THEY HAVE CHANGED
THE WORLD AND
YOUR DAILY DAY

Stories out

standard

afnor ÉDITIONS

THEY CHANGED THE WORLD
AND YOUR DAILY DAY

30 stories
extraordinary

afnor ÉDITIONS

“Normalization voluntary is a form of collective wisdom. »

Olivier Peyrat,general director of the AFNOR group

" Standards volunteers are before very useful to anyone who wants to use it – as for those who use it every day without knowing it. »

AFNOR, “French Standardization Association”. We know more about “glamorous”... Why does an organization like yours want to publish a book on standards, a subject that is anything but general public...

OLIVIER PEYRAT: If the standards are not “glamorous”, as you say, it is firstly because they are said to be too many. This is why we wanted to send this message: there are standards... and standards. With few exceptions, ours – the standards which are part of AFNOR’s scope – are completely voluntary. Which means that they are not only desired, but written by the economic actors themselves, in the common interest. Let's take an example, which everyone can encounter, that of the "stick" battery (or accumulator) type AA or AAA, universally widespread thanks to the miracle of voluntary standardization: this battery which will bring your electronic object back to life , you will find it all the way to the bottom of the planet. This is “interoperability”, which results in a product that works perfectly when you press the “On” button at any time, wherever you are... Voluntary standardization is also the source of significant economies of scale. Setting up standard formats allows for... standardized production, therefore much less costly per unit and therefore more accessible to the community (we thus find the concerns of the German Bauhaus: bringing the arts and industry together...). In any case, a Compromise must take place, and this is where we come in, so that the effort of each actor contributes to the common benefit and that each actor also derives its own interest, within the framework of a “positive sum” game.

“Common benefit”: the formula is attractive, but... in practice?

OP: The voluntary norm is the logic of collective interest. On February 7, 1904, in Baltimore (USA), a fire of phenomenal magnitude devoured the city. Alerted, multiple fire companies rush from neighboring towns, but the fire hydrants of Baltimore are only compatible with the fire hoses of the firefighters... of Baltimore. Since then, the American NFPA (National Fire Protection Association) has understood the benefit of standardizing fire hydrant nozzles. We learn a lot, and too often, through pain... But it is not forbidden to imagine a simpler way of learning, I mean the possibility of progressing without the test, through anticipation, through work preparation upstream which would enable downstream lives to be saved. In the hospital, in the emergency department, a nurse, even under extreme tension, must not be able to accidentally connect the vacuum hose to the oxygen or compressed air supply... L Error must not be able to turn into a defect, like the Japanese Poka-Yoke approach. It is because these people – doctors, nursing staff, industrialists – spoke to each other that we were able to achieve to this result. Can we then still see standardization as a constraint?

We wholeheartedly adhere to these universal examples. But there is a more everyday world, which does not need additional complexity...

OP: Voluntary standards are above all useful to all those who want to use them – as well as to those who use them every day without knowing it. Think about the NF EN ISO/IEC 13818 series of standards, which define, among other things, the main video formats. Precisely, how many videos are viewed each day from Europe, the United States, Asia, on smartphones, on PCs, on Macs? Videos which will have traveled around the world before reaching a recipient who is very amused to discover them and totally indifferent (we cannot blame him) to the technical marvel that is present in this transmission. Another telling example is that of mobile phone accessories and in particular battery chargers. The fact that they are interchangeable is very practical: it is a real step forward for the billions of users that we are, without forgetting the environmental effect: fewer specific models means fewer raw materials to use.

And if consumers choose an “unusual” product, they should not be surprised to see themselves imposed additional costs to acquire an “unusual” adapter whose main, if not only, function is to connect to a standard charger! Said adapter not being

necessarily compatible with the next version of the "non-standard" manufacturer's smartphone! This approach is part of a totally integrated and very profitable (if not virtuous) economic model, which makes the consumer prisoner of his first choice. Is this reasonable in the long term? On a completely different level, a major advantage of voluntary standardization compared to regulation lies in a regular review (every five years), with the assistance of all the stakeholders concerned. This helps avoid stagnation and ensures that things are updated without fail, for the benefit of all. This makes it possible to capture all the innovations that have occurred since the last version of the voluntary standard while slowing down the obsolescence of the existing fleet of products, thanks to intelligently designed maintenance of compatibility (spare parts, consumables, etc.).

So standardization would be a perfect world?

OP: Certainly not. Entropy is also rife in the world of voluntary standardization, until the moment when actors talk and listen to each other, in order to progress together. You know that the most experienced luthier would no longer know how to make a Stradivarius these days... Because the different skills have been lost. Standardization, precisely, is a way of not losing track of know-how: the inclusion of a standard in tablets makes it easier to transmit it to future generations as well as to maintain or update old devices (think of a pipe system in a city like Paris, or the renovation of old buildings).
Voluntary standardization is the manifestation of a deterministic logic: if we implement certain components, under certain conditions, we know that we achieve a certain result. Of course we can then take all the liberties we wish with the standards, to aim for improvement or adjust to the situation encountered.

"The standards are comparable to beaten paths, on which it is difficult to get lost..."

"Normalization voluntary, precisely, is a way not to lose track of expertise. »

The standards are comparable to beaten paths, on which it is difficult to get lost... Of course there is nothing perfect, nothing stable, and the standards must be regularly revisited. Others even disappear – at the initiative of the actors concerned – on steam locomotives, for example. We spontaneously understand why. But coming back to this search for more virtuous processes, knowing exactly what products are made of is the key to recyclability; this recyclability which is one of the challenges of today and tomorrow, in the face of resources which are not infinite, and which are already widely consumed. This is what makes it possible, in the automotive industry, to achieve recyclability rates of up to 95% on new vehicles marketed in 2016...
In summary, I think that voluntary standardization is a form of collective wisdom that can be mobilized in the face of the major challenges that humanity will face in the future. It is the meeting of knowledge, experience and general interest.

So you are a convinced activist...

OP: Yes. And I aspire to more voluntary standards in certain areas. It is a mode of reasoning and a procedure that helps to "drive out waste". When a head-on battle of standards takes place, unfortunately it is not necessarily the best who wins. Think about the struggle, at the turn of the 1980s, between VHS, V2000 and Betamax standards. Obviously, like the formula *"winner takes all"*, the ecosystem that wins, wins in its entirety. And in this case, what was, according to specialists, the best video recording system did not win, but once the war of standards was over, the massification of production made it possible to reduce costs, both equipment and supports. Especially since voluntary standardization "embarks" innovation: it can evolve, serving the market which expects progress, compatibility and price reduction. Voluntary standardization is a way of structuring a market which, without it, would see the hegemony of a single person, who would make his law, his prices, and who would impose his derivative products. Just look at the dominant ecosystems that seek to shaping companies whose headquarters are located across the Atlantic to be convinced of this.
To avoid such hegemonies, to create truly open ecosystems, we still need to speak the same language. Let us remember that the first source of standardization is that of the lexicon. Everyone needs to agree on a common set of definitions, and terminology is the fundamental element. And finally, the standard provides a coating, a binder that makes daily life much easier... In a certain way, the language we use every day is a form of voluntary standard. Nothing stops you from choosing your words, or inventing new ones. Overall, the important thing is to understand each other!

" Language that we use every day is a form of voluntary standard. »

Why 30 standards?

OP: We could have added many more! The necessarily arbitrary choice that we have made affects various areas that concern everyday life. No one can reasonably say that they are not affected by any of these voluntary standards. We also wanted to show an evolution. The first standards concerned products, then standardization spread to services. Then standards conquered management systems, that is to say the capacity and competence of actors to produce products and services. These are collective ways of asking the right questions and providing the right answers. Another generation appeared in the last decade with governance standards, such as the social responsibility of organizations. The debate rises to the level of the relationships between a structure and its ecosystems, its stakeholders. This is not the least success of voluntary standardization. My belief? A world of tomorrow, more secure, more prosperous, more united, and more harmonious, can only be imagined with more intense recourse to voluntary standards. Failing this, humanity's departure from the road could very well result, from poor governance - international or national (for very populated countries) - from collective problems, from uncontrollable global warming, from exhaustion resources, or even serious international conflicts resulting from the aforementioned dangers, for example in the field of water, energy or pollution...

SUMMARY

THE SPIRIT OF STANDARDS

To favor THE trades

THE SPIRIT OF STANDARDS

Take a time in advance

Standard !
What are we talking about?

AFNOR, facilitator of standardization voluntary

Credit card format, toy security, barcode, etc.our daily lives are improved by a set of voluntary standards that set standards in terms of quality, safety or performance for the products, services or practices around us. Whether it involves anticipating future voluntary standards or supporting their creation and evolution at the French but also international level, AFNOR acts as a facilitator of standardization in France and displays one ambition: to contribute to the dissemination of good practices and effective solutions for the benefit of all.

Collective, responsibility, trust, quality; these 4 values have guided the history and know-how of AFNOR since 1926, and are more relevant than ever to facilitate a better and shared horizon. Beyond its general interest mission of standardization, AFNOR as an international group, carries out training, monitoring and technical and professional information, evaluation and certification activities in the competitive field,
around the world.

Voluntary standardization, mandatory regulation: what are the differences?

Too many standards in our society? Let's not confuse. On the one hand, there is regulation, sometimes abstract, cumbersome, arbitrary: treaties, laws, decrees, circulars, etc.; on the other, voluntary standardization (ISO, EN, NF standards, etc.). Complementary, they are essentially different. In France, there were 34,000 voluntary standards in 2016, of which less than 1% are mandatory, while local authorities, to name but a few, must respond to 400,000 regulatory texts.

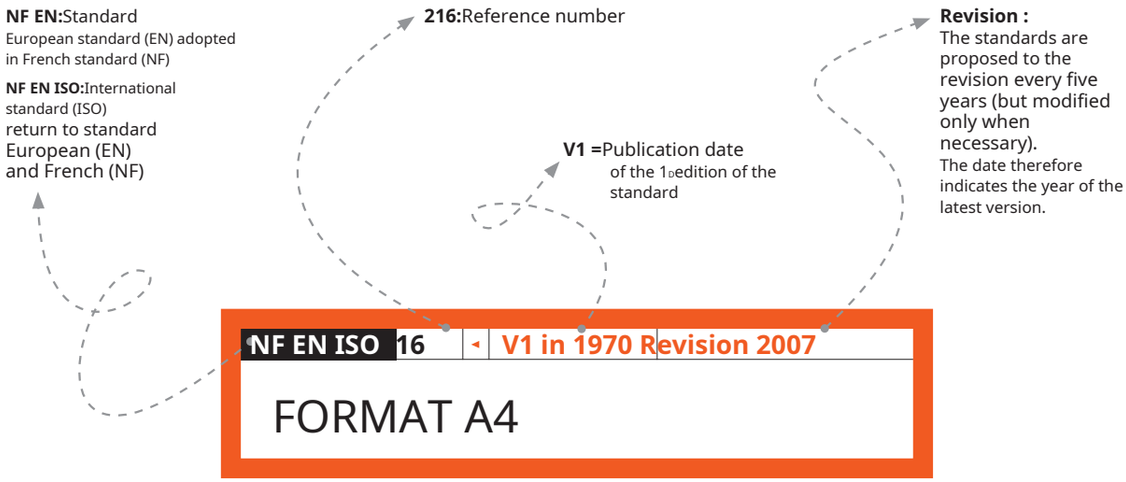
The public authorities are aware of this. Committed to a simplification process, they encourage the practice of voluntary standardization. Especially since voluntary standards are reviewed every five years to be revised or even withdrawn. We are far from regulatory inertia. It is the full force of law

“soft” law over “hard” law, which obviously remains necessary in certain cases.

What is a voluntary standard?

There is norm and norm. Among them, so-called "voluntary" standards. But what is a voluntary standard? How is it different from a "mandatory" or regulatory standard?It's all in the epithet: the voluntary standard is launched at the initiative of market players, in order to constitute a reference framework applicable to products, services or practices, in the service of the general interest. It also has the specificity of being the result of a consensus between all the players in a sector concerned: businesses, consumers, associations, unions, local authorities, etc. We can speak of a
"co-production" between professionals and users. And everyone can participate in its creation, just as any organization is free to use it or not, to refer to it or not. Finally, a voluntary standard is also a reference document approved by an internationally recognized standardization body. AFNOR is one of them!

A vignette opens each of the 30 stories of this book by labeling the standard to which it refers.



1

ISO/IEC 810 /IEC 3-4 | **V1 in 1995 and 2000**
Revision 2006 and 2016

BANK CARD, SMARTCARD

"Here's my card"

They have revolutionized everything in some 30 years. They are everywhere now. In “select” circles, it is even very chic to open a card holder which contains cards of all colors, and which are used for all kinds of things – to pay for purchases, to pay your pharmacist, to enter the parking lot of his building. It's hard to escape it, to be honest. Which supermarket chain does not have its loyalty card, which national brand does not have its deferred debit “privilege” card? As diverse as they are, these little plastic rectangles have many points in common which mean that the same bank card, for example, can be used in all ATMs around the world. That's a standard.

185

THIS IS THE NUMBER
PAYMENTS
by credit card and per second in France in 2015.
(Source: Bank card group)

46.8€

AVERAGE AMOUNT
OF A TRANSACTION
by credit card in France in 2013.
(Source: Bank card group)

10.25

BILLIONS OF
DEBIT CARDS,
credit and prepaid cards in circulation in the world at the end of 2015.
(Source : *The Nielson Report 2015*)

WHAT DO THE STANDARDS SAY?

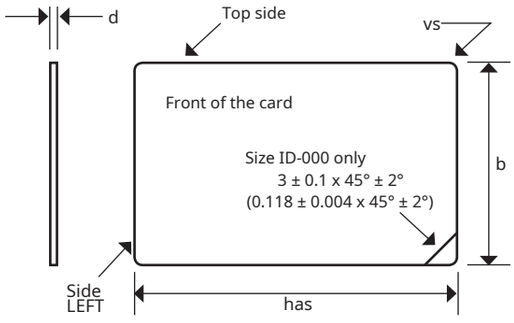
We don't play with the cards

It's a standard very international serious, which details characteristics cards identification, as defined in the clause for the definition and use of these cards for international exchanges. To this end, the standard specifies the features physical cards identification, including material, manufacturing process, characteristics, and dimensions for four card formats. In detail, the ISO/IEC 7810 standard describes the requirements for the cards used for identification, and in particular the testing procedures used to guarantee cards against risk factors specified in the international standard. It takes into account the human aspects as mechanical, and sets minimum requirements.

Protocol

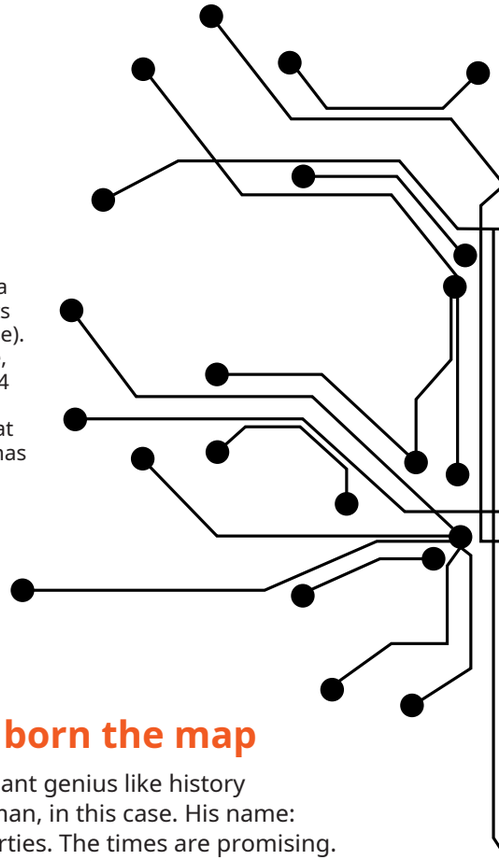
The ISO/IEC standard 14443, for its part, defines a protocol including the needs specific to a environment without contact, and defines the activation sequence and deactivation of said protocol.

Board dimensions and tolerances (in millimeters)



The contactless card

The “contactless” payment card is a recent creation, for small payments (€50 to €100 depending on the case). To avoid any risk of fraudulent use, the card must be placed less than 4 cm from the terminal, and the operation can only be carried out at the request of the merchant who has initiated a transaction.



From a figure was born the map

In the beginning he was a brilliant genius like history sometimes gives us. A Frenchman, in this case. His name: Roland Moreno. He is in his thirties. The times are promising. The 70s gave free rein to the craziest ideas. Like Innovatron, an association and future commercial company that he created in 1972. Innovatron... Quite a program. Two years later, the association filed a landmark patent. An integrated printed circuit card project, capable of protecting data and equipped with an extra-flat connector which allows connection to an external reader. The card also includes an error counter. The same one which, even today, renders our card invalid after the third false code.

His genius lives in our pockets

But it's not the bank card that appears first. First there was the Télécarte, a prepaid telephone card that was used in telephone booths. (Yes, public booths with a telephone in them.) In 1992, it was the big leap. The smart card became a bank card, allowing payments and money withdrawals. Except that the “unified” bank card did not appear at first attempt. Everyone (CB, MasterCard, La Poste) initially went there on their own initiative, incompatible with the other networks. The standard is therefore a case of “ex-post” standardization, the conclusion of some ten years of transition. But also came the Vitale card, the Pass Navigo... Later, the smart card fell into the public domain. It was in 1998. Roland Moreno died in 2012. But his genius is still more alive, there, in our pocket.

NEWS

The map
without code

Not all countries have adopted the electronic chip, far from it. In most countries around the world you are still asked to sign on the invoice, the merchant

will compare your signature to the one on the back of the card. In the United States, for example, there is no code to enter to authenticate the payment, but a signature (the "iron" is still used there).

Find

"The patent application was filed on March 25. I describe a system that has nothing in common with the 21st century smart card.e century, practically only the presence of a PROM memory on a credit card, the composition of the secret code and a few other discoveries, including the beginning of what would become twelve months later a unique characteristic, specific to my project: a system addressing prohibiting altering a word already written (amount of debits, credits, carrier code and especially RIB).

Roland Moreno,*Secret history smart card*,2001.

The map... without a map

The explosion of "online" commerce has given a new dimension to card payment. Without a card, in this case, since it is no longer a physical object, but a number and (very often) a cryptogram on the back, to ensure that the
the person who pays has good access to it. The single-use card number is another very effective solution.

2

NF EN ISO 0471 | V1 in 1995 Revision 2013

HIGH VISIBILITY CLOTHING

Let's think GOOD

Reflective clothing is definitely very trendy. A famous, very chic fashion designer of German origin recently promoted it in a prevention campaign. That is to say if it is becoming. And we know, it is as important to see as to be seen. In all circumstances.

Especially since today, the difference between professional equipment and non-professional equipment almost no longer exists. And that's good.
At work, in the car, on a motorcycle, during your leisure time, reflective clothing has become... a must.

- 12% data 1990-2013 TRS show **a constant decline in accidents on construction sites.**

The systematic wearing of PPE* has largely contributed to this development.

* Personal protective equipment, including reflective harness.

(Source: INRS)

3.6

MILLIONS OF TWO WHEELS **motorized In France.**

(Source: Federation French motorized two-wheelers)

WHAT DOES THE STANDARD SAY?

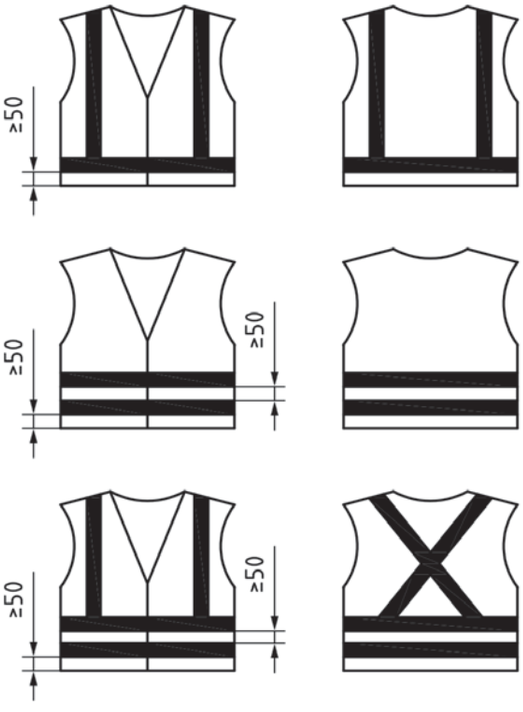
Conspicuity, I write your name

There are three classes of clothing, defined based on three minimum surfaces different from retroreflective materials. Each of these classes confers a level different from conspicuity, class 3 being the one which offers, day and night, the highest degree of conspicuity in urban environment as in rural areas (conditions are Effectively different, the environment urban being much richer in sources bright). These classes are independent of the surface covered (this can be a single item of clothing or a together (torso; torso and arms; torso, arms and legs), but they have in common that they ensure 360° visibility.

Standing the test of time

The standard defines also the qualities physical characteristics of the material (in new condition and after use, after washing) and of course its photometric properties: requirements of forward photoreflection and after use, folding, aging, exposure to rain, etc. Good conditions real, in short.

Examples of clothing covering only the torso Dimensions in mm



This little cardigan looks great on you

Who remembers the reflectors, those little plastic plates that we enjoyed placing on the spokes of the wheels of our bicycles, or even on our school bags? Well for the *Larousse*, the reflector is *"an optical system allowing light rays to be returned in the direction from which they came »*. Which makes it the precursor of the reflective vest bands, knowing that the notion of "retroreflection" indicates that the light from a projector – that of a torch, the headlights of an automobile – is reflected in the direction of the projector, thus making the object or person clearly visible to those who are in the axis of the projector. The effect is... remarkable.

Safety is in fashion!

So much so that the wearing of reflective clothing has become widespread in the professional world, and now on the roads, by legal obligation (the yellow vest has been compulsory for motorized two-wheelers since January 2016) or "simple" initiative salutary. It is also very chic, these days, or rather our nights, to practice cycling or urban rollerblading in light clothing. Safety is in fashion, and that's a good thing!

Real protection for people working along traffic lanes

"From its inception, the EN ISO 20471 standard has represented a considerable step forward in terms of safety for this family of personal protective equipment. The effectiveness of the materials used, the definition of the minimum surfaces of the constituent materials and the description of test methods made it possible to set a high level of design requirements. Successive revisions have reinforced this requirement, by abandoning unsightly and ineffective harnesses in favor of rewarding work clothing that provides real protection for people whose professional activity leads them to work along this particularly dangerous environment that constitutes traffic routes. »

Alain Le Brech, INRS, CMLT division manager (construction, handling, lifting and transport).

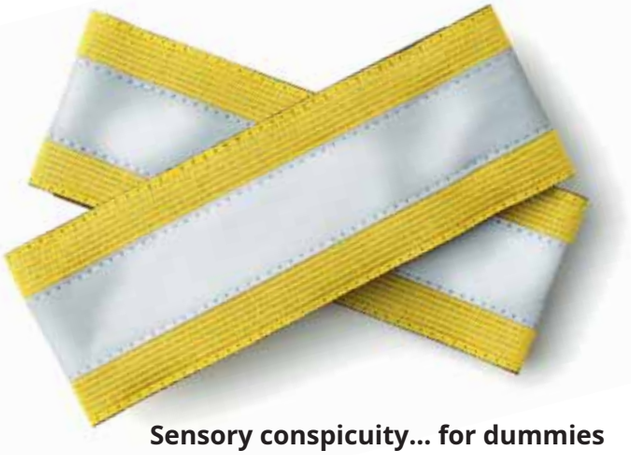
LED

When the vest don't think anymore...

...or not only. Reflective materials reflect light from a light source such as a car headlight beam or urban lighting, but the LED fluorescent vest goes further. Its diodes no longer reflect: they produce their own light. To make you a star.

10%

The night represents less than 10 % traffic but 35% of injuries hospitalized and 45% of those killed.
(Source: Synamap)



Sensory conspicuity... for dummies

Sensory conpiscuity is the degree to which an object can be distinguished from its environment, due to its physical characteristics: luminance contrast, color contrast, pattern, design, characteristics in relation to the environment, etc. In short, conpiscuity is the ability to attract attention visually.

Nothing to do with concupiscence which is the natural attraction to material goods. Though...

3

NF EN 5048-1 | V1 in 2007

BOLTINGS OF
METALLIC CONSTRUCTION

Unbreakable bolts

Honestly, that's not what we think about most often in a day. And even if the car contains more than one, we happily go on weekends without worrying too much about knowing what a bolt might be. This is wrong. Because we have known since Flaubert that for something to become interesting, you just have to look at it long enough. Looking at a bolt, really? Yes. Let us take a moment to take a closer look at this mechanical unit that is unfairly ignored, except by standardization, which definitely leaves nothing to chance.

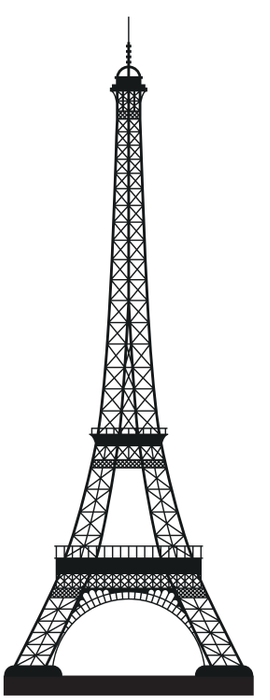
1 BILLION
OF EUROS
APPROXIMATELY :
turnover screws-bolts In France.
(Source: Technocalcul 2005-2014)

10,000

JOBS IN FRANCE

in the screws-bolts.

(Source: Technocalcul/Customs 2010)



7.80M

LENGTH

AND 10 CM OF

DIAMETER :

this is the size of the bolts present in the massifs anchor of the Eiffel Tower...

(Source: www.tour-eiffel-deparis.com)

WHAT DOES THE STANDARD SAY?

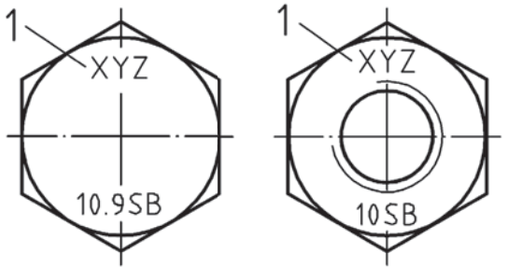
How bolt without restraint internal

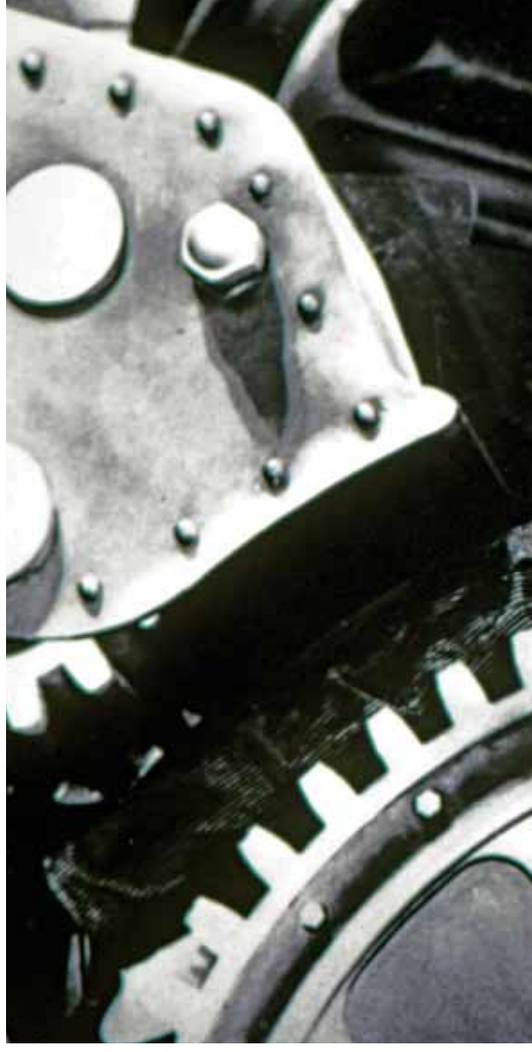
The NF EN standard 15048-1 sets requirements that allow to ensure that the screw-nut assemblies washer suitable to construction bolts no prestressed in civil engineering, that is to say without internal constraint in the system in the absence of solicitation exterior.
In other words the most common case, knowing that the sets thus described can be employed in the assemblies in shearing and/or the assemblies tense.

No mixing! The standard details characteristics mechanics of components (carbon steel, alloy steel, stainless steel), the required tensile strength, and the terms of the tensile tests which will make it possible to

ensure that a together works correctly. Useful precision for a good interpretation of the standard: tensile strength of assemblies screw/nut being very sensitive to manufacturing differences, it is important that the sets are supplied by a single manufacturer.

Example of marking the screw and nut





Joseph Whitworth, the first to standardize screw thread sizes in the UK.

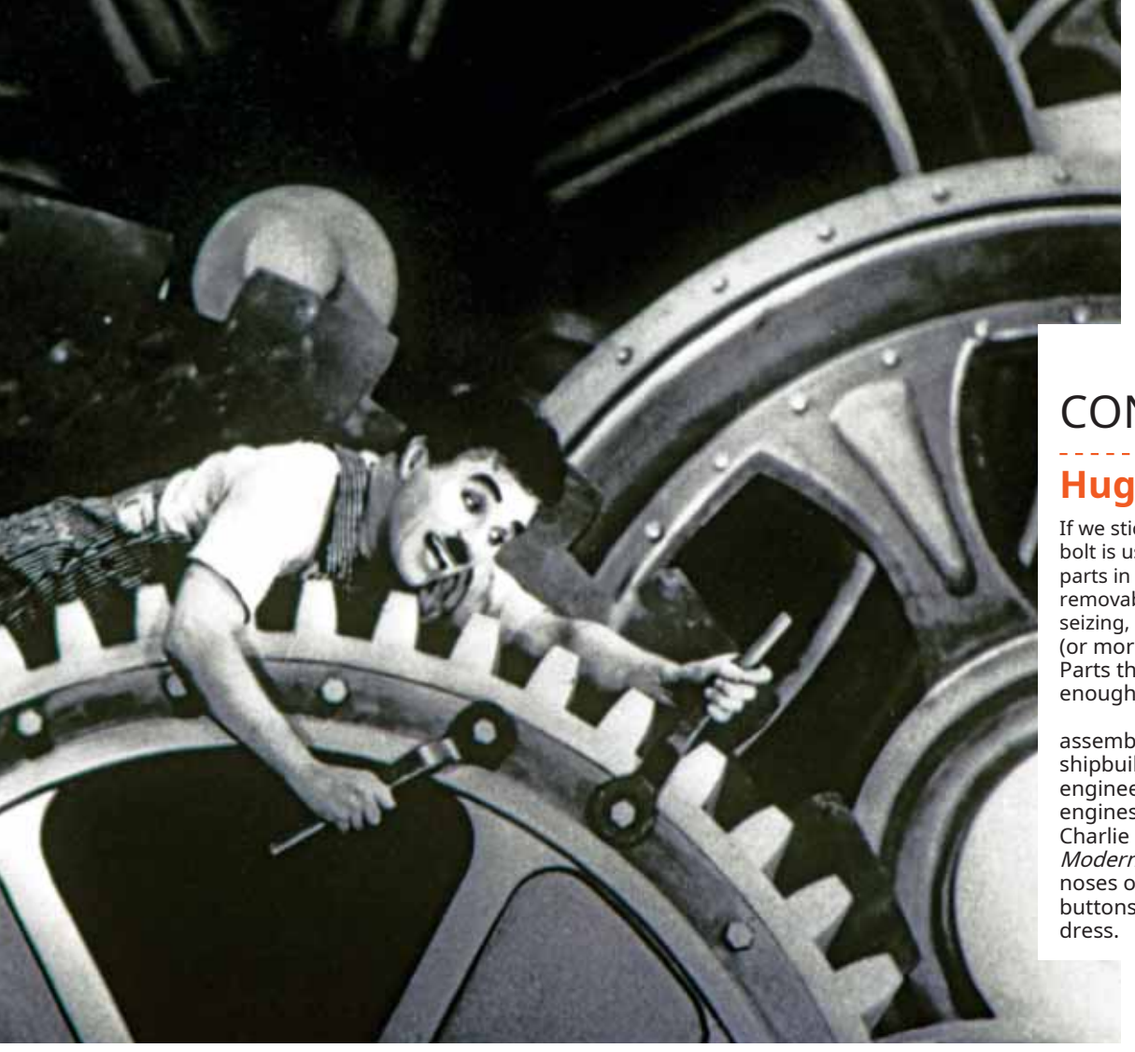
When the United Kingdom unifies

The adventure of the bolt is obviously linked to the industrial revolution, and (therefore) to the United Kingdom. He has been employed there since 1720, but it was in 1760 that J. and W. Wyatt* imagined an industrial process which would democratize this assembly principle and reduce its cost. Problem: each manufacturer has its own threads and dimensions, and it's a bit *anarchy in the UK* (Already). But in 1841, a certain Joseph Whitworth imagined standardizing the size of screw threads from London to Glasgow. The same standardization effort is reaching Manchester, where industrial boilers have an unfortunate tendency to explode.

The Allied Forces

To agree to cover the risk, insurance companies require that their mechanical elements be subjected to resistance tests. Standards are established. Everything went pretty well until the First World War, when material from multiple origins was mixed up within the Allied forces. The second conflict made things worse, so much so that in 1948 the United States and Canada imposed unified threading for all countries using the “imperial” system (Anglo-Saxon, therefore), similar to the threading of the German DIN of 1919. Then one day came the EN 15048-1 standard for the whole of Europe. A good turn of the screw doesn’t hurt...

* Source : *Innovation and technology*, Loïk Roche and Thierry Grange, ed. Maximum.



CONNECTION

Hug me tight

If we stick to its definition, the bolt is used to connect two parts in a complete, rigid and removable manner (except seizing, etc.).
(or more) that he crosses. Parts that must be rigid enough to fit this type

assembly. This is the case for shipbuilding parts, engineering structures, engines... Or the parts that Charlie Chaplin squeezes in *Modern times*, except the noses of colleagues and the buttons of the secretary's dress.

Screw or bolt?

Let's call things what they are. A bolt is an assembly consisting of a screw (threaded rod), a nut and normally a washer. Said washer has its use: it is it which will support the friction of the rotational movement linked to tightening and not the part to be tightened. There are even “fan” washers, which can be used in summer but above all to slow down assembly.

Separation of the satellite Galileo of a Soyuz rocket (artist's impression).

When your bolt goes boom

Unbelievable but true, there are also explosive bolts. In other words, bolts equipped with a pyrotechnic device whose remote-controlled explosion releases the assembly. This is particularly useful for separating rocket stages when they have completed their functions, whereas doing it by hand in mid-flight would be a bit difficult... One of the first to "use" them was Yuri Gagarin, during the first space flight manned by man, in 1961 (by exploding, the bolts separated its return module from the elements useless for landing).

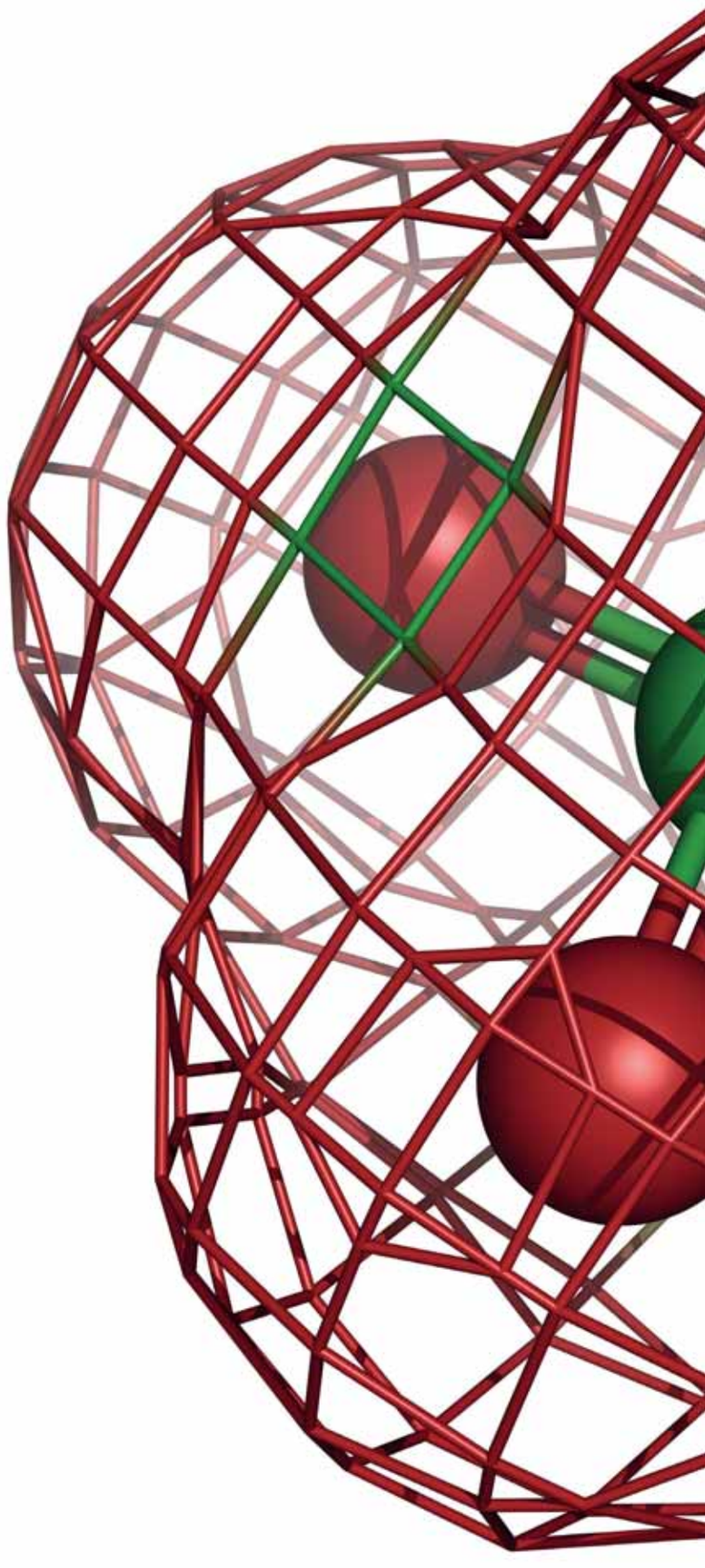
4

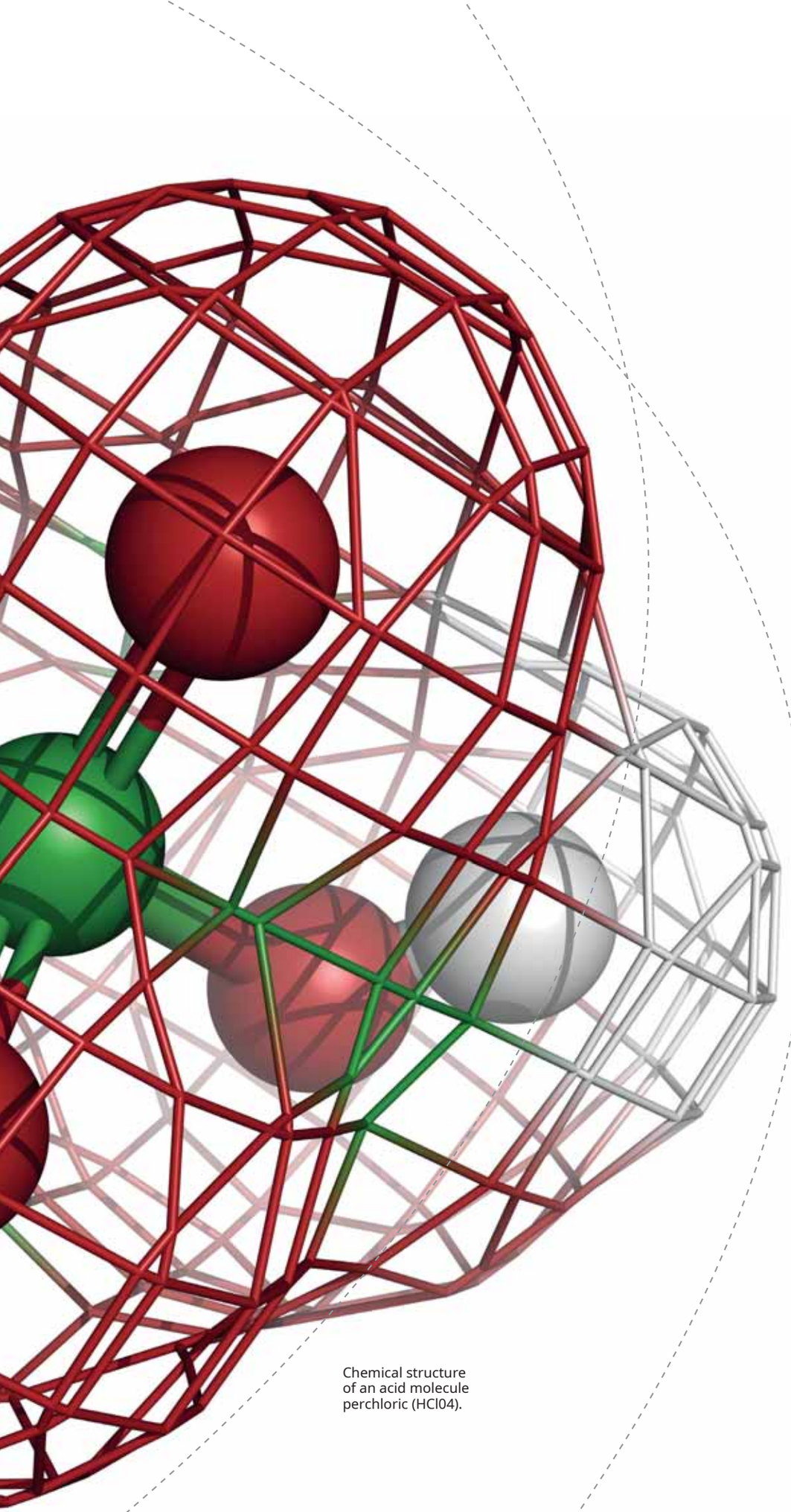
NF EN ISO 393-1 | **V1 in 1984 Revision 2000**

CHLORINE DOSAGE
IN WATER

How "chlorine" debate

It is simply vital. It is also one of the major challenges of tomorrow. So we don't joke with the quality of the water. Water which, in nature, is loaded with a multitude of sometimes harmful micro-organisms, such as bacteria and viruses. No way,
obviously, to find them at the outlet of the tap or in the swimming pool basin. To disinfect this precious mixture of oxygen and hydrogen, chlorine remains the most effective product. Provided you know how to dose, obviously. This dosage is the matter of a standard, ISO 7393-1, which is unfairly ignored. Light on a shadow norm.

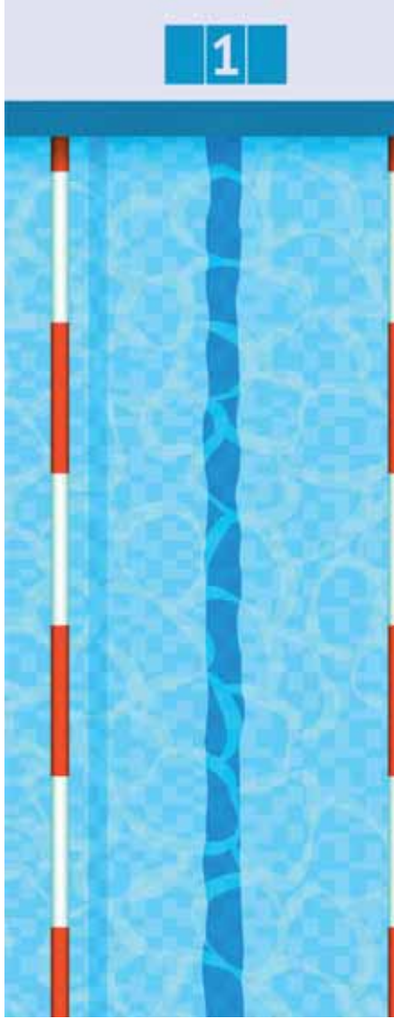




Chemical structure of an acid molecule perchloric (HCl04).

0.2 to 0.5MG/L:
CONCENTRATION RECOMMENDED
in chlorine to kill bacteria.
(Source: futura-planete)

20%
CHLORINE INDUSTRIAL
is used for produce agents of whitening and disinfectants.
(Source: futura-planete)



WHAT DOES THE STANDARD SAY?

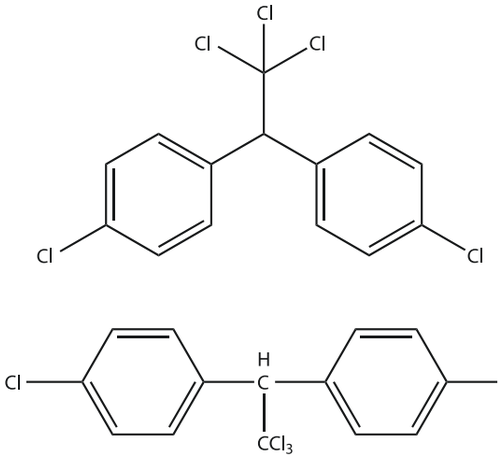
Deal with titrimetry

The ISO 7393 standard offers a method titrimetric for the dosage of free chlorine and total chlorine in water.(Those who skipped chemistry classes will have to hold on a little, because the titrimetry *"includes the whole methods analytics based on the determination of a reagent of known concentration that is needed to react completely with a volume solution known containing the substance to be analyzed »* .) The method is applicable to total chlorine concentrations, expressed in chlorine (Cl_2) from 0.0004 to 0.07 mmol/L.

Language abuse

In its appendix A, the standard also describes an operating procedure for the differentiation of combined chlorine of the monochloramine type, combined chlorine of the dichloramine type, and combined chlorine in the form of trichloride nitrogen. Useful clarification: the chlorine atom does not walk alone, it must combine. The name "chlorine" is therefore an abuse of language.

Molecular diagram of chlorine DDT (dichlorodiphenyltrichloroethane)

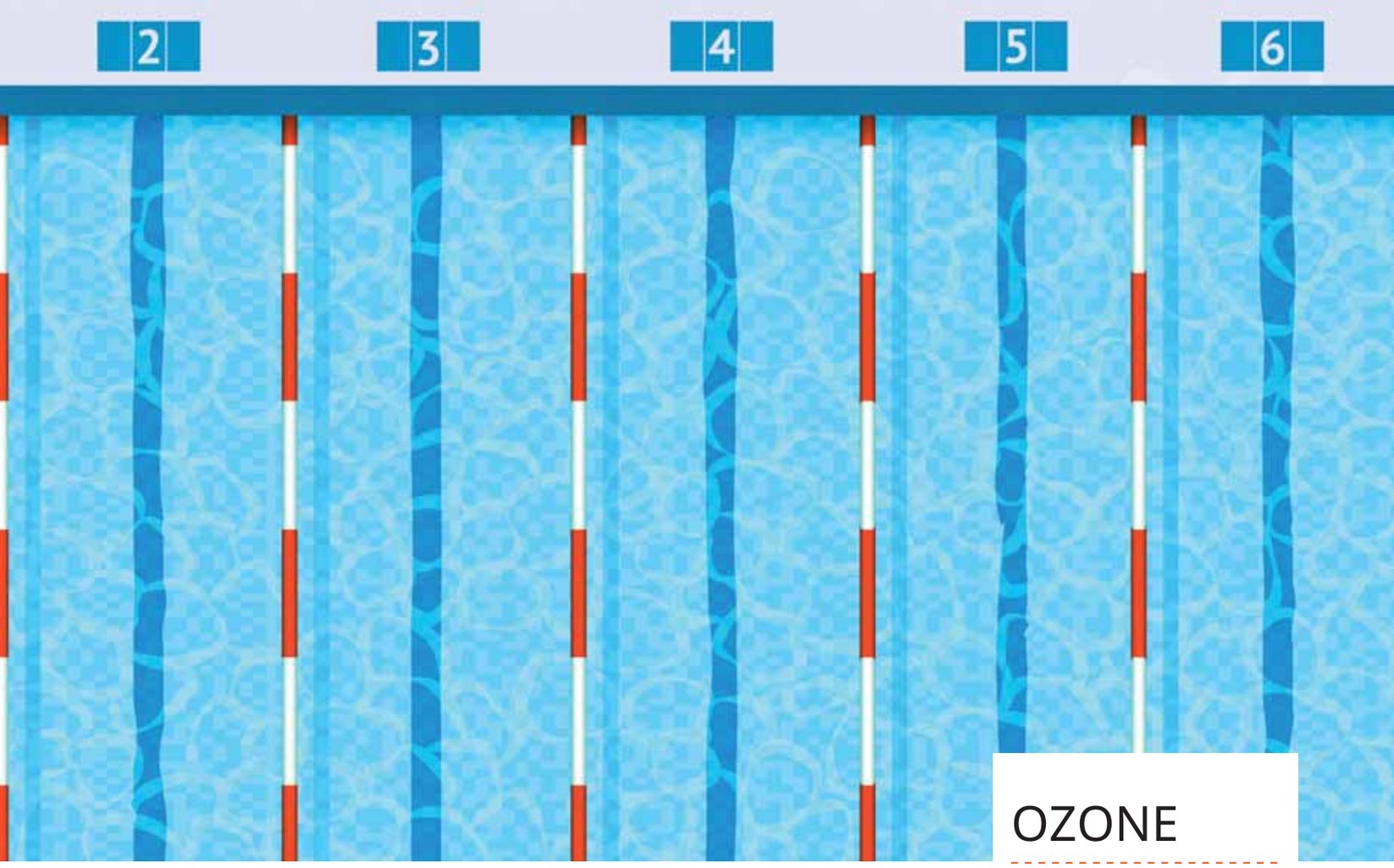


How to dichlorine gas came to the man

1774. In the depths of Sweden, the chemist Carl Wilhelm Scheele, to relieve boredom, heats manganese dioxide with hydrochloric acid. Boom? No. It obtains manganese dichloride, water and dichlorine gas. However, this gaseous chlorine is clearly soluble in water and has the property of whitening paper, plants and flowers. In 1810, another chemist, this time English, named his elder's dichlorine gas "chlorine". It must be said that the man had letters and knew that *chloros*, in Greek, means greenish yellow, which is not given to everyone. But what do we do with this chlorine, incidentally greenish yellow?

Pass me the salt

Well chlorine can form very stable substances, like table salt, but it can also form very reactive products, like hydrochloric acid. Between the two, chlorine (and in particular hypochlorous acid) helps eliminate pollutants from water, by burning the organic matter it contains. Bottom line, pathogenic viruses, bacteria, germs, microbes responsible for serious illnesses such as dysentery, cholera, are destroyed in a few minutes. But you still need to be able to drink the water and possibly swim in it. A standard ensures this, ladies and gentlemen.



OZONE

My swimming pool holds a diaper

There is more than just chlorine in life (from a swimming pool, from a tap). Ozone, a natural gas made from oxygen in the air, has a very effective disinfecting power. Thanks to this oxidizing power, it will destroy all the organic matter present in the pool water, and even help fight against algae.

Yuck?

Tuesday pool sessions in fifth grade taught generations that chlorine also had a taste and smell. It is now just a bad memory, the

clarifications of the standard having made it possible, since the 1970s, to make

eliminate the smell of swimming pool water thanks to better dosage. When it comes to food, if the smell persists in your highly chlorinated tap water, there is a solution: let the water air out in a carafe placed at the bottom of the refrigerator.

145 LITERS: VOLUME WATER MEANS **consumed per day and per person in France (including 39% for washing).**
(Source: futura-planete)

The formula of chlorine.

5

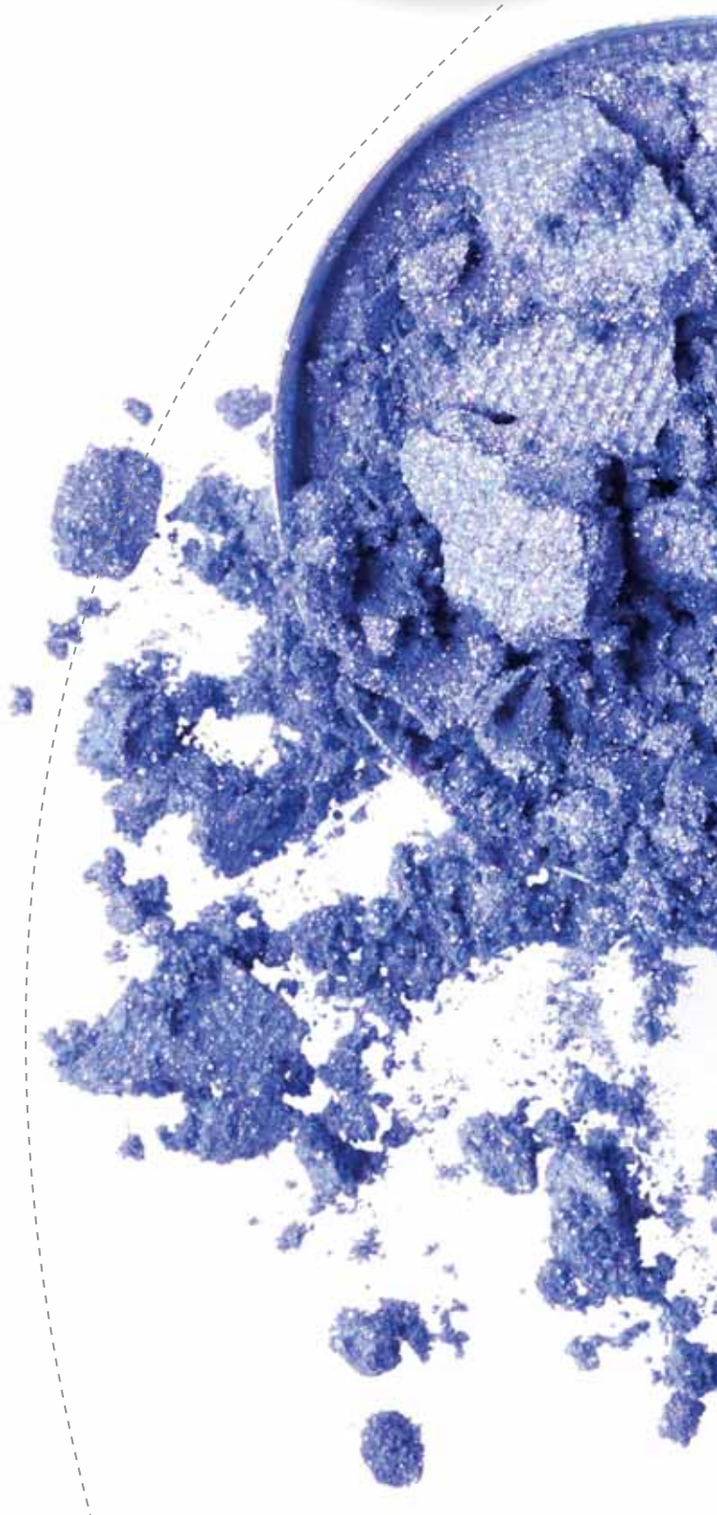
NF EN ISO 1930 | **V1 in 2007 Revision 2012**

COSMETICS

Because we are worth it

I take care of my skin with a day cream, but does my day cream take care of me? No question of applying anything to the face, hair or eyes. Health is too serious a thing to entrust it to ointments carrying microbes, or to products likely to degrade over time. Clearly, even if this new makeup line discovered on TV is a must, antimicrobial protection is essential. And for this there is a standard which harmonizes the directives at the international level... in a sector

very globalized.



4
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(Source
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Makeup box Greek containing his product again original... often extremely toxic.

Appearing, that is the question

Quite honestly, it would be possible to live without cosmetics. Except for essential hygiene products, some people will never use them in their entire lives. However, as far back as history allows us, men and women have taken pleasure in taking care of their appearance. That's the whole point of cosmetics: to beautify to better seduce, obviously. To the point of excess, sometimes. In the 17th century$_{e}$and XVIII$_{e}$ centuries, the alabaster complexion is fashionable. So we coat our faces with creams based on white lead and mercury, extremely toxic substances that eat away at the skin.

But without suffering

The Ancient Romans were not necessarily more cautious, who moreover did not distinguish aesthetic treatments from medicine. The modern era is much more rigorous. No component escapes scrupulous examination to ensure that this shampoo, this sunscreen, this lipstick will not have a deleterious effect on health. And then obviously, cosmetics, which are never far from fashion, follow the trend. So the time has come for "organic" cosmetics, whose components come from organic farming. Who said you have to suffer to be beautiful?

WHAT DOES THE STANDARD SAY?

Matter of proliferation microbial

The NF EN ISO 11930 standard defines a series of steps to follow to assess protection antimicrobial overall product cosmetic.
Said protection antimicrobial of a product may have several origins: chemical protection, characteristics specific to the formulation, design of conditioning, manufacturing process.

Successive measurements

A test method allows you to evaluate the product protection against typical microbial proliferation (based on inocula): after inoculation, successive measurements the quantity of microorganisms present in the product are carried out, at different sampling times. The rate reduction in the amount of micro-organizations allows to assess the quality antimicrobial product, and therefore minimize the risk for the user.

Make way for cosmetotextiles!

It's THE trend of the moment. Textile articles (underwear, tights, etc.) containing a microencapsulated cosmetic formulation, intended to be released sustainably.
On the menu, anti-cellulite tights, slimming panties...

"Use the eye as canvas is my way of mixing my love for art, design and makeup », explains Tal Peleg (***The Huffington Post*** UK, 5/10/2016). The Israeli artist is used only eye shadow and eye liner.

BEAUTY FATAL

For what products?

The range of cosmetics is particularly vast. Alongside hygiene products, we find jumble of perfumes, facial care products, shaving foam, aftercare

shampoo, creams sunscreen, lipsticks, mascara...
None of them escape meets the requirements of standard NF EN ISO 11930.

3,000 FRENCH SMEs **make cosmetics.**
(Source: Cosmetic Valley, France)

25 BILLIONS OF EUROS PER YEAR **of turnover for the cosmetics sector in France.**
(Source: Cosmetic Valley, France)

6

NF EN ISO 2005 | **V1 in 1997 Revision 2007**

TRACEABILITY OF THE FOOD CHAIN

On the track quality

Everyone remembers the infamous prion and the mad cow crisis. The episode alone justified the implementation of rigorous standardization, in a context of globalization of trade in food products. Exchanges which mean that a beef raised in Argentina is cut in Germany and "processed" in France. How to find your way if something has gone wrong? This is the whole spirit of the standard: being able to determine the history or location of a product or its components, at all stages of

the food chain.

232

BILLIONS

OF EUROS

It's the budget food Household French in 2014.

(Source: INSEE)

20.4% THIS IS THE PART **MEAT**
in French food expenditure in 2014. It was 23.7% in 1960 and even reached 26% in 1967.

(Source: INSEE)

It is brand above

Since 1998, following the mad cow crisis, the identification cattle is done by a plastic buckle placed on each ear, approved, with 10 digits preceded by country code and of a code-bars.

WHAT DOES THE STANDARD SAY?

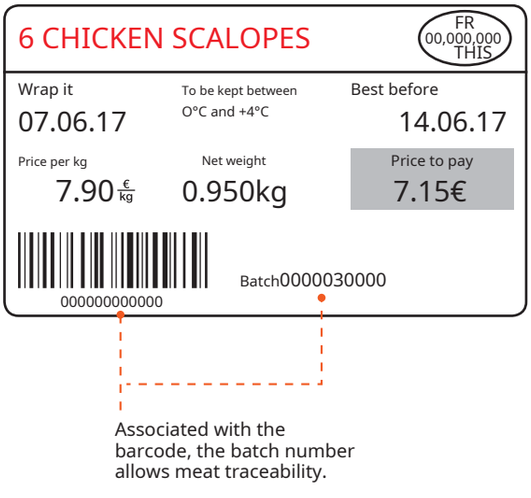
From upstream to... swallow?

Food is a complex and above all diverse matter. The variety of products and production methods places limits on standardization: raw materials, production methods, quantities produced, etc. One of the principles is obviously the effectiveness of the traceability system, which must be verifiable and consistent. , fair, practical, but also profitable. To do this, it must make it possible to identify the responsible organisms in the food chain, and communicate useful information to stakeholders and the consumer.

Requirement

The standard therefore requires, logically, that the traceability system indicates this information (definition of the product, identification of the batch, positioning in the food chain, etc.) from written or recorded documentation, enriched at each stage, from the upstream to downstream.

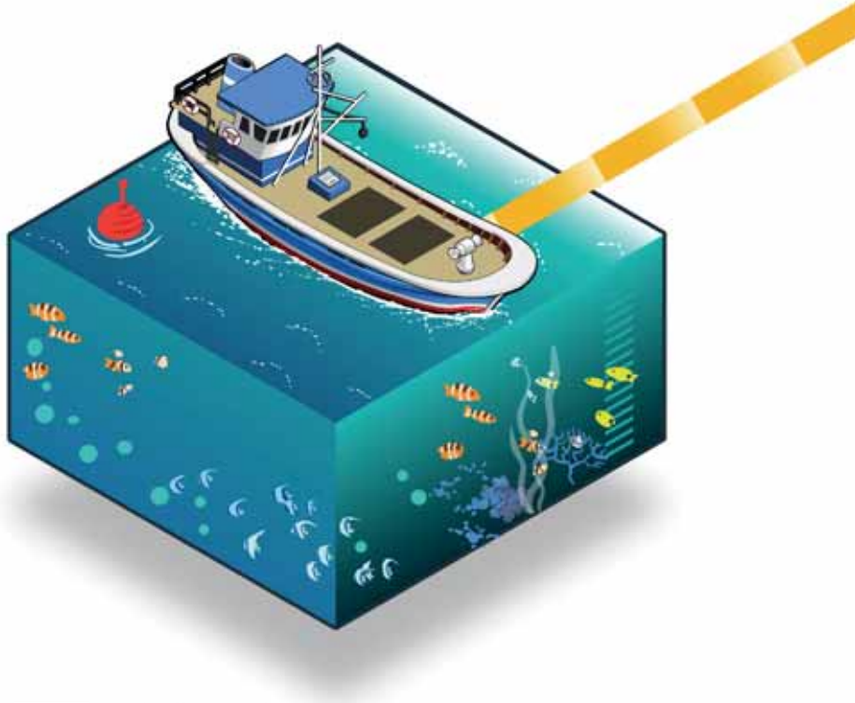
Poultry label allowing traceability



Associated with the barcode, the batch number allows meat traceability.

On the trail

The globalization of trade today leads to tracing the path of the most diverse foodstuffs. An ordinary can of tuna can thus contain fish taken from an ocean, cut up and processed in a very distant country, to finally be sold all over the world...

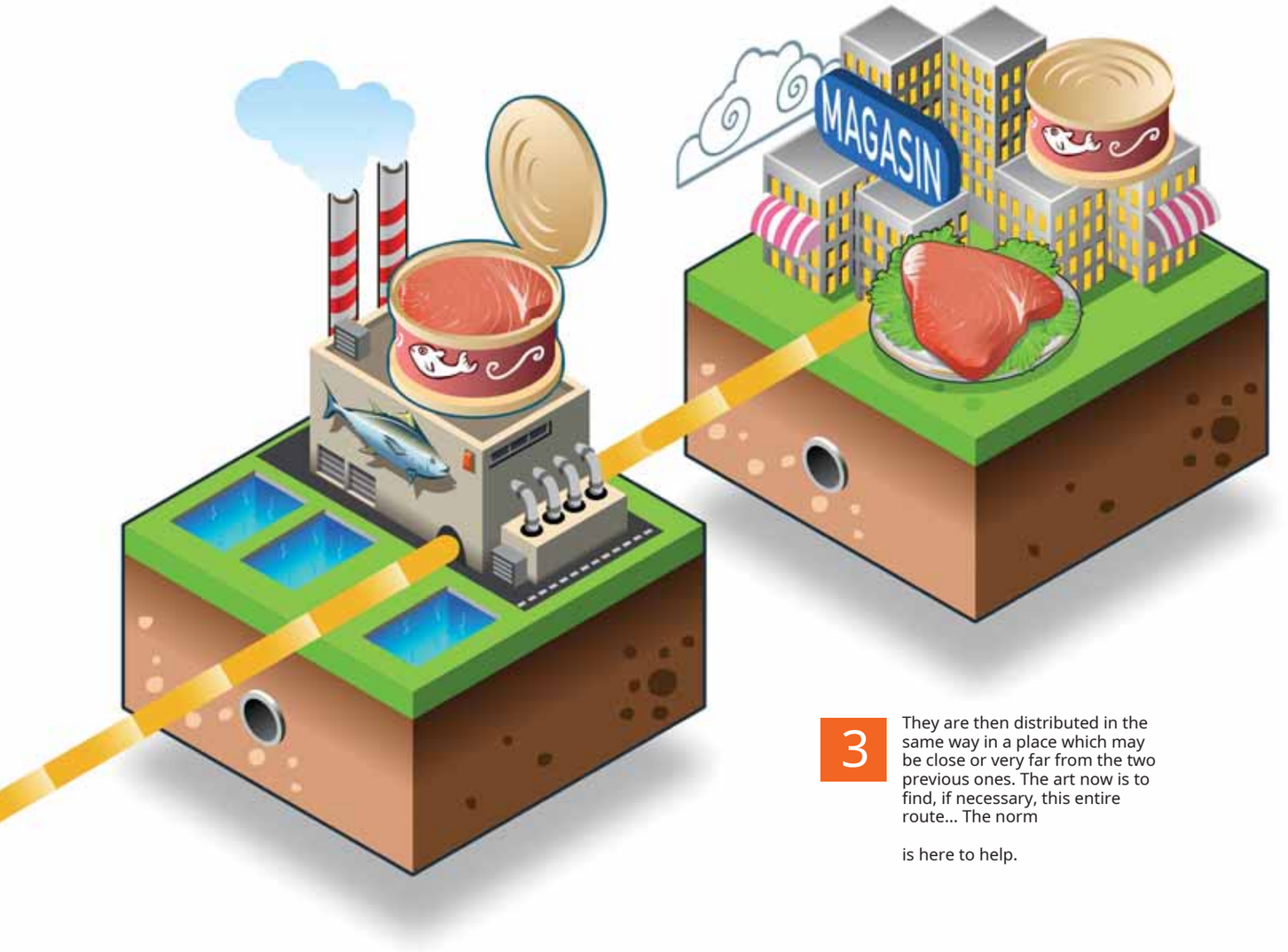


1 Foodstuffs are produced and collected in a very specific location on the globe...

20.4% SHARE OF EXPENSES FOOD

in overall French spending in 2014. It was 35% in 1960.

(Source: INSEE)



3 They are then distributed in the same way in a place which may be close or very far from the two previous ones. The art now is to find, if necessary, this entire route... The norm

is here to help.

2 They are then transformed in another very specific location which may be close or very far away... There may even be several transformations in several different countries.

RFID

My little sweetie

The barcode is not the only traceability tool, far from it. RFID chips are also part of the information transmission chain. Applied to the product, they allow a wealth of information to be stored. An English engineer is even considering placing it in food, which will tell us everything about its past, but also its nutritional intake, the number of calories, etc.

We are what we eat

Food traceability is not a new idea. Neither does protection against diseases caused by animal feed. The marking of animals intended for slaughter dates back to the late Middle Ages, a time that plague epidemics certainly traumatized. The principle is to exclude questionable animals, a seemingly obvious principle, but only in appearance because food shortages sometimes force deviations. At the end of the 18th century$_e$century, things are written in stone, or rather on paper.

When the king gets involved

A royal decree of 1784 requires sick animals to be marked with a green wax seal on the forehead. Sick of what? The list of terms of the time will discourage the most hungry: snot, anthrax, scabies, rabies of course. Finally, despite a still recent crisis, food security is an achievement of the 20th$_e$century. The implementation of traceability is one of the levers. But traceability is not just a matter of food safety. It is also a guarantee of quality. A way to choose wisely. And everyone wins: the producer, the manufacturers, and of course the consumer.

7

NF EN 649 | V1 in 1995 Revision 2005

BAR CODE

Exercise parallel bars

For the supermarket cashier, it’s a “shower”. It is true that it looks a bit like it, even if the toilet is undoubtedly the only time of the day when the barcode can do nothing for us. Let's say it bluntly, despite its uselessness in terms of personal hygiene, the "barcode reader" is a tool with tremendous potential. Just like the barcode itself, whose outlines date back to the 1970s. We can learn things from a series of vertical bars of different widths...

8 BILLIONS
FROM "BEEPS"
resound every second, everywhere on the planet.
(Source: LSA)

3 THIS IS THE CODE
FROM FRANCE
in the number line (4 for Germany, 0 for the United States).

WHAT DOES THE STANDARD SAY?

The barcode, manual

The NF EN 1649 standard is intended to be practical and accessible to the public. Because it is thanks to it, among others, that it is possible for creators of symbols and for those who wish to read them to be informed of the requirements that must be satisfied for any equipment production and reading of usable symbol for their system respective.

concrete, bar point

The text of the standard also indicates to builders of equipment barcode marking and reading requirements to which the equipment must be compliant. As to organizations that write application standards for industries, they will find the means to ensure that all requirements appropriate techniques are satisfied during the process of creation of standards.

"Decrypted" barcode

What's the point ?

Its simplicity is not unrelated to the success of the barcode, which is made up of a succession of vertical lines, some thin and others wider, underlined by a series of numbers, the code. The optical reading of these bars triggers a cascade of operations. So today, from a simple code scanned at the checkout, the distributor knows in a fraction of a second the status of his sales, his stocks, the journey of a product... The icing on the cake, we also know the price of the item.

Norman Woodland, the co-inventor of the barcode.

What are we doing?

There are inventions which summon a number of actors, others which are the work of a few. This is the case with the barcode. Its creator is an American born in 1921, Norman Joseph Woodland. In 1948, in prosperous post-war America, a classmate presented him with the idea of a system that would help merchants identify their products and manage their stocks automatically. The man named Bernard Silver and Norman Woodland team up to take on the challenge, using Morse code. A patent was filed in 1949, but no industrial follow-up was given to the invention for a long decade. It was not until 1971 that IBM decided to commercialize the system.

A medal, or nothing!

Logically, the giant "US" turned to Norman Woodland, who was personally involved in the development project, led by a certain George Laurer, another American engineer. The barcode became a reality in 1973, with a committee of distributors. (The first article scanned would be a pack of chewing gum...) It crossed the Atlantic in 1977, and its counterpart, the EAN (European Article Numbering), in turn found a place in the sun. A 13-digit pictogram is established as standard. Since then, the barcode has been used for almost everything. But Norman Woodland, whose patent expired the year before the IBM solution, gained nothing from the affair other than the national medal of technology which was awarded to him in 1992...

SHOWER

Please note, this is a laser gun

No barcode without a reader, which will emit a light beam, absorbed by the black bars and reflected by the light gaps. The reflected light is transformed into binary code, then interpreted into alphanumeric characters. From there, as in the game of seduction, one must take the first step. At the supermarket checkout,

it may be the article and its barcode which go to a built-in reader. In most other cases, a portable laser reader (“gun”, “shower”) aims the code with its light beam.

What about the QR Code?

To put it simply, the QR Code (from Quick Response) is similar to a “2D” barcode, which allows it to contain much more information: 7,089 numeric characters or 4,296 alphanumeric characters, compared to 10 to 13 characters or 2953 bytes for the barcode. Another advantage is that the QR Code can be read by a mobile phone which will then display an Internet page, a video, dial a telephone number, make a payment, etc.

5%

ECONOMY
on each product for the merchant thanks to bar code.
(Source : *West France*)

THE SPIRIT OF STANDARDS

Protect THE people

Voluntary standards are a valuable tool that contributes to everyone's well-being.

Each standard is the result of collective construction work, where the user, the user, obviously has their part. Because the standards are there – also, above all – to protect the interests of everyone, starting with the human person.

8

NF EN 177 | **V1 in 1997 Revision 2008**

PLAYGROUNDS

A crash test anti-grip of head

Synthetic rubber everywhere to avoid the most serious injuries, i.e. to the head? Not necessarily, says the law which requires “appropriate shock-absorbing materials”. But what does this adjective “appropriate” mean when it comes to protecting the pretty little heads of our children, while sparing adults the headaches and spats inherent to their divergent interests?

It is therefore with their heads on their shoulders that the adults concerned have built together and in detail a crash test which solves this puzzle:
the “NF EN 1177 standard”.

12.3 MILLION

of children aged 0 to 14 potentially affected in France in 2016.

(Source: Regional Health Observatory)

2/3

ACCIDENTS

in the air games are caused by falls.

(Source: Health Monitoring Institute)

WHAT DOES THE STANDARD SAY?

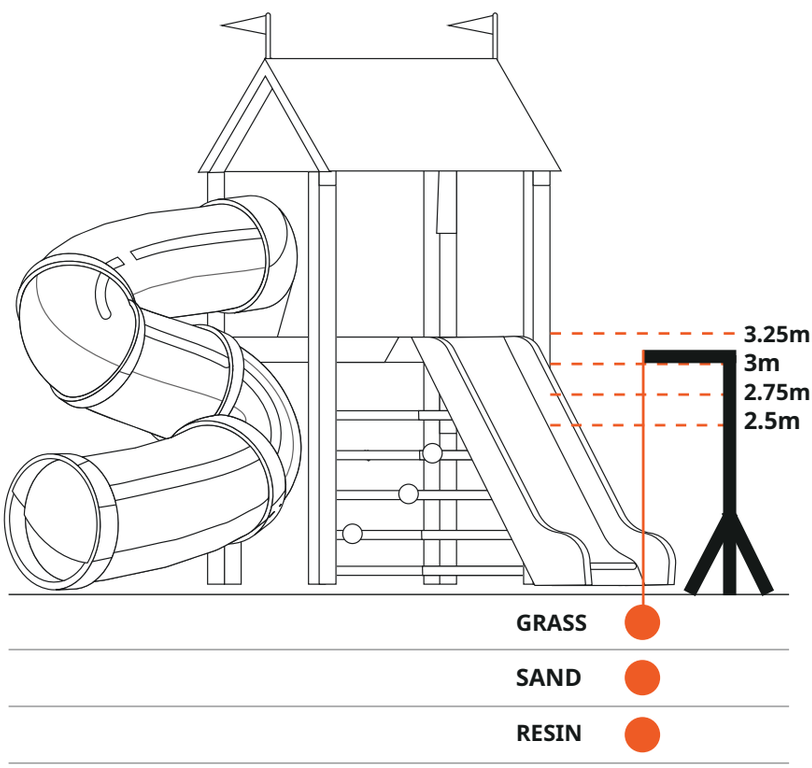
Calculate height critical drop

The standard defines a crash test protocol.

Objective: to assess the ability of playground facilities to reduce the likelihood of head injuries. That is to say, concretely calculating, using an algorithm, the critical fall height depending on the type of soil. This extremely precise scientific method requires the intervention of a laboratory and defines, among other things:

- the number of heights tested (4 minimum);
- the number of attempts for each (3);
- the difference between the tested heights;
- the height ;
- the temperature at which the tests are carried out (23° + or – 5°).

Calculation of the critical fall height according to the surface



“False head”

4.6 kg metal used for a crash test. More precisely a device called HIC meter for Head Criterion Injury. Coupled with an accelerometer, it makes it possible to measure the “impact attenuation capacity” of each soil.

The right measure

In the mid-1990s, at the request of the State, AFNOR published a voluntary standard which defined the hygiene and maintenance conditions to be respected for the use of public sandboxes. But the controversy broke out. “Financially unbearable,” say the elected officials of small towns who threaten to condemn all their sandboxes. AFNOR is therefore relaunching consultation, this time with associations of elected officials. A new standard, FDS 54-206, more flexible,
is published immediately. It is still relevant today.

THE GROUNDS

5 possible coverings to absorb shocks

Games are serious

1989: a series of serious accidents raises the alarm. The Consumer Safety Commission (CSC) is conducting the investigation and issuing an opinion on the “numerous safety problems” posed by play areas. Message received five out of five by the public authorities who legislate immediately. Two decrees from 1994 and 1996 oblige manufacturers and operators to comply with a certain number of safety and information requirements. All equipment present in the play areas is concerned: slides, swings, turnstiles, sandboxes, climbing nets, etc. It's the law, but we know it's cryptic.

10 standards... Boom!

Actors in the field therefore take up the subject to clarify their respective responsibilities and give themselves the means to honor them. Manufacturers, local authorities, state services, mayors' associations, parents' associations, sports associations, testing laboratories: there are 48 around the table to “voluntarily” agree on the criteria acceptable to all. And they succeed. The first standard was released in 1997. Since then, 10 European voluntary standards have clarified safety on play areas. Boom!

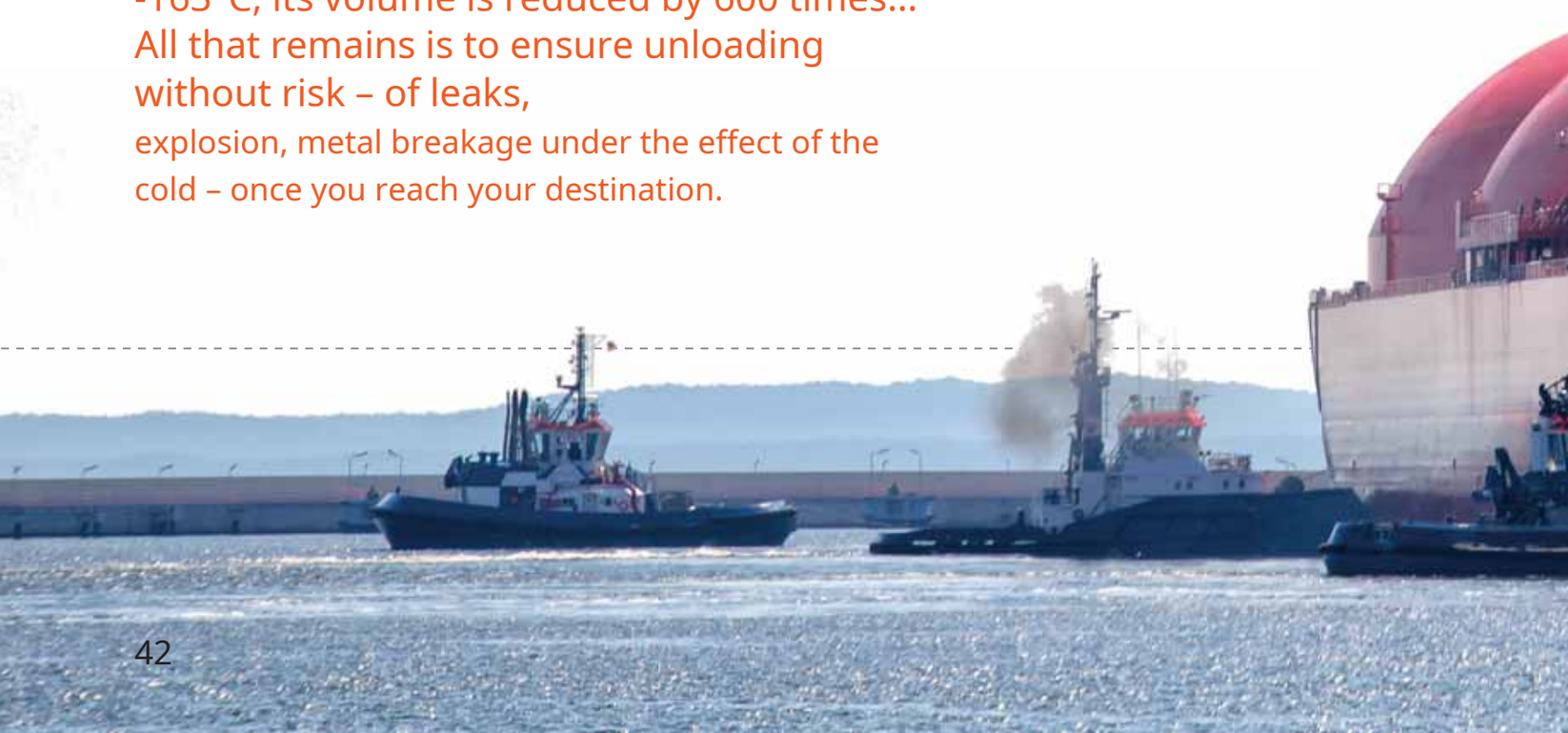
9

NF EN ISO 8460 | V1 in 1997 Revision 2013

“LNG” PORT FACILITIES

Water and gas all the shores

Do you know about LNG? This is the nickname for liquefied natural gas. Know it, this fuel has a bright future. Because the reserves of natural gas are immense, because it is a less polluting fuel than oil or coal, and because it is transported in large quantities in the liquid state. This allows it to free itself from geographical constraints, and why not political ones, like those imposed on gas pipelines. Cooled to -163°C, its volume is reduced by 600 times... All that remains is to ensure unloading without risk – of leaks, explosion, metal breakage under the effect of the cold – once you reach your destination.



378

LNG CARRIERS
IN SERVICE
IN THE WORLD

(8 in 1970) i.e. a total transport capacity of 56 million of m^3gas.(Source :*planete-energies.com*)

93

TERMINALS
RECEPTION

in 26 countries on 4 continents.
(Source :*planete-energies.com*)

WHAT DOES THE STANDARD SAY?

Full throttle on LNG

The ISO 28460 standard is the result of an observation: the significant growth in maritime LNG traffic. **To ensure the security of transport, it is necessary encourage the installations ports and LNG terminals to dispose of systems operational *ad hoc*.** We must also ensure that the LNG tankers will be in accordance with these systems.

Control risks at -160°C

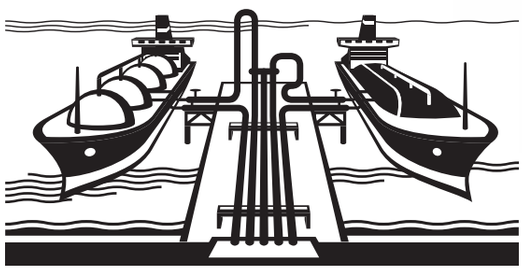
The issue is to transport the LNG in the best conditions before regasifying it for its final use, knowing that LNG at -160°C presents risks of frostbite for personnel, breakage for steel, but

also overpressure, explosion or

of asphyxiation.

Where it comes to mooring, wharf, leak...

The standard therefore aims to exclude the risks of failure of mooring the ship, leaks, poor workmanship in the drain, overflow, overpressure. To do this, are defined – among other things – the layout of the pier, the mooring area, the procedures mooring and wharf, the provisions against leaks, communication of data, safety conditions in general.



Towards the floating terminal?

Just as there are floating terminals for oil, there could be floating terminals for LNG. Technical solutions are already in place, which allow maneuvers to be carried out in acceptable safety conditions.

But for the moment, the most widespread solution remains that of the sheltered port and its surroundings.

+50%

OF GROWTH

for consumption world LNG by 2040.

(Source: IEA World Energy Outlook 2014)

CH_4

Of influence bovids

Methane (CH_4) is present in a natural state on our planet, the cows which graze (yes, who graze) and digest, contributing for example to its production. It is also found in marshes, and failing that in contact with living organisms, under the effect of fermentation. Colorless and odorless, methane constitutes 90% of LNG, the third largest energy resource in the world after oil and coal.

Gas car in Paris in the middle of the 20th century.

LNG, for today and tomorrow

There was a time when things were simple. The world was divided in two: on one side petroleum gasoline engines, on the other, heavy oil engines, those of Rudolf Diesel. It was at the end of the 19th century. Then things changed, particularly due to war (but not only). During the Second World War, (rare) cars and trucks were equipped with a “gasifier”, a system allowing an engine to be powered with wood gas. Limited performance, but... “in war as in war”, as they say. The oil crises of the 1970s quickly reopened the question of alternative fuels. Starting with LPG (liquefied petroleum gas), a fuel made up of propane and/or butane. LPG, much cheaper than “unleaded”, is still used by individuals to power automobiles equipped accordingly.

Cheaper and green

But the gas car can also run on natural gas, just like industrial vehicles: buses, trucks, barges, locomotives... The cost of the transformation is limited, and especially natural gas (compressed, CNG, or in liquid state , LNG) emits much less sulfur dioxide and nitrogen oxide. Best of all, it's much cheaper. Better yet, LNG has strategic significance. Because it is a way to reshuffle the cards for fossil energy production, and therefore to contribute to our energy independence. QED

10

14040 | V1 in 1994 Revision 2006

LIFE CYCLE ANALYSIS

Accurate of decomposition

"You are dust and to dust you shall return..." Everyone sees noon at their door. But we know that everything has a life, and that products, whatever they may be, have an impact on the environment.
An impact that must be reduced to a minimum, because we only have one planet that sends us alarm signals every day. So we are interested in the life cycle – "from cradle to grave", and now from cradle to cradle – of this phone, of this car, of this alkaline battery. So that their "eco-balance" is the best possible. And make sure that if we are mortal, at least the materials are not.

3 YEARS

This is the duration average of renewal phones portable in Europe.
(Senate report no. 850, September 27, 2016)

100

MILLIONS OF
PHONES
LAPTOP
sleep in the drawers of French.
(Senate report no. 850, September 27, 2016)

124

MILLIONS
GOLDEN EUROS
LOST
for lack of recycling of 27,000 tonnes Cards electronic In France in 2012.
(Senate report no. 850, September 27, 2016)

WHAT DOES THE STANDARD SAY?

Speech of the method

How to proceed ? This is the question to which the NF EN ISO14040 standard – whose work have France as their origin – means answer. To do simple, it involves compiling and evaluating consumption energy, uses of raw materials and releases into the environment, and assess the impact potential on the environment of a product, process or even a service, over its entire life cycle.

Management environmental
To do this, LCA (life cycle analysis) is broken down into four phases:

a) definition of the objectives and scope of the study;

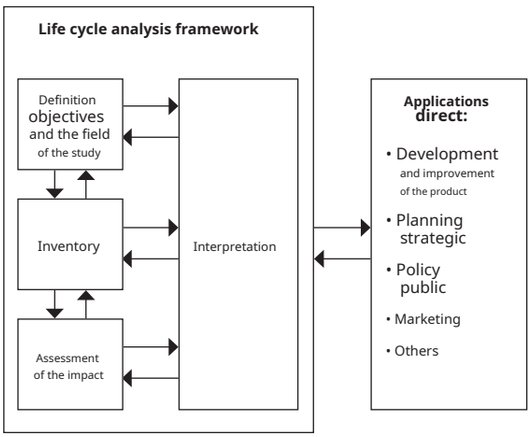
b) inventory work;

c) evaluation study of the impact;

d) interpretation of results.

In practice, LCA is one of multiple techniques for management environmental existing, and also one of the most constructive.

Phases of a life cycle analysis



The Arc de Triomphe illuminated following the signing of the Paris Agreement during COP21 in December 2015.

Inanimate objects, so you have a life

Measuring the environmental impact of a product is not a new idea (the first energy assessments date from the 1960s), but the means of evaluation have long remained embryonic. It was at the beginning of the 1990s that the need for a "multi-criteria" approach emerged, taking into account all stages of the life of products: production, emissions, transport, packaging, final consumption, elimination or – ideally – valuation.

The novel of matter
As you might have guessed, the objective of LCA is to identify opportunities for improving environmental performance at each of these stages. This is of interest to industry decision-makers as well as organizations in charge of strategic planning, priority setting, design or redesign of products or processes. Which helps to choose relevant performance indicators. Which can even become a marketing argument for the producer. End of the anaphora, but multiple proofs of the relevance of LCA: it is precisely because it brings together a multiplicity of issues – preservation of resources, energy choices, mode of production – that LCA is the one of the tools favored by companies for the implementation of the Paris climate agreement. If only to learn that 70% of the environmental impact is at the raw material stage, which is indeed the crucial subject.*"Life is the novel of matter »*, said Cioran.

“I started using waste purely out of necessity. I found my life there. I exalted myself in this material [...]. By chance we installed,

in France, in Villetaneuse, the first big press I dreamed of.
I immediately wanted to pay homage to the material. »

Thus spoke the French sculptor, César, who compressed numerous objects using hydraulic presses, as an act of defiance against the consumer society.

LOOPS

Nothing is lost (but can be created)

Like the world in Sergio Leone's westerns, the world of recycling is divided into two: open-loop recycling and closed-loop recycling. The first concerns certain materials which are recycled without the addition of new material or almost (the aluminum of our cans, for example), the second, products which will be degraded to be used for something else. Like those old jeans that will become indoor slippers or a flattering handbag.

A breaker who knows how to break...

The time of carcasses rusting in the sun is fortunately over. The automotive industry has made immense efforts in the field – among other things – of recycling end-of-life vehicles: the recyclability rate of a new vehicle is today 95%, while the recovery rate of an old vehicle is 83%*.

The rule is that of maximum reuse (metals) and a drastic reduction of waste (plastics, glass, rubber), via recovery. The “demolition workers” are no longer what they used to be... And that’s very good.

*Source: CCFA.

11

NF EN 0061-1 | V1 in 1976 Revision 1993

LAMP BASES

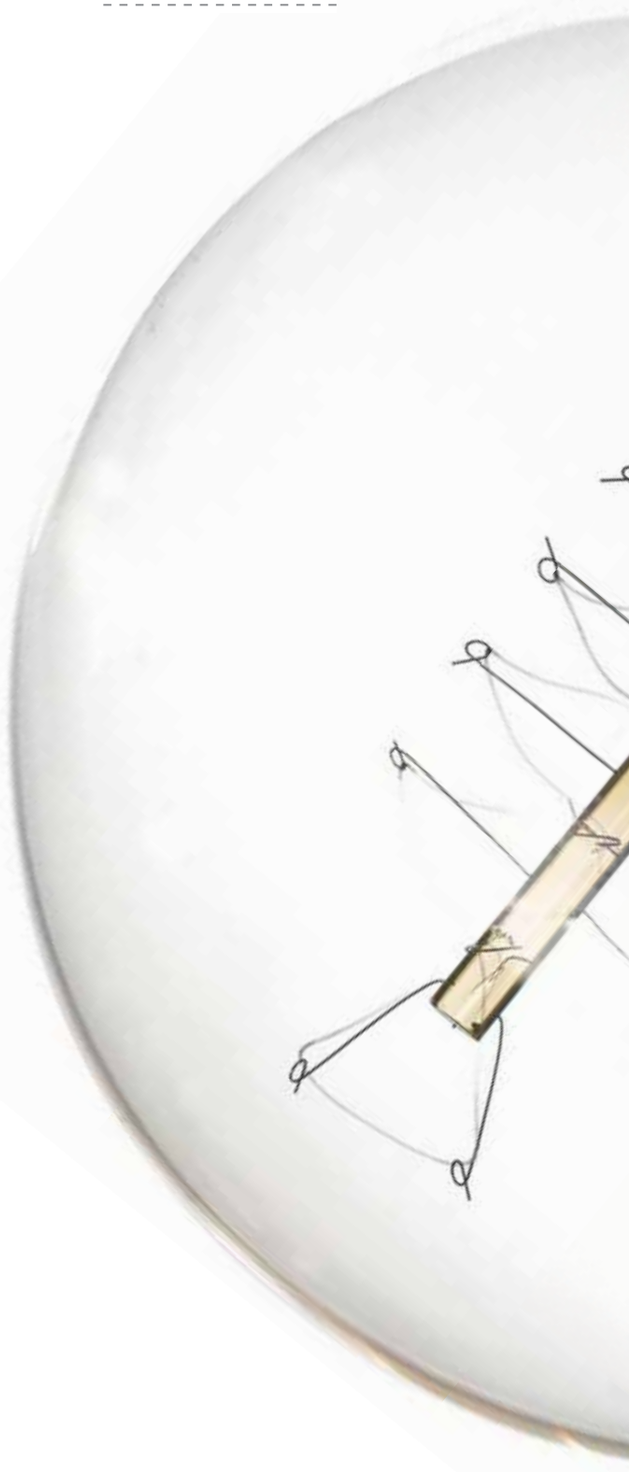
12%

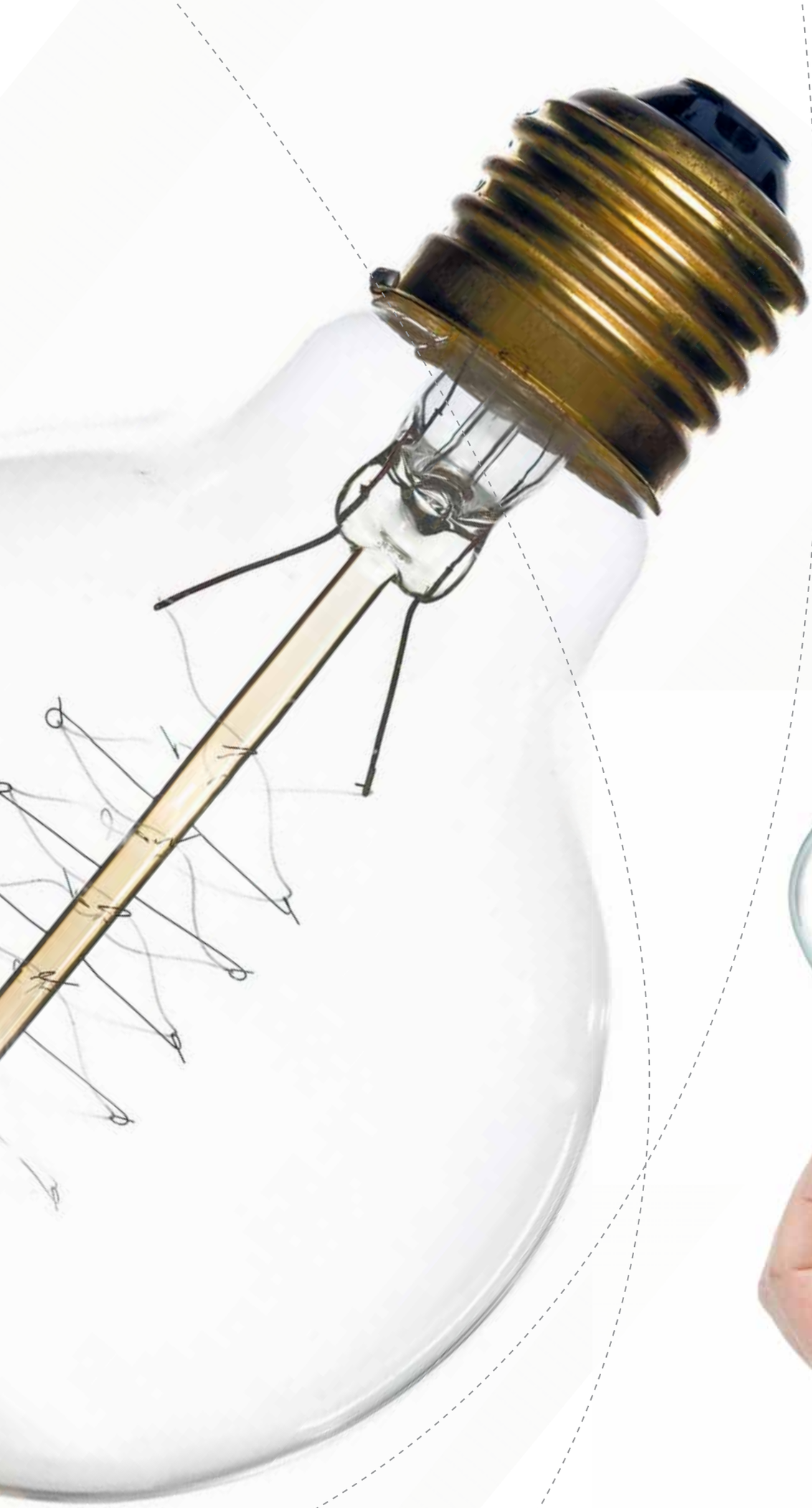
THIS IS THE PART
LIGHTING
in the consumption electric of a accommodation.
(Source: Ademe)

It is necessary nerve for tighten the screw

This is the whole problem with so-called “wear” parts. Whether incandescent, fluorescent or LED, among others, bulbs go out one day ("pop", or even "pan") and must be replaced. Preferably in the pitch black of a basement where everything was fine just five minutes ago. Change that bulb... You still have to find the right fit. For those who do not have the patience of Prince Charming, who is very stubborn in trying on his shoe of... vair, we have created a standard. A standard in three official languages (French, German, English) whose valiant torch, armed arm of coherence and unity, finally breaks the darkness of multiple

and miscellaneous. (Bulk.)





90

MILLIONS

lighting fixtures urban in Europe, including 75% have more 25 years old.

(Source: Association French lighting)

WHAT DOES THE STANDARD SAY?

NF EN 60061-1, or the pangs diversity

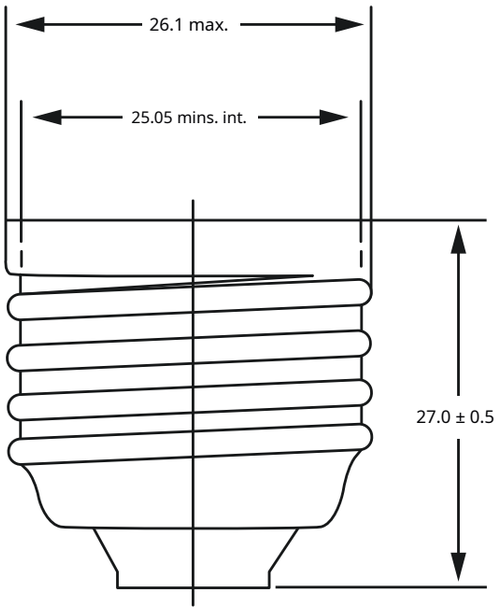
Here is a norm which embraces a singular variety of cases. Because the lamps cannot be distinguished only by their fastening system, but also, it goes without saying, by their dimensions. This is how the only bayonet bases, the first on the list of cases envisaged by the text, occupy alone some fifteen lines of the summary. And this is only the beginning, we will also have to address the sizing and assembly rules screw bases, lamp bases tubular to fluorescence (incorrectly named "neon tubes"), bases for automobile, photography, infrared...

The price of a livable life

In short, the scope of the NF EN 60061-1 standard is immense: 250 pages, 110 references, described by 400 diagrams and 100 paintings, but that is the price to pay to keep modern life livable.

E27 screw base

Dimensions in mm



56

BILLIONS

OF DOLLARS :

this is the expected market share for lighting clever in 2020.

(Source: Cabinet Markets and Markets)

By the force of bayonets?

No. It would rather be the opposite. There was a time that those under 20 cannot know, when our homes were the place of joyful diversity in the field of lamps. There was 40 watts for the thrifty, 100 watts for the ambitious, and above all this terrible dilemma that had to be resolved: screw or bayonet. In doubt, in fear of doing wrong, in the dark in short, we often chose not to choose anything. Clearly, two ranges of bulbs were loosely stocked, for as many fixing systems. But times are changing, some will have noticed.

No ! Low tension !

Screw-in sockets have become the standard for household lighting. To the point that bayonet lamps seem condemned to an imminent end, only pushed back by the lighting equipment in our homes. Equipment that lasts and whose sole purpose is not to illuminate. Besides, we would fight to replace the bulb of this Bauhaus lamp designed by Wilhelm Wagenfeld in 1924... But the future is here knocking on our doors. And the quarrel over screws and bayonets will perhaps be resolved by other issues and other innovations, such as low-voltage lighting. Other times, other lamps, a standard sleep.

DIODES

The hidden beauty LEDs

The LED, Light-Emmiting Diode, has long been confined to specific uses in electronics. Then technology and the obligation to save energy have brought it into common use domestic and even automotive, LEDs are now fitted to the headlights of high-end cars. In our homes, the LED lamp is gaining ground with its high efficiency (and therefore its low

heating), its lifespan is much greater than that of a conventional bulb, its lighting capacity instantaneous, its compactness, its compatibility with our current equipment. Everything to please.

Decoration trend

We can make do with a socket and a bulb hanging from the ceiling. But we can also go further in the field of decoration. And it must be said that lighting has something to inspire creators. For the luminaire itself, but also for the bulb. Witness these stunning lamps decorative filament lamps that we like to combine with a very chic vintage industrial pendant light, with their ultra-classic screw base.

Remembered

Lunch digital nostalgia this accessory which in the evening topped Kodak's Instamatic cameras, in the 60s and 70s, still present in the text of the standard. Named Flashcube then Magicube, it launched a brave flash then pivoted a quarter turn for a new assault. Four lightning bolts in number, obviously. Then nothing.

12

NF ISO 000-1 | V1 in 1970 Revision 2015

TIRES AND RIMS FOR PASSENGER CARS

Let's dream a tire

We can't repeat it enough: our car only touches the ground on a limited surface, roughly equivalent to four times the palm of our hand.
At 110 km/h in the rain, we will agree that it is not much. So no question of choosing gum puddings. The first to worry about this are car manufacturers, who strive to find the best tire compromise for each vehicle.
Adhesion, behavior,

consumption, a host of parameters are studied before the final set of tires is defined. All in strict compliance with the standard, obviously.

20 to 50

COMPONENTS
enter into the making of a tire.
(Source: Michelin)

50,000 KM

THIS IS THE AVERAGE MILEAGE
what a good tire can accomplish, but the type of vehicle and driving style have a significant impact on the life of the tire.
(Source: Michelin)

20%

THE EQUIVALENT
OF A FULL
OUT OF FIVE
is consumed by resistance to the rolling of pneumatic tires.
(Source: Michelin)

WHAT DOES THE STANDARD SAY?

Of the train (of tires) where things are going

Characteristics of a tire are based on four essential data, what are the nominal section size (which ends in 0 or 5), the nominal ratio appearance (also a multiple of 5), the construction code of the pneumatic, and finally the nominal rim diameter code.

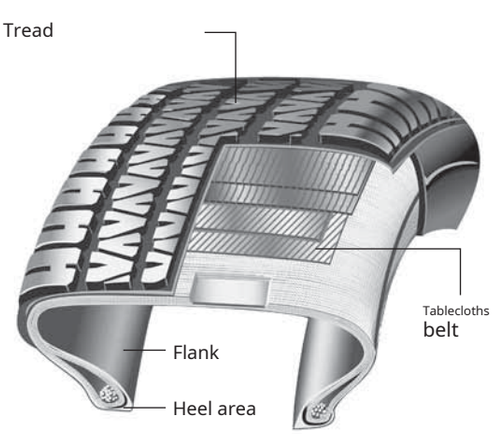
Data detail

The NF ISO standard 4000-1 between precisely in the detail of this data, possibly under form of tables. Speed codes, for example, range from J (100 km/h) to Ya (300 km/h). The standard also specifies the tire selection criteria. So, the normal load of the vehicle resting on the tire must not exceed 88% of the maximum load capacity of the tire pneumatic, this calculation based on the total mass of the vehicle, with its accessories, its payload and even its options production.

Crowd of calculations

But that's not all. Because the text also includes a host of theoretical calculations that it is not essential to know in order to go on a weekend - even if it is good to know that nothing is left to the chance.

Tire cut with dimensions



How to win 0.3 liters/100 km?

Due to rolling resistance, tires are responsible for around 20% of the energy consumed by the car. This is why many manufacturers offer ranges of “green” tires, supposed to reduce rolling resistance.

And it works: the gain can reach 0.3 l/ 100 km for the best!

205/55 R16 91V...

This cabalistic code, you should know, is engraved on the side of your car's tires. The numbers are not necessarily the same, but each of the data in the equation says something precisely. Above all, each car model is the subject of a rigorous study by its manufacturer to define the most suitable tire “fitting” (this is the established term). There's the tread width, first of all, here **205**mm. Obviously, a wider tread is a guarantee of better grip, but it is also resistance which consumes energy, and therefore fuel. The famous “wide rims” do not make you go faster, but rather less. Then there is the series, that is to say the percentage ratio between the width and the height, here**55**%.

Just a little more effort

The lower the number, the more “low waist” the tire is: more rigid due to its lower sidewalls, therefore sportier and even very chic, but less comfortable. “**R**»tells us about the structure of the tire (here radial). The value**16**, for its part, tells us the diameter of the rim in inches, here 16”; the rim being, as you might have guessed, the circular metal part on which the tire is mounted. Next comes the load index, which corresponds to the maximum load that the tire can support, here**91**;and finally the speed index. THE**V**allows the vehicle to travel up to 240 km/h, but you don't have to follow your tire... exactly.

RECYCLING

this is not a tire

What to do with a used tire? Recycle it of course. And we must recognize that in this area, some stand out for their imagination. Repainted in very attractive pastel tones, old tires become plant pots in the garden, a dog (or cat) basket in the living room, or even interior decoration elements. But artists are not left out, who use it as a material for sculpture or even clothing creation.

And if you lack creative ideas, the Aliapur sector,founded in 2003 by professionals, collects and recycles used tires.

Michelin poster,
mid-20th century.

A tire of history

- 1839, Goodyear industrializes the vulcanization of rubber.
- 1888, Dunlop filed the patent for the “inner tube”.
- 1891, Michelin invents the removable tire.
- 1910, entry of metal into the structure of the tire.
- 1937, Michelin created the steel carcass, in 1946, the radial carcass, in 1955, the Tubeless tire.
- 1980s, development of “low-rise” tires.
- 1992, Goodyear invents the tire that can run flat. “Eco” tires with low rolling resistance.
- 2010s: the tire communicates its pressure and temperature to the car's electronic control unit, to optimize behavior.

Tram rail fishplate manufactured in from recycled tires.

13

ISO 4710 | V1 in 1988 Revision 2000

CORKS
FOR SPARKLING WINES

ISO pushes a little bit cork

At the risk of spoiling the party, a sparkling wine – starting with champagne – is first and foremost a wine which contains a certain concentration of carbon dioxide. Flute, that breaks the myth a little. The rest, which is certainly not the least important, lies in the prestige of the label and the quality of the beverage. But quality is also a matter of the stopper when it is made of cork. And when it is made of cork and cylindrical, we apply the ISO 4710 standard to it, without moderation.

300,000

TONS OF CORK

extracted every year around the world, 52% coming from Portugal.
(Source: French Cork Federation)

68% FROM PRODUCTION MONDIALE DE LIÈGE
is transformed into corks.
(Source: French Cork Federation)

6% FROM PRODUCTION WORLD WINE
concerns sparkling wines.
(Source: AgriMer, 2012)

WHAT DOES THE STANDARD SAY?

To each its cap

Let it be said, a cork for sparkling wine is not only one cylinder in cork bark.

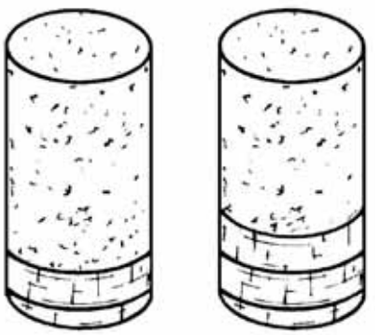
Agglomerated and natural

The ISO 4710 standard distinguishes two types: caps entirely in chipboard, based cork granules (reserved for wines gasified), and caps which also include a or several washers natural cork, which allow to make the best use of the sealing qualities of cork (this second type suitable cap also to sparkling).

Handle and washer

The handle, part main part of the cap, as well as its possible washers, are described precisely by the standard: composition, number, arrangement, thickness. The packaging, marking, storage, are also part of the topics addressed by the text. In short, we don't joke with corks of carbonated wine, nor sparkling wine, nor especially of champagne.

Agglomerated cork stoppers with natural cork washers



Cap fully in cork agglomerate

Oak cork, engraving.

Grand Siècle, Great Bretons and Champagne wines

We will not revisit the history of the Champagne vines, whose origins date back to the Romans and the fortunes of the bishopric of Reims, which for a long time crowned the kings of France. That said, a coronation is a moment of excitement, which is quite good. Because the history of sparkling Champagne wines dates back as far as the Middle Ages (which certainly lasted a thousand years), a time when Champagne wines were distinguished by a slight natural effervescence linked, according to specialists, to fermentation. incomplete must. This singularity remained relatively misunderstood until the end of the 17th century.ecentury and to a certain Dom Pérignon, a holy man to whom we owe the discovery of the mechanism of double fermentation.

Help from England and Portugal

Thanks to the genius of the monk, the quality of Champagne wines took a leap, but the foaming remained random, the effervescence poorly controlled, and the losses numerous. It was not until the beginning of the 18the so that thicker glass bottles appeared, capable of withstanding strong pressure, on the model of the bottles used in England, where sparkling wine was already mastered. We took the opportunity to replace the wooden “broquelets” – a simple tied and greased peg – with corks which avoided loss of pressure or wine. Cork from Portugal... on the initiative of the English. Definitely...

100% NATURAL

Let's all recycle!

Recycling fever has taken hold of corks, 100% natural and 100%

recyclable! So why deprive yourself ? To participate, type “cork recycling” on the Internet and you will find the place to drop them off near you.

The cork thus recovered is used in the manufacture of ecological products with high added value – thermal or acoustic insulators, for example – used in particular by the aeronautics industries,

aerospace, automobiles, but also through construction, large infrastructures, and... increasingly design and fashion.

The cellar does not make the mushroom

Why is the champagne cork shaped like a mushroom? Well initially...he’s not. It is classically cylindrical. But the partial depression, then the installation of the capsule and the muselet
– this metal wire that inspires us to create the most daring sculptures while we enjoy it – will give it its characteristic deformation which, moreover, helps it bounce on the ceiling.

Tell me where it comes from

your carbon dioxide...

Sparkling wines are special wines, treated in accordance with the code of the International Vine and Wine Office. Carbonated wines are also special wines treated according to techniques accepted by the same OIV, with physical characteristics similar to those of sparkling wines, but in which carbon dioxide (or gas
carbon dioxide) is of partially or totally exogenous origin. Added gas, then.

14

ISO/IEC 646 | **V1 in 1993 Revision 2014**

UNIVERSAL GAME OF
CODED CHARACTERS

In secret signs

When you type an “a” on your keyboard, you are used to seeing an “a” appear on your screen. Whatever the PC, whatever the font, and preferably capitalized when you decided it would be capitalized, italicized when you decided it would be italicized. But you also know that digital, as its name suggests, is a matter of code. So what actually is an “a” for your computer? What is a “2”? Well that's what makes all the PCs and all the protocols in the world speak a common language. And behind this magic, there is a standard – and much work, and much thought.

99% **It is that represented English in communication worldwide.** (UN number)

6,000

APPROXIMATELY

It's the number of languages spoken In the world.

(Source: Géopolitis)

120,000 CHARACTERS

(symbols, letters, numbers, ideograms, logograms) from languages, writing systems and other traditions around the world are listed in the Universal Coded Character Set.

(Source: www.stackoverflow.com)

WHAT DOES THE STANDARD SAY?

Any character is a number

The ISO/IEC10646 standard is applicable “to the representation, to the transmission, to exchange, to processing, storing, capturing and displaying written forms of world languages and symbols additional”. Vast program that hears allow the exchange of scaled data international.
In principle, and this is what makes it strong, the standard assigns each character a number and a name.

Where does it come from?
an abstract character set, where each of the characters (the alphabet Roman, for example, but also the tiny, the capitals, the inclination: roman, italic) is identified by a unique name associated with a positive integer, named “code point”. Which gives 9,362 pages to the 2014 version of the standard, including 2,300 pages of tables in all alphabets, and 6,882 pages of code lists...

Table of Greek and Coptic codes

	037	038	039	03A	03B	03C	03D	03E	03F
0	Ͱ 0370		ΐ 0390	Π 03A0	ΰ 03B0	π 03C0	ϐ 03D0	Ϣ 03E0	ϰ 03F0
1	ͱ 0371		Α 0391	Ρ 03A1	α 03B1	ρ 03C1	ϑ 03D1	ϣ 03E1	ϱ 03F1
2	Ͳ 0372		Β 0392		β 03B2	ς 03C2	ϒ 03D2	Ϥ 03E2	ϲ 03F2
3	ͳ 0373		Γ 0393	Σ 03A3	γ 03B3	σ 03C3	ϓ 03D3	ϥ 03E3	ϳ 03F3
4	ʹ 0374	΄ 0384	Δ 0394	Τ 03A4	δ 03B4	τ 03C4	ϔ 03D4	Ϧ 03E4	ϴ 03F4
5	͵ 0375	΅ 0385	Ε 0395	Υ 03A5	ε 03B5	υ 03C5	ϕ 03D5	ϧ 03E5	ϵ 03F5
6	Ͷ 0376	Ά 0386	Ζ 0396	Φ 03A6	ζ 03B6	φ 03C6	ϖ 03D6	Ϩ 03E6	϶ 03F6
7	ͷ 0377	· 0387	Η 0397	Χ 03A7	η 03B7	χ 03C7	ϗ 03D7	ϩ 03E7	Ϸ 03F7
8		Έ 0388	Θ 0398	Ψ 03A8	θ 03B8	ψ 03C8	Ϙ 03D8	Ϫ 03E8	ϸ 03F8
9		Ή 0389	Ι 0399	Ω 03A9	ι 03B9	ω 03C9	ϙ 03D9	ϫ 03E9	Ϲ 03F9
A	ͺ 037A	Ί 038A	Κ 039A	Ϊ 03AA	κ 03BA	ϊ 03CA	Ϛ 03DA	Ϭ 03EA	Ϻ 03FA
B	ͻ 037B		Λ 039B	Ϋ 03AB	λ 03BB	ϋ 03CB	ϛ 03DB	ϭ 03EB	ϻ 03FB
C	ͼ 037C	Ό 038C	Μ 039C	ά 03AC	μ 03BC	ό 03CC	Ϝ 03DC	Ϯ 03EC	ϼ 03FC
D	ͽ 037D		Ν 039D	έ 03AD	ν 03BD	ύ 03CD	ϝ 03DD	ϯ 03ED	Ͻ 03FD
E	; 037E	Ύ 038E	Ξ 039E	ή 03AE	ξ 03BE	ώ 03CE	Ϟ 03DE	ϰ 03EE	Ͼ 03FE
F	Ϳ 037F	Ώ 038F	Ο 039F	ί 03AF	ο 03BF	Ϗ 03CF	ϟ 03DF	ϱ 03EF	Ͽ 03FF

One point is (almost all

Transmit text regardless of writing or speaking, the idea is not new. We think of the smoke signals of the Amerindians, or the telegraphy of Claude Chappe in the 18th century.ecentury. It is the same telegraphy, moreover, which inspired a certain American painter, Samuel Morse, in 1832. We owe him the electric telegraph and its international Morse code, still in use today among the military and civilians alike. (maritime signs, scuba diving, etc.).

A telegraph of Morse.

Babel... web

This is the problem of the Tower of Babel, electro version. How can we ensure that what has been formulated by one is understood by another at the other end of the web? Things were certainly simpler when the word processor only led to print. Especially since if we stick to its title – WorldWide Web, “global network” – the web naturally extends beyond the limits of the Latin alphabet. For the Latin alphabet alone, moreover, the impasse was made from the start, at the beginning of the 1980s: at that time, the ASCII code, American Standard Code for Information Interchange, was retained as the character coding standard. . As English does not include an accent, all the singularities that "old Europe" may know (French, Italian, Spanish, Polish, Czech, etc.) were swept away, particularly in terms of addresses.

Goodbye ASCII, hello Unicode!
But the web is not so sectarian, even if the standardizer's task is extremely complex. We had to find a solution so that each language found its account. To expand the range of characters, previously limited to 128, ASCII gave way to Unicode which opened the door to Cyrillic, Hebrew, Thai... Now Unicode is the fruit of the reflections of consortium of the same name, partner of ISO and its ISO/IEC 10646 standard. Each evolution of one leads to an evolution of the other. And this is how the range of characters continually expands, because standardization is not uniformity...

BABEL

Vanity of vanities

It belongs to our common culture and it is at the same time the illustration of the vanity of men and their pathetic inability to agree to carry out a project successfully. The Tower of Babel therefore announces, in a sense, the terrible difficulties

that the Shadoks were going to encounter, in the second half of the 20th century, to tear themselves away from their frankly worthless planet. Except that the Tower of Babel is primarily a problem of language, when the Shadoks deliberately chose to make it complicated rather than simple, which is one way of looking at things.

Mojibake – The payback

It's not just Latin languages accentuated which have had to suffer from the early ASCII code, the specter of which still haunts Internet addresses, which means that the author of these lines is not Philippe François, but Francois. A term has even established itself as a standard for all those who type a character on their keyboard and don't get exactly sound reflection on the screen: mojibake ("hieroglyph" for Frenchies). A loan from Japanese. We ask well Why.

THE SPIRIT OF STANDARDS

Facilitate the life daily

Voluntary standards help to simplify our daily lives.

The result of broad consultation, voluntary standards aim to harmonize practices and technologies, and therefore, in short, to make our lives simpler. The best standard is the one we enjoy every day without knowing it...

15

NF ISO 864-1 | V1 in 1959 Revision 2013

SIGNALS AND MARKINGS
OF SECURITY

“A good sketch is better than a long speech "

(Napoleon Ier)

There are road signs, railway signs, river signs, each with their own specific code, to be learned by heart. But safety is a universal issue that also concerns workplaces and public places.

The principle: avoid accidents and facilitate emergency evacuation, so that no one gets lost in a restricted area, is exposed to an electrical risk, or desperately searches for the exit. Hence the interest in a simple language, intelligible to everyone, regardless of the language spoken. But keeping simple is often complicated, especially when it comes to symbols. This is why safety pictograms are a very serious and closely supervised matter. Another proof of the usefulness of standards.

13%

ACCIDENTS
of work are accidents... path.
(Source: INRS.)

WHAT DOES THE STANDARD SAY?

It's what your sign?

The purpose of the NF ISO 3864-1 standard is to standardize a system providing information from security which reduces at least the use of text, because international travel and worker mobility require a mode of

communication common.
This communication relies above all on a color code and geometric shapes, associated with a meaning good precise: a circle crossed out transversely to the ban, a triangle yellow bordered with black for the warning, a red square for everything relating to the fire safety...

Distance and height

Green striped with white, conversely, will evoke safe conditions. Other aspects mentioned by the standard: the distance and height for reading the signage. To know again, the NF ISO 3864-1 standard does not apply to the signage used in traffic rail, road, river, maritime, nor aerial.

Everyone has their own pictograms.

Typology of different safety signs

Circle with bar transversal
Prohibition

Circle
Obligation

Equilateral triangle with angles rounded exteriors
Warnings

Square
Condition of security

Square
Wrestling equipment against fire

Two centuries before our era, the emperor Chinese Qin Shi Huang, well known for his army of warriors of terracotta, was also a great standardizer weights and measures.

The pictogram is not a new idea

Before being a visual tool intelligible to all, the visual symbol was a tool of written language. We think of hieroglyphs, of course, and among them ideograms. This is the sign word: we draw what we want to name. The ideogram is also the basic element of the Chinese language. Two centuries BC, “Emperor Qin”, Qin Shi Huang for the civil status, would have standardized Chinese writing with the Xiaozhuan spelling (small seal style) for around 3,000 characters. He would also have standardized weights and measures and currency, which therefore makes him a distant inspiration for AFNOR.

Immediate intelligibility

But the pictogram is another matter still, more “essential” perhaps. It is the representation of the concrete thing, with a degree of symbolization which must allow immediate intelligibility. Man finds himself reduced to a line for the trunk, to four lines for the limbs, to a marble for the head. But it's for his own good. Because these pictograms are not there to create a tapestry. They are there to protect us, and even to save our lives. And secondarily so as not to get lost between ladies' toilets and men's toilets. Although, here too, a quickly intelligible symbol is not necessarily useless.

STREET ART

Under the sign of humor

The Breton artist Clet masterfully handles a universal language on... universal panels. And it works ! The magic happens: we understand and we smile, in the four corners of our streets and even around the world. What motivates him? "*My job is drawing and I want to communicate. The only way to do it is the street*", he explained to *World* in May 2013 under the pen of Olivier Razemon.

Baustellen-Rabatt*

German sign doubly expressive since it announces both work on the street and discounts at the merchants on the said street, in order to attract customers despite everything!

* Discount due to work.

Disabled safety

By establishing the right of free access to all buildings of people suffering disability, the law for equal opportunities of February 11, 2005 has generated new small panels of signage... green!

16

17025 | V1 in 1989 Revision 2005

COMPETENCE OF
TESTING LABORATORIES

We do t comme we saidit

The XXecentury and May are those of the idiot But no question n with closed eyes. For the consumer to towards a product that p expected, or even required by labor regulations ensure that the pe there, that the qualities m comply with the reference that the material emp It is still necessary that the test make it possible to of cause. Thus, all products or services in laboratories are Simple question of for consumption

WHAT DOES THE STANDARD SAY?

Speech of the method

The spirit of the standard is simple: laboratories must provide proof that they manage a quality system capable of satisfying to their mission, that they are technically competent and that they are capable of produce results technically valid. Logically, the NF EN ISO/IEC 17025 standard requires them to call on technical staff having the SKILLS required.

Rigor requirement

They must also demonstrate their independence and their ability to control confidentiality. No question of committing either in actions risky who would taint their reputation, nor to call on subcontractors who do not have the skills required. Staff management, including interns, must also respond to requirements of responsibility and skill. All of this goes without saying, but it's better to say it...

Metrology specifications

We see again Obélix's perplexity in the face of the Bretons' measurements, insensitive to the easy charm of decimals. From which it appears that “it takes six feet to take one step”. But everyday language also has its share of sentimental measurements, difficult to convert by testing laboratories:

It's a bit too long

Just a tear

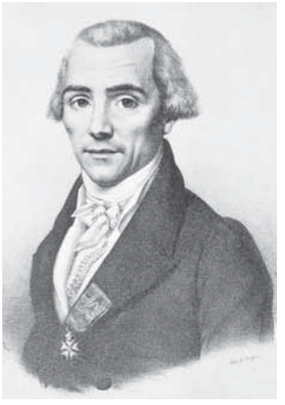
It makes a trot

It weighs a dead donkey

ALL...

... is in everything but not reciprocally

Testing and calibration laboratories which comply with standard NF EN ISO/IEC 17025 will also operate in accordance with to ISO 9001. Conversely, ISO 9001 certification is not sufficient to ensure compliance with the NF EN ISO/IEC 17025 standard.



Nicolas Vauquelin, first director from the laboratory School essays mines.

Someone loves you secretly

What happened on 22 Nivôse year III? Everyone will naturally have thought of the official opening of the testing laboratory of the School of Mines, itself created some time previously, under another timetable, in 1783. It must be said that at the end of the 18th century$_{e}$century, which corresponds to the first steps of the industry, mines are a crucial issue, which calls for all attention. And all the scientific skills.

Tacit pact

The first director of the laboratory will also be a pharmacist, Nicolas Vauquelin. Under his authority, then that of all his successors, we will carry out tests and research. That's a bit what you'd expect from a testing laboratory, you might say. Certainly ! But it would not be doing them justice to believe that the mission of the testing laboratory, whether in Mines or elsewhere, is insensitive to us on a daily basis. Because there is indeed a tacit pact which binds us to these organizations which guarantee us that the products we consume every day comply with what we expect of them. It's a bit like trains that arrive on time: they're not used to being talked about. And just as there is only proof of love, there is only proof of competence...

17

4074 | V1 in 1985 Revision 2015

CONDOMMASCULINE

We don't mess around not with love

In the field, we can say that we have tried everything. The objective being, as one might have guessed, to distinguish the practice from its consequences. At the risk of surprising, the idea is not new. As far back as it is possible to trace, the man “came out covered”. With all kinds of “bladders” originating primarily from the animal world, comfort and effectiveness... varying. But we cannot stop progress, that is well known. And that's good, because the male condom, to use the less light expression, has become relevant again for some three decades. The AIDS epidemic was and still is raging, among other sexually transmitted diseases. One more reason to make sure that the condom will not come loose, and will not be pierced or even porous.

27

BILLIONS

condoms sold in the world in 2015.
(Source: Geopolis)

100

MILLIONS

It is sold every year in France 100 million condoms masculine.
(Source: AC Nielsen 2011)

WHAT DOES THE STANDARD SAY?

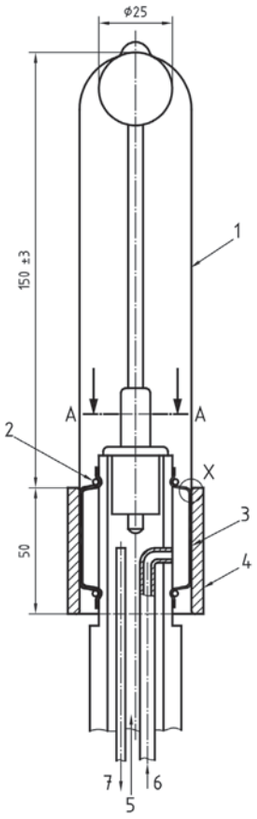
One kilopascal

Otherwise nothing

First reminder : the condom is a medical device
Its composition – material, lubricant – must therefore guarantee that it does not release any toxic substance for the organism. Afterwards, manufacturers must ensure that their production presents a quality level constant, just as they must be able to assess the shelf life of condoms.
The condom must also respond to sizing requirements (length Width, thickness) and features mechanical well precise. Are tested, as it happens, volume and burst pressure (measured in kPa, without Blaise Pascal having significantly contributed to the standard).

Another framed aspect by the standard: the packaging
The condom must be packaged in a individual packaging, even if several individual packaging can be packaged in another packaging for sale.

Apparatus suitable for determining bursting characteristics
Dimensions in millimeters



1 Condom
2 Rope
3 Extension cuff flexible
4 Clear plastic clamp ring
5 Air intake for attempts
6 Air intake allowing us to keep condom in place
7 To the pressure measuring device

Torture Test
Very thorough, the tests carried out in laboratories require equipment worthy of torture chambers: mandrel, graduated ruler, hydraulic, mechanical or pneumatic press, inflation device, oven, tensile testing machine, vacuum chamber, etc.

Even if he doesn't seem like it, the man opposite, Gabriele Fallopio, is the inventor of the “modern” condom

Protect yourself, through the ages

Nothing to do with the penis sheath, with its ornamental motivations. No, the condom has a very practical purpose from the start. According to certain archaeologists and ethnologists, this departure would have taken place in Roman Antiquity, a time when hygiene was not a joke. Hence this first model of *condom*, made from animal intestines or bladders. But the historical attestations... diverge. Some call Egyptian High Antiquity, others even Prehistory. What is more certain is that the “modern” condom is a Renaissance creation, born from the imagination of an Italian surgeon, Gabriele Fallopio.

The weight of morals
In this Italy with loose morals, the object is intended to protect against venereal diseases. It flourishes, crosses borders. So much so that in France, a law from the 17th century prohibited the possession of such an accessory, associated with fornication. Animal bladders, linen, paper, leather, you had to wait until the 19th century for the condom to experience its greatest growth. It's time for rubber vulcanization, by Goodyear. The English are also getting into it, exporting to all of Europe. Then, in the 1930s, the latex condom came onto the scene. The same one we use today, even if technology advances...

HIGH COUTURE

Happiness is in the condom

Students in the city of Bombay, India, know how to be pumped up. To break the taboos on wearing condoms, in a country heavily affected by the scourge of AIDS, they designed this dress made entirely of condoms. The smile and beauty of the model will finish off even the most reluctant.

To each their own

It is less known – and much less used – but the female condom has been available in France for around fifteen years. Its properties are the same as that of the gentleman, except that it is not he who decides.

18

NF ISO 3216-1 | V1 in 2000

ANCHORAGE OF CHILD SEATS

ISOFIX at the ties

You have been a father or mother for a few weeks, and your work colleagues have chosen to celebrate this happy event.
An envelope turned discreetly and what a surprise! You are now equipped with a superb baby seat to transport your little one in the car. Well know, the baby seat does not do everything in terms of safety, because what is the point of properly securing the toddler to the seat if said seat is not securely anchored? So there is a standard for this. Primary objective: to make things simpler to avoid to get the straps tangled.

10 YEARS OR 1.35 M

Since 1er January 1992, a specific restraint system is compulsory for children who have not reached one of these two values.

2011

FIXINGS ISOFIX ARE MANDATORY

for cars new produced since February 2011, who must behave in less two fasteners of this type. Attention ! All the cars don't have so no ISOFIX fixing...

WHAT DOES THE STANDARD SAY?

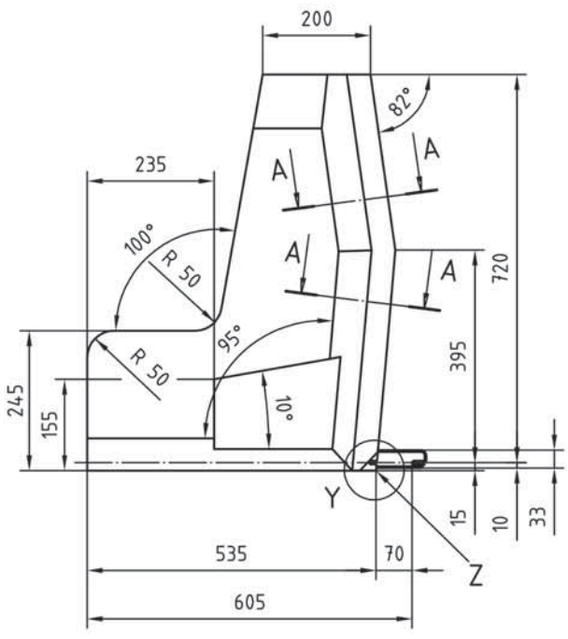
Two anchors to “clip” the seat

The ISOFIX system has two anchors placed near the junction between the backrest and the seat cushion, intended to be connected by “clipping” to the Installation System of Restraint for Children (SIRE).

The objective is to limit rotation in pitch (from before and rear) of the SRE. In practice, the anchors are round bars horizontal transverse 6 mm diameter, with effective length minimum of 25 mm. Spacing transversal of the bars must be 280 mm “center to center”, and they must come from the adjacent structure of the seat or vehicle, such that the anchors are easily accessible.

The reason for the standard, once again, is to simplify the stowage for the make it safer. For this reason, the person installing an SRE must be able to secure it with one hand.

Child Restraint Installation System (CRIS) Dimensions in millimeters



Belt ?

It is always possible to secure the baby seat without using the anchorages provided for by the NF ISO 13216-1 standard (i.e. using the classic seat belt). The fact remains that the standardized anchoring solution reduces the risks of incorrect installation, and significantly increases the performance of the restraint system.

From the Gemini mission to the baby seat

Would you have guessed it? The child seat is an invention that came from the United States a long time ago. The first initiatives emerged in the 1930s, but their intention was first to raise the child's height to allow him to admire the landscape, and therefore to have peace (some were even equipped with an artificial steering wheel). In terms of safety, we are still far from the goal, and this is also the case for all passengers in the vehicle. In Europe, we do come across some rather serious creations from the 1960s, but due to a lack of regulations, many toddlers travel in their bassinet, between the back of the front seat and the seat of the rear bench. At this same time, however, a Swedish university professor, Bertil Aldman, observed that the astronauts of the Gemini mission took off with their backs facing away from the acceleration force.

Braking force

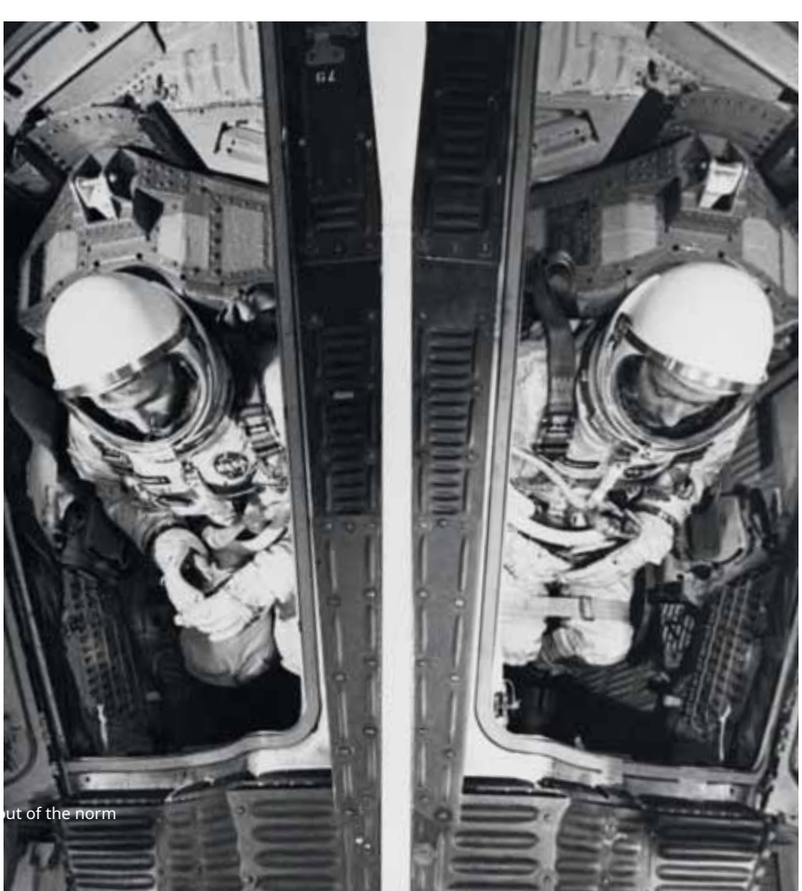
Why not apply this idea to the baby seat, but this time to counter the force of braking? The first rear-facing shell seat was born. In 1984, it was a Dutchman who created the first baby seat worthy of the name, for children under 9 months of age, to be placed in the rear seat, facing the road. But it is the regulations that will advance safety: in 1992, the use of a restraint system adapted to the child's morphology became compulsory in Europe. A big step for the little man and security...

LIFT-OFF

Back facing acceleration force

Like the astronauts on the Gemini mission, the seat must be fixed rearward facing for children weighing less than 13 kg or less than 15 months (groups 0 and 0+). If it is attached to the front, the airbag will need to be deactivated.

The safest mounting location for the child seat is the central seat. And too bad if it's less practical...



Between 1963 and 1966, 10 missions Gemini prepare with success the program Apollo.

19

NF EN 729-1 | V1 in 2001 Revision 2016

SCHOOL FURNITURE

Learn your tables!

If the Dalton brothers were to attend the modern school, which is unlikely, they would find furniture there perfectly adapted, designed to enable schoolchildren to adopt good postures. This is because chairs, tables and other stools are scrupulously sized to meet the requirements of standard NF EN 1729-1. Well seated, comfortable, the big Averell, for example – seven feet! (2.13 m) – would perhaps be more interested in the charms of arithmetic and grammar, thus opening the doors to a more constructive future.

It is not forbidden to dream.

12,775,400

STUDENTS AND APPRENTICES IN FRANCE
(Source: Ministry of Education 2014)

146

BILLIONS

OF EUROS
spent for education.
(Source: ministry of Education 2014)

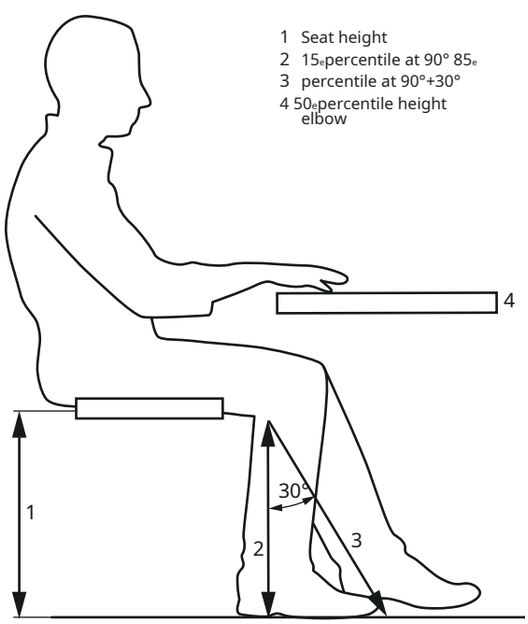
WHAT DOES THE STANDARD SAY?

In posture to succeed

Favor the good ones postures, such is the spirit of this standard applicable chairs and tables intended to establishments general education. Preliminary clarification: the NF EN 1729-1 standard does not go into detail about the design of the furniture. It focuses on the dimensions that promote good posture, whether the furniture is of fixed or adjustable height.

Seven sizes
Stools, chairs, tables, dimensions minimum specified (from seven size marks) are considered as absolute minimums, which can be exceeded. Likewise, the maximum dimensions specified are considered as absolute maximums, and smaller dimensions can therefore be used. The main thing, we will have understood, is that the students behave well, do not develop scoliosis or early lordosis. Against the late afternoon slumber, however, the norm can do nothing.

Seat height



Equivalence class...?

It is a discreet building, in the center of a village in Berry. Time seems to have stopped. And besides, he does it on purpose. Because this school house in Épineuil-le-Fleuriel is the one that saw the growth of the man who would become known a little later under the name of Alain-Fournier, the author of *Grand Meaulnes*. The place has become a museum, and you can walk around in a IIIe Republic and newly compulsory school. There are only two classrooms, parchment maps stretched along the walls, a stove in the middle of each room. And then desks, of course, long black-tinted pieces of furniture, each equipped with a fixed bench, and pierced with as many inkwells as they hold gray pants. We can sense the ruckus of the students who are settling in, the even greater ruckus of the same students that the bell has just released.

Two Republics later...

Did the carpenter who made these century-old pieces of furniture care about the comfort of schoolchildren? Perhaps, but the task was not easy for him in those times when the municipal classes brought together all ages (and all sizes, "grand" Meaulnes included). Two Republics later, at the beginning of the 21st century e century, a standard came to bring a little order and, above all, comfort to classrooms. Not just Berry, by the way, because the NF EN 1729-1 standard applies to the entire European Union. While allowing local habits, teaching practices, and the technical and economic imperatives of each country to be expressed. But it's not forbidden to be nostalgic.

SIZE

Always more ?

Certainly, the morphology of man has changed a lot since Homo habilis, some 2 million years ago. Without going back that far, our measurements continue to evolve. In a century, men have grown by 11 centimeters and women by 8. Average weight follows the same trend. Or even more, since a quarter of the French population is now overweight. Young people are not spared: in France, in kindergarten, 9.7% of girls and 7.3% of boys were overweight, and 3.8% of girls and 3.1% of boys were obese (figures Ameli 2013).

When the tablet

and the PC make the furniture evolve...

For the happiness of some, for the misfortune of others, the computer and in particular the tablet are taking an increasing place in school. This is why the NF EN 1729-1 standard also applies to furniture usable for computers.
laptops and portable devices. We know how to live with the times.

1,507

LEGES 9 AND VSL 11

SCHOOLS

equipped with tablets at the back to school 2016.

(Source: www.government.fr)

20

NF EN 01511 | V1 in 2004 Revision 2015

GSM

My gang and me

European mobile networks use two frequency bands, one at 900 MHz and the other at 1,800 MHz. For those who dream of the latest “US” or Korean mobile phone, all this is of little importance. However, whatever the brand or color of this marvel, we must first avoid interference, knowing that the radio world is as congested as terrestrial communication channels. It's a bit like the 100 meters in athletics, everyone must stay in their lane. Even if our mobiles have fun stepping over several at once, to wander from one country to another.

2.6 BILLIONS OF PEOPLE

connected to the Internet via a mobile phone in 2015.

(Source: International Communications Union. 2015 figures in *Internet newspaper*)

7 BILLIONS
SUBSCRIPTIONS

on mobile phone worldwide at the end of 2014 (3.6 billion in Asia-Pacific).

(Source: International Communications Union. 2015 figures in *Internet newspaper*)

43%

TRAFFIC
INTERNET

is carried out from a mobile (for France in 2015).

(Source: International Communications Union. Figures 2015 in *Internet newspaper*)

WHAT DOES THE STANDARD SAY?

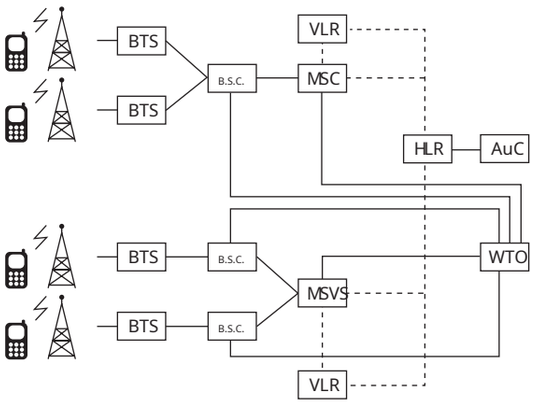
A specter is there near you

The NF EN standard 301511 applies at the terminals of telecommunication digital cell phone GSM type (Global System for Mobile Communications), More precisely to their operation in the telecommunications system GSM 900 and GSM 1800. In accordance with Directive 1999/5/EC, the text intends contribute to ensuring that these radio equipment use effectively spectrum allocated to radio communications terrestrial or spatial (and therefore that they do not exceed the frequency band allocated), in order to avoid interference. Human exposure at the fields electromagnetic is also part criteria addressed by the standard.

Adjustments automatic... phew!

Standard NF EN 301511 specifies the requirements relating to the protocol of communication data. As such, it defines the terminology and describes the administration concepts of ACP systems (Automatic Cell Planning), otherwise says systems aimed at optimizing the performance of UMTS networks (Universal Mobile Telecommunications System) in terms of capacity, coverage and quality of service by adjusting automatically Antenna parameters and common channel power.

GSM network architecture



AuC: *Authentication Center* BSG: *Base Station Controller*

BTS: *Base Transceiver Station,* transceiver base station

HLR: *Home Location Register*

WTO: *Operation and Maintenance Center*

MSC: *Mobile Switching Center, Mobile Service Switching Center*

VLR: *Visitor Location Register,* visitor position register

Generational flow

2G, 3G, 4G... It's simply about generations. This is why "1G" existed: it was the Radiocom 2000 standard. Since then, the speed (expressed in kbit/s) has continued to increase. 2G was at 10 kbit/s, 4G reached 100 kbit/s, and even 1 Gbit/s for 4G+. At the risk of surprising, the next step will be 5G.

It will be that of ultra-high speed mobile, capable of several tens of Gbit/s.

Don't touch my megahertz

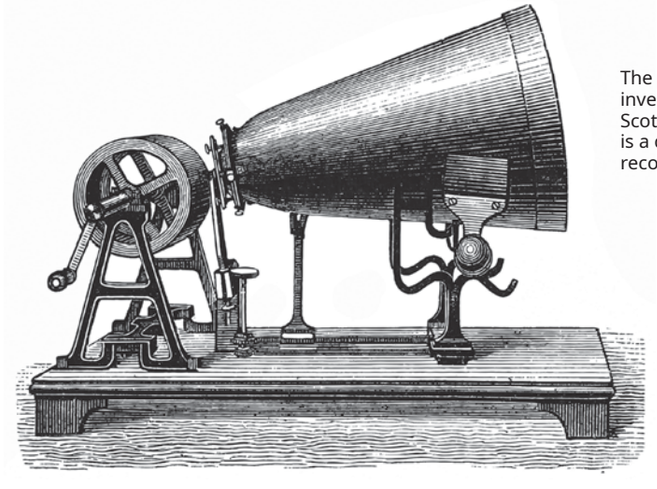
The mobile phone is a wonderful invention, which in fact does not date from yesterday, but from the end of the 70s. But this tool, at the time reserved for a privileged few, now has some 7 billion subscriptions. As many as there are men on earth, therefore. However, the use of wireless technologies is based on the availability of frequency resources, the perimeter of which is physically limited. Let's be clear, it was very difficult to get everyone to agree. And besides, that's not the case. Each country has developed its own system, starting with the United States with AMPS (Advanced Mobile Phone System), in 1978, or France with Radiocom 2000 in 1986. Faced with these atomized standards, only one response, one standard common. In 1982, the European Conference of Postal and Telecommunications Administrations looked into the problem, and eight years later, a European standard for digital transmission was created: GSM (Global System for Mobile Communications). A European standard therefore, which will extend to the world and which remains in use today. To achieve this, Motorola had to agree to license one of its patents deemed essential to the standard. The same one that made it possible to make the first call in 1991... But actually, how did we do it before?

USES

Telephones very “smart”

With the increase in flow rate, the spectrum of mobile phone uses. Yesterday we were amazed at making calls from the bus, today we are no longer surprised at surfing the Net, or even paying for purchases (with, incidentally, an ad hoc app to benefit from discounts at the supermarket), or even play online. And as we don't stop progress, the phone has also learned to change into something else, a connected watch or a portable coach to manage your physical activity,

For example.



The phonautograph invented in 1857 by Scott de Martinville is a device that records sound.

Small debits deserve no credit

The acoustic wave is transformed by the laptop microphone into an electromagnetic wave. With a high frequency (much more than that of the voice), this wave will travel through the air to its recipient. But not all frequencies travel the same way. The lower a frequency band is, the more it is diffused (case of 900 MHz versus 1800 MHz). Conversely, a high frequency (more than 1000 MHz) allows more data to be transported and will therefore be preferred in dense areas. Consequently, and to increase the performance of their mobiles, equipment manufacturers have implemented technology allowing frequencies to be aggregated together, in order to accumulate speeds.

21

NF EN 3834 | **V1 in 2001 Revision 2009**

CULINARY ITEMS
FOR DOMESTIC USE

A standard who actually a whole dish

Your heart may go boom, but your oven won't. Provided, however, that you use culinary items that comply with standard NF EN 13834. Because obviously the heat puts a strain on the materials, and the gratin dish is not intended to melt like the gratin itself. Nor to disintegrate. Nor to lose its handles at the fateful moment of taking it out of the oven. Nor even to rust over time. We don't joke with zucchini and ricotta cannelloni, that's all.

24% ACCIDENTS OF LIFE CURRENT

take place in the kitchen
(INPES figures)

300°C

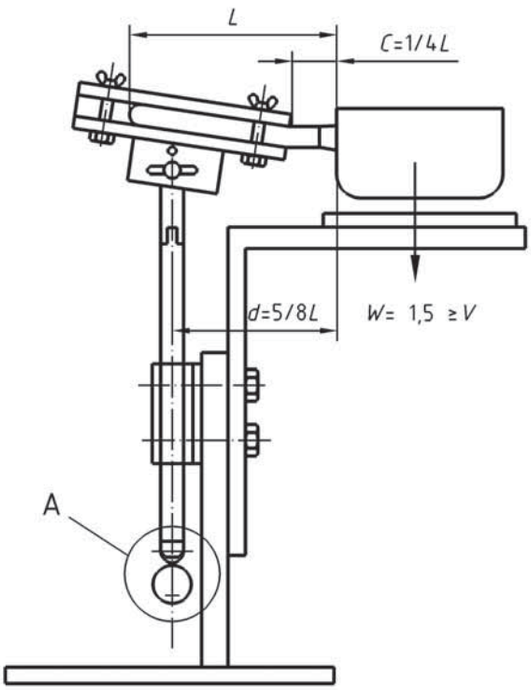
THIS IS THE TEMPERATURE
maximum cooking time of a common oven (th. 10).
(INPES figures)

WHAT DOES THE STANDARD SAY?

A battery of parameters

The NF EN 13834 standard sets the requirements safety and performance relating to articles culinary products intended for **be used in domestic ovens.** It therefore applies to all oven items, independently of the material or method of manufacture, but it does not apply to saucepans metal, to culinary articles for use single or disposable, nor to articles intended to be used only in the oven microwave. It applies however to the articles culinary products intended for be used both on the stove and in the oven. Stability, hygiene, mechanical risks, thermal resistance, sealing, a "battery" of parameters are reviewed.

Scheme for handle fatigue testing



Forty centuries of bowls gaze upon us

A brief glance at Roman tableware from the beginning of our era gives a taste of eternity. And even if metal utensils were reserved for the wealthy classes, we must recognize that we could easily prepare the next Sunday lunch with these tools. In reality, the great revolutions are recent. They begin at the beginning of the 20th$_{e}$century, with stainless steel but also Pyrex, a borosilicate-based material which has the property of withstanding significant thermal shocks. Since then, copper and iron no longer have a monopoly on oven-safe dishes. But heat resistance isn't everything.

Big deal

The cook also appreciates dishes that "do not stick". In the middle of the 20th century$_{e}$century, DuPont de Nemours came to grant their wishes with Teflon®, non-stick coating which allows food to be cooked without adding fat. Suspected of being harmful, the coating has also evolved, very recently, in 2015, towards a version without PFOA (perfluorooctanoic acid). A manifestation of our growing concern for food security. But kitchen safety is a broader issue. Because it is the room, along with the bathroom, where the greatest number of domestic accidents take place. Hence, for example, the famous cold doors of the most recent ovens, supposed to protect our offspring from their curiosity. This is precisely why voluntary standards are there....

CRASH TEST

My rump steak first

We can say that the NF EN 13834 standard studies its subject in real conditions, because cooking is indeed part of the testers' activity. To test the non-stick qualities of a cake mold, for example, we prepare a real cake, for a gratin dish, a rump steak. Other tests are less appetizing, on the contrary, such as these 15,000 handling cycles for the resistance of a handle. But it whets the appetite.

Siliconized kitchen

We know the qualities of silicone in the increase in certain volumes, but we perhaps measure less the revolution that this material is bringing about in our kitchens. Because silicone combines several advantages, in the field of mussels in particular: flexible to facilitate unmolding, it adapts to cooking and defrosting, it is non-stick and incidentally very resistant.

22

NF EN ISO 16 | **V1 in 1970 Revision 2007**

FORMAT A4

Leaf... persistent

The A4 sheet of paper is very exceptionally a nightmare. That is to say Monday morning, at the photocopier, when the last ream is used up and the stock is in the basement, five levels below. The rest of the time, the A4 format sheet greatly simplifies life in the office, and not just in the office. So much so that it is everywhere, now, and has been for quite a while now. Almost 50 years ago, when a desire for standardization made it the European standard. Moreover, it is precisely because it is essential that this empty A4 tray is a terrible stroke of fate.
Meeting in 5 minutes.

3 RAMETTES OF PAPER / EMPLOYEE / YEAR

consumed in France, of which only 25% is recycled.
(Source: Ademe 2015)

33,300

PRINTED PAGES
each second in Europe.

(Source: consoglobe.planetoscope.com – leading French media on responsible consumption)

95%

PAPER USED FOR NEWSPAPERS
in France comes from of the industry recycling.

(Source: Ecofolio year 2015)

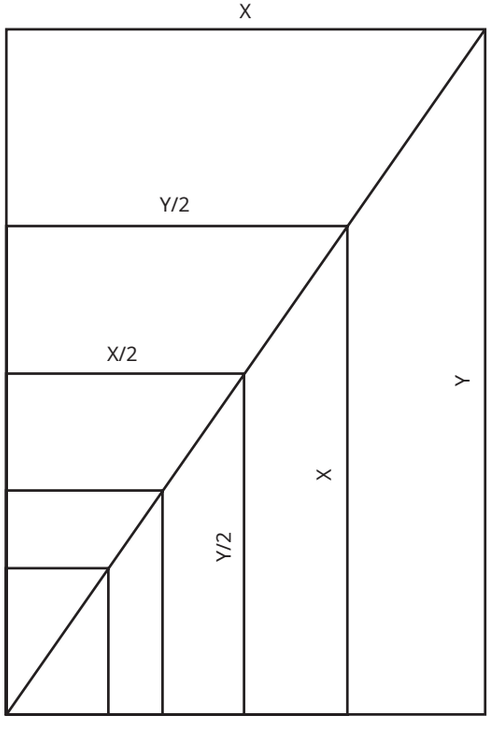
WHAT DOES THE STANDARD SAY?

Deal with geometry similar

The standard defines the rules of sizing applicable to paper sizes series A, B and C in their uses administrative, commercial and technical. It also concerns certain categories printed matter – forms, catalogs, etc. The principle: ranges of formats designed in such a way that each of them is obtained by dividing in two equal parts format immediately upper, parallel to the short side.

2:1
The surfaces of two successive formats therefore compose the ratio 2:1. In summary, all formats of each series are geometrically similar.
For the purposes of identifying the machine direction, the dimensions of the sheet must be expressed in millimeters (594 x 841 mm for example), the second dimension must correspond to the dimension parallel to the machine direction.

Principle of similarity
"h/l = l/(h/2)"



Da Vinci dresser

Did Leonardo da Vinci invent the ISO 216 standard? In any case, his Codex Atlanticus is an opportunity to show that already, at the end of the quattrocento, the papers have a format. In this case an Atlantic format, that of atlases (64.5 x 43.5 cm). But the origin is older. In France, in the 14th century$_e$century, a royal decree obliged mills to sign their production with a watermark, to avoid excessive reductions. The shape of the watermarks gives their names to the papers: Petit Raisin, Raisin, Jésus, Grand Jésus... At the end of the 18th century$_e$ century, the German Georg Christoph Lichtenberg observed that when the height/width ratio of a sheet is equal to √2, these proportions are preserved when we fold the sheet in its longest side. In fact, Leonardo would have observed it before him...

A0 for Germany
The French Revolution, concerned with uniformity, seized the principle. The "large register" format is created, equivalent to the current A2. But this beautiful rigor quickly fades. A century passes. It was in Germany, in 1922, that the A0 format was defined, i.e. 1 m_2. The same standard, called ISO 216, was introduced in France in 1970. But in the United States and Canada, we remain faithful to the US letter format, i.e. 21.6 × 27.9 cm. Nothing to do, however, with the 21 x 27 cm used in France until the 1960s. Obviously, a little rigor couldn't do any harm...

PERFECT!

Material benefit

It is therefore a given: whatever the format, the proportions of what is on the page are the same.
A clear advantage when it comes to reducing dimensions by half, for example for photocopying. Likewise, a Word, PDF or prepress file created in A4 format prints
naturally in A3. The advantage also applies to equipment, with perfectly standardized printing, scanning or fax equipment, when it is not simply furniture intended to receive documents in said format! Long live ISO.

Chi va plano...

The formula has something deliciously Latin and scholarly, but what exactly is a quarto? It's quite simple. Let's start with a flat sheet, "in-plano": folded once, it becomes an "in-folio" (two leaves, four pages), twice, a "quarto" (four leaves, eight pages) , three times, “in-octavo” (eight leaves, sixteen pages), four times, “in-seize” (sixteen leaves, thirty-two pages). And that’s why the number of pages in this book is necessarily a multiple of four...

23

NF EN ISO 0462 | V1 in 2002 Revision 2014

ACETYLENE BOTTLES

Never enough acetylene

Two carbon atoms, two hydrogen atoms. So what? Well that's the formula for acetylene, a hydrocarbon discovered by an Englishman in 1836.
So what? you insist. Well it is a colorless gas, very illuminating. Which also illuminated our cities in the past. But it is also used to fuel the flame of blowtorches. This should enlighten you. Provided you are careful, because acetylene is
extremely flammable and decomposes spontaneously. Boom.

3000°C

It's the temperature what can be achieved the flame produced by acetylene presence of oxygen.
(Source: Air Liquide)

5 MINUTES

It's time that a being human can pass into a mix air and acetylene at 50% without disorder of awareness.
(Source: INRS)

WHAT DOES THE STANDARD SAY?

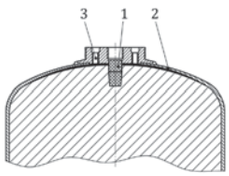
When we love the bottle...

Acetylene is a unstable and therefore dangerous gas. So why acetylene cylinders differ from all others gas bottles or gas cylinder tablets or liquefied: they contain a porous material and, normally, a solvent in which acetylene is dissolved (e.g. acetone). This porous material intended to limit, where applicable, the decomposition acetylene, and to thus prevent any accident.

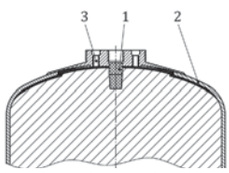
Avoid a decomposition brutal gas
A reduction in porous material, or the presence of a defect (cavity, crack, large void) due to rupture or subsidence porous material, can lead to sudden decomposition gas, causing the cylinder to rupture, accompanied by a blast. Hence the interest in a standard, for the use of people competent, for control (visually and mechanically) and maintain the bottles and their various components, starting with the porous material.

Acetylene cylinders with an ellipsoidal top containing a monolithic porous material – bottles with fusible caps.

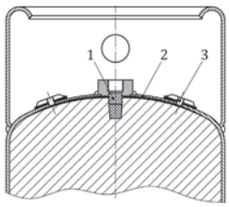
1 Central hole
2 Game
3 Orifice of cork fuse



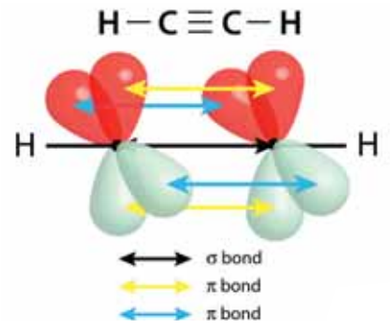
Ellipsoidal/toroidal head with marking on the ogive



Ellipsoidal/toroidal head with marking on the flange



Ellipsoidal/toroidal head with marking on the collar



The real recipe for acetylene

Three methods make it possible to produce acetylene, which does not exist in its natural state: the partial combustion of methane, the dehydrogenation of the heaviest alkanes in petroleum, and the so-called carbochemical method. Difficult to carry out in your kitchen (fortunately), the process consists of placing quicklime and coal in an electric arc furnace heated to 1,700°C. But we are not at the end of our troubles, because the calcium carbide thus obtained must still be mixed with water to give acetylene. This is a bit why we invented the gas bottle...

Alphonse Allais is a French journalist, writer and humorist, born October 20, 1854 in Honfleur (Calvados) and died on October 28, 1905 in Paris.

Good morning,
my name is acetylene

During the Belle Époque, Alphonse Allais, between two zanies and a serious invention (freeze-dried coffee, that's him), imagined thawing the North Pole. The reasoning was unstoppable: it is not because it is cold at the North Pole that there is ice, but because there is ice that it is cold there. *"Let's thaw the pole! »* he concluded. How ? Thanks to a new fuel: acetylene. He even offered the recipe: *"In water, you throw calcium carbide, which decomposes, producing lime, and, on the other hand, giving off a gas which is none other than acetylene.*. And voila! Eventually the pole melted on its own.

From lighting to industry

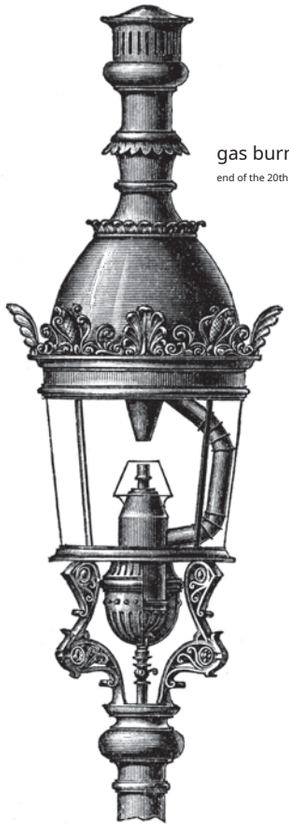
Acetylene is indeed used as a fuel, but for other uses. For lighting, still today, buoys, beacons and other lighthouses, or as a component of fuel for certain motor boats. It is also useful to the chemical industry (synthesis of acrylates, monomers used in plastics, etc.), to the rubber, glass and even steel industries, for oxyacetylene cutting [read opposite]. More on a daily basis, acetylene is also the plumber's best friend who knows how to weld.

MERGER

The blowtorch with two bottles

Unlike propane, the combustion of acetylene allows steel to be heated to the melting point (1300°C). Simply add a flow of pressurized oxygen, and the cutting jet ignites the steel and cuts it following the trajectory of the torch.

The same oxyacetylene torch, equipped with a different head, will allow welding to be carried out at 1,500 °C and autogenous welding of steel at 3,000 °C, “autogenous” meaning that the filler metal is also metal. 'steel.



gas burner,
end of the 20th century.century.

And the Electricity fairy fell on a beak

Gas has been lighting our cities since the 1830s, generally from coal gas coming from a “gas factory”. Then

Gas burner technology gradually improved, without even disappearing, with the arrival of electricity in 1878 (the process remained inefficient in its early days). At the turn of the century, the use of acetylene for public lighting even aroused interest in gas, the candelabra of which adorned cities until after the Second World War.

“Acetylene nozzles For assisted children
And Hélène's smile On a beautiful summer evening »

“The Mad Complaint”, Charles Trenet

24

NF EN 71-3 | V1 in 1966 Revision 2015

BLOCKS

Concrete block daily

The concrete block is a bit like the basic element of a construction game for adults. We place a certain number of them on top of each other, and in the end we get a house, a shed, or a shed to store the bikes. Gray and rough to the touch, these concrete blocks don't seem to have much to seduce them. Often they are even hidden under a coating that is more attractive to the eye. However, they have very specific characteristics,

starting with their mechanical resistance. We don't joke with concrete blocks, although we might want to.

57.3%

FROM PRODUCTION GLOBAL

China is the leading producer of cement with 2.3 billion tonnes per year (2013).

(Source: Planetoscope)

84%

BEARING WALLS

houses individual are in concrete blocks, against 32% in the collective.

(Source: INSEE)

4 BILLIONS OF TONS

of cement produced in the world in 2013, or 555 kg per capita.

(Source: Planetoscope)

WHAT DOES THE STANDARD SAY?

A text downright concrete

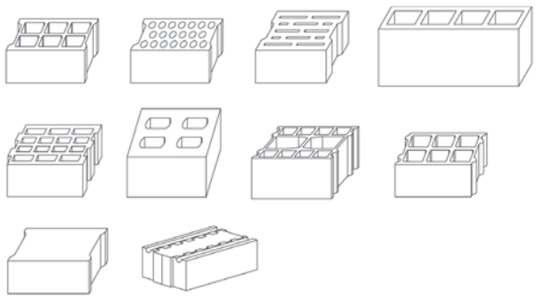
A question of performance, before All. Standard NF EN 771-3 specifies the characteristics and the requirements of performance(mass volume, tolerances dimensional, resistance) of a wide range of concrete blocks, whether they are made from common aggregates or light, whether they are exposed or not, whether used in common masonry or in facing, whether they are load-bearing or not, and whether they are buildings or civil engineering works. Please note that the text of the standard is not limited to the concrete block parallelepiped such that we all know: elements of particular shape and accessories enter also in his perimeter.

But not frozen

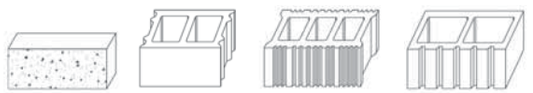
Conversely, and it is useful to know this, the standard does not specify the standard formats of aggregate concrete blocks, nor features angular blocks shaped concrete particular. The manufacturers have therefore full latitude in this domain. Normalization does not exclude freedom...

Example of different shapes of aggregate concrete masonry elements

Common masonry elements

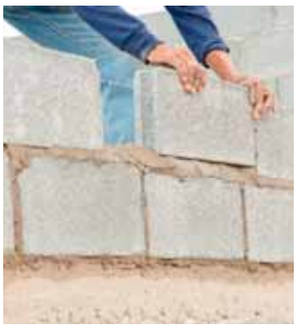


Facing elements exposed or not to bad weather



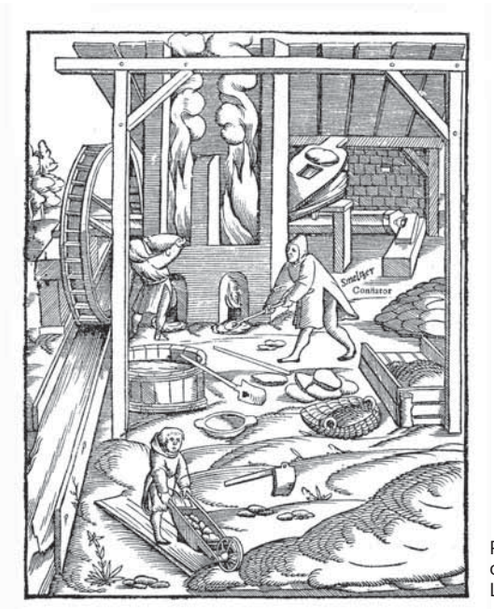
Accessory elements

Lintel Corner



The assembly? This is a glue...

The assembly of concrete blocks should not be taken lightly. Especially as technology evolves. If yesterday's concrete blocks were quite coarse and assembled with a classic mortar (mixture of sand, cement and water), more modern concrete blocks appeared. Called thin-joint concrete blocks, they are assembled with a simple bed of glue spread with an applicator roller.



Peasants working on a construction, Late Middle Ages.

Summarized epic of concrete blocks through the centuries

Those who only see the concrete block as a parallelepiped of grayish and rough material are completely wrong. Concrete block is a little more than that. First of all, today's concrete block is the heir, in a sense, of yesterday's concrete block. Because the same term includes cut or molded masonry elements. The concrete block is therefore both this Comblanchien stone lovingly cut with a chisel by the craftsman, and the industrially manufactured concrete block. Certainly concrete is a recent creation, cement itself having only been resurrected at the end of the 19th century.e century. The Romans had invented it, but the “recipe” was lost in the Middle Ages.

Mass production

The rise of concrete blocks begins, as one might imagine, with reconstruction and the enormous need for housing following the Second World War. We have to build quickly. The concrete block is a way to bring prefabrication into the picture: construction elements are mass produced in the factory, and then assembled on construction sites. The need for qualifications is less, buildings are being erected quickly and in number. And then the concrete block is solid. A standard ensures this, which stipulates performance requirements.

UNUSUAL

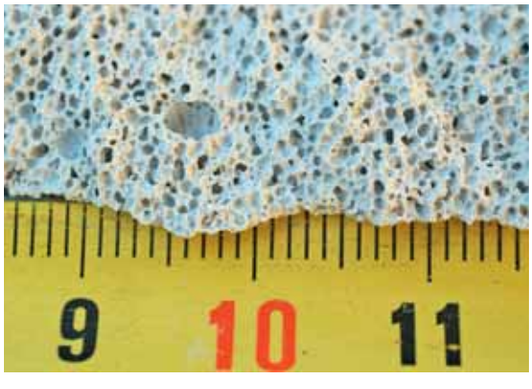
concrete, a “white gold”?

Those who imagine that concrete is only used to create buildings or highway bridges will have to abdicate their prejudices. Because concrete, a sort of “liquid stone” that we mold at leisure, seduces even designers furniture and other interior designers. On the menu of these inspired creations: concrete deck chairs (si), armchairs (si-si), wall panels,

inertia radiators, lighting, decorative objects of all kinds...

The gentle warmth of aggregate concrete

The NF EN 771-3 standard does not cover blocks with thermal insulation added to the sides likely to be exposed to fire. But the insulation in question, we often ignore, can be placed inside the concrete block itself. We therefore find concrete blocks on the market which are not hollow, but filled with polystyrene type insulation which considerably reduces “thermal bridges”.



Like the telephone,

the concrete becomes cellular

The world of concrete is evolving. Yesterday's concrete block, which has little insulation, is sometimes replaced by cellular concrete blocks, known as integrated insulation. The development is almost a revolution, because the idea is quite simply to trap air (insulating) in the very material of the concrete. This results in lightweight elements, of all shapes and thicknesses, which can be cut with a saw and assembled by gluing. And it holds.

THE SPIRIT OF STANDARDS

To favor THE trades

Voluntary standards arise from the real world, serving the real world.

90% of voluntary standards are international. They are therefore useful to everyone. And are the fruit of reflection that never stops, directly linked to reality. And reality is, more than ever, communication and exchanges between people, on a global scale.

25

NF ISO 668 | V1 in 1967 Revision 2014

MARITIME CONTAINER

When the trade

comes out in a box

A huge steel crate,
which can be handled as desired,
placed on a train, a boat or a truck,
and in which you can transport
anything and everything, scooters,
T-shirts, bananas,
smartphones... A very simple, brilliant
idea which, once standardized, changed
everything: ports were transformed into
gigantic car parks, cranes and gantries
replaced dock workers. With the
container, maritime transport has
exploded, opening the way to galloping
globalization
economy.

600

MILLIONS
of containers unloaded every year in people.

(Source : *The echoes*–September 4, 2014)

0.17€

THE kilo

This and the cost means of transportation maritime by container Today.

(Source : *The cross*, June 23, 2011)

20

CONTAINERS
are loaded each second in the world.

(Source : *The Provence Herald*–May 25, 2015)

WHAT DOES THE STANDARD SAY?

Two weapons fatal

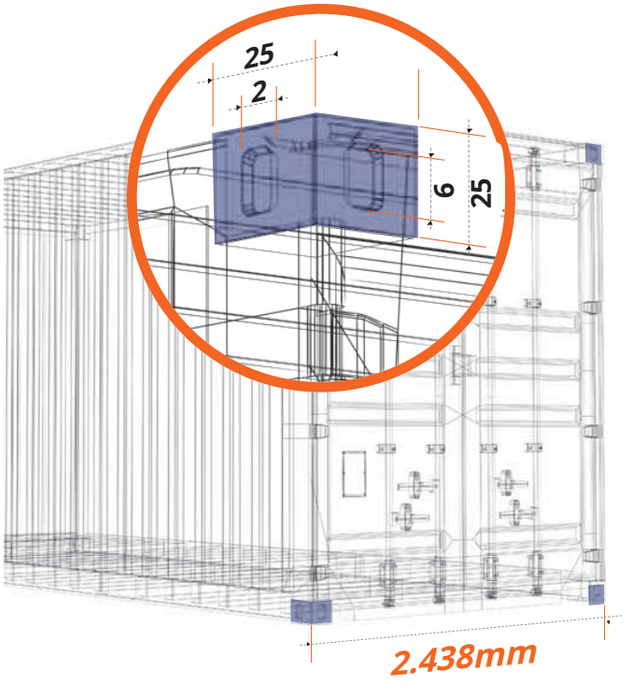
It is the standard which gave the basic container (called series I) its two fatal weapons:

- An unchanging width of 2,438 m (8 feet), which allows them to be stack.
- Its corner pieces, with a minimum number of 8, which are used to grasp and secure it, removing any manual intervention in its handling.

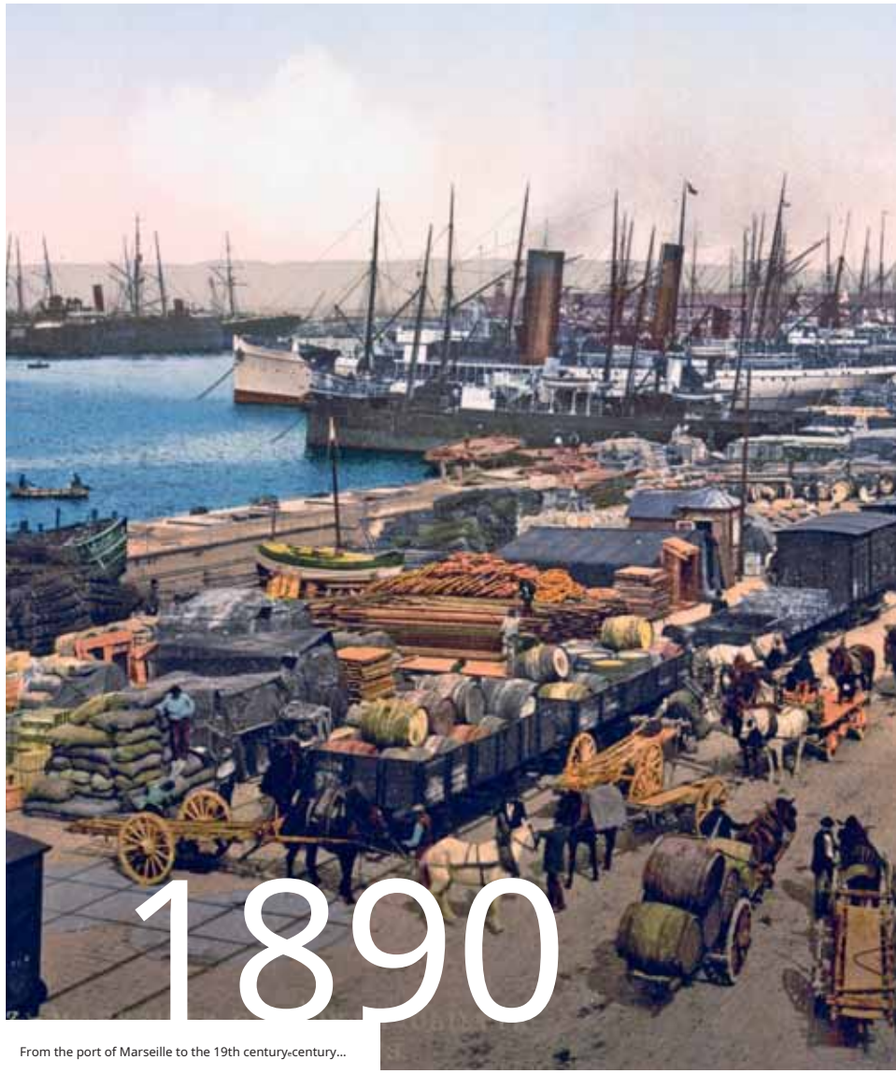
A whole range

A whole series of standards came complete the range, in particular the standard NF ISO 668 of May 30, 2014, which establishes a classification of series 1 containers, based on the external dimensions (to the nearest millimeter), and prescribes the maximum gross masses corresponding and, if necessary, to certain types of containers, minimum dimensions interiors and minimum dimensions door openings.

Zoom on the dimensions of corner pieces



Profits
The container allows transport literally from door to door, without load break between the different vehicles which can be road, rail, river and maritime. It can be stacked and stowed 7 to 8 stories high, making a total of 18,000 containers for larger ships.



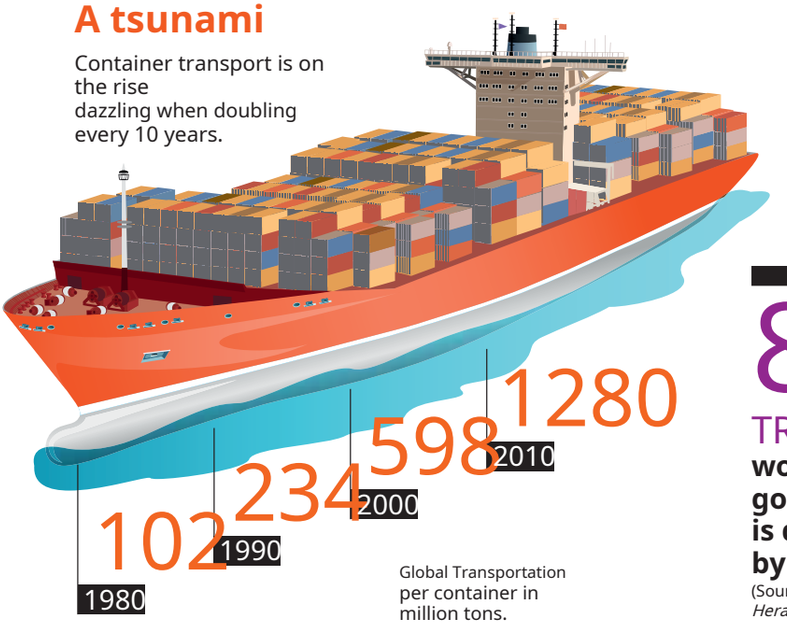
From the port of Marseille to the 19th century century...

... At port of Amsterdam dam in the 21st century.

TRANSPORTATION

A tsunami

Container transport is on the rise dazzling when doubling every 10 years.



Global Transportation per container in million tons.

80%

TRAFFIC **world of goods is done today by sea.**

(Source : *The Provence Herald*–May 25, 2015)

The container or clash of the titans

Bulk goods have been loaded in all the ports of the world, by the strength of the arms of dockers, for centuries. Until an American became impatient in 1937 while waiting for his cargo of cotton to be loaded on board. He thinks. But Malcolm McLean will have to wait another 19 years to order trailers from which the running gear can be removed so that they can be loaded directly onto a boat. He stacks 58 of them on an old oil tanker equipped with a crane. The cost per ton transported falls from 6 dollars to 15 cents. It's in the box, apparently. But the investments required to equip ports and ships are colossal. To guarantee profitability, containers must be made compatible with cranes, trucks and trains around the world. And therefore agree on dimensions and a fixing system.

And Malcolm showed a trump card

The battles are titanic: the different technical systems clash, managers hesitate, dockers' unions cross swords. Malcolm McLean plays a trump card: he donates his patent on corner pieces, the American National Standards Institute sets the width in the mid-1960s. The ISO then sets the world standards. Strikes paralyze major ports for a long time, but the battle to try to slow down the globalization of trade is already lost...

Malcolm McLean, inventor of the container.

The container in one hell of a state

ART

He inspired Huang Yong Ping

Representative of the Chinese artistic avant-garde, the artist brought 300 containers from all over the world, notably from China, for the Monumenta 2016 exhibition which was held in Paris at the Grand Palais last May and June. A spectacular installation which exalted the universal symbolic power of the container in our civilization of movement. And which took up space, as its name suggests.

All that remains is to sweeten

Growing strawberries in containers that could be installed in cities, alongside those who will eat them, is the idea tested by two young entrepreneurs who think they can produce 7 tonnes per year per container, or as much as a half hectare of cultivation in the open field. Without transportation nor intermediaries, and even if the cost of manufacturing the production tool remains to be quantified, it is easy to be profitable, they hope.

HABITAT

Container, sweet container

Take a few undamaged containers, pierce them from a window to one end and a door to the other, stack them, and you get a very attractive residential "building" that will please necessarily to an audience of students in need of space and means. And more the more colorful the whole, the more playful it will be, and therefore attractive.

26

13818-1 | V1 in 1997

CODINGMPEG

1 BILLION OF USERS
from YouTube.
(Source: YouTube, 2016)

Code, code,

there will be some left always something

MPEG. For “Moving Picture Experts Group”. So far we have not made much progress. However, these experts who met in 1997 (and who have continued since then) have not been idle. They even put together a set of benchmarks for coding video and audio and combining them. And this is how the wedding video can be viewed on Grandma's PC, who, moreover, doesn't understand anything (about coding).

1.4 BILLION
SMARTPHONES
sold worldwide in 2015.
(Source: Gartner)

265 MILLIONS
OF PC
sold worldwide in 2016.

WHAT DOES THE STANDARD SAY?

The art of management
flows

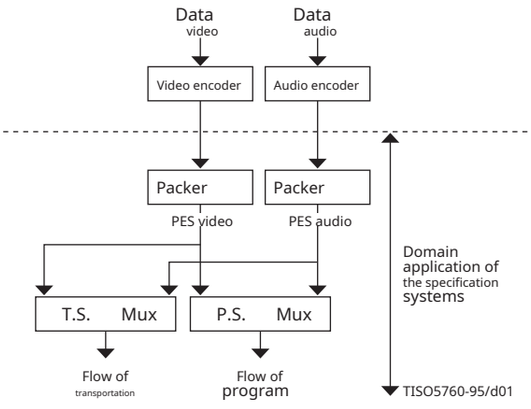
If the content technique is complex, the object of the standard is relatively simple: it involves combining one or more elementary flows of video data and audio to form streams that lend themselves to recording or to transmission. This coding system contains information that will then allow a synchronized decoding of the content of memories of decoders (this coding/decoding is abbreviated as "codec"), "in a wide range of conditions of extraction or reception". Element of importance: coding includes two forms: flow transport and program flow.

Buffer

The two streams convey the syntactic elements which are necessary and sufficient to synchronize the decoding and presentation of video information and audio, by ensuring that the buffers of the decoders will not suffer or overfilling nor underfilling of data. The definitions relating to these two flows are assimilated to multiplex mode packet: transfer capacity is allocated individually to data submitted to network, which is the case with the web.

Example

Simplified overview of MPEG coding



PES: packaged elementary flow PS: program flow
TS: transport flow

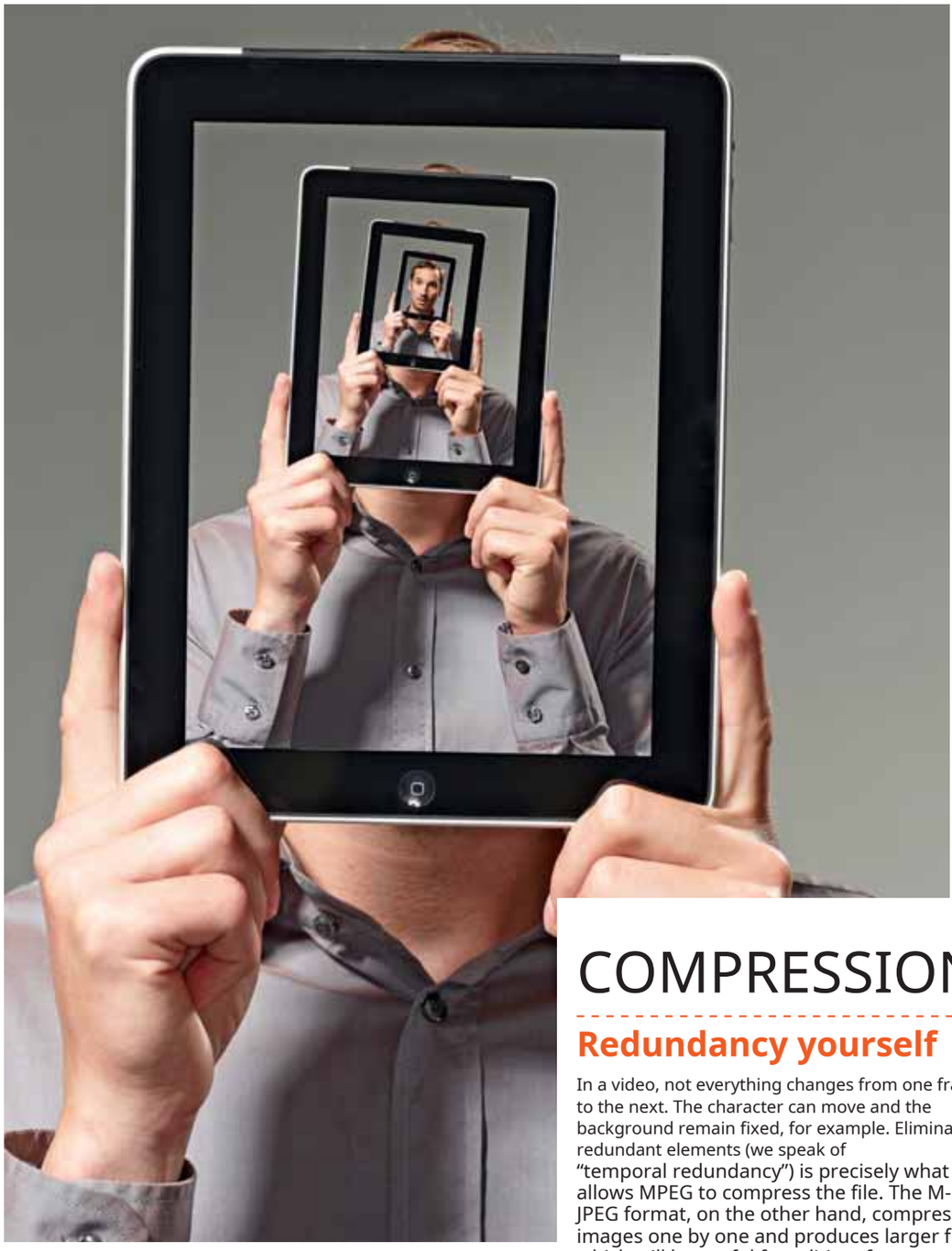
The Emmy Awards, usually reserved for the greatest artists, was submitted to ISO/IEC for the JPEG/MPEG standard on October 2, 1996.

The army of numbers

A video sequence "weighs" very heavy. Megas, and more certainly gigas of binary elements – 0 or 1 – the famous "bits". They are the basis of digital technology, they are the ones who have enabled the incredible rise of the web and video. Among others. However, the gigabit cannot be handled like a kilo of feathers. They may only be 0s and 1s, but they must be read, copied, transmitted. A work by Romain (which did not, however, have Arabic numerals). Especially since some people strive to produce more and more films, clips and other videos, while others marvel at viewing them at the other end of the web or on a 12 cm DVD. diameter.

Engineering Emmy Awards

Visionaries, men of good will, coming from IT, telecoms and electronics, decided to unite for the common good. They imagined a stratagem to bring the infinitely large into the ridiculously small. And that for everyone, with Mr. Everyman's equipment. One day, because there is justice, they entered the light. On October 2, 1996, in New York, the National Academy of Television Arts and Sciences (NATAS) awarded an "engineering Emmy Award" to ISO/IEC for the international standardization of JPEG, MPEG-1 and MPEG-2. A trophy usually reserved for the greatest artists. And then they even received another one, in 2009. Because their fight for compression and decompression knows no end.



AVI or MPEG?

AVI (Audio Video Interleave) is a standard packaging which encompasses the data audio and video. It is a transport "format", in the same way as MPEG-2, for example.
Which one to choose ?
Fortunately, the said choice is not Cornelian. Utilities allow you to convert one into the other and reciprocally. Phew!

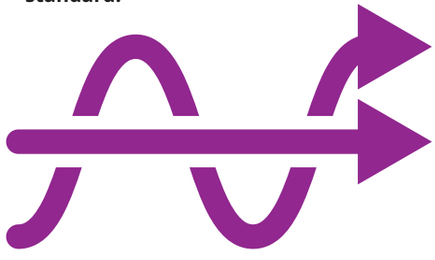
COMPRESSION

Redundancy yourself

In a video, not everything changes from one frame to the next. The character can move and the background remain fixed, for example. Eliminate redundant elements (we speak of "temporal redundancy") is precisely what allows MPEG to compress the file. The M-JPEG format, on the other hand, compresses images one by one and produces larger files, which will be useful for editing, for example.

20M BIT/S IN HD

reached in 1994 by the MPEG-2 standard.



Always more (or always less)

In 1988, the MPEG-1 standard made it possible to obtain speeds of around 1.2 Mbit/s. In 1994, the MPEG-2 standard made it possible to reach 6 Mbit/s in standard definition, 20 Mbit/s in HD (high definition). The MPEG-4 standard (still in force) which succeeded it in 1998 does not aim so much to increase the bit rate as to increase the quality of the image and sound
compressed, while reducing the need for bandwidth and taking into account new uses (streaming reading, in particular).

27

NF EN ISO 001 | V1 in 1987 Revision 2015

QUALITY MANAGEMENT

Quality,
I write your name

What is quality? In fact, it's a bit like in love: there is no quality, there is only proof of quality... Since 1987, this proof has been the subject of a standard, the now famous " ISO 9001". Having become the world reference, it is applied in all areas and declined in several others. The starting principle is simple and effective: write what you do, do what you have written, and prove it. Success also comes from the fact that the standard knows how to continually reinvent itself.

Its fifth version shows that quality management is more than ever an opportunity for innovation, in the service of development. organizations.

1 MILLION ORGANIZATIONS

apply the standard ISO 9001 in more than 170 countries.

(Source: ISO 2015)

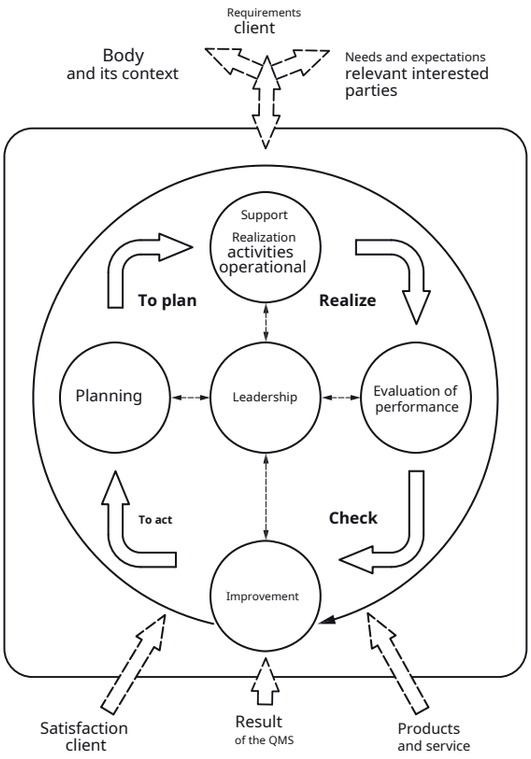
WHAT DOES THE STANDARD SAY?

True to his spirit...

The ISO 9001 standard is based on the same rules fundamental since his creation :
customer orientation; the involvement of staff in his together, from the top to the base of the hierarchy; the process approach; the management of organization and efficiency seen as a system ; the amelioration keeps going ; the factual approach to decision-making, which must follow an analysis; relationships mutually beneficiaries with the suppliers.

... and always working
The 2015 version expands the scope. It is no longer only interested in customers or users, but also in staff, local residents, financiers, partners. It also introduces the concept of risk management, knowledge management seen like capital intangible of the organism, or the requirements relating to the control of the planning operational – identification of objectives, traceability...

Quality management system



And modernity invented quality

Like happiness, is quality a new idea? Because quality tends to be defined based on a standard: a product is *more or less good* quality. Of the work of the craftsman, we would rather say that it is a job well done. This is why the idea of quality goes hand in hand with mass production. It begins at the end of the 19th century century. Having become a link in a production chain, the worker is no longer fully responsible for the object produced: quality control escapes him, others besides him ensure conformity to the standard. But this end-of-chain control is long, and non-compliance is costly.

Poka-yoke, ishikawa, kaizen
The Second World War saw the appearance of the first statistical controls and *Military Standards* in the United States, which require their suppliers to be audited and therefore comply with their requirements. Nuclear power and NASA are quickly following suit, because in the first area as in the other, the smallest detail counts. Japan was not left out, and from that time it developed excellent tools –*poka-yoke, ishikawa, kaizen*– to the point of taking a lead over Westerners who changed their approach in the 1980s, for example in the automotive world. No more curative, make way for a preventive vision. This is good, because the economy will globalize, production will internationalize. But for suppliers, the multiplication of standards can rhyme with a multiplicity of audits. Then ISO comes into play. In 1987, three standards were created: ISO 9001, ISO 9002 and ISO 9003. It was the start of a great story – which does not exclude sectoral variations.

FROM THE INDUSTRIAL WORLD
HAS
O
D .

The ISO 9001 standard applies
s united
s pu
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ES
SERVICES

30,000 COMPANIES USE THE ISO 9001 STANDARD **in France in 2015.** (Source: ISO 2015)

41% ORGANISMS WHO USE THE ISO 9001 STANDARD **belong to the world of services.**

28

NF EN 43	EN	NF EN 080	
◂ V1 in 1998 –1996 – 1997		Revisions 2008 – 2007 – 2013	

HELMETS

To live happy, live in helmets

Asterix the Gaul was afraid that the sky would fall on his head. However, this is not what was likely to fall on his back in the first place. As the first danger for the skull, there was above all war, the origin of protections of all kinds. We think of the cylindrical helm of the Black Knight of Monty Python, but also of the spiked helmet of the Prussians, whose appendage was supposed to deflect the trajectory of the enemy saber. Other good reasons to protect yourself, professional risks of course, and dangers of all kinds – we think of the precious protections of firefighters.

From miner's helmets to construction helmets, the collection is long. And then the civilization of leisure came to increase the number of protections, some for motorcycles, others for skiing, others still for caving... Sweet helm.

10

TIMES LESS

A road safety investigation indicates what to do to wear a helmet to pedestrians and motorists would reduce the number of head injuries.

WHAT DO THE STANDARDS SAY?

Absorption shocks... but not only

Helmets are intended to reduce the number and severity of injuries to the skull and the part of the head they cover.

Helmets protection for the firefighters

The spectrum of requirements is obviously very broad: heat resistance, shock absorption, resistance to crushing, penetration, insulation electric... The field vision and the extent of protection are also regulated by the standard.

Helmets for skiers alpine skiing and snowboarding

On the ski side, heat resistance is not obviously not the subject. The standard therefore focuses on the construction, properties shock absorption, the qualities of the retention system.

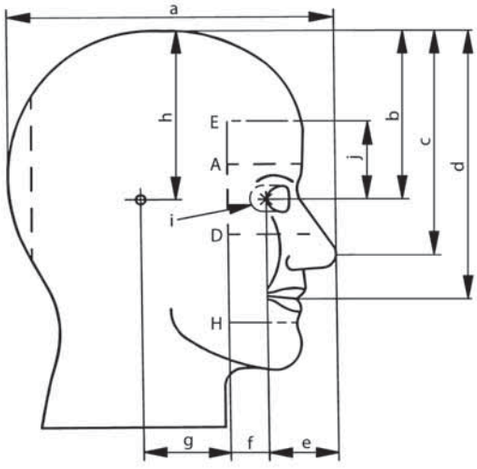
Helmets for young children

As you might have guessed, the constraints linked to the use of helmets by toddlers is specific. So why the standard determines very precisely the drawing of the chin strap (no chin strap) and the clamping system, in particular the systems with automatic opening. The opening pressure, for example, is thoroughly framed: neither too much nor too little.

And all of this is subject to test protocols very rigorous !

Fire helmets

Definition of protection zones 2 and 3 (out of the 5 zones established by the standard)



Thomas Edward Lawrence says, Lawrence of Arabia, loved speed. On May 13, 1935, he drove at more than 100 km/h on his Georges VII motorcycle. But he goes off the road to avoid two cyclists. Shock, brutal, causes serious trauma cranial. His cap will not have protected him. He died 6 days later at age 46.

If the helmet was told to me

The helmet doesn't go back as far as the men's first fight with each other, but almost. In any case, it has been an accessory for fighters since Antiquity. Less far in the past, at the end of the Middle Ages, knightly combats gave rise to clever creations, at the very least original if not necessarily effective... and easy to use.

Lawrence of Arabia

Later, the generalization of firearms obviously changed the situation: ineffective against a bullet that would hit him head-on, the helmet nevertheless remains useful to protect the head from shrapnel and falling objects of all kinds. It has even become high-tech, and uses composite materials. Like the motorcycle helmet, for example. This one owes a lot to the disappearance of an illustrious man: Lawrence of Arabia. The story goes that Dr. Hugh Cairns, desperate to save him, decided to study motorcyclists' head injuries to advance safety. However, it was not until 1973 that wearing a helmet became compulsory on motorbikes in Great Britain, in the same way as in France (at the same time as seat belts in the front seats of cars). Later, cyclists themselves got into it. So much the better for safety, and too bad for Eddy Merckx's very elegant cap.

The helmet has been the accessory of all wars since Antiquity. An example with this Greek Athenian style helmet, not without panache!

15 MILLIONS OF EUROS
APPROXIMATELY

This is what the ski helmet market in France represents.

(Source : *LSA*, February 2014)

Good for the trash!

A helmet that has suffered an impact should no longer be used. Even in the absence of a crack or other mark of impact, its mechanical qualities may have been reduced by a significant impact.

SPORTS

Everyone has their own helmet

Today, many sporting and leisure activities are developing, leading to certain risky practices. The helmet is therefore a highly recommended safety accessory! Its wearing is however not obligatory in France only for drivers of two-wheeled motor vehicles.

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NF EN 15603 | V1 in 2008

OVERALL CONSUMPTION
ENERGY

No to comfort “watté”

It’s a reality that no longer escapes anyone: the building is one of the main culprits of global warming. The fault, most often, is insufficient insulation, which we compensate for by heating – or cooling – excessively. To improve existing buildings, to force designers to do their best, the energy consumption of buildings is now subject to careful evaluation. So as not to throw kilowatt hours out the window.

5336

KWH/YEAR

It's here consumption electric average of a French family in 2014 (the highest in Europe).
(Source: Planetoscope)

54.6

BILLIONS

OF EUROS:

Invoice energy from France in 2014.
(Source :*Panorama energy climate*2015

86€

ANNUAL COST

per household devices in watches in France.
(Source: Ademe, 2016)

WHAT DOES THE STANDARD SAY?

Check, inform, to watch, to correct

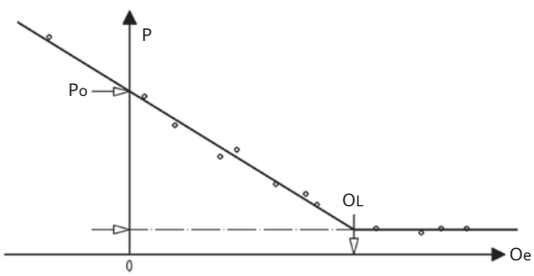
Define a framework general for the evaluation of the consumption global energy, this is the purpose of standard NF EN 15603. Because there is more than one good reason to evaluate the performance energy of a building. The first one is to ensure that it complies with the regulations in force regarding limit values of consumption, the second, of ensure the transparency operations commercial (purchase, rental). But the evaluation of performance energy allows also to monitor the yield energy of the building and its systems techniques, or to help implement rehabilitation measures.

The new like the old

Please note: the standard applies both new and existing buildings, and it includes two types of evaluations:

the calculated energy rating and the measured energy rating. The gap between the two makes it possible to evaluate the effects of actual construction, systems and operating conditions compared to standard values. We don't escape reality...

Energy signature



P Average power between two successive recordings Power at
Po 0°C
OL Non-heating temperature
Oe Average outdoor temperature between two successive recordings

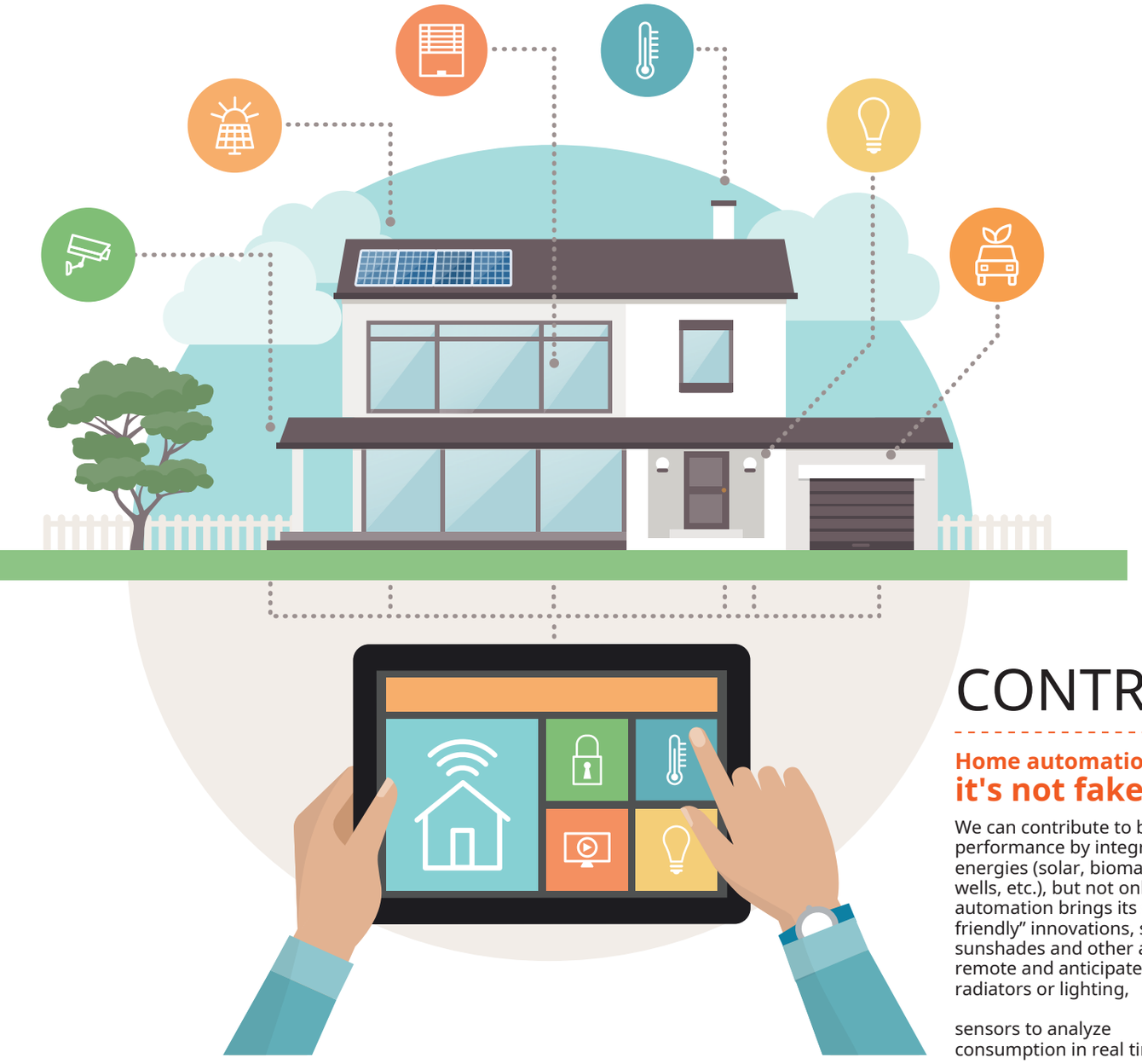
Your accommodation, how much does he consume?

We often ignore it, the “residential-tertiary” sector is responsible for around a quarter of polluting emissions in our country, just behind transport and ahead of industry. Above all, it is the largest consumer of final energy, all economic sectors combined: 43%* of French consumption, or 1.1 toe** per year and per inhabitant. And when we know that housing represents 30% of the household budget, there are many good reasons to be interested in its case, and to try to improve the situation. We still need to know the reality item by item, because the energy consumption of a home of course includes heating, but also domestic hot water, possible cooling (i.e. air conditioning), ventilation, and of course lighting.

Of the interest of the evaluation

The behavior of the occupants obviously has an influence, as does geography and climate, but it must be recognized that the quality of the building and its equipment is decisive. Hence the interest in evaluation, knowing that the door remains open... to creativity. To air-condition an old house with a Canadian well, or to compensate for your dream of large bay windows with a solar water heater, for example. Performance is also a question of balance.

* Ministry of Sustainable Development.
* * Ton of oil equivalent.



CONTROL

Home automation
it's not fake

We can contribute to better energy performance by integrating renewable energies (solar, biomass, Canadian wells, etc.), but not only that. Home automation brings its share of “eco friendly” innovations, such as sunshades and other automatic blinds, remote and anticipated triggering of radiators or lighting,

sensors to analyze consumption in real time...

A standard that sticks to the label

They are not part of the content of the standard, but for the general public, the energy performance of a building is today materialized by two labels with 7 classes (from A to G): the energy label and the label climate (greenhouse gas emissions).

Two tools that will allow you to escape energy-intensive rental accommodation, or to check that the house of your dreams will not be a nightmare for the environment.

“kWhEP/m²/year”

A bit kabbalistic (we are talking about kilowatt hours “oil equivalent” per square meter per year), this formula is the unit of measurement used to evaluate the energy performance of a building. For example, the limit is set at 57.5 kWh/m2/year for new collective housing buildings until December 31, 2017, and should then increase to 50 kWh/m²/year.

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NF ISO 7296-2 | **V1 in 2015**

ADDITIVE MANUFACTURING

Do not move, I make it for you

At first it was a common joke in all the offices: “I'll print it for you in 3D”. And then one day it was no longer a joke. Because for several years now, we have really been printing “in 3D”. In volume, Praxiteles style but in too stylish a fashion. It is true that we dreamed of this miracle tool. Which would make it possible to give shape to our software creations in just a few minutes. We still need to agree on the definition and the process.

+25.9%

OF GROWTH

for the manufacturing market additive in 2015.

(Source: Wolhers report)

5.16

BILLIONS

OF DOLLARS :

global market of printing 3D in 2015.

(Source: Wolhers report)

1984

FIRST PATENT

filed by the French Jean-Claude André.

(Source: www.makery.info)

WHAT DOES THE STANDARD SAY?

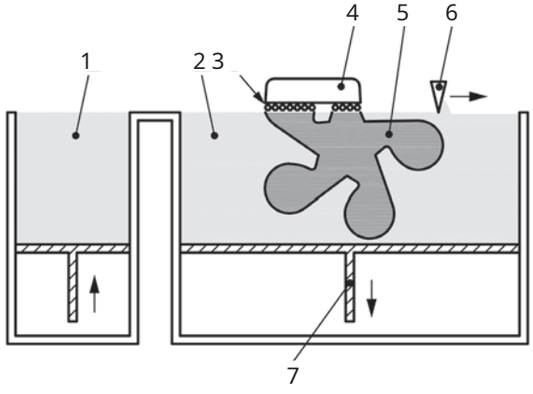
Speech of the method

The NF ISO standard 17296-2 can be considered to be the premiere of a new unborn set in terms of industry "4.0", that of smart factories and systems "cyber-physical". Additive manufacturing is one of them. Versatile technology that can be used throughout the development of a product, it allows to make prototypes, tooling, and the final part. But as said technology is still news, we must first sort out the different terminologies and between the different processes, their applications and their boundaries.

To understand the processes

This is the object of chapter 6. The principles are studied general manufacturing, and processing of raw materials in depending on the geometry of the desired product. Objective: improve understanding of processes and communication between the customer and suppliers, on the basis of processes that have proven themselves on the market for several years.

Vat photopolymerization scheme



1 Powder feeding system
2 Powder material distributed in a powder bed 3 Liquid Bonding Agent
4 Dispensing apparatus including connection to the binding agent supply system
5 Powder spreading device
6 Manufacturing platform and elevator 7 Product

To do at home

The format of additive manufacturing devices has been considerably reduced in just a few years. In some cases, the print size is reduced to around ten centimeters in three dimensions, for a few hundred euros. What to do with it? Well put your work to work imagination: jewelry, a phone case, toys for children, little soldiers from the imperial army...

3D puts everything back on track

1983. At the CGE (General Electric Company) research center, in Marcoussis (91), an electrochemical engineer, Alain Le Méhauté, was interested in fractal objects and a way of manufacturing them, something impossible at the time* . Tests based on lasers and monomers were carried out, without success. Then a certain Jean-Claude André, researcher at the CNRS, intervenes, who suggests doing "2 and a half D". In other words, stacking layers that merge together. A patent was filed, but an American working on the same subject managed to get ahead of the French: Charles W. Hull created 3D Systems, inventor of the first 3D printer, which was preparing to become the leader in the sector.

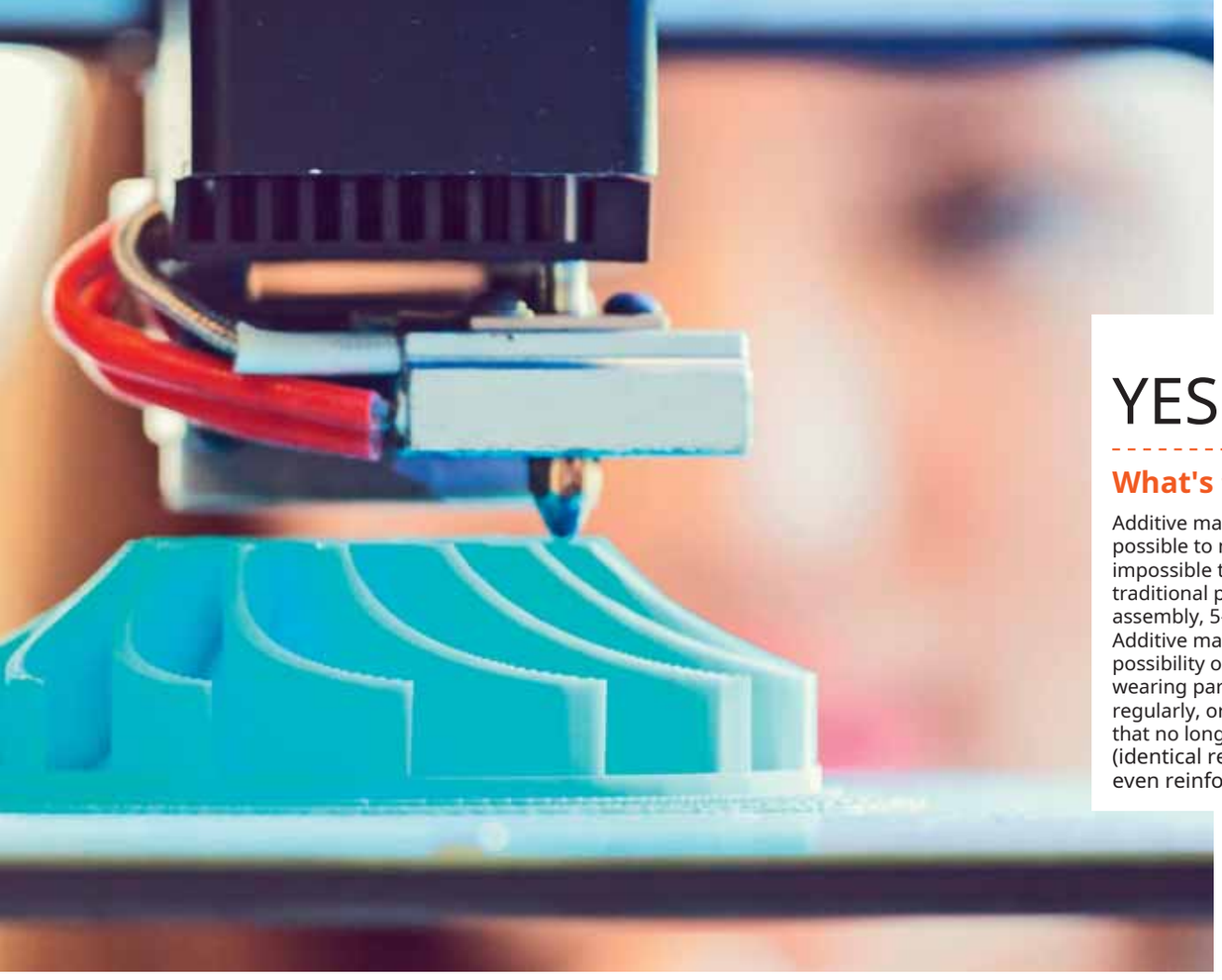
Prototypes and small series

Thirty years later, seven technologies are at work, using some 250 plastic, metallic, mineral and organic materials. A real revolution. Because 3D printing provides manufacturers with a unique production speed for prototypes and small series, and therefore an extremely accelerated commercial launch. It also makes it possible to produce objects with complex shapes, impossible to achieve with usual means. And then 3D also means the possibility of producing infinitely customizable parts. And even at home, now...

Is 3D printing an oxymoron?

Additive manufacturing lends itself very well to the cost-effective production of limited series. By eliminating the tooling stage and going directly from design to production, it enables short manufacturing cycles, which significantly reduces costs. And this makes it an ideal tool for prototyping and mass customization.

* Source: magazine *Capital*, Eric Le Braz.



YES WE CAN

What's the point ?

Additive manufacturing makes it possible to manufacture parts that are impossible to produce using other traditional processes (molding, assembly, 5-axis machine, etc.).
Additive manufacturing is also the possibility of producing at a lower cost wearing parts that must be changed regularly, or even parts to be repaired that no longer exist.
(identical reproduction, or even reinforced).

“3D printing is an asset for any surgeon, particularly for long procedures. It allows you to better prepare for an operation, save time and increase precision for a better result for the patient. »

Professor Julien Pauchot, surgeon in the orthopedic surgery department of Besançon University Hospital,*Le Figaro*(May 9, 2014)

3D is strong in soft tissues

No it's not a dream. Additive manufacturing already makes it possible to produce certain parts of the human heart: valves, vessels.
But the objective is, within a few years, to create a complete heart. And for this, 3D bioprinting still faces a challenge: the development of a method for printing structures in soft materials. Only the heart cells remain to make the muscle contract, and the impression of an entire heart will be possible.

The man who was worth... 3D

Additive manufacturing is of great interest to the world of medicine. Who uses it for example to model an intervention by making an exact copy of a patient's mandible before its reconstruction.
But additive manufacturing also leads to the final object: orthopedic surgeons were the first to benefit from 3D printed implants, with materials chosen for their biocompatibility and their functional properties – titanium alloy for example, or even polyether.

THE SPIRIT OF STANDARDS

Take a time in advance

Voluntary standards are at the forefront of innovation and progress.

Voluntary standards are naturally one step ahead. Because they are the realization of the expectations, reflections and work of the actors concerned. They embody the spirit of anticipation and innovation which is the beating heart of standardization

voluntary. Demonstration...

MOVE

TOMORROW

Difficult question that that of mobility. Not just in the city either. Information technologies are a game-changer, but the new must be

accompanied...

NEW MOBILITY SYSTEMS AND SERVICES

It is an understatement to say that our cities are congested. But do we know that with the same transport infrastructure, it would be enough to reduce traffic by just 10% for the flow of traffic to be completely changed? And to do this, we must inform: make known the less congested routes, the departure times which will avoid traffic jams, the alternatives to the initially chosen mode of transport... The future will therefore be interoperability and compatibility information flows. The same rule applied to public transport would bring a significant benefit in terms of user comfort. And this, thanks to information transmitted by “push”, that is to say from the infrastructure to the user. The question that then arises is that of governance: in whose hands should it be placed? In this area, voluntary standardization obviously has a say. Transport, mobility in general, is also a significant evolution from ownership to use. There is no longer a large urban area that does not have its own self-service bicycle or even automobile service. And, here again, standardization can help pave the way for companies that will be able to offer innovative solutions, and give power back to the user.

PHYSICAL INTERNET

Logistics may well be making undeniable efforts to improve its efficiency, but the continued growth in transported volumes is accompanied by a dramatic dispersion of efforts. The example of road transport is undoubtedly the most significant: partially filled trucks, empty journeys, diversity of shapes and materials... The result is obvious economic and energy waste, saturation of the networks, and an obvious nuisance for the transport sector. 'environment. Aware of the needs of the sector, a working group imagined applying the concept of Internet TCP/IP to transport, in other words drawing inspiration from this open and distributed infrastructure to reinvent logistics and open up the transport market in network. First principle: pool routing and the transport network to optimize content, thanks to interconnected supply networks, intelligent standard interfaces, or even modular and clip-on containers as in the case of the Modulushca project, financed by the European Union: goods are placed in standardized containers to reduce wasted space and facilitate their use as part of an intermodal transport network. Another “incarnation” of the physical Internet is the work carried out by the ISO* on renewable packaging, to move from disposable to reusable in the midst of the explosion of e-commerce. So much work awaiting voluntary standards...

* International standards organization.

EAT

TOMORROW

We only know too much: the Earth will have more and more difficulties to feed the world's population. In this domain, AFNOR closely monitors the paths to the future.

FOOD INSECTS AND ALGAE

There are 7.5 billion people on Earth today. And probably 9 billion in 2050. But planetary resources are running out, and new eating habits are making the situation worse: eating animal meat means consuming much more plants than we do in the case of a traditional food based on rice and bread. We will need to quickly find alternatives and other sources of protein, the basis for the functioning of the human body. So why not insects? The idea may be startling in Europe (less so in Asia), but studies show that the protein level of edible insects (crickets, locusts, etc.) is higher than that of plants, and also - this is the surprise - than that of plants. meats and eggs. It can reach 75% on dry extract. Another solution: seaweed, like wakame. But these upcoming upheavals in our eating habits require reassuring the consumer. In this area, the role of voluntary standardization and its monitoring work are essential to understand the major issues, to detect “win-win” situations, to maintain power on the client's side when innovation most often comes from supply side. These are shared bases that create trust, and AFNOR is there to provide the bases of this trust...

FOOD WASTE

The paradox is striking: on a planet where the human population is ever increasing, where new eating habits aggravate imbalances, where resources are increasingly constrained, food waste is a common scourge in developed countries. In France, it is estimated that 21% of food purchased ends up in the trash, or 6.5 million tonnes of food waste per year (20 kg per French person, etc.)*. It is imperative to “drive out waste”. And once again, information will play a key role. For example, to inform the consumer that a particular product will soon expire, and that they should buy it before it ends up in the trash. Information is also, and will be, even more traceable. For standardization, the objective is to identify the problems and then set up “tour de table”, work carried out collectively which could lead to standards. Because voluntary standardization, it is better to say it, is only possible if the actors agree. There is no question of “playing” the norm for the sake of the norm either. In this area, the players can be supermarkets and communities.

* Source: Planetoscope.

MAKE SOCIETY

TOMORROW

Have you noticed it?

Our society is changing.
It even changes profoundly, and raises both economic and moral issues.

DESIGN FOR ALL

*Design for all.*Design for everyone. Multiplication of technological objects, aging of the population, situations of permanent or temporary disability: many of the products we use remain unsuitable for certain categories of the population. However, there are many products specially designed for these users, but they cost more to design, are not necessarily easy to use and clearly "sign" the user's disability. This is the "triple punishment". The principle of*design for all*is to pool the design in advance, for a cost that is barely higher and spread across all consumers, but also to not give rise to "infamous" products. The subject and the issue are important at the international level. But the people concerned are often absent, because they are already affected by a disability which distances them from the interlocutors. Yet the *design for all* allows us to respond to issues such as staying at home, while contributing to economies of scale that maintain solidarity. THE*design for all*is both necessary learning and a universal subject. Therefore a theme of choice for standardization whose aim is to serve the general interest. In this area, AFNOR plays a catalytic role, for example by organizing round tables where stakeholders can exchange views. AFNOR acts as a "watchdog", identifies the issues, searches for committed participants. Shadow work for a noble mission...

COLLABORATIVE ECONOMY

The term was still unknown ten years ago, and it is now part of everyone's life: collaborative economy...A practice which takes advantage of digital technologies and which is investing in increasingly diverse areas. It is even a socio-economic model that is being invented: housing exchange, vehicle rental between individuals, carpooling, loan or rental of tools, online courses, educational support... For some the benefit is very concrete (we travels by car from Paris to Rennes for a few euros while making conversation), but we must also protect others from the possibility of abusive behavior. The most obvious problem is undoubtedly that of counting usage: how to assess the wear and tear of a drill used over a Saturday? Another question is that of the "reputation" of users. For this same example of carpooling, drivers and passengers are often rated on the platforms in question: how can we ensure that some of them will not be victims of a "false bad reputation"? Here again, possible approaches based on standards are possible. And AFNOR is of course there...

TO HANDLE BETTER

TOMORROW

Science
without conscience...
Technology and
in particular information
technologies open up
extraordinary perspectives.
But it is appropriate to do
watch out for abuse.

INTERNET OF THINGS

For the ITU, International Telecommunications Union, the Internet of Things is a “global infrastructure for the information society, which provides advanced services by interconnecting objects (physical or virtual), thanks to Internet technologies. “existing or evolving interoperable information and communication”. The potential is enormous. We of course think of home automation, with thermostats, presence detectors that can be controlled from your mobile... We also think of health, with connected bracelets, sensors of all kinds which will give the alert in the event of of glitch. The potential is enormous, therefore, but the dangers are numerous. Objects can be attacked from the Web. We must therefore find ways to interact so that everyone finds their interest in the adventure, and with strict respect for privacy. The problem arises of collective governance and authorizations, which is why AFNOR works in close collaboration with the CNIL*. Because certain major players will refuse to play the game of standardization. But the standard is the users' weapon. A patent enshrined in a standard, for example, is more likely to be protected. Voluntary standardization is not the reason for the strongest...

ENERGY STORAGE

The time for the end of fossil fuels has not come, but electricity is gaining ground. Thanks to photovoltaic panels, among other things, everyone can now create energy. In this case, and as is somewhat the case for the collaborative economy, the problem of counting arises. Today the electricity produced by households, their homes, is sold to EDF. But will EDF continue to control everything in the future? The electricity of the future is also the smart grid. The smart electricity grid. Because the big pitfall of electricity, as we well know, is that of storage. Power plants are often kept in a state of overproduction, and the excess electricity produced is exchanged between states. But the solution is expensive and we are considering alternative options. To cushion peaks in electricity demand, we are thinking, for example, of using the batteries of electric vehicles when they are connected to the charging network. But how can we evaluate this “loan”? Here again, it is the role of standardization to encourage dialogue between stakeholders, so that neither the user nor the SME is harmed.

* National Commission for Information Technology and Liberties.

Looking at standardization Today and tomorrow

Alain Bravo, X-Télécom, general telecommunications engineer, President of the Academy of Technologies, is co-author of the work entitled *Futures of research and innovation in France* (La Documentation française, 2005). He gives us his take on the methodology he wants to see applied to the concept of standardization, today and tomorrow.

> "You have to be sure that the system will work without the "standardization" is only one specification of choice techniques. »

AFNOR was created in 1926, and long before that, the ITU-T had laid the foundations for standardization. Since then, and at many stages, standardization has undergone profound changes... ALAIN BRAVO: Today we use the word standardization which is in fact an old term, and in a completely different meaning from what it was originally. For the French, there is an element of ambiguity. The example of the ITU-T, International Telecommunications Union, is indeed convincing. At the time, that is to say the second half of the 19th century, interoperability was essential, but the systems used already knew interconnection. Since then, we have opened up to the era of services and software, and the context has changed in nature. The initial standardization, which came under "coordination", entered a very Anglo-Saxon world, and the concept of "Standardization" has established itself as a logic applicable at the international level, which encompasses state decision and voluntary standardization. In fact, it is a terminology that is ultimately more vague than before, when AFNOR manages to remain modern by sticking to "voluntary standardization".

Not all standardization processes are the same. Telecoms, in this respect, are a special case...

AB: Telecoms are a very interesting example. They actually came up against "standardization*" when they entered the electronic era and even more so in the Internet era. Since the 1985 law, telecoms have taken standardization in a new direction: whereas until then we had relied on technical solutions, the approach has turned towards functional specifications. So-called "dominant" standards have appeared, always voluntary but motivated by a context of liberalization due to technological innovation. Incidentally, talking about standardization requires us to recall an essential reality: France has 35,000 standards and... 400,000 rules resulting from regulatory processes. This is an obvious problem. After the agreement signed between the ITU-T and the Isoc (Internet Society), telecoms have finally moved closer to voluntary standardization as envisaged by AFNOR. The factors that have played a role are liberalization and technological innovation. Clearly, and in this case,

" Ripening of the concept of normalization is linked to evolution of the environment economic and innovation technological. »

the maturation of the concept of standardization is linked on the one hand to the evolution of the economic environment, and on the other hand to technological innovation (hardware, software, applications, etc.).

The Autosar project, with its principle of "open standardization", can also be considered as a specific case, and as a model...

AB: This is an example of open standardization linked to another phenomenon: the evolution of the industry towards "systems", and more precisely the desire to integrate novelty into increasingly final systems. innovative. Development and production centers are located around the world, for which the imperative is integration. Therefore, the question that arises is to put in place an "integrative" system (open, therefore) which works upon arrival. However, we must be sure that the system will work without "standardization" being just a specification of technical choices. Managing this duality means achieving, in the case of Autosar, a situation where small companies can benefit from the international benefits of open standardization. In this case, Autosar is the application of standardization to globalized industrial production: open standardization gives integrators the possibility of making more or less intelligent, more or less complex architectural choices, and it is this which guarantees the success of the operation. In short, being an integrator means open standardization... This leaves space for other players who can ensure that their offer will be useful and profitable. But volunteering has its limits. We must be careful of the "invisible hand of the market", which is not necessarily virtuous. To be virtuous, precisely, competition must be monitored: even so-called free software can contain limitations to the emergence of a consensus...

Even the building has its own standardization project. The idea, this time, is to exchange computerized data, around a "digital model". What are the specific problems posed by such a type of project?

AB: Following the aeronautics model, the building strives to promote PLM (Product Life Management), i.e. a single entry of computerized data then the end-to-end exchange of digital data. In this context, "BIM" (Building Information Modeling) calls for tenders must be studied by BIM-certified firms. Which means that firms will take certain materials into account, in accordance with the standard. Therefore, depending on whether the candidate chooses one solution or another, he or she may be automatically eliminated. This is another limitation: the true innovator who will respond with an unknown material will be excluded. We will have understood that those who drive the definition of the "digital model" have a enormous responsibility for innovation. Taken to the extreme, BIM can lead to the underlying protection of national markets. We must therefore remain vigilant, to leave the door open to innovation.

These examples show that the standardization process is expected to evolve continuously. What are its specific resources, and what are also, perhaps, the dangers that threaten it?

AB:A new European approach to standardization and patents is based on "essential requirements". The risk is that faced with these essential requirements, large groups file "essential patents". Hence the creation of extraordinary dominant positions. Here again, we must therefore be vigilant. And this vigilance calls upon the community of actors: not only the State, but the members of the community who develop, the regulators, and also the users. It is therefore a matter of constant vigilance but also of collective vigilance. We have recently observed this in the cases of "GAFA" (Google, Apple, Facebook, Amazon), against which the European Union is starting to strike fiscally. In the same spirit, the Academy of Technologies that I chair has given itself a credo: "For reasoned, chosen and shared progress". It is in fact a question of collective wisdom, which aims to protect ourselves against certain dangers, such as considering that volunteerism alone is the guarantor of a balanced consensus. Voluntary standardization and standardization are undoubtedly immense progress. But there is no place for candor: wise voluntarism must and will be demonstrated. Thus, under the New Industrial France, it is strategic to target a few key targets in terms of standardization.

* The translation of the English word "standardisation" by the French word "normalisation" contributes to the entanglement of the standard (standard *de jure*) and the standard (standard *de facto*).

About the Author

Philippe François

Philippe François is one of those discreet characters that we enjoy discovering.
If he served as technical editor for *The new factory*, *Undertake* Or *Health Magazine*, this poet of images and juggler of words writes and illustrates with equal passion a book on Gérard de Nerval – *Sylvie or melancholy dazzlement*, preface to L'Institut de France – a work on the history of skyscrapers and their structural techniques. At the age of 50, as our image civilization continues to expand its empire, he began writing short film scripts. The last, *Dialogue of Phryne and Praxiteles*, is simply written in alexandrines.

"My life as an editor gave me the opportunity to write on a multitude of technical subjects, which sometimes hid their game well. By this I mean that the mission, sometimes, can become pleasant like a game, precisely. This was the case with this work on standards: with the support of AFNOR, with the inventiveness and audacity of its directors, the writing of this work became an authentic literary adventure. And therefore a human adventure. »

Thanks

AFNOR particularly thanks Alain Bravo, president of the Academy of Technologies, for his kind contribution to the content of this work.
He also thanks the companies Safran, Deltec Equipement, Aliapur and MSA - The Safety Company for kindly providing us with visuals.

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AFNOR – 11, rue Francis de Pressensé,
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TRY THE EXPERIENCE, SAY “STANDARDS”.

You risk causing perplexity. Unless you have taken care, at first glance, to open this book which will help you to enamel your words – by drawing from the approximately 100 short stories which are there, or by launching yourself into the story of one of the 30 voluntary standards that it describes. Undoubtedly, perplexity will give way to astonishment and curiosity. Because the standards

Volunteers, know it, do not breed gloom.

Thrown alive into the little-known language of consultation and standardization, you will discover behind the scenes of these very methodically developed consensuses, whose effects are evident (it is painless, and very useful) even in the smallest gesture of our everyday life. Taking your children to play in the square, applying cream to your face: as Monsieur Jourdain marveled at writing prose without him knowing anything about it,

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