Aluminium

Beauty, incorruptibility, lightness and abundance, the metal of the future

Graham Harwood
Aluminium

Beauty, incorruptibility, lightness and abundance, the metal of the future

Graham Harwood

The Rest of Now, Manifesta7, Bolzano, Italy, July-November 2008
Acknowledgements

Author: Graham Harwood

Graphic Design: Matsuko Yokoko

Software: Filippo Tommaso Emilio Marinetti

Aluminium is produced for The Rest of Now, Manifesta7 (Bolzano/Bozen, Italy 2008 www.manifesta7.it)

Curated by: Raqs Media Collective

Thanks to the following:
Raqs Media Collective for getting me involved, Denis Isaia at Manifesta7,
Matthew Fuller for his trip to the beach, Richard Wright and Jon Fletcher for diligence.
Thanks to issuecrawler.org for the use of their Issue Network Visualization Tool.

All images from:
Metal in Harmony, 1961, Directed by Kenneth Fairbain, Courtesy of Scottish Screen Archive

Source images from Metal in Harmony, copyright Scottish Screen Archive at National Library of Scotland.
Source images from Aluminum on the March, in the public domain.
<table>
<thead>
<tr>
<th>Contents</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Algorithm</td>
<td>4-5</td>
</tr>
<tr>
<td>URL Address Codes</td>
<td>6</td>
</tr>
<tr>
<td>Alumino-Manifesto</td>
<td>7-8</td>
</tr>
<tr>
<td>Cells</td>
<td>9-59</td>
</tr>
<tr>
<td>With Respect to Residue</td>
<td>60</td>
</tr>
</tbody>
</table>
Algorithm {

__machine/book

__Recursively Issue Crawl the internet for instances of Aluminium.

internet_search {

__follow links into and out of files containing an instance of this word on the internet.

Initialise; Issue Crawler software;

list webpage_address = {

    any web page containing the word /Aluminium/ from issuecrawler.net;
}

for each webpage_address {

    return any page_links on the web pages containing the word /Aluminium/;
}

}

__Recursively search through WWW links returned from the issuecrawler.net

process_search {

    page_link ){

        text = get_web_page(TEXT);
        sentences = split text into sentences;
        extract sentences containing the word “aluminium”;
    }

}
__save all keywords occurring next to Aluminium and order by number of occurrences.

process_words {
  for each( sentence containing aluminium ) {
    words = split sentence into words;
    for each word in the sentence {
      if ( word match /aluminium/ ) {
        increment word_before Aluminium;
        increment word_after Aluminium;
      }
    }
  }
}

__Associate the most occurring keywords with sections of the following films:

process_films {
  films = ( Metal in Harmony (1961), Aluminium on the March (1956) );
  __Because we despise the precise, mechanical, glacial reproduction of reality in these films,
  __and as we are not interested in the reconstruction of movement which has already been broken up
  __and analysed by the lense, we code up ways for time to occur across the division of the frame.
  re_render {
    __the films to reveal the movement between frames.
    frame = split film { 15 frames per second }
    new_frame = ( frame + [frame+1] / difference [frame + 5] );
  }
  choose 459 cells from a possible 36,000 frames {
    associate a keyword to each cell in the order of their frequency;
    order by probable co-occurrence with Aluminium;
  }
  for each( cell ){ associate the sentence that contains the keyword }
}

print a book;
URL Address Codes

[3331] = abal.org.br
[3332] = alcan.com
[3333] = alcoa.com
[3334] = aleris.com
[3335] = alfed.org.uk
[3336] = alouette.qc.ca
[3337] = alu-verlag.com
[3340] = alu.ch
[3342] = aluar.com.ar
[3343] = alucluster.com
[3344] = alucobond.com
[3345] = alufenster.at
[3346] = alufoil-sustainability.org
[3347] = alufoil.com
[3348] = alufoil.org
[3350] = aluminfo.de
[3351] = alumnation.info
[3352] = alumbuild.ru
[3353] = alumil.gr
[3354] = aluminilimited.com
[3355] = aluminio.org
[3356] = aluminiocaiama.org
[3357] = aluminium-award.eu
[3359] = aluminium-india.org
[3360] = aluminium-info.com
[3361] = aluminium-info.nl
[3363] = aluminium-messe.com
[3364] = aluminium-union.ru
[3366] = aluminium.nu
[3368] = aluminium.org.au
[3369] = aluminium.org.gr
[3371] = aluminiumarchitecture.com
[3372] = aluminiumbahrain.com
[3373] = aluminiumcenter.be
[3374] = aluminiumcentrum.nl
[3376] = aluminiumriket.com
[3377] = aluminium.or.jp
[3378] = aluminium.org
[3379] = aluplanet.com
[3380] = alupro.org.uk
[3381] = amag.at
[3382] = ams-aluminium.no
[3383] = anexpa.org
[3386] = aughinish.com
[3387] = automotive-lightmetals.com
[3388] = avonmetals.com
[3389] = wasu.com
[3390] = ball-europe.com
[3391] = basemetals.com
[3392] = bhpbilliton.com
[3393] = bpindex.co.uk
[3394] = bristol.be
[3395] = brockmetal.co.uk
[3396] = c-a-b.org.uk
[3397] = cancentral.com
[3398] = canmakers.co.uk
[3399] = canmakers.org
[3400] = cenorm.be
[3401] = centuryca.com
[3402] = cepmc.org
[3403] = cetim.fr
[3404] = chadwicks-lids.com
[3405] = chalco.com.cn
[3406] = corusgroup.com
[3407] = dubal.ae
[3408] = eaa.net
[3409] = hydro.com
[3410] = oea-alurecycling.org
[3411] = rusal.ru
[3412] = world-aluminium.org
[3413] = world-bureau.com
[3414] = alrtech.is
[3415] = alu.dk
[3416] = alufuture.org
[3417] = alfed.org.uk
[3418] = alouette.qc.ca
[3419] = altech.is
[3420] = alu-verlag.com
[3421] = alu.it
[3422] = aluar.com.ar
[3423] = alufenster.at
[3424] = alufoil.org
[3425] = alufuture.org
[3426] = alinfo.de
[3427] = aluminilimited.com
[3428] = aluminio.org
[3429] = aluminiocaiama.org
[3430] = aluminium-award.eu
[3431] = aluminium-india.com
[3432] = aluminium-india.org
[3433] = aluminium-info.nl
[3434] = aluminium-konin.com.pl
[3435] = aluminium-messe.com
[3436] = aluminium.matter.org.uk
[3437] = aluminium.nu
[3438] = aluminium.org.au
[3439] = aluminium.org.gr
[3440] = aluminium.org.pl
[3441] = aluminiumarchitecture.com
[3442] = aluminiumbahrain.com
[3443] = aluminiumcenter.be
[3444] = aluminiumcentrum.nl
[3445] = aluminiumleader.com
[3446] = aluminiumriket.com
[3447] = aluminium.org
[3448] = aluminium.org
[3449] = alupro.org.uk
[3450] = asauk.co.uk
[3451] = avonmetals.com
[3452] = ball-europe.com
[3453] = bpindex.co.uk
[3454] = c-a-b.org.uk
[3455] = cancentral.com
[3456] = canmakers.co.uk
[3457] = centuryca.com
[3458] = cepmc.org
[3459] = corusgroup.com
[3460] = eaa.net
[3461] = hydro.com
[3462] = oea-alurecycling.org
[3463] = world-aluminium.org
We have been up all night, my mates and I, beneath the hum of the microwave transmitter, electricity piped in through high-voltage aluminium conductors. Transported here by motors, alloy rims with deep polished lips, fat pipes and chrome spinners, bright as our souls. Like our machines, we are ruled by the internal glow of electric hearts. Trampling the earth underfoot, we wear down the heels of violent Chinese pirates: fresh from Nike-faking factories slaving along the Cambodian border. We have been discussing right up to the limits of our programming and scrawling across filthy keyboards to create these demented writings.

Our hearts were filled with an immense pride at feeling ourselves standing quite alone, like an Essex squaddie in some far-off outpost. Holding up tickets to heaven for an army of suicide bombers. Alone at the gates of social hygiene. Alone with the engineers in clean rooms servicing the reactors of nuclear submarines rehearsing attacks on no-one in particular. Alone with the train driver bearing down on some fool who jumped under the 8:22 to Fenchurch Street. Alone with the dark spirits which rage in the belly of a cruise missile aimed at the church, synagogue, mosque or temple of animism. Alone with the drunkards beating their better halves and spewing curried onions up the walls.

Then, suddenly distracted by the giant whining aluminium tubes, grinding their jet engines to stir the nightmares laid out in their beds at the semi-detached rind of the city. Planes returning from Bangalore, New York and Tokyo... they scream up the Thames following the eddying flight path of regeneration.

Then we kicked back. In the silent intervals we listened to distinct media for the very last time, a faint memory of the dead masses of the 20th Century. The crackling needle jumping on etched groves of vinyl, speeches by Mussolini and Hitler.

Suddenly the hungry automobiles roared beneath our windows and we were refreshed again by the fumes of speed coursing through our nostrils. ‘Come, my friends!’ I said. ‘Let’s go!’ Electrolytic refining for aluminium, immune to corrosion and with only one-third the weight of steel, the future was ours.

At last... I thought the mystic cult of animism was abolished. We are going to be present at the greatest birth, a noble embryo, from whose mixed biology a flock of electric angels will shoot 3 miles high into the sky. Their electricity will illuminate the planet, open windows and reflect light into the darkened flesh of the undeserving. ‘Test our atheism to the metal!’ I said. ‘Let us go!’ Here is the very first sunrise on earth! Cloning. Stem cells catching our minds on fire to light our millennial darkness.

This is the bacteria growing on the frothy brew of capitalism.

We went up to the three silent machines to caress their aluminium cages, placing our finger tips deep within their heat sinks. We felt the breath of their cooling fans running over us like the fanny-breath of a joyous youth. I lay alongside mine – naked, like a corpse on its slab, but I suddenly revived again in front of the keyboard - a guillotine knife - which threatened my stomach. A great sweep of madness
brought us sharply back to ourselves and drove us on through issue crawlers, web pages, audio patches and deep technical details of network surveillance.

Here and there we could catch sight of unhappy souls looking at us looking at them. Soft windows taught us to despise our mathematical eyes.

`Smell, the numbers´ I shouted, `smell is good enough for wild dogs!´ And we hunted like dogs, with the morals of a Tactical Autonomous Combatant, death’s relentless progress bar flashing in front of my eyes, my face dappled with blood & guts. And yet we had no ideal Mistress stretching up to the clouds, nor yet a cruel Queen to whom to offer our corpses split apart! Here, in our machines we could die and die again with full resuscitation as long as memory lasted. No reason to die I thought, unless it is the desire to be rid of the great weight of our courage!

Piccadilly circus: 18:30

We drove on by Eros, crushing everything beneath our burning wheels, like shirt-collars under the iron. Death ran in front of me at each corner offering me his hand nicely, and sometimes lay on the ground with a noise of creaking jaws and jolted screams giving me velvet glances from the bottom of London’s filthy tide.

Let us leave good sense behind like a discarded skin - let us hurl ourselves, like cocks spiced with pride, into the immense cunt of the world! Let us feed the unknown, not from despair, but simply to enrich the unfathomable reservoirs of the Absurd!

As soon as I had said these words, I turned sharply back on my tracks with the mad intoxication of an 11 year old script kiddy, and suddenly there was a woman with a baby in a pushchair, tottering in front of me like two persuasive but contradictory reasons.

Her sentimental cooing got in my way. What an arse! Pouah! I gave the pram a slight tap, sending it spinning. As it went under the wheels it punctured my tire and ripped the rubber from the rim of my alloys. The air bag sprung from the nape of its seat; my motor – crumpled. Its metal - vlam! - ending up in a ditch.

Oh, maternal shit pit, half full of oily water! An aluminium factory gutter! I savoured a mouthful of strengthening muck which recalled the black teat of my African nurse! As I raised my bloody body, shit-spattered and foul smelling, I felt the red hot poker of joy deliciously pierce my heart at what I had done. A crowd of Tescos tossers and domestic shoppers crowded terrified around this spectacle. With patient and tentative care they helped me pull the car out, like a vast great white shark that had run aground. It rose slowly leaving the ditch, with shining scales, its heavily modified bodywork and its upholstery of comfort came clean.

We thought it was dead, my great shark, but I awoke it with a single caress of its powerful back, and it was revived running as fast as it could on its fins. Then with my face covered in good factory mud, covered with metal scratches, useless sweat and celestial grime, amidst the complaint of staid shelf-fillers and angry green shoppers, we dictated our first will and testament to all the living men on earth.

Filippo Rossi, Southend 2008
The most celebrated British sculptor of the end of the 19th century, Sir Alfred Gilbert, made the famous statue, Eros, from aluminium, which can be found in Piccadilly Circus, a key London landmark.

As a material of construction for the mass production of vehicles, aluminium was once dismissed as being too costly and impractical. By 2001 the aluminium can weighed about 14.9 grams. The first aluminium drinks can was invented in 1972. The corporate history of aluminium production is an interesting story.

In the European union the workforce in the aluminium industry is about 200,000. Can you give me more information on recycling aluminium cans? What makes aluminium such a special material? The market for used aluminium is steadily growing.
A world where aluminium exists opens a wide range of opportunities. Accessibility and the price of power drives the second trend of aluminium industry. Aluminium salts are used to reinforce vaccines, as they are not considered to be harmful to humans. Does aluminium play a role in Alzheimer’s disease? Formability is one of the most important properties of aluminium. Aluminium is used in car bonnets to lighten the front of the vehicle. Let us imagine our life without aluminium. It should be noted that the Russian aluminium industry is unique in many respects. Its body is made entirely of aluminium!
Modern cars with streamlined bodies are made almost entirely of aluminium. Total GHG emissions from European aluminium have been reduced by 45% between 1990 and 2005. In 1990, it was about 50 kg of aluminium per car, but in 2005, it was as much as 132 kg per car. Aluminium rolled sheet for doors, hoods or wings can amount to a 50% weight reduction. US-manufactured aluminium hoods in family sedans registered a 42% direct weight reduction over steel. By recycling aluminium products such as bicycles or engine blocks up to 95% energy is saved. With Aluminium replacing iron in engine blocks, the potential to save the energy is the equivalent of 8,000 litres of crude oil over its lifecycle. All our analyses are based on publicly-available information concerning weight reduction achieved through the application of aluminium. A large majority of recycled aluminium is used by the automotive sector.
A radiator normally consists of tubes made of aluminium brazing sheet. About 80% of all vehicles contain aluminium heat exchangers. Brazing alloys in the aluminium-silicon system with silicon contents between 7% and 13% have proven successful from strength and corrosion-chemical points of view. It took about 7 tonnes of aluminium to make each car, 10 tonnes less than for the steel version. The aluminium bodies of the Land Rover have been giving excellent service since the model was first introduced in 1948. The 1924 Vauxhall, with an unpainted all-aluminium body, is a good example and is still in excellent condition. For an average family car, each 100 kg weight saving from the use of aluminium amounts to a fuel saving in the range of 0.4-0.6 litre per 100 km. The average life-span of aluminium products (12 years in automotive sector) also limits the supply of used products. The brilliance, strength, beauty, and versatility of aluminium provide an unparalleled medium for design and engineering.
There are "all-aluminium" car-bodies, such as the Audi A8 and Jaguar XJ and the latest development is the hybrid car-body. The aluminium hood on the US-manufactured family sedan registered a 42% direct weight reduction over high-strength steel. For the transport sector, the reduced weight offered by aluminium improves fuel economy. For aluminium and its alloys inert gases are usually used. Flexible aluminium packaging is normally totally oxidised under waste incineration conditions with 1 kg of incinerated aluminium releasing as much energy as 1 kg of coal or 0.8 litres of fuel oil. But for an average family car, each 100 kg of weight saving from the use of aluminium amounts to a fuel saving in the range of 0.4-0.6 litre per 100 km. Incorporating aluminium in the car fulfills this requirement in an exceptional manner. Nowadays radiators in cars, both for engine cooling and air conditioning systems, are normally made of aluminium brazing sheet. A Russian car currently contains only 40 kg of aluminium.
Foldable chairs made of aluminium tubes and nylon appeared in yards and gardens, while drink cans made of bright anodized aluminium were seen on tables. In the USA, about 50% of beer and non-alcohol drinks are stored in aluminium cans. Inside these aluminium cans there is a protective polymeric coat, which prolongs the product's storage life. The aluminium in a drinks can used today could once have been used in Queen Victoria's fork. An average aluminium can (without its contents, of course) weighed 16.55 grams in 1992 in 2001 it weighed just 14.9 gram, 30% lighter than 25 years ago. The aluminium barrier is what plays the essential role, making it possible to transport and store food for long periods without refrigeration. Keeping contents fresh and protecting them from external influences, guarantees the long shelf-life. In addition there is a ready market for used aluminium cans once they have been recovered from the waste stream. In Russia, Alcan sells aluminium products for the tobacco and cosmetics industries.
Aluminium thickness of 0.006 mm is sometimes enough to provide the required barrier. A 4.8 g flexible fruit juice pouch is 33 times lighter than a traditional bottle and the standard 33cl aluminium beverage can now only weighs 14 g or less! When used to package sensitive products such as pharmaceuticals or food, aluminium is hygienic, non-toxic, non-tainting and retains the product’s flavour. Trban will soon start to collect aluminium beverage cans in one of the most populated districts of Bucharest. Use of aluminium products helps limit greenhouse gases emissions. Dadco has ownership of aluminium Oxid Stade GMBH, a tolling company that produces aluminium hydroxide and alumina. The market share of aluminium cans in the overall European aerosol can market accounts for about 40%. About 16% of all aluminium goes into packaging products, such as beverage cans, food and aerosol cans, menu trays, tubes, closures and other foil products. The demand therefore for recycled aluminium exceeds supply for given products.
European production of aluminium aerosol cans hits the 2 billion mark in 2004.

Good prospects for aluminium aerosol cans in 2004, 1.932 billion aluminium aerosol cans were produced in Europe. In Europe aluminium enjoys high recycling rates, ranging from 58% in beverage cans to 85% in building and construction and 95% in transportation. Romanian consumers can bring their used aluminium beverage cans back to the real hypermarket in Bucharest. The Polish aluminium beverage can recycling rate reached an impressive 65% last year, well above targets set by the EU packaging and packaging waste directive. Look, flexible aluminium packaging is normally totally oxidised under waste incineration conditions with 1 kg of incinerated aluminium releasing as much energy as 0.8 litres of fuel oil. Recycling aluminium reduces greenhouse gas emissions by about 95%.
The naturally occurring surface oxide on aluminium in the presence of atmospheric oxygen acts as a shield and renders foil corrosion resistant. When fully annealed, aluminium foil retains no temper and therefore retains its shape when deformed. For most alufoil packaging, virtually pure aluminium is used but, increasingly, alloys are being ‘tailored’ to lend strength. Warren Mcarthur was among the first to develop aluminium tube furniture. The efficiency of aluminium smelters has shown a steady improvement since the 1950s, and electricity consumption has fallen by more than a third. At the start of the 1950s, during the rise of mass consumption, aluminium articles were associated with a new and optimistic lifestyle. Although some planes such as the Eurofighter and Airbus use carbon fibre composites, it is safe if thick enough and used in conjunction with aluminium. The quality of remelted aluminium is as high as the new metal. One kilogram of aluminium can conduct twice as much electricity as one kilogram of cuprum.
Even deodorants and anti-perspirants contain aluminium. Even the first aircraft in the world, constructed by Wright brothers in 1903, had a four-cylinder 12 horse power engine enclosed in an 13.5 kg aluminium unit to make the aeroplane lighter. Foil is the second most popular type of aluminium packaging. However, aluminium is not only used in Haute couture, but many women have lurex clothes made of aluminium foil and plastic. He obtained 22 other patents, mainly connected with aluminium production. His show in 1999 shone with aluminium disc dresses. It is not surprising that aluminium was first used for jewellery and other luxury articles. One tonne of aluminium is produced from every two tonnes of alumina. Over 25% of aluminium produced in Russia is used in electrical equipment.
Aluminium pharmaceutics, transport electrics, engineering industry packaging should be light, solid, unbreakable. Salvatore Ferragamo once created elegant bags made from the metal, and Oscar de la Renta made aluminium swimsuits. Starting in 1979 with a single pot line, producing only 136,000 MTPA, Dubal today has a production capacity of 900,000 MTPA of aluminium. For example, aluminium walls with insulation and foil reflecting coating provide protection which is four times more effective than 10 cm brick coat or 20 cm-thick masonry. So, aluminium foil not only meets many ideal packaging requirements, but it can make everyday life easier too. The ability of aluminium to absorb kinetic energy is taken into consideration when modern cars are designed. The company incorporates bauxite and nepheline ore producers, aluminium, alloys, foil and packaging materials, as well as power assets. The Russian aluminium industry is developing rapidly. Founded in 2001 during the privatization of the Chinese aluminium industry.
Aluminium never occurs naturally in metallic form. I am looking for recent pricing trends in the aluminium industry. I want to know more about the production process of aluminium foil. It is now impossible to imagine power systems and power equipment without aluminium wires as it is also applied for the wiring of engines and transformers. In the supply chain of a soft cheese, aluminium foil’s contribution to energy consumption is, even if land filled after use less than 10%. The first applications designed and developed for mass production date back to the early post-war period. Military applications too, are increasingly turning to aluminium as an alternative to steel. Its light weight provides scope for transport cost-savings and its good thermal conductivity means that aluminium-packed products can be heated or chilled quickly and economically. In Sydney 2000, the Olympic torch survived the long journey from Greece to Australia thanks to the intensive use of aluminium.
Anodised aluminium foils, present remarkable dielectric properties. On the other hand, the tasteless aluminium barrier will retain liquids and prevent the loss of aroma and other volatile components. Aluminium is an old person, recycling gives it the same effect as the fountain of youth. Mostly polymer matrix compounded with conductive material: e.g. carbon soot, graphite fibres, nickel-coated carbon fibres; steel fibres; aluminium flakes; metal nanoparticles. On the one hand, aluminium foil has the ability to protect its contents from damaging environmental influences such as oxygen, light, moisture, micro-organisms and unwanted aromas. In the latter case, aluminium is recovered from incinerator bottom ashes (12,500 tonnes extracted in 2001). Purification thus becomes an important aspect in re-use of aluminium for production. Usually the parts machined for automotive use are composed of aluminium-silicon alloys. Aibo, a well-known Japanese robot dog, is made with aluminium.
High strength joints with great structural integrity can be readily made with aluminium by welding, brazing, riveting and by adhesive bonding. In the air, aluminium has been the natural choice for aircraft construction for many years. Since aluminium was first commercially produced over 115 years ago, its unique combination of properties has enabled designers and manufacturers to develop products that enhance the quality of life. Jacques le Chevallier made several aluminium lamps, the most outstanding of which is called Chistera. Aluminium lighting fixtures, which have become an important element of modern minimalist interiors, also spring from the pre-war period. A Dane, Jorgen Balthasar Dalhoff used aluminium to create ceremonial crowns for the King Frederick VIII and the Prince Ferdinand. Its dome was coated with silvery aluminium. Its oxide film makes it resistant to corrosion and this means that the life of aluminium goods is very long. He applied cheaper metallic sodium in order to displace aluminium.
Outlook: prices a late cycle burst for aluminium. Professor Nisancioglu has 36 years of expertise in aluminium research and development activities in Europe. Rene Lalique once made a diadem, where aluminium was decorated with ivory and garnets. Rio Tinto aluminium mines bauxites, produces alumina and primary aluminium, accounting for 26% of all aluminium, manufactured in Australia. Rio Tinto proposed to take over Alcan, which, in turn, has already taken over the French aluminium manufacturer Pechiney. Russian aluminium smelters fully comply with the standards of the international market. Emperor Napoleon III, at whose table the most honorary guests were served food on aluminium tableware, dreamed of supplying his army with Cuirasses made of this light metal. It was he who named the metal aluminium. Its base is made of this universal metal, a role that aluminium seized from brass in the 1950s.
At sea, the use of aluminium for the construction of ships, hulls and superstructures, is increasing year on year. The European aluminium industry is conscious that the well-being of future generations depends on how we preserve our social and environmental resources. It is for this reason that the most efficient place to construct aluminium smelters is in remote regions, where there is free access to power sources. It produces 15% of the world's alumina and 12% of its aluminium. On a world-wide average, 4 to 5 tonnes of bauxite are needed to produce two tonnes of alumina, from which one tonne of aluminium can be produced. On an international level, harmonisation on the material aluminium is discussed within the technical committee ISO/TC 79. Low maintenance: besides routine cleaning for aesthetic reasons, neither bare nor painted aluminium requires any maintenance. For this reason, used aluminium is rarely lost. Modern society without aluminium is unthinkable.
Lomako is known as the father of the Russian aluminium industry, smelters in the country were established under his management. Over half of the energy used in the global primary aluminium industry is derived from non-polluting hydropower in regions remote from the world’s main population centres. Holland and Norway use a high volume of aluminium for offshore applications. Primary aluminium is an energy intensive process, however specific energy use in the primary aluminium industry has been steadily reduced. Its ductility allows products of aluminium to be basically formed close to the end of the products design. Tikhonov's project, the USSR state committee for standards building where aluminium structures were widely used, was constructed on Lenin avenue. In 1865, Beketov invented a chemical method to produce aluminium. Recycling of used aluminium beverage cans saves up to 95% energy. Recycling takes about 5% of the energy needed in the primary aluminium process.
The exceptional barrier properties of aluminium make it possible to transport and store food for long periods. Recycling is a major consideration in the continued use of aluminium, representing one of the key attributes of this ubiquitous metal. Aluminium foil in household waste can be extracted and recycled. In this section the process used to create the hydrophilic properties of aluminium are introduced. Made of elegant cast aluminium, it became an iconic symbol of the city and is now one of its best loved attractions. Now that the Atomium is undergoing renovation, the original aluminium skin is about to serve new purposes. Old scrap is an aluminium material that is collected after an aluminium containing product has reached the end of its useful life.
The majority of these alloys consist of aluminium with carefully controlled additions of copper, magnesium, silicon, manganese, zinc and more recently lithium. Steel clad with aluminium has good EMS properties. Alcoa is one of the world’s leading manufacturers of primary aluminium, aluminium products and alumina. Only those who can establish and manage the full production cycle in a highly efficient way can become leaders in the aluminium industry. Hydro aluminium is a downstream-integrated company with major alumina assets in Brazil and Jamaica, and aluminium smelters in Australia, Canada, Germany, Norway and Slovakia. It controls or holds shares of several aluminium smelters in the US and Iceland, as well as a number of mining assets in Jamaica and in the USA. Increased recycling through improved aluminium collection. Indeed, aluminium scrap can be repeatedly recycled without any loss of value or properties. Bauxite mining: the mining of bauxite is the first step in aluminium production.
The ore is refined to make 'alumina', a pure aluminium oxide. Every company that has an aluminium innovation can take part. Alumina or aluminium oxide, is produced from extracted ore. Despite its name, it has nothing to do with clay or black soil but resembles a flour or very white sand. Heroult invented a method for industrial aluminium production through the electrolysis of alumina molten in cryolite in 1886, the same year as Charles Hall. The main waste generated during the aluminium production cycle, is during alumina production and is called red mud, a thick suspension of water-insoluble silicates, aluminium silicates and metal oxides. How to number and write an aluminium alloy correctly, e.g. en aw-6060? In 1898, the dome of San Gioacchino's church in Rome was clad in aluminium sheets, which are still in pristine condition today. Producing one tonne of aluminium oxide in turn produces 360 800 kg of mud.
Some 26 million tons of primary aluminium are now produced annually around the world. Western Europe accounts for approximately one quarter of primary aluminium use. Consumers are wealthy, profitability is evident; it seems a lot of companies should be rushing to enter the aluminium sector. It is interesting that not only professional designers from industrial countries, but also African craftsmen choose aluminium. The main deposits of high-quality bauxites with high aluminium content (not less than 50%), are already divided by the main players. In 1998, world-wide production of primary aluminium was about 22.7 million tonnes per year. Four tonnes of bauxite are required to produce two tonnes of alumina which in turn produces one tonne of aluminium at the primary smelter. Who ever owns resources owns the world. Resources of bauxites, the raw material for aluminium, are not widespread throughout the world.
The first anti-perspirants and deodorants contained aluminium chloride, and the main agent in modern products is aluminium hydrochloride. Several solutions have been developed to improve adhesion of coatings and organic films on aluminium. The Olympic games is the arena in which aluminium can shine. During the war, aluminium was used in the defense industry as it ended, it again became part of everyday life. These include the la cupola coffee machine by Aldo Rossi, the hot Bertaa tea-pot by Philippe Starck, the Lockheed lounge sofa by Mark Newsom. These words became a mantra repeated during discussions about aluminium in the construction sector. The European aluminium industry directly employs about 236,000 people. Ms Bertram presented studies demonstrating aluminium’s capacity to reduce weight in vehicle applications. Ancient middle eastern civilisations used aluminium salts for the preparation of dyes and medicines: they are used to this day in indigestion tablets and toothpaste.
In 2003, total recycled aluminium increased 4.3% compared to the previous year. We are interested in buying or selling aluminium. Before an industrial method for aluminium production was discovered, it was so rare and precious that there was a time when it was more expensive than gold. During the restructuring of the Russian economy, aluminium industry facilities constructed in soviet times remained operational. In Europe 40% of the 13.2 million tonnes of aluminium used in 2006 came from recycling. In Europe, usually the average bauxite consumption is 4.1 tonnes per tonne of aluminium. In addition, aluminium can be sawed, drilled, riveted, screwed, bent, welded and soldered in the workshop or on the building site. Furthermore, aluminium is also by far the lightest ‘complete barrier’ packaging material.
Used aluminium is valuable, it is easily and endlessly recycled without quality loss. Aluminium Bahrain became the largest modern aluminium smelter in the world when it was commissioned in May 2005. Aside from passenger railway cars, freight cars have been made from aluminium for a long time, with the first car being manufactured in 1931.

For these reasons, for railway manufacturers, aluminium is certainly a material of the future. In the 1960s, aluminium was used in the manufacturing of box freight cars with a capacity of about 100 tonnes. Where laminates are involved, even the smallest aluminium thickness of 0.006 mm is sometimes enough to provide the required barrier properties. Whether used for the manufacture of trucks, trailers or buses, aluminium cuts down weight and brings substantial savings. With non-registered collection activities taken into account today at least 2 out of 3 aluminium beverage cans are collected and recycled. Yet, we are not aware of any such situation on aluminium material standards.
For the high speed trains, the choice of aluminium proved to be almost a must. Passenger coaches for rail transport are now virtually all aluminium in construction. From 1855-1860, he worked at the court of Napoleon III and created, in particular, an aluminium rattle for the crown prince and several ornate goblets and bracelets. In addition, decorative grids and reinforcements were made of aluminium. In addition, there are huge power savings: melting and production of secondary aluminium consumes only 5% of the power. A thin layer of aluminium foil, which is sometimes only 6.35 microns thick provides full protection from light and liquid. In addition, transport manufacturers now try as much as possible to replace traditional iron and steel with aluminium. In autumn 1999, when the new James Bond movie The World Is Not Enough called for a special money case for 007, there was only one choice a suitcase made from aluminium. The first important structural applications of aluminium were found in passenger hydrofoils.
Their excellent condition bears witness to the fact that aluminium does not age and needs no protection from ultraviolet light.

According to analysts these factors will combine to see China consume 36% of world’s aluminium production as early as 2010. After the war aluminium became more and more common. Modern designers have created aluminium products which have also become cult objects and have been shown at the modern art exhibitions. Aluminium was such a valuable commodity that rulers and the wealthy preferred impressing their guests with plates and cutlery made from aluminium rather than gold. About 40 percent of European aluminium demand is satisfied by recycled material. If the lightning goes in the front of the plane, it then travels along the outer aluminium skin and exits the other end, he says. Alupro is the aluminium packaging recycling organisation. Over 80% of the aluminium produced by Russian smelters is exported.
The most effective antacids are based on aluminium. This is the basic principle behind the sustainable development indicator exercise of the European aluminium industry. The aluminium surface is a complex transition zone between the bulk of the alloy and the environment. The process was subsequently used in commercial aluminium production and the price of the metal quickly fell to one-hundredth of its former price. Between 1855 and 1900 many aluminium manufacturing businesses were established, most prospered briefly and rapidly waned. Since the 1930s, designers in Benin, Kenya, and Ghana started to make not only aluminium jewellery but furniture as well. In 1970 the production of primary aluminium amounted to 2.4 million tonnes. Reprocessing 1 kilogram of aluminium saves 8 kilograms of bauxite. Since 2007, Russia has been the motherland of the largest aluminium company in the world.
Welcome to Dubal, Dubai’s industrial flagship and the largest single site aluminium smelter in the western world. Long-distance overhead conductors use aluminium in preference to copper the lower electrical conductivity being more than compensated by the lower density and cost. Emissions from aluminium production are not connected with the production itself, but with the necessary power generation from fossil fuels. This has made aluminium the most commonly used material in major power transmission lines. In 1808, Humphry Davy, an Englishman, tried to extract aluminium through electrolysis. In 1825, Rsted produced the first metallic aluminium. In 1856, he applied electrolysis to molten sodium-aluminium chloride to produce aluminium. He greatly supported Deville and later constructed several aluminium smelters. In 1926, aluminium was chosen as a material in the construction of the united church in Pittsburgh designed by Henry Hornbostel.
Pure aluminium has a face centred cubic crystal structure. Automobile manufacturers also consume much of the world’s aluminium. The atomic number of aluminium is 13; the element is in group 3 of the periodic table. Contrary to popular opinion, aluminium mines do not exist. A cheaper method to produce aluminium appeared only at the end of the 19th century. Only jewellery and luxury articles were made from aluminium at that time. The Aluminair building has become one of the best examples of the link between new designs and the opportunities of the aluminium industry. The cover of the first satellite launched in 1957 was made of aluminium, and this metal has become irreplaceable for discoveries of the future. Today, aluminium cans are about 30% lighter than they were 25 years ago.
Countries like India, Iceland, China, Russia, and USA enjoy growth and development of aluminium production. Replacing steel by aluminium can reduce the body mass by around 40%. Many of these different methods are used for welding aluminium, e.g. mig, tig, laser and plasma welding. By that time the share of aluminium in each car will have increased several times. Aluminium industry Alcoa CEO’s 2007 compensation doubles to over $25m 18 march Pittsburgh, Dow Jones Pittsburgh - Alcoa inc. The aluminium sector is the leader of Russian industry. Aluminium rapidly replaced wood and other materials traditionally used in the industry and the first aeroplane made completely of aluminium appeared at the beginning of 1920s. Even after 30 years of active use, aluminium ships remain without signs of metal fatigue and are easy to maintain. Even at present, the number of people working in the aluminium industry, including workers of allied industries and social services, is estimated to be 1 million people.
Aluminium in all its various forms, plate, sheet, extrusions, castings and forgings is increasing across the whole range of transport applications. In principle this applies for all metals, including aluminium. By using the aluminium, it is possible to reduce the weight of a truck or bus by 1,800-1,900 kilograms and enable them to carry much more cargo. Century aluminium was founded by the Swiss company Glencore international, as a holding for its aluminium assets, in 1995. This new method ensured an increase of aluminium production up to 8000 tonnes per annum by 1900. This problem was solved by Alfred Wilm, a German chemist, who melted aluminium with small quantities of cuprum, magnesium and manganese. This was the beginning of the aluminium world’s triumph. Production of alumina: alumina, the raw material for primary aluminium production, is extracted from bauxite. The aluminium industry emits certain greenhouse gases.
For ac-electrograining, during the anodic charge cycle, the pits, initiated by the graining solution anions, grow due to aluminium oxidation.

In an ac-electrolytic process, the two electrodes (aluminium printing plates in this case) are alternately anode and cathode. Alumina is fed into the electrolyte and separates into positively charged ions of aluminium and negatively charged ions of oxygen. The molten aluminium settles at the bottom of the cell where, at regular intervals, it is extracted or tapped using a vacuum crucible.

23 years later, this reaction was applied to produce aluminium at a smelter in Gmelingen, Germany.

It is based on the following principle: when the alumina solution is electrolyzed in molten cryolite, pure aluminium is produced.

The European aluminium industry directly employs about 250,000 people. Structures like offshore living quarters, helicopter decks, balustrades, scaffolding and ladders, are also commonly made of aluminium.
More generally, flexible cables for electrical applications often use multi-stranded aluminium wires. The aluminium metal is then produced from alumina by passing an electric current through it in a process called ‘electrolytic reduction’. This electrolytic process is driven by the application of an ac-current or an ac-potential across the aluminium surface. To meet these different requirements, different aluminium alloys are chosen. Above pH 10 aluminium is oxidised as aluminate ions, which are unstable in the bulk of the acid solution and consequently precipitate at the pit site, forming a hydroxide-etch film. By passing chlorine through a hot mixture of alumina and coal, he produced aluminium chloride. Production of primary aluminium is produced by electrolysis. From 1888, Hall worked for the reduction company of Pittsburgh, which constructed the first large aluminium smelter. From 1904 to 1906, Wagner constructed the postal deposit bank, decorating the facade were fixed to walls with aluminium bolts with protruding heads.
In the aluminium liquid-contact set-up there are no solid electrical contact points. A 96 metre wave piercing catamaran can contain up to 400 tonnes of aluminium. Aluminium and its alloys, as with most metals, are never completely uniform in all directions some degree of anisotropy is always present. The electrical current is carried from the first contact plate to the aluminium coil via the electrolyte, then travels through the aluminium web. The demand from western transport manufacturers is 26% for primary aluminium and 38% for secondary aluminium. The electrolysis of aluminium oxide melted in cryolite produced wonderful results, but required a lot of power. Pure aluminium is extracted from alumina by the Hall-Heroult process. If I was lucky to extract the metallic substance I was searching for i would propose a name for it aluminium, wrote Davy. If a company uses power generated by hydro power plants, as many Russian aluminium smelters do, this problem disappears.
A controlled furnace atmosphere is vital; it is designed to help disrupt the native oxide film on aluminium, and to improve the wetting of the oxide-covered aluminium by the liquid cladding alloy.

Then, alumina is reduced by electrolysis into molten metallic aluminium through the Hall-Heroult process. The raw materials required to produce one tonne of aluminium are 1.9 tonnes of alumina; 418 kg of carbon (a blend of petroleum coke and pitch) and 17.5 kg of aluminium fluoride.

Today, 50% of outboard engines are made of aluminium. Up to 400 tonnes of aluminium may be used in a modern ferry boat. Various types of aluminium products are used in modern construction. Wires for high-voltage power lines and cables are made of aluminium. The reduction of alumina into liquid aluminium is operated at around 950 degrees celsius in a fluorinated bath under high intensity electrical current. Yes, if we use aluminium packaging!
By adding small amounts of alloying elements, the solute atoms replace aluminium ones, causing the crystal lattice to distort. In this process the native oxide on aluminium is first ‘disrupted’, otherwise it would compromise the adhesion of the nickel coating. The solar water heating system has been built entirely from aluminium, except the solar collectors. Alumina is then transformed into aluminium through electrolytic reduction. Aluminium production technology applies pre-baked anodes, a method used at many European and American aluminium smelters, and characterised by less power consumption and a negative impact on the environment. The aluminium bumper beam saved 2.6 kilograms (kg) over the high-strength steel beam. This model accounts for all greenhouse gases emitted during aluminium production, vehicle use and end-of-life processing.
The Bayer and Hall-Heroult processes are still applied at modern aluminium smelters. A “cradle to cradle” cycle of an aluminium product system can be modelled using different process steps. The use of aluminium combined with the use of water-jet propulsion made it possible to create the so-called high-speed ferries. There has therefore been a long history of co-operation between the car industry and the aluminium industry. There is only one worldwide registration system for aluminium and aluminium alloys. These inventions sealed the fate of aluminium by 1890 the cost of aluminium had tumbled some 80 percent from Deville’s prices. The total market including central eastern Europe grew by 16% to more than 32.7 billion aluminium cans. The total number of aluminium beverage cans in Europe rose from 25.1 to 28.3 billion units, resulting in an overall aluminium share of 68% in Europe. In addition, aluminium panels trap heat.
He has been the investigator for many research programmes on aluminium recycling, filiform corrosion, and surface modification issues of aluminium. Two types of test are most widely used to measure fracture toughness in aluminium alloys. These attempts failed, but the scientist produced an aluminium-iron alloy. The high scrap value of aluminium is one of the key success factors. The indirect employment of persons working with aluminium can amount to 1 million persons in Europe. In recent years, aluminium has been increasingly applied as a main material in the restoration and reconstruction of historical buildings. In terms of primary aluminium production, Russia is second only to China. One of the first aluminium jewellers was Honore-Severin Bourdoncle. Since the 1940s, aluminium has almost replaced cuprum in high-voltage power lines and today it is the most efficient way of transmitting electric power.
Quite a few planes get hit, but because they’re made of aluminium, it goes in one end and out the other. The aluminium companies are well represented, as are instrument manufacturers and researchers from the international scientific community. The corrosivity of seawater varies from one ocean to the next, and thus the nautilus must be built with aluminium. The present section covers aluminium applications in trucks, buses, railways, marine and aeronautics, while passenger cars are treated separately in the automotive section. The recuperation of used aluminium products is thus both energy-efficient and cost-efficient. The name was re-spelt as the more pleasant sounding aluminium by later scientists. The new aluminium range is perfect for Bond it not only looks sensational, but, like all aluminium products, it is built to last. Both steel and aluminium are abundant and easily available resources. However, not only the representatives of high design ensured a stable place for aluminium in architecture and construction.
He has also been a part of the European research initiatives on aluminium including EATP 2030. By 1937, 75% of his goods were made of aluminium, which is resistant to corrosion. The Aeronautics aluminium moulding industry automotive material removal machining techniques have progressed immensely. Resistance spot welding of aluminium is therefore a surface-critical process. Get an insight into the great versatility and unique properties which make aluminium a material of choice. Down-gauging, using thinner and stronger aluminium sections, is constantly researched and developed. Energy is stored in aluminium products and can be re-used. Featuring a specially treated aluminium shell and a magnesium frame, the suitcase is both hard-wearing and ultra-light. Finally, about 0.2 million tonnes of aluminium were used in castings for a range of building applications.
In Europe aluminium enjoys high recycling rates ranging from 42% for beverage cans, 85% in building and construction and 95% in transportation products.

His research area includes microstructure and corrosion of aluminium alloys. The tear test can also be used for very ductile aluminium alloys, where linear elastic fracture mechanics do not apply. A more realistic view of the aluminium surface is given, considering the different types of surface defects. The consumption of aluminium cans in central Eastern Europe grew by nearly 1.4 billion units to a total number 10 billion cans. The demand therefore for recycled aluminium exceeds supply for given products. In 1886, he produced the first aluminium ingots by passing an electric current through a bath of alumina dissolved in cryolite. The more aluminium there is in a product, the more chance it has of being recycled.
Aluminium foam is being considered for EMS applications. But aluminium alloys and aluminium-matrix composites, titanium and magnesium alloys, and carbon fibre composites now all compete with steel. However, certain characteristics are common to all milling, drilling and turning operations conducted on aluminium alloys. The key to a plane’s protection is its aluminium skin which conducts the electricity away, says John Sherlock. The strength of aluminium is its sustainability. The stunning art deco-inspired empire state building in New York was the first building to use anodised aluminium components back in 1931. The success of the Hall-Heroult process was advanced when Karl Bayer, an Austrian, invented a process for making aluminium oxide from bauxite. The aluminium industry is deeply involved in aluminium recycling. The aluminium industry is part of the answer to climate change.
However, compared to other materials, aluminium has good machinability. In 2006 Alba has produced 2.3% of the world's aluminium. During the first process, primary or secondary aluminium is cast into rolling ingot (slab), extrusion ingot (billet) and wire bar ingot. The aluminium share in western Europe rose 4% to 56%. Squeeze casting forces liquid aluminium to infiltrate the preform. Thanks to the metal's inherent sturdiness, aluminium window and curtain wall frames can be very narrow, maximising solar gains. The aluminium barrier also plays the essential role of keeping the contents fresh. The aluminium hydroxide is then precipitated from the soda solution, washed and dried while the soda solution is recycled.
Although the energy required to produce primary aluminium is high, it only takes 5% compared to the original energy investment to recycle the metal. Capacitor foil is made out of high purity aluminium, mostly 99.99%. Molten aluminium is deposited under a cryolite solution with 3-5% alumina. Moreover, aluminium components can add a modern look to cars. Not only the hull, but the furniture inside was also made of aluminium. The application of aluminium in shipping extends also to other types of vessels. Aluminium cladding initially conceived to last six months has served its purpose for almost 50 years. The collection rate of aluminium beverage cans in western Europe has almost tripled from 21% (1991) to 60% (2005). Successful extraction and the first commercial applications of aluminium all took place in the 19th century.
In Athens 2004, once again the Olympic torch has been made of aluminium, this time in combination with wood, to reflect man's relationship with mother nature.

Old aluminium products can be used to produce new ones over and over again without any loss of quality. An average aluminium can (without its contents, of course) weighed 16.55 grams in 1992. Aluminium has been providing designers with the freedom of self-expression, and the consumer the opportunity to admire beautiful articles. By the following year, he had obtained enough aluminium to cast a 7 kg/15 lb block. 20% of the world's aluminium is used in the construction sector. During his studies at Oberlin college, he became interested in chemical experiments and focused his research efforts on the methods of aluminium production. Each year, millions of aluminium frames and doors are installed in new and old buildings. Entire substations, where the voltage is reduced and electricity is distributed through different channels, are frequently made of aluminium.
The graphs below show the variation of yield strength and elongation to failure for five aluminium alloys. The original wet electrolytic capacitors comprised a lead or aluminium can containing the aqueous electrolyte and the loosely coiled anode foil. The presence of the oxide layer makes aluminium very suitable for many applications. Aluminium bearing compounds have been used by man from the earliest times. Aluminium has unique recycling qualities: the quality of aluminium is not impaired by recycling it can be repeatedly recycled. Aluminium products can be reconverted into primary aluminium saving up to 95% of the energy used in their primary production. Aluminium industry committed to sustainable development. Aluminium output has increased by a factor of 13 since 1950, making aluminium the most widely used non-ferrous metal. Aluminium recycling is economical: it uses less energy and recycling is self-supported because of the high value of used aluminium.
In addition approximately 1.9 million tonnes of casting alloys were used from mainly the secondary aluminium industry. This reduces the risk of burning of the aluminium coil, related to the high contact resistance of the oxide covered aluminium surface. From that moment, the scientific community was made aware of after the existence of aluminium. The Chinese economy already consumes a quarter of the world’s aluminium production. He called the aluminium oxide alumina. The aluminium industry is clearly showing its willingness to play an active part in reviewing the Lisbon process. A more modest, but still substantial, 1 million tonnes found their way into rolled products, representing approximately 24% of all rolled aluminium shipments. A study by Delft university of technology recently revealed aluminium’s considerable recycling potential in the building sector. A thousand aluminium triangular panels are available for sale with a certificate of authenticity for collectors and Atomium enthusiasts.
Cladding steel with aluminium raises the conductivity. Conventional air conditioning heat exchangers use copper tubes and aluminium fins. This molten aluminium (also called primary aluminium) is then cast into ingots for subsequent remelting or more usually into cylindrical extrusion billets or rectangular rolling slabs. Originating as the Pittsburg reduction company in 1888 was led by Charles Martin Hall, Alcoa now operates in some 42 countries globally. This corresponds with a saving of over 8kg of greenhouse gases per kg of aluminium produced. This ensures that aluminium maintains its position as the most valuable material that can be recycled. Today, aluminium is widely used in cars, trucks, buses, coaches, trains, metros, ships, ferries, aircraft and bicycles. After calcination, the end-product, aluminium oxide (Al2O3), is a fine grained white powder. All plain or lacquered aluminium is 100% recyclable, saving up to 95% energy time and time again.
Material and mechanical properties dead fold: when fully annealed, aluminium foil retains no ‘temper’ and therefore retains its shape when deformed. However, the corrosion resistance of this alloy is not as good as that of most other aluminium alloys, and Da Vinci Airways may reject it. This adhesion ensures, for example, a lifespan of over 25 years for coated aluminium window frames. Please advise me on how to clean and keep aluminium in a good condition. The London metal exchange quotes aluminium scrap prices. Also, effective use of recycled aluminium means that in most cases upgrading to pure metal is necessary. Today aluminium accounts for approximately 80 percent of the structural weight of modern airplanes. Today, 7 out of 10 cans produced and filled in Europe are made of aluminium. 1888 electrolytic cell used for producing aluminium electrolytically from aluminium oxide (alumina) dissolved in cryolite.
Making aluminium foil alufoil is a very thin sheet of aluminium ranging from about 0.006mm to the upper ISO defined limit of 0.2mm (200 m).

Have you ever wondered why your aluminium thermos is so reflective, while your aluminium door has a matt appearance? However, in some environments aluminium may show corrosion behaviour. The ease of manufacturing enables aluminium to compete with materials which can appear superior on properties alone. Both the steel and aluminium industries continue to work together towards the recycling targets. The UK the levels of recycling achieved in 2004 were 23.4% for aluminium packaging. The Atomium's aluminium cladding is ready for a new life, built for the universal exhibition of Brussels in 1958. Aluminium was used in the Pyramide Du Louvre in Paris (1989) and the European parliament in Brussels (1995), which contain around 1000 tonnes of aluminium. Davy tried unsuccessfully to produce aluminium by electrolysis a fused mixture of aluminium oxide and potash.
Edition surface-treated aluminium semi-finished rolled products for high-tech, post-formable architecture. Single rolled aluminium foil can also be made in thinner gauges and produces a bright finish on both sides. By tailoring the surface of aluminium sheet, various optical effects can be generated. Conveyor belts and automated control systems, stairs, scaffolds and fittings are all made of aluminium. Good hydrophilic properties of oxidised aluminium surfaces can be created, suited for lithographic offset printing. Europe recycles more aluminium than any other region in the world. The first step in extracting aluminium was made by the famous Paracelsus in the 16th century. For example, the famous Boeing 747 contains 75 tonnes of aluminium. For example, one recycled aluminium can saves enough power to watch three hours of television.
With Respect to Residue
(The Bolzano/Bozen Variation)

Raqs Media Collective

“The extraction of value from any material, place, thing or person, involves a process of refinement. During this process, the object in question will undergo a change in state, separating into at least two substances: an extract and a residue.

Coffee beans and coffee grounds, coffee grounds and a coffee pot, a coffee pot and a cup of coffee, a cup of coffee and a shot of caffeine, a shot of caffeine and a slight spike of energy, a spike of energy and a decision, a decision and its consequences, the consequences and a fragment of history, a fragment of history and an aluminium factory, an aluminium factory and aluminium, aluminium and a coffee pot, a coffee pot and coffee grounds, and so on.

With respect to residue: it may be said it is that which never finds its way into the manifest narrative of how something (an object, a person, a state, or a state of being) is produced, or comes into existence. It is the accumulation of all that is left behind, when value is extracted. Large perforations begin to appear in chronicles, calendars and maps, and even the minute agendas of individual lives, as stretches of time, tracts of land, ways of being and doing, and entire clusters of experience are denied substance.

There are no histories of residue, no atlases of abandonment, no memoirs of what a person was but could not be.

Everything is valuable, yet all things can be laid waste.

The sediments that precipitate at the base of our experience of the world can, however, decompose to ignite strange sources of light, like will o’ the wisps in marshlands by night. Sometimes, this is all the illumination there can be in vast stretches of uncertain terrain.”
The European aluminium industry is conscious that the well being of future generations depends on how we preserve our social and environmental heritage. 

Modern society without aluminium is unrecognizable. However, in some environments aluminium may show corrosion problems. Good hydrophilic properties of oxidised aluminium surfaces can be created, this corresponds with a saving of over 8 kg of greenhouse gases per kg of aluminium produced. This reduces the risk of burning of the aluminium coil, related to the high contact resistance of the oxide covered aluminium surface. 

The Atomium's aluminium cladding is ready for a new life, built for the Olympic torch in 1959 and used in the famous Boeing 747 to symbolise the word ' aluminium'. 

As done was coated with 'silver' aluminium. Its oxide film makes it resistant to corrosion and this metal is suitable for aluminium 'wires' very long. 

- Aluminium industry committed to sustainable development. 
- Aluminium recycling is economical. It uses less energy and recycling is mate-1.9 million tonnes of castings were used from mainly the secondary aluminium industry. 
- Aluminium is produced by melting aluminium oxide (alumina) dissolved in cryolite. 
- This molten aluminium (also called primary aluminium) is then cast into ingots for subsequent remelting or more usually into cylindrical extrusion billets or rectangular rolling slabs. 
- Brazing, soldering and welding use liquid aluminium, which is around 80°C. 
- All plain or lacquered aluminium is 100% recyclable, saving up to 95% energy time and time again. 
- However, the corrosive nature of this metal means that coatings are often necessary. 
- This is done with a variety of finishes. 
- Coated aluminium is often used for industrial purposes. 
- Aluminium output has increased by a factor of 13 since 1950, making aluminium the most widely used non-ferrous metal. 
- Aluminium recycling is economical. It uses less energy and recycling is mate-1.9 million tonnes of castings were used from mainly the secondary aluminium industry. 
- Aluminium industry committed to sustainable development. 
- Aluminium recycling is economical. It uses less energy and recycling is mate-1.9 million tonnes of castings were used from mainly the secondary aluminium industry. 
- Aluminium industry committed to sustainable development. 
- Aluminium recycling is economical. It uses less energy and recycling is mate-1.9 million tonnes of castings were used from mainly the secondary aluminium industry. 
- Aluminium recycling is economical. It uses less energy and recycling is mate-1.9 million tonnes of castings were used from mainly the secondary aluminium industry.

Davy tried unsuccessfully to produce aluminium by electrolysing a fused mixture of aluminium oxide and potash. 

In 1865, Beketov invented a chemical method to produce aluminium. 

On international level, harmonisation on the material aluminium is discussed within the technical committee ISO/TC 79.

Back to top