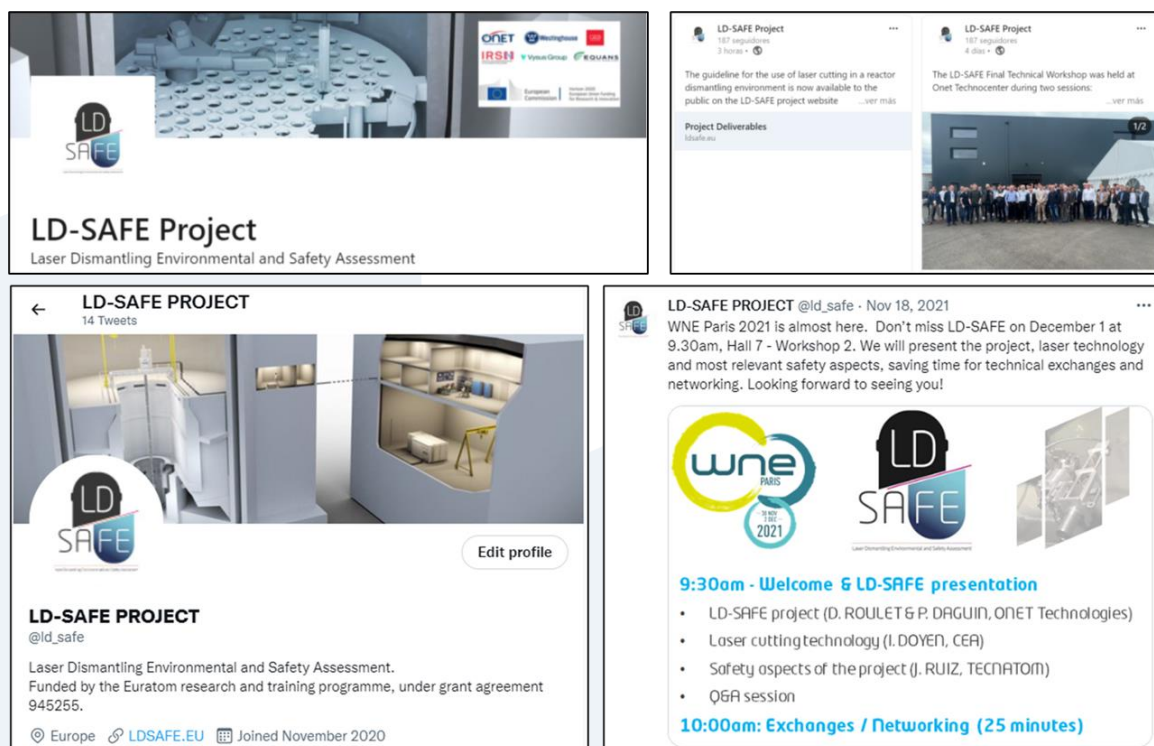


Figure 5.2. LD-SAFE Project Twitter and LinkedIn Accounts

5.4. Organization of Technical Workshops

The organization of two technical workshops was envisaged in the LD-SAFE Proposal. While the first technical workshop aimed at presenting the project to the stakeholders and sharing views with them about the use of laser cutting for reactor dismantling, the second technical workshop aimed at disseminating the results of the project both to industry, academics and Research and Technology Organizations (RTOs). The table below summarizes the objectives and target audiences of the workshops:

Table 5.1. LD-SAFE Technical Workshops

Workshop	Location	Objectives / Topics	Target Audience
Workshop 1 M3, 2 days	Day 1, OT headquarters	Presentation of the LD-SAFE project. Invitation to express interest to be part of the End User Group.	Open workshop for scientists, professionals from the nuclear industry, and safety authorities.
	Day 2, OT headquarters	Sharing expert views on the requirements for power reactor dismantling with laser cutting. Questionnaires to the End User Group.	End User Group (confirmed members) and technical experts in the field of safety and power reactor dismantling.
Workshop 2 M45, 2 days	Day 1, OT headquarters	Presentation of LD-SAFE results followed by a visit of the demonstrator (underwater)	End User Group (final) and technical experts in the field of safety and power reactor dismantling.
	Day 2, OT headquarters	Scientific thematic work sessions followed by a visit of the demonstrator (underwater).	Academics and Research and Technology Organizations (students, post-graduate scientists, engineers, and researchers).

Due to COVID-19 restrictions, the first technical workshop was organized in three phases/events:

- First Technical Workshop (webinar, by videoconference) on the 9th of December of 2020, covering the same topics and target audience. The Webinar presented the objectives and milestones of the project and shared views with the End User Group and Expert Group, through interactive polls and questions/answers. A questionnaire was also shared with the End User Group, which was fully completed by the 12 members of the End User Group (100%).

As a result, the objectives set for the workshop were successfully achieved. However, additional events were scheduled for providing the opportunity for face-to-face exchanges and further discussions of the project, as detailed below.

- LD-SAFE Public Workshop in WNE 2021 (Paris, France), on the 1st of December of 2021.

- Presentations of the different Work Packages (mainly WP2 to WP5) in two videoconference sessions with relevant stakeholders, in March 2022.

The second (Final) Technical Workshop was held in Onet Technocenter at the end of May of 2024, in two days as initially planned (the 30th and 31st of May 2024). The commitment of the stakeholders to participate to the second workshop was an important milestone of the project and is a measure of its success. A target of 100 participants in the workshop was set, and it was clearly reached with approximately 70 participants per day.

5.5. Participation in Events and Conferences

Participation in international and national events by Consortium members was also a dissemination and communication method for the LD-SAFE project.

The participation of events in 2020 and beginning of 2021 was limited due to COVID-19 restrictions, which caused the cancelation of many of them. After that, LD-SAFE intensified its participation on events, being actively present in the following:

- SFEN DEM 2021, in Avignon (France) - September 15, 2021
- Spanish Nuclear Society 2021, in Granada (Spain) - October 6, 2021
- ICOND 2021, in Aachen (Germany) - October 18, 2021
- BASE symposium - SafeND, in Berlin (Germany) - Nov. 12, 2021
- WNE 2021, in Paris (France) - Dec.1, 2021.
- FISA 2022 - Common presentation on several H2020 projects, in Lyon (France) - June 1, 2022
- Spanish Nuclear Society 2022, in Cartagena (Spain) - September 28-30, 2022
- NEA workshop - Innovative Techniques and Technologies to support Decommissioning of Complex and Legacy Sites, in Paris (France) - December 1, 2022
- WM2023 - D&D of Nuclear Power Plants, in Phoenix (United States of America) - March 1, 2023
- IAEA - DECOM 2023 - EURATOM activities on the decommissioning of nuclear facilities, in Vienna (Austria) - May 16, 2023
- Spanish Radiation Protection Annual Event of 2023, in Oviedo (Spain) - May 25, 2023
- ICEM 2023, ASME 2023 International Conference on Environmental Remediation and Radioactive Waste Management, in Stuttgart (Germany) - October 3-6, 2023.
- SFEN DEM 2024, International Conference on Decommissioning Challenges: Role and importance of innovations, in Avignon (France) - May 27-29, 2024.

5.6. Publications and Dissemination Materials

Publications and dissemination materials were created throughout the project in order to reach all target audiences. The following was planned:

- Flyer and Poster for disseminating project objectives and milestones. This material was available so Consortium members could use it in events or as considered necessary (refer to Annex II).
- Press Releases. The first press release was disseminated in Month 12, a second in Month 24, a third in Month 36, and the last press release in Month 48.
- Videos used on the website, social networks, or events. For their public dissemination, a LD-SAFE YouTube channel was created. Videos were disseminated in Month 12 and 24 (Figure 5.3), and the final project video in Month 48.
- Newsletters were released approximately twice a year, being a tool for maintaining stakeholders updated about the project progress and relevant news. Six newsletters were submitted to the End User Group (October 2021, April and November 2022, June 2023, and January and June 2024).
- Scientific publications in relevant journals (i.e., Journal of Nuclear Materials, Nuclear Engineering and Design; Fusion Engineering and Design, etc.), and to update the IAEA Wiki, as relevant project results become available. The technical, professional, and scientific publications produced by the project will be open accessed in order to be compliant with the general principle of the Horizon 2020 funding programs, as defined in D6.9, Data Management Plan [Ref. 2]. The links to other research and innovations activities, as described in the LD-SAFE Proposal [Ref. 1] were considered.
- Deliverables, either public or shared with the Expert and/or End User Groups (as defined for each document) will serve to disseminate project results. The website is used to share public deliverables.
- Other dissemination publications¹ to increase awareness of the LD-SAFE project, as the papers submitted for different conferences (refer to section 7 for publication details).

Indicators and targets are set for dissemination and communication materials, as described in section 7.

¹ LD-SAFE project information was provided to CORDIS, SNETP, IRSN (and associated ETSON network, European Technical Safety Organisations Network) and IGNALINA PPP:

- <https://cordis.europa.eu/project/id/945255>
- <https://snetp.eu/portfolio-items/ld-safe/>
- <http://www.etsn.eu/node/109>
- <https://www.iae.it/en/news/press-releases/finding-the-best-solutions-for-reactors-dismantling/643>
- IRSN Newsletter ("Updates 65")

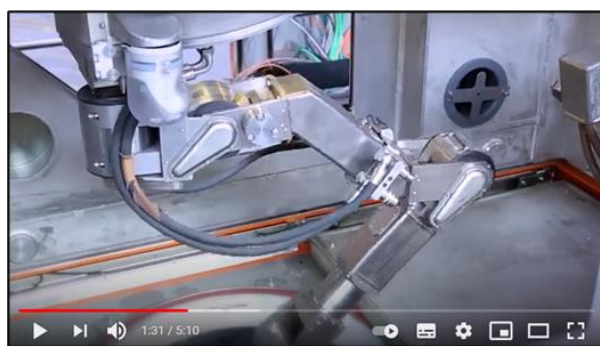


Figure 5.3. LD-SAFE Project Video

5.7. Education and Training Program

Education and training programs were organized for students, workers, and researchers to reach best practices and knowledge of technologies in decommissioning of nuclear facilities. Such activities will be supported and disseminated by Research & Development (R&D) and academic partners.

An online course was developed to provide the attendants with knowledge about the latest cutting technologies for dismantling. Additionally, a training session was done in the Final Technical Workshop. 25 participants per session was set as a target/indicator of this dissemination method.

The course is publicly available in an online platform for increasing its visibility and impact. The course will also be proposed to the ELINDER program for a wide dissemination.

5.8. Advisory Board: Expert Group, End User Group, and Support Group

The formation of the Advisory Board is an essential aspect for ensuring that communication and engagement with target audiences was achieved throughout the project, and thus, obtaining relevant feedback to align the project outcomes to the expectations of interested parties.

The composition of the Advisory Board was the following:

- End User Group, consisting of dismantling operators and contractors, research & technology organizations and technical safety organizations interested in the results of the project. It was

composed of 12 members: ENGIE, Ignalina NPP, SCK-CEN, LEI, JAEA, Bel V, Belgoprocess, KTE, EDF (DP2D), GRAPHITECH, SOGIN, and DSRL.

- **Expert Group**, consisting of experts on laser safety, conventional cutting techniques for dismantling of reactor pressure vessels and internals, nuclear safety, and dismantling project management. It was composed of 4 members: GRS (one nuclear safety expert), PYLA-ALPHANOV (one laser safety expert), EDF (DP2D) (one expert of conventional cutting techniques used for RPV and RVI dismantling), and DSRL (one dismantling project management expert).
- **Support Group**, consisting on groups with activities whose inputs or outputs are connect to LD-SAFE objectives. It was composed of 5 members: JEPIC, EPRI, European Commission, VTT, and BASE.

6. ACTION PLAN

The schedule of implemented actions, together with the main responsible Consortium Member for its implementation is included in Annex I. Further information about allocation of responsibilities can be found in the LD-SAFE proposal [Ref. 1].

7. MONITORING, EVALUATION, AND STATUS

The dissemination plan and associated activities was monitored and updated constantly. Targets/indicators were set to evaluate dissemination progress and effectiveness, and actions were taken in case dissemination needed to be strengthened. The information is synthetized in Table 7.1.

Table 7.1. Dissemination Indicators and Progress Evaluation

Dissemination Method	Main Target Audience	Target	Progress		Additional Actions / Observations
			Value	%	
Website	All	500 Single Visits	605 ²	121%	Continuous update of website content (deliverables/news) was made. Further visits are expected even after project completion, since final project results are available.

² Monitoring started on February 1st, 2021. In October 2023 the monitoring platform from the provider was modified, so the single visits are counted in two periods: 412 (February 2021 - September 2023) + 193 (October 2023 - June 2024).

Dissemination Method	Main Target Audience	Target	Progress		Additional Actions / Observations
			Value	%	
Twitter / LinkedIn ³	All	300 followers (appr. 100/year)	188	63%	Continuous updates of social media were made. Additional dissemination campaigns were implemented from LD-SAFE project and Consortium members Twitter and LinkedIn accounts to increase the number of followers. Followers' distribution (Twitter vs. LinkedIn) may be linked to the profile of target audience, so only the maximum value of both social networks was considered relevant (in this case, LinkedIn followers). Indicator was below initial target, but dissemination overall objectives are considered well achieved as, among others, the number of participants in the Final Technical Workshop.
Twitter / LinkedIn	All	36 Updates	39	108%	Additional actions are not considered necessary at this stage. Further updates will be performed as project results become available
1 st Workshop	Industry & SME, Research Community	100 participants	100	100%	Approximate numbers of participants, including speakers for the three events performed in compensation of 1 st Workshop (Covid restrictions): - First Webinar (Dec.2020): 40. - WNE2021 (public session, Dec.2021): 40. - WP videoconferences sessions (Mar.2022): 20.
2 nd Workshop	Industry & SME, Research Community	100 participants	140	140%	Approximate numbers of participants, including speakers for the two days.

³ The maximum value of Twitter or LinkedIn will be considered for followers and updates indicators, as it better reflects the dissemination impact through social networks.

Dissemination Method	Main Target Audience	Target	Progress		Additional Actions / Observations
			Value	%	
Publications in International Conferences	Industry & SME, Research Community	10 Publications	10 ⁴	100%	Additional actions are not considered necessary at this stage. Further publications will be performed as project results become available
Publications in International Journals	Industry & SME, Research Community	5 Publications	1 ⁵	20%	Further publications may be performed after project finalization, since most of project results became available in the last stage of the project (i.e. final laboratory tests and calculations, feedback from demonstrators).
Online Course	Industry & SME, Research Community	25 participants	70	280%	<p>The course was released at the end of the project, so it is not possible to measure the progress based on the online course participants. The indicator is measured with the participants of the training course delivered in the 2nd day of the Technical Workshop.</p> <p>The online course will continue to be publicly available after project finalization, allowing further project results dissemination.</p>

⁴ LD-SAFE abstracts:

- "Development of New DGDs' Technologies" for SFEN conference (DEM 2021), Sept.21.
- "LD-SAFE Project, Laser Cutting of Reactor Vessel and Internals" for Spanish Nuclear Society annual event, Oct. 21.
- "LD-SAFE: Laser Dismantling Environmental and Safety Assessment" for BASE symposium, Nov.21.
- LD-SAFE Workshop Abstract for WNE 2021, Dec.21.
- "LD-SAFE project for laser cutting of vessels and internals. update of the safety assessment based on laboratory tests" for Spanish Nuclear Society annual event, Sept. 22.
- "LD-SAFE: Laser Cutting Demonstration for Nuclear Power Reactors Dismantling", for WM 2023, Mar.23.
- "LD-SAFE Project: Laser Dismantling Environmental And Safety Assessment. Laser Cutting Demonstration for Nuclear Power Reactors Dismantling" for DECOM 2023, May.23.
- "Laser cutting technology for nuclear power plant decommissioning. Advantages and associated risks", for Spanish Radiation Protection Society annual event, May.23.
- "LD-SAFE Project: Laser Dismantling Environmental and Safety Assessment. Laser Cutting Demonstration for Nuclear Power Reactors Dismantling" for ICEM 2023, Oct.23.
- "LD-SAFE: Laser Cutting Demonstration for Nuclear Power Reactor Dismantling" for DEM 2024, May.24.

⁵ LD-SAFE publications:

- "European collaborative efforts to achieve effective, safe, and cost-controlled dismantling of nuclear facilities" published in EPJ Nuclear Sci. Tech. Vol. 9, in a collaborative effort with other H2020 projects.



8. ANNEXES

Annex I - Action Plan

Annex II - Dissemination Material

Annex III - Brand Book

ANNEX I - ACTION PLAN

Table A-I.1. Action Plan

Materials	Main Resp.		Project Year 1										Project Year 2								Project Year 3						Project Year 4							
		1	2	3	4	5	6	...	9	...	12	...	15	...	20	21	...	24	...	27	...	33	...	36	...	41	42	47	48			
Website	WEC																																	
Social Networks	WEC																																	
Press Releases	OT																																	
Flyer	WEC																																	
Poster	WEC																																	
Videos	WEC																																	
Newsletters	WEC																																	
Workshops & Webinars	All																																	
Public Deliverables	All																																	
Scientific Publications	All																																	
Training Material	WEC																																	

Green: Action performed. Blue: Action planned.

ANNEX II - DISSEMINATION MATERIAL

This Annex includes the following dissemination material:

- LD-SAFE project poster (Figure A-II.1)
- LD-SAFE project flyer (Figure A-II.2)



Laser Dismantling Environmental and Safety Assessment (LD-SAFE) Project

July 2020-June 2024



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Introduction

LD-SAFE is a four-year European research and innovation project focused on the use of laser cutting technology for the dismantling of nuclear power reactors. It will demonstrate laser cutting capabilities meet key technical challenges in dismantling, assessing its environmental and safety impacts, and proving the economic advantages of its use.




What is to be achieved and How?

Objective 1: Demonstration of the capabilities of a versatile laser cutting solution to address key technical challenges in the decommissioning of large nuclear facilities.

Objective 2: Environmental and safety assessment of the implementation of laser cutting for nuclear reactor decommissioning.

Objective 3: Technical validation of the laser cutting prototype in operational environment.

Objective 4: Demonstration of the economic advantage of using the laser cutting technology for the forthcoming reactor decommissioning market.

Work Packages:

- ❖ **WP 1:** Analysis of the reactor dismantling with laser cutting.
- ❖ **WP 2:** Laboratory tests and calculations.
- ❖ **WP 3:** Protection of workers and environment.
- ❖ **WP 4:** Safety assessment.
- ❖ **WP 5:** Case studies and demonstrator.
- ❖ **WP 6:** Dissemination, exploitation, education and training activities.
- ❖ **WP 7:** Project Management.

- Laser beam residual power
- Secondary emissions: aerosols
- Hydrogen gas generation during underwater laser cutting
- Representative mock-ups
- Operation of the demonstrator
- Technology technical validation
- Final Workshop
- Training Course

Laser Cutting Advantages

- **Excellent cutting performance** on metallic/ceramic material with a cutting capability of up to 200mm in thickness.
- **Cleaner** than most of other thermal techniques, especially for dust & fumes.
- **Technique minimizing slag production** (secondary waste production).
- **Has been paired with a selection of manipulators** for various applications in nuclear decommissioning
- **Proven performance** and long life in highly radioactive environments.
- **Safe** during operation and maintenance (reliable & remotely operated).




Economical Impact

Nuclear facilities decommissioning costs around the globe will amount to at least EUR 90 billion by 2040, per international estimations. Segmenting the Reactor Pressure Vessel (RPV) and Internals (RVI) is particularly long and costly, and whose complexity often leads to project deviations. The ambition of the project is firstly to demonstrate the potential of **cost and time reduction** and better mastering of RPV and RVI dismantling by using laser cutting technologies. On this basis, the project will quantify the positive economic impact on the European Dismantling market of using laser cutting in order to support End Users in the decision of adopting the technology.

Consortium

LD-SAFE consortium is a strong partnership of leading industrial companies and European research centers with extensive track-records in dismantling of nuclear facilities, protection of people and the environment, safety assessment, and associated domains.

ONET TECHNOLOGIES - France 

EQUANS - Belgium 

CEA - France 

VYSUS GROUP - Sweden 

IRSN - France 

WESTINGHOUSE - Spain 










Horizon 2020
European Union funding
for Research & Innovation

This project has received funding from the Euratom research and training programme 2019-2020 under grant agreement No 945255

Figure A-II.1. LD-SAFE Project Poster



Laser Dismantling Environmental and Safety Assessment



LD-SAFE Consortium

Strong partnership of leading industrial companies and European research centers with extensive track-records in dismantling of nuclear facilities, protection of people and the environment, safety assessment, and associated domains.

ONET TECHNOLOGIES - France



EQUANS - Belgium



CEA - France



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IRSN - France



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LD-SAFE Project Coordinator

ONET TECHNOLOGIES, France.

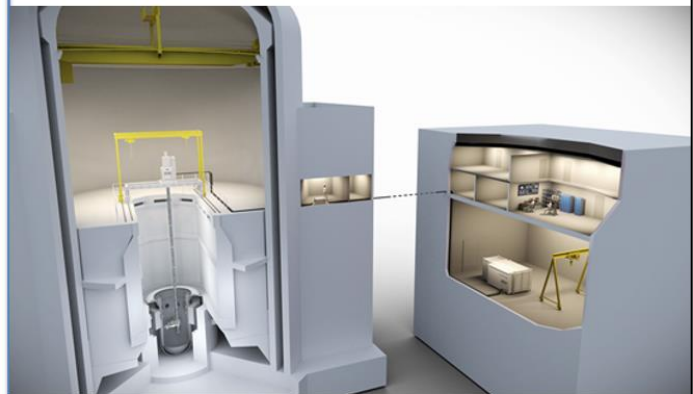
Damien ROULET: rouletd@onet.fr



Laser Dismantling Environmental and Safety Assessment

Laser Dismantling Environmental and Safety Assessment

July 2020 - June 2024



www.ldsafe.eu



@ld_safe



LD-SAFE Project

This project has received funding from the Euratom research and training programme 2014-2018, work programme 2019-2020 under grant agreement No 945255



European
Commission

Horizon 2020
European Union funding
for Research & Innovation

LD-SAFE

LD-SAFE is a four-year H2020 European research and innovation project focused on the use of laser cutting technology for the dismantling of nuclear power reactors.

The project aims to validate the laser cutting technology, in air and underwater, for the dismantling of the reactor pressure vessel (RPV) and internals (RVI).



What is to be achieved and How?



Objective 1: Demonstration of the capabilities of a versatile laser cutting solution to address key technical challenges in the decommissioning of large nuclear facilities.



Objective 2: Environmental and safety assessment of the implementation of laser cutting for nuclear reactor decommissioning.



Objective 3: Technical validation of the laser cutting prototype in operational environment.



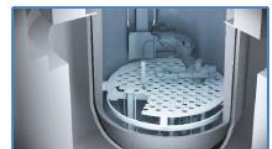
Objective 4: Demonstration of the economic advantage of using the laser cutting technology for the forthcoming reactor decommissioning market.

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Laser Cutting Advantages

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- **Has been paired with a selection of manipulators** for various applications in nuclear decommissioning.
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- **Safe** during operation and maintenance (reliable & remotely operated).



Economical Impact

According to international estimates, the costs of decommissioning nuclear facilities around the globe will amount to at least EUR 90 billion by 2040. For nuclear power reactors, the segmentation of the RPV and RVI is a particularly long and costly step, whose complexity often leads to project deviations.

The ambition of the project is firstly to demonstrate the potential of **cost and time reduction** and better mastering of RPV and RVI dismantling by using the laser cutting technologies.

On this basis, the project will then quantify the **positive economic impact** on the European Dismantling market of using laser cutting technologies in order to support decisions by the End Users to effectively adopt them.

Figure A-II.2. LD-SAFE Project Flyer



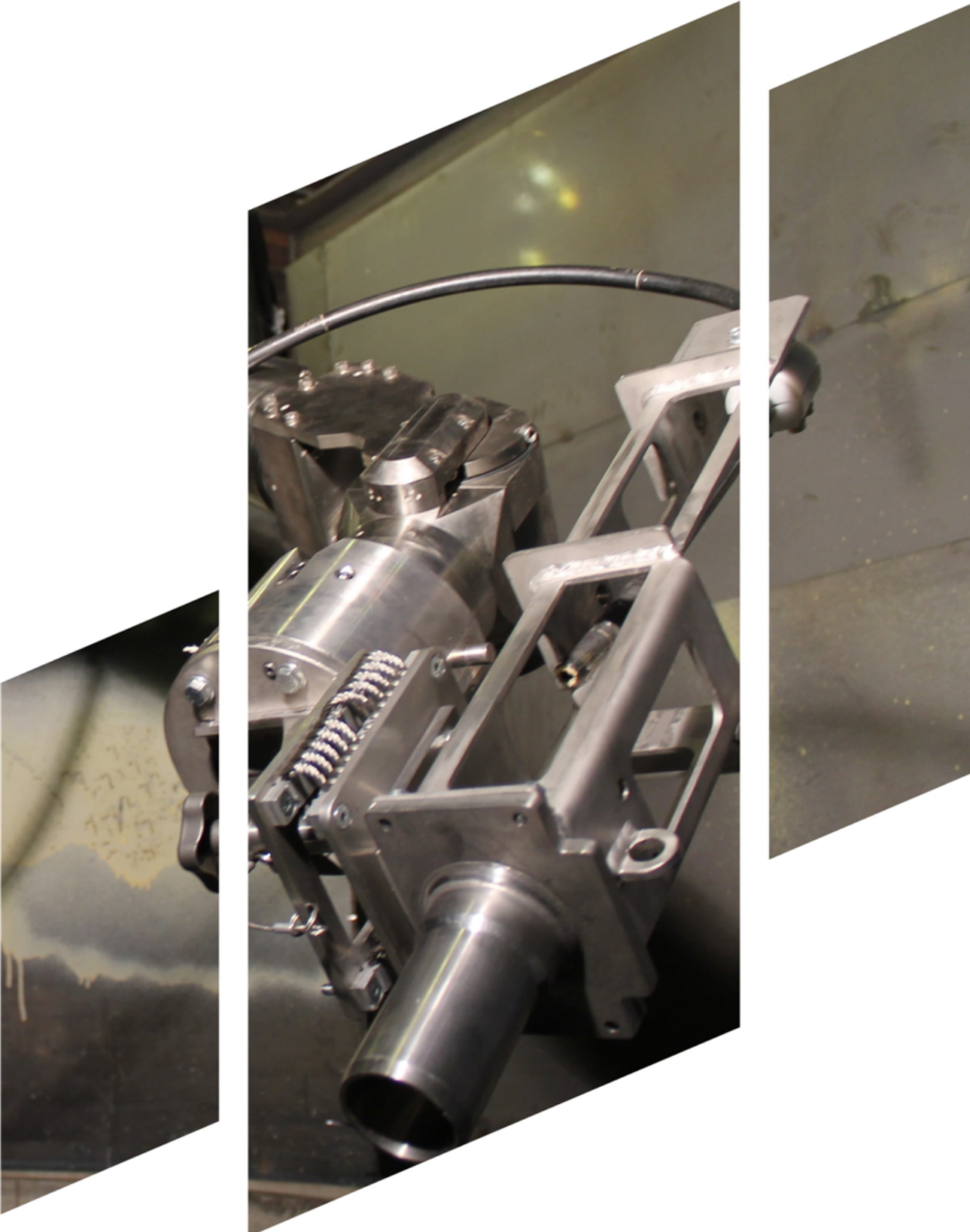
ANNEX III - BRAND BOOK

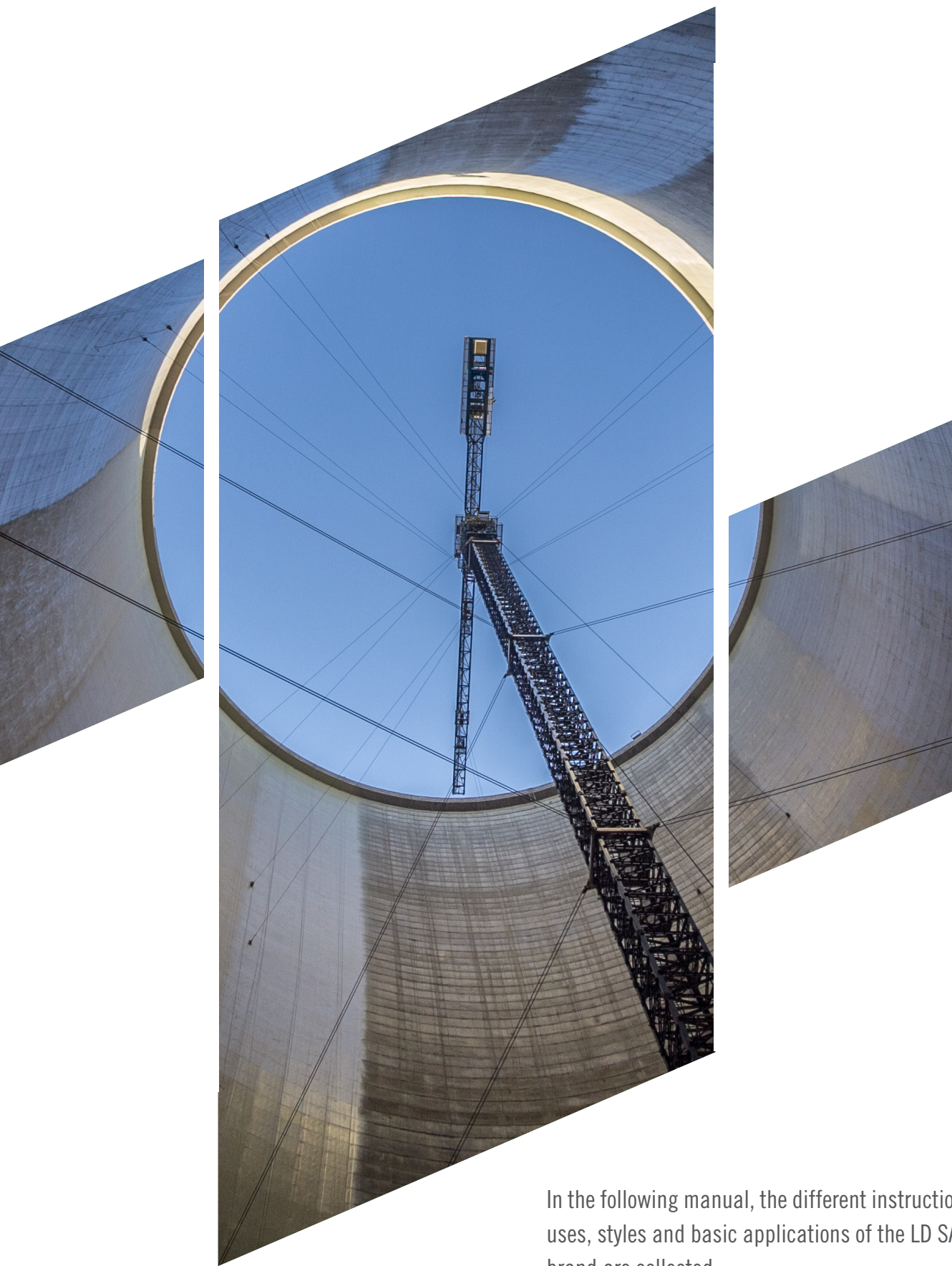
This Annex includes the last version of the LD-SAFE project Brand Book (16 pages).





Laser Dismantling Environmental and Safety Assessment





In the following manual, the different instructions, uses, styles and basic applications of the LD SAFE brand are collected.

Designed to facilitate the work process of all those responsible for using and interpreting the brand.

BRANDBOOK

- 01** THE BRAND
- 02** CORPORATE TIPOGRAPHY
- 03** CORPORATE COLOUR
- 04** GRAPHIC RESOURCES
- 05** CORPORATE STATIONARY



01
THE BRAND

The LD SAFE brand is made up of a series of elements: Naming (or logo), claim, isotype, typography and corporate colors.

Below we show a diagram of the main parts that the seal or brand includes:



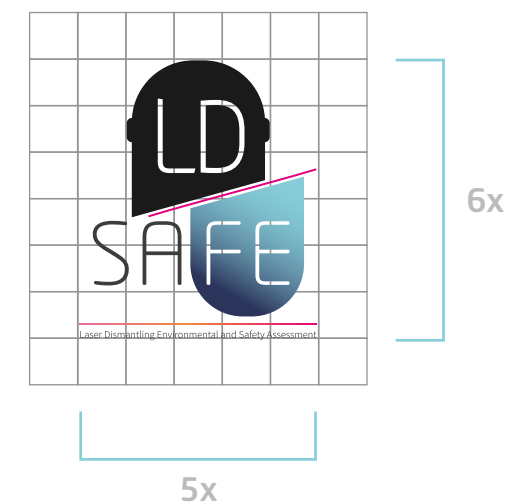
The LD SAFE brand is built into one on a modular surface 5x long by 6x high.

The value "x" constitutes the unit of measurements and by respecting it we achieve the perfect construction of the brand.

For the correct use and application of the brand, a reservation or security area of 1x is established, on which no type of graphic resource can be placed or added that could hinder the legibility and vision of the brand.

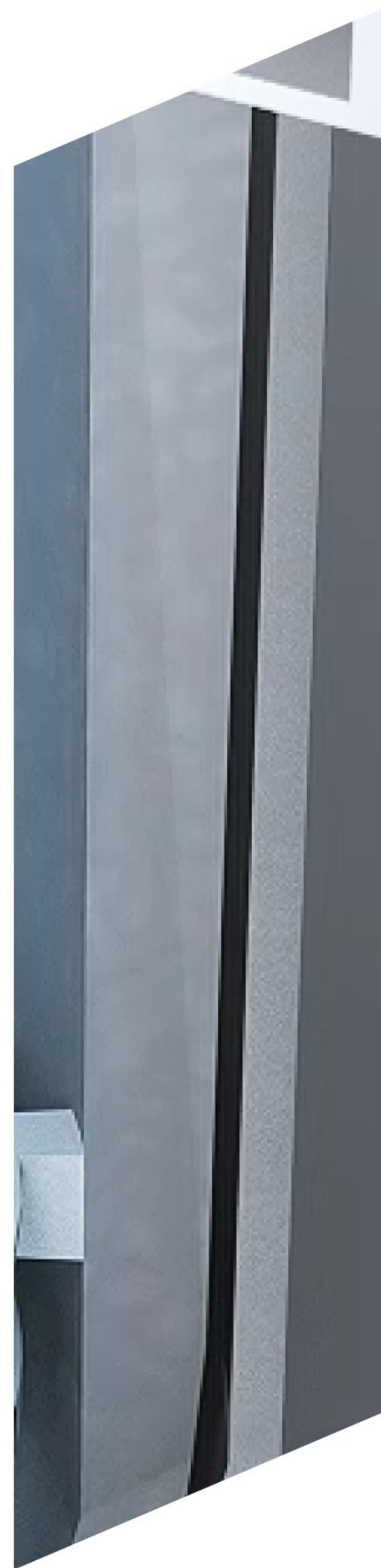
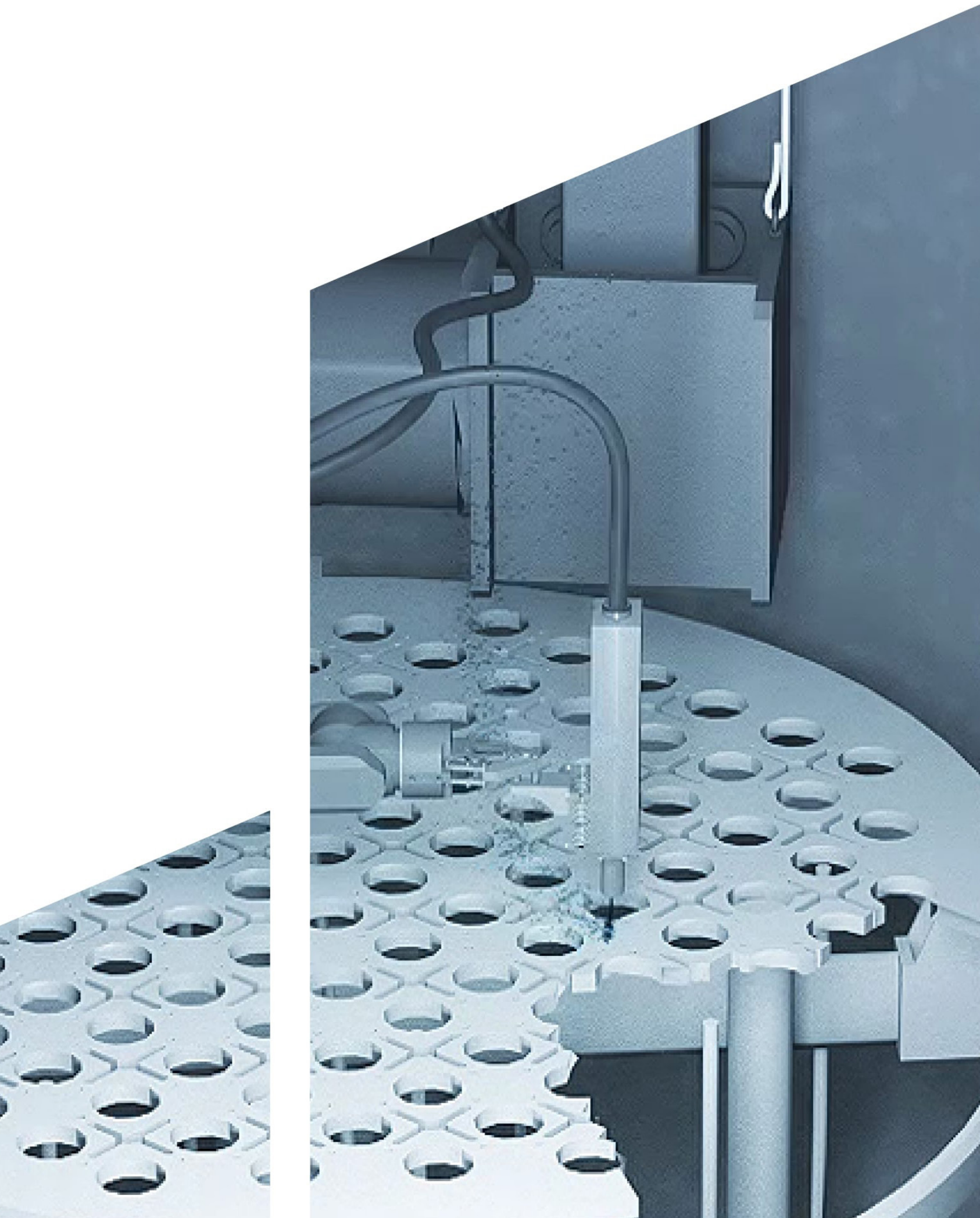
Here again, we use the value "X" as the unit of measure.

CONSTRUCTION



SECURITY AREA





02
TIPOGRAPHY

CORPORATE TIPOGRAPHY

NEO TECH STD (BOLD)

ABCDEFGHIJKLMNOPQRSTUVWXYZ
 abcdefghijklmnopqrstuvwxyz
 1234567890(!".\$%&/'=^*~Ç,.:;_)

NEO TECH STD (MEDIUM)

ABCDEFGHIJKLMNOPQRSTUVWXYZ
 abcdefghijklmnopqrstuvwxyz
 1234567890(!".\$%&/'=^*~Ç,.:;_)

NEO TECH STD (REGULAR)

ABCDEFGHIJKLMNOPQRSTUVWXYZ
 abcdefghijklmnopqrstuvwxyz
 1234567890(!".\$%&/'=^*~Ç,.:;_)

NEO TECH STD (LIGHT)

ABCDEFGHIJKLMNOPQRSTUVWXYZ
 abcdefghijklmnopqrstuvwxyz
 1234567890(!".\$%&/'=^*~Ç,.:;_)

SECONDARY TIPOGRAPHY

TRADE GOTHIC LT STD (BOLD)

ABCDEFGHIJKLMNOPQRSTUVWXYZ
 abcdefghijklmnopqrstuvwxyz
 1234567890(!".\$%&/'=^*~Ç,.:;_)

TRADE GOTHIC LT STD (REGULAR)

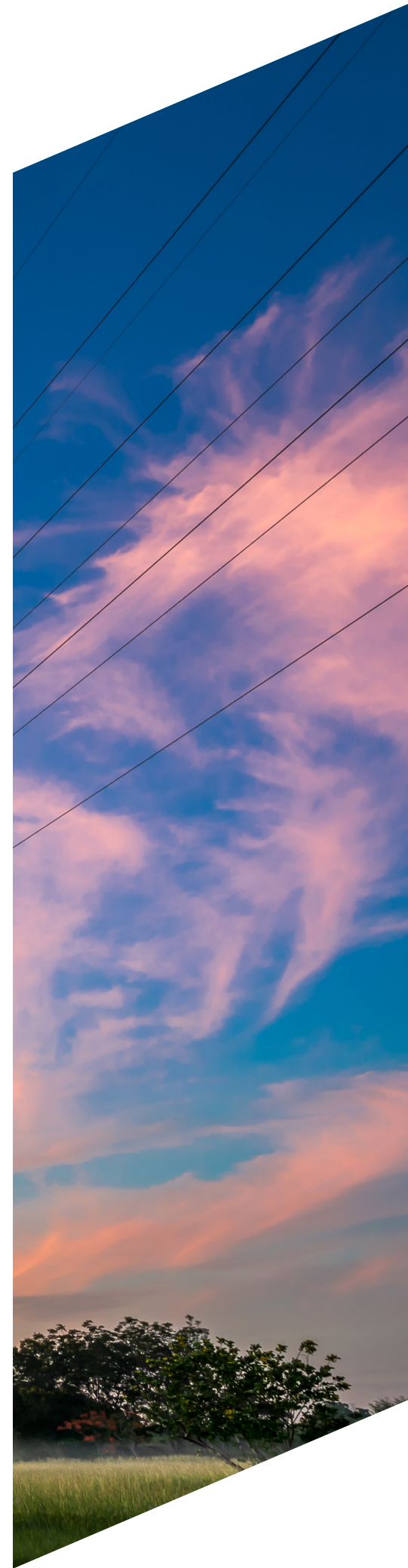
ABCDEFGHIJKLMNOPQRSTUVWXYZ
 abcdefghijklmnopqrstuvwxyz
 1234567890(!".\$%&/'=^*~Ç,.:;_)

TRADE GOTHIC LT STD (LIGHT)

ABCDEFGHIJKLMNOPQRSTUVWXYZ
 abcdefghijklmnopqrstuvwxyz
 1234567890(!".\$%&/'=^*~Ç,.:;_)

TRADE GOTHIC LT STD (CONDENSED)

ABCDEFGHIJKLMNOPQRSTUVWXYZ
 abcdefghijklmnopqrstuvwxyz
 1234567890(!".\$%&/'=^*~Ç,.:;_)



03 COLOURS

CORPORATE COLOURS



PANTONE 636 C

cmYk: 42 | 0 | 0 | 0
rgb: 139 | 211 | 230
hex: #8BD3E6



PANTONE 2038 C

cmYk: 0 | 72 | 1 | 0
rgb: 239 | 96 | 163
hex: #EF60A3



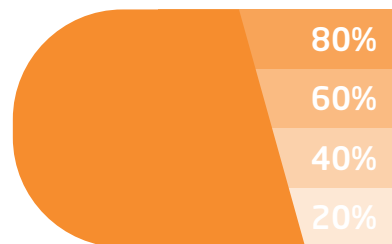
PANTONE 226 C

cmYk: 0 | 100 | 0 | 2
rgb: 208 | 0 | 112
hex: #D00070



PANTONE 2119 C

cmYk: 100 | 96 | 0 | 32
rgb: 44 | 46 | 101
hex: #2C2E65



PANTONE 715 C

cmYk: 0 | 50 | 93 | 0
rgb: 246 | 141 | 46
hex: #F68D2E



PANTONE BLACK 6 C

cmYk: 100 | 61 | 32 | 96
rgb: 16 | 24 | 32
hex: #101820

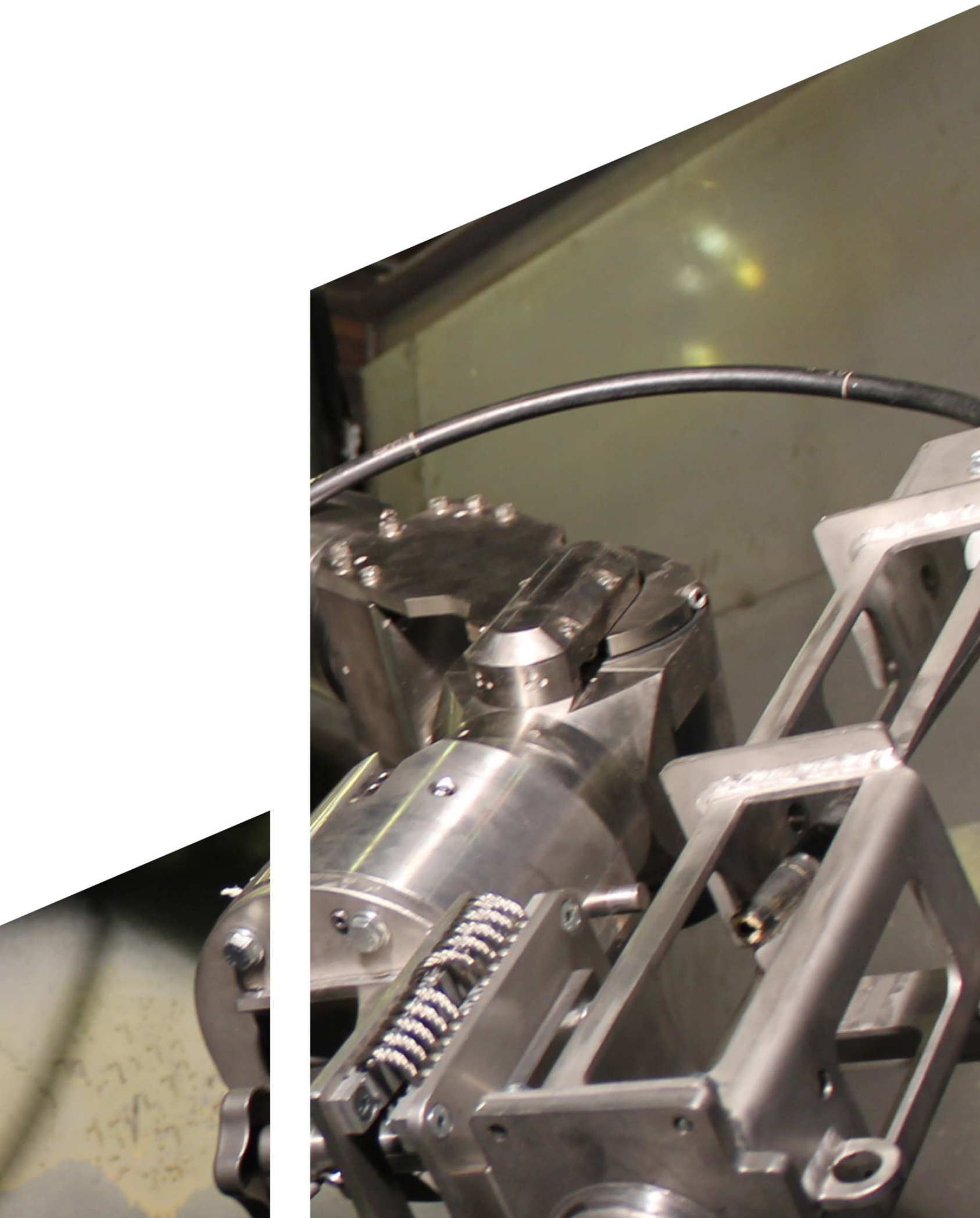
COLOUR VERSIONS

OFFICIAL VERSIONS

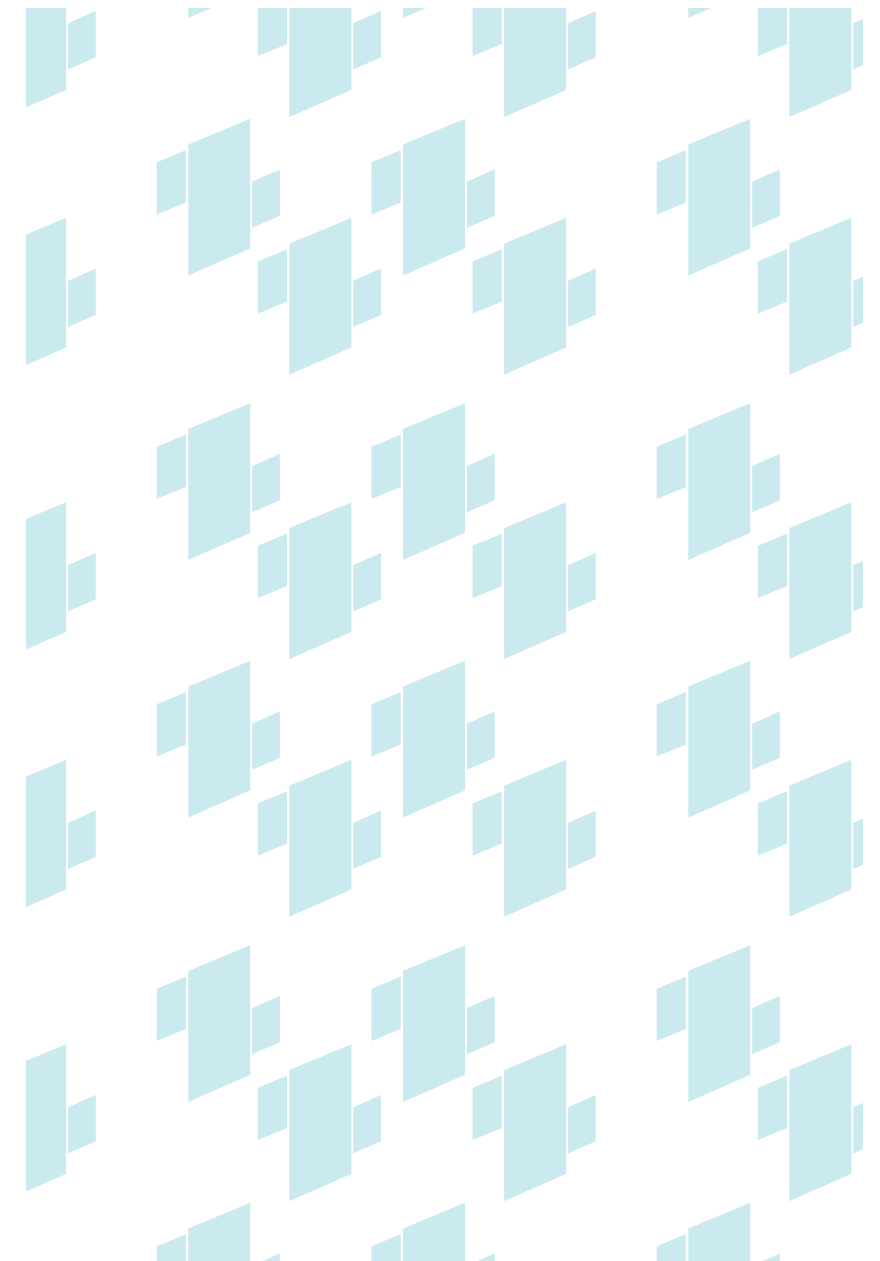


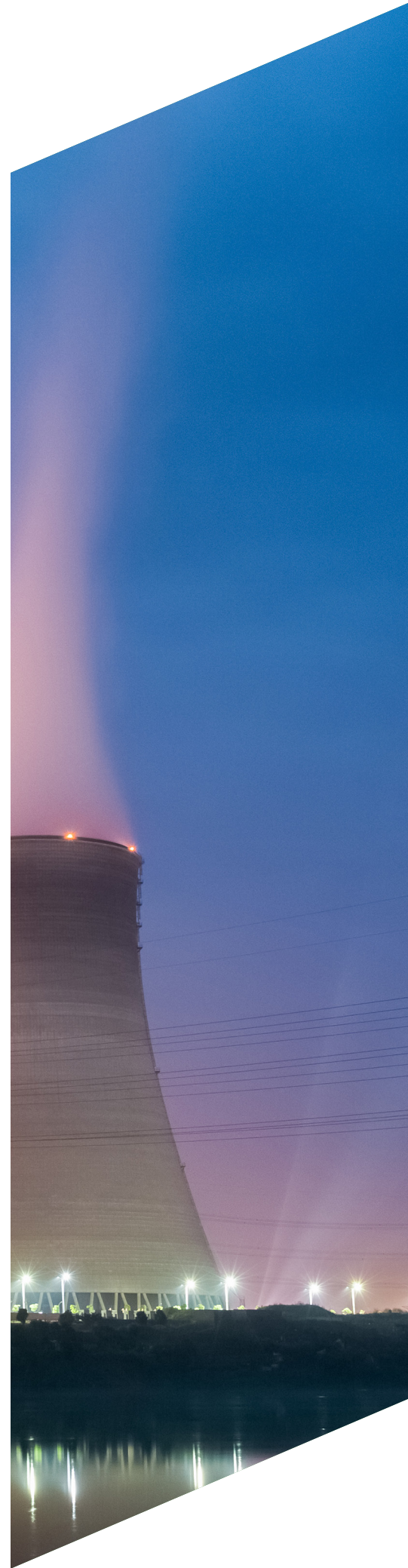
POSITIVE & NEGATIVE VERSIONS



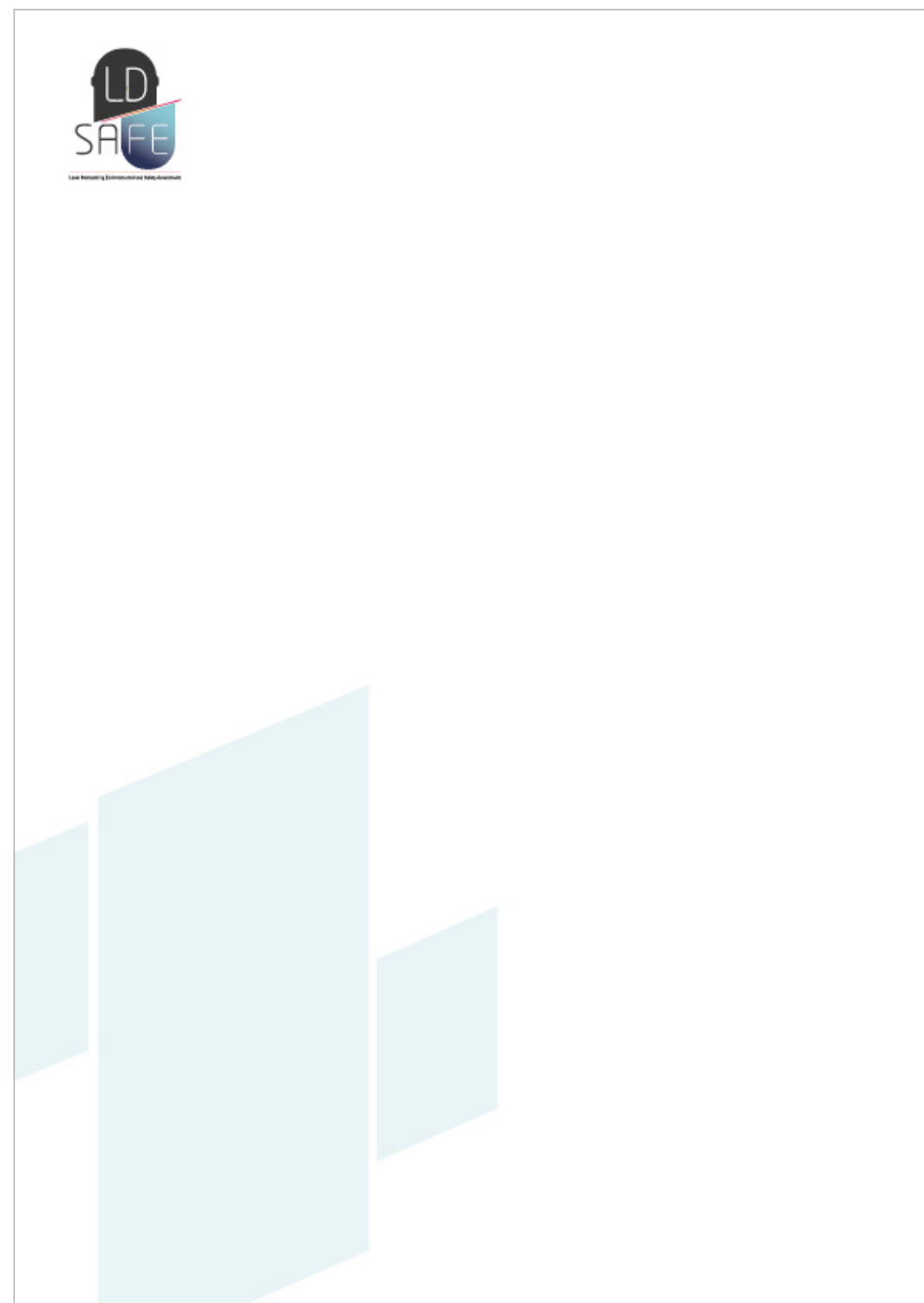


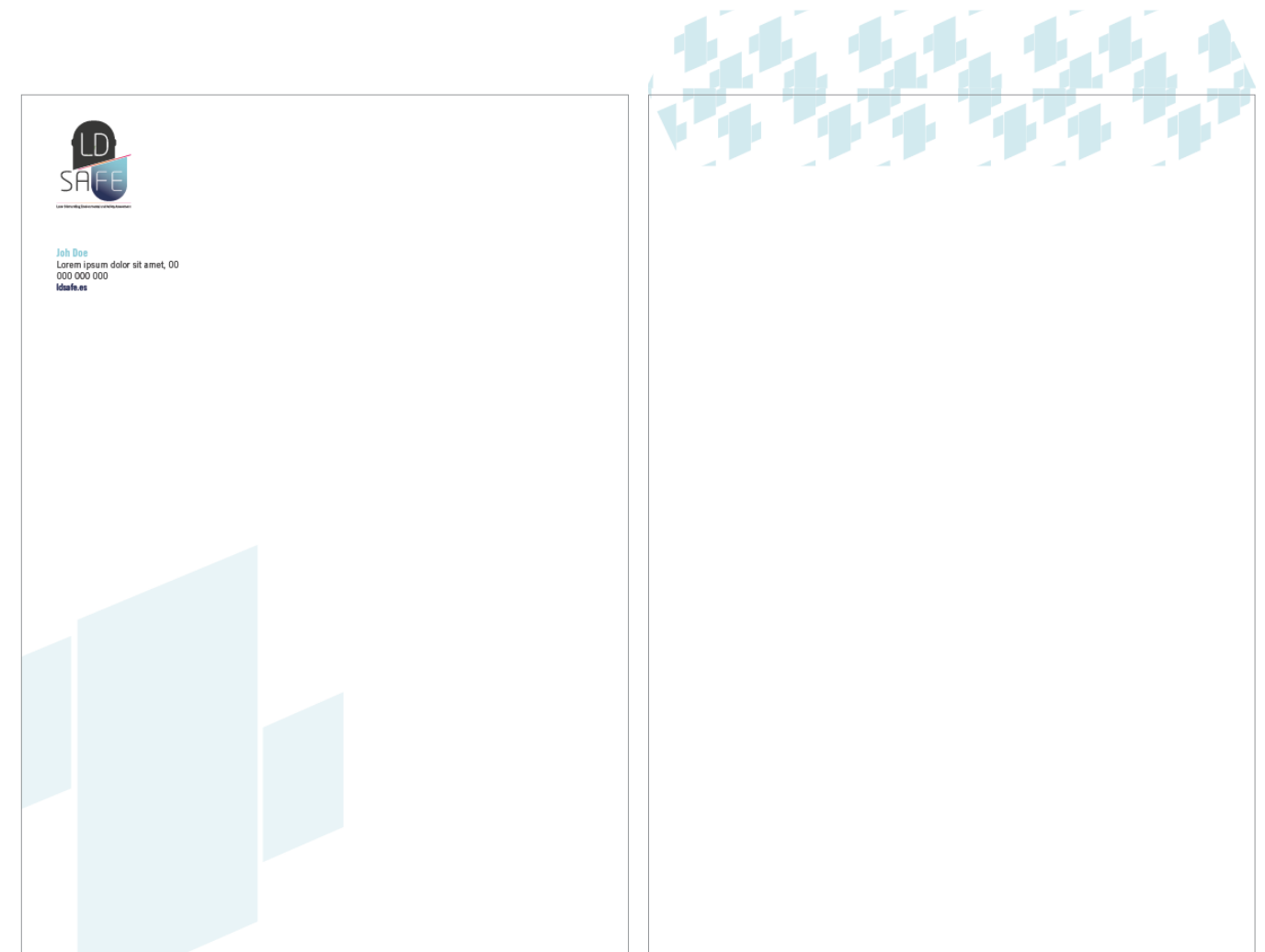
04
GRAPHIC
RESOURCES





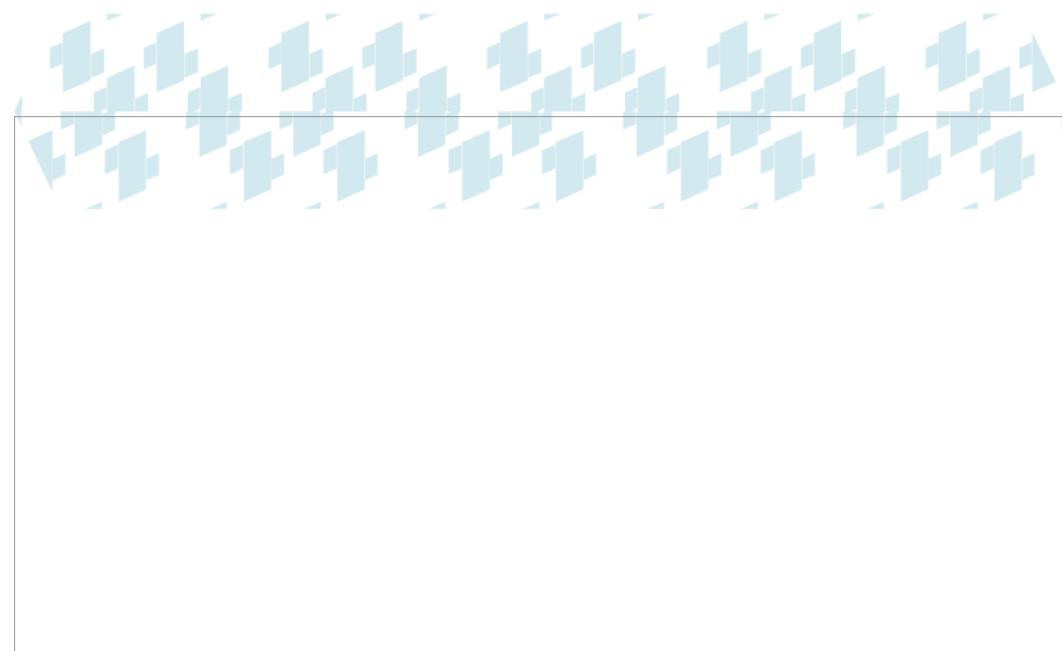
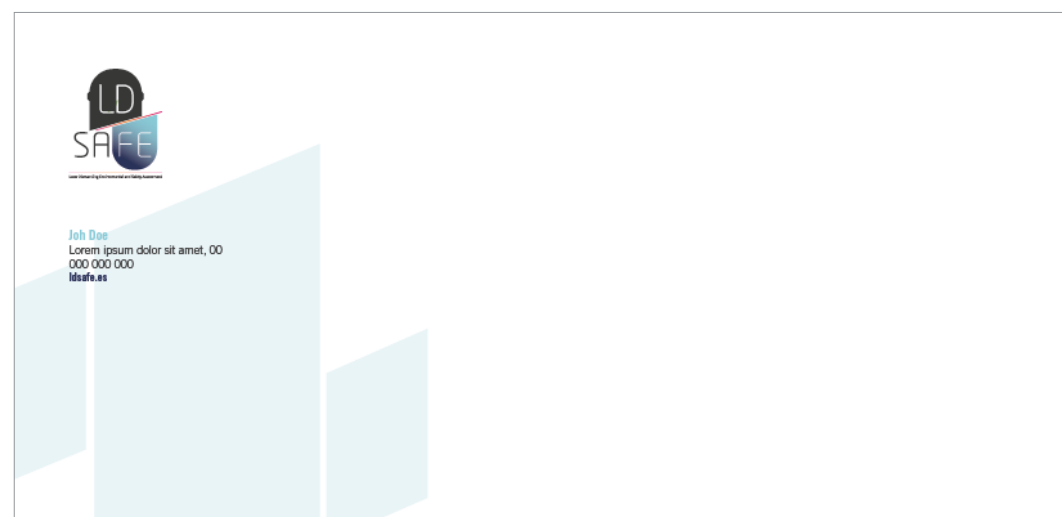
05
STATIONARY





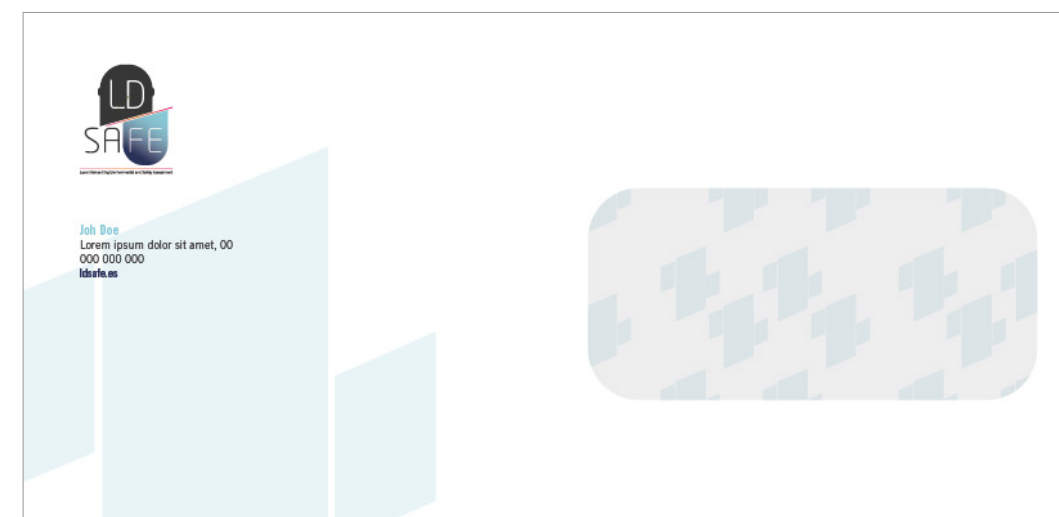
13

AMERICAN ENVELOPE



14

AMERICAN ENVELOPE (WINDOW)



BUSINESS CARDS



OFFICE STATIONARY

