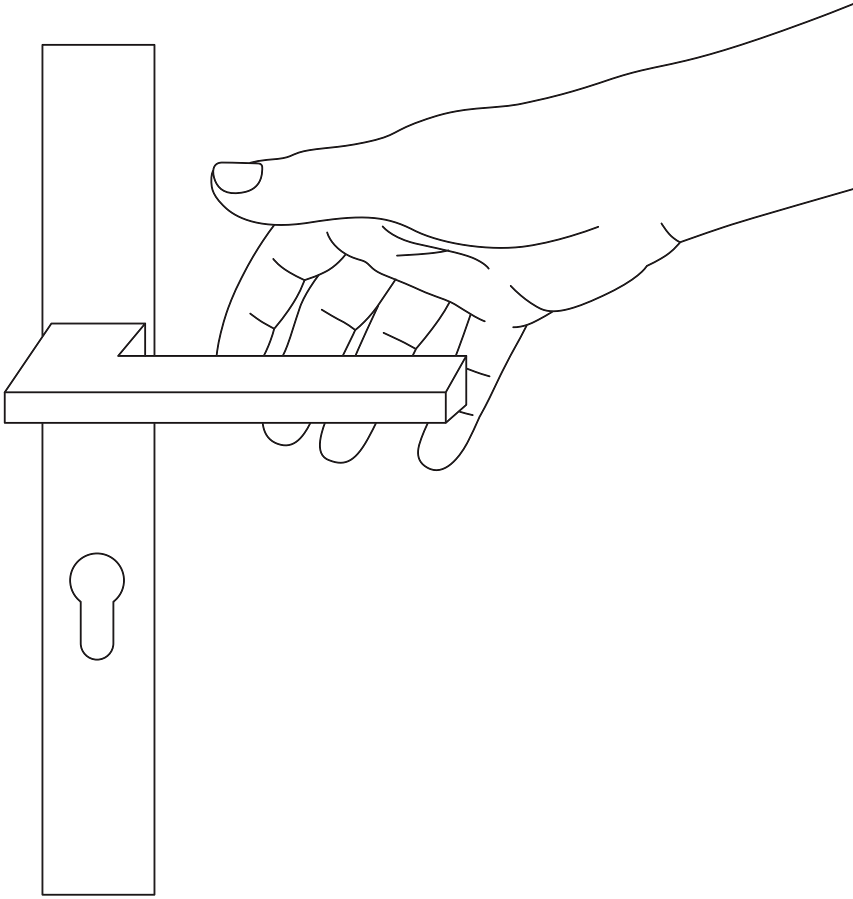
FSB

Geometry to get to grips with



Cover page: FSB 1204

Geometry to get to grips with

True innovations arise when well-informed recourse is had to eternal constants – of which geometry is one. Selected designers and architects have sounded out its present-day potential to arrive at the FSB door hardware set out here. The outcome is geometry to get to grips with: elemental bodies and classic forms in a contemporary guise.

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Spotlight on formal excellence

Over and over again architects and designers have striven to invent the ideal form. For many centuries they have made use of measuring and ordering systems from antiquity to this end. Which is what this little work is all about. It shows how the compositional roots of many a modern idea actually lie in the past.

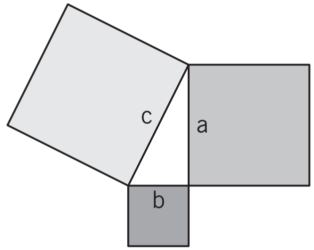
The ancient philosopher Pythagoras of Samos is considered one of the first mathematicians in history. He addressed himself primarily to geometry, which for the Greeks was the most important branch of mathematics.

In around 500 BC, Pythagoras discovered that there are conspicuous symmetries between many forms and bodies in Nature – from the starfish to the raindrop, from the snowflake to the galaxies. He investigated the laws underpinning these phenomena and distilled them into mathematically determinable numerical correlations. His famous observation that, in a right-angled triangle, the sum of the square on the hypotenuse is equal to the sum of the squares on the other two sides forms the basis for geometrical designs.

The search begun by Pythagoras for a mathematically determinable ordering of the world as a harmoniously ordered cosmos (Greek for universe, order) also informs the philosophy espoused by Plato (427–347 BC).

Plato surmised that Nature's pure forms and regular bodies cannot have come to be by chance but that they reflect the plan of a creator. In his works "Philebos" and "Timaeus", he links the elements of Nature with regularly symmetrical bodies. As a consequence, Plato assigns the Earth to the cube and the air to the sphere, compares fire with the pyramid, and links water to the cone.

Illustration of the Pythagoras theorem $a^2+b^2=c^2$

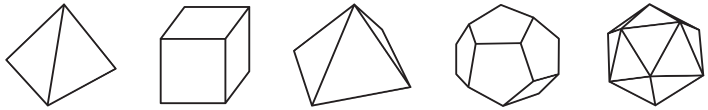


Sphere, cube, pyramid, cone:
The true and good forms
according to Plato

Pythagoras's views on natural symmetries led Plato to the surprising assumption that regular bodies have their origins in the immaterial heaven of the gods and that they formed the basis for the creation of the cosmos. Divine ideas can also be perceived in the world – albeit merely as shadows – in the dimensions of base geometrical bodies.

The more closely such phenomena resemble the base geometrical bodies, the nearer they are to the heaven of the gods. This is why, for Plato, the pure forms of the sphere, cube, pyramid and cone are the essentially beautiful forms and as such are also true and good.

The five regular Euclidian bodies



In his 13-volume work "Elements" published in around 300 BC, the ancient Greek mathematician Euclid drew on Plato to prove that there are five regularly symmetrical bodies:

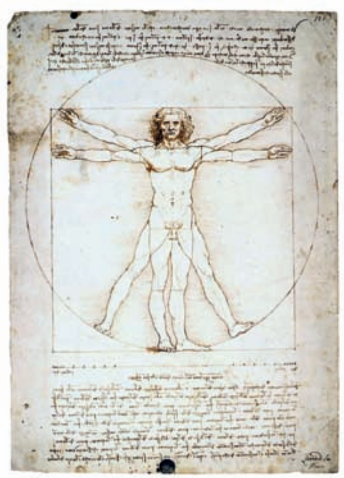
1. the regular tetrahedron, with four triangular sides (pyramid)

2. the regular hexahedron, with six square sides (cube)

3. the regular octahedron, with eight triangular sides (3-dimensional rhombus)

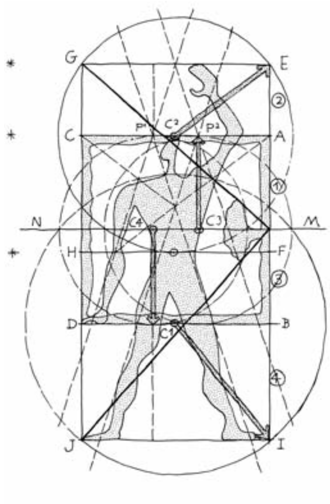
4. the regular dodecahedron, with twelve pentagonal faces

5. the regular icosahedron, with twenty triangular faces



Study of the proportions of the human body after Vitruvius, drawing by Leonardo da Vinci, c. 1490

Some 250 years later, the Roman architect and writer Vitruvius referred to Plato and Euclid in devising a theory of beauty grounded in the concepts of symmetry, proportion and rhythm, and in the process revived the thesis of the mathematical determinability of true beauty. In his “Ten Books on Architecture”, he elucidates this thesis by means of a study of the proportions of the human body that Leonardo da Vinci sought to capture in a famous drawing in 1490.



The Modulor, after Le Corbusier, 1942

It is Vitruvius we have to thank for the dimensional ratio of the “golden section”, which has remained an essential part of creative knowledge to the present day. The method of finding beautiful proportions it gave rise to was adopted in the 20th century by the Swiss architect Le Corbusier when he developed his Modulor in the 1940s.

The system draws on human measurements and the golden section. Le Corbusier initially set the standard height at 175 cm, raising it to 183 cm (six feet) from 1950, and used the respective data to develop a series of further geometrical specifications that all relate to one another in the proportion of the golden section.

Draft for a high-rise city,
Ludwig Hilberseimer, 1924

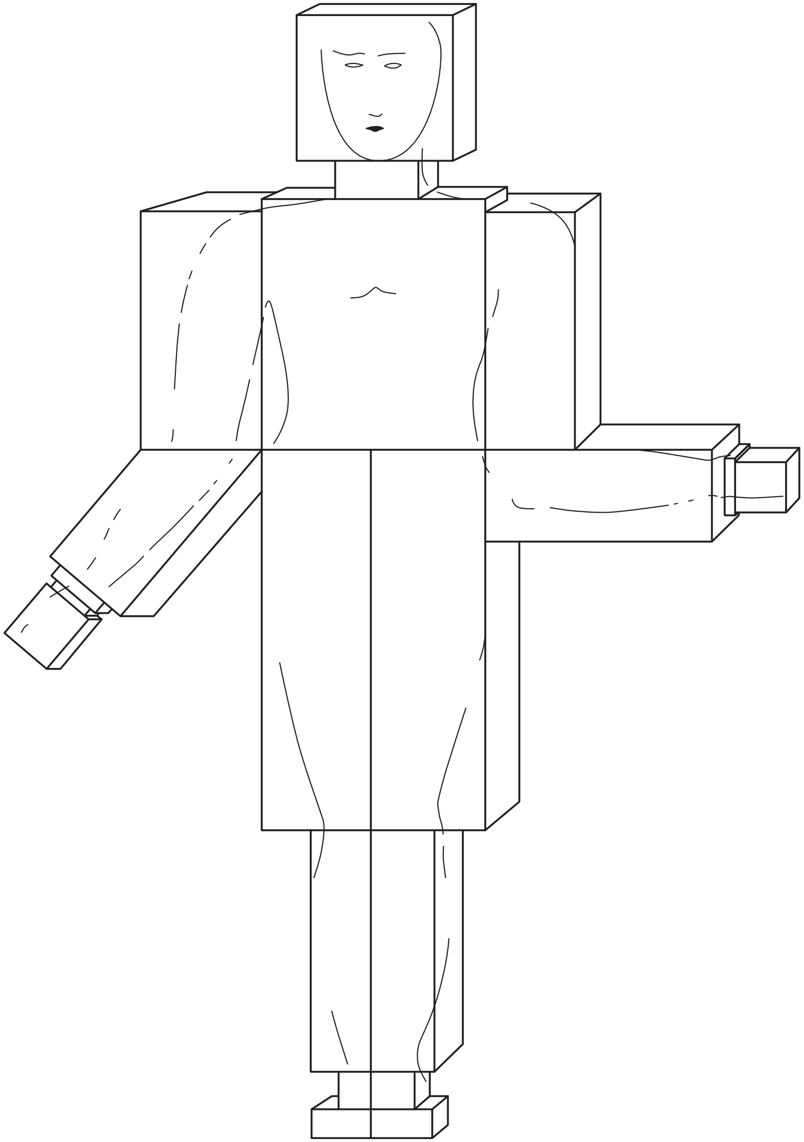
Architecture has always served as a central point of cultural mediation whose great esteem derives from its inevitable association with stability and order. This quality is rooted in the geometrical purity of its formal composition.

Pure form has always been a vision of architects: they have dreamt from time immemorial of developing objects liberated from all transient effect, instability and disorder. Over and over again the upshot has been buildings with straightforward geometrical forms: be they cubes, cylinders, spheres, cones, pyramids etc., they are fitted together observing the rules of composition and hence to the avoidance of all conflict.

No form is allowed to disrupt another; at the same time, each form contributes to the harmonious whole. In this way the composed geometrical structure becomes the building's engineering structure. Form's purity guarantees its structural strength.

Things that act on a large scale can also be depicted on a smaller one: our attempt in this brochure to put a series of hardware together that embodies the rules of past masters, whilst also pursuing contemporary design trends, can assist in putting the ideal holistic blueprint to effect.

Figurine,
after Oskar Schlemmer, 1924

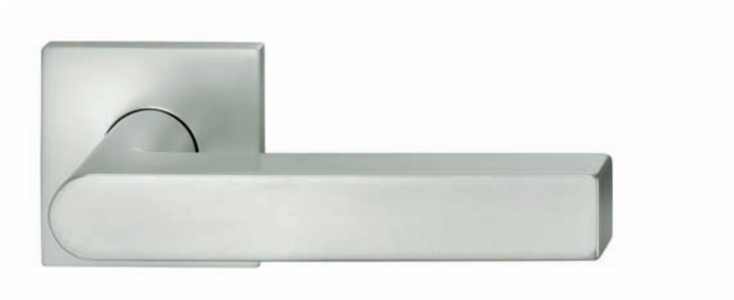


Aluminium

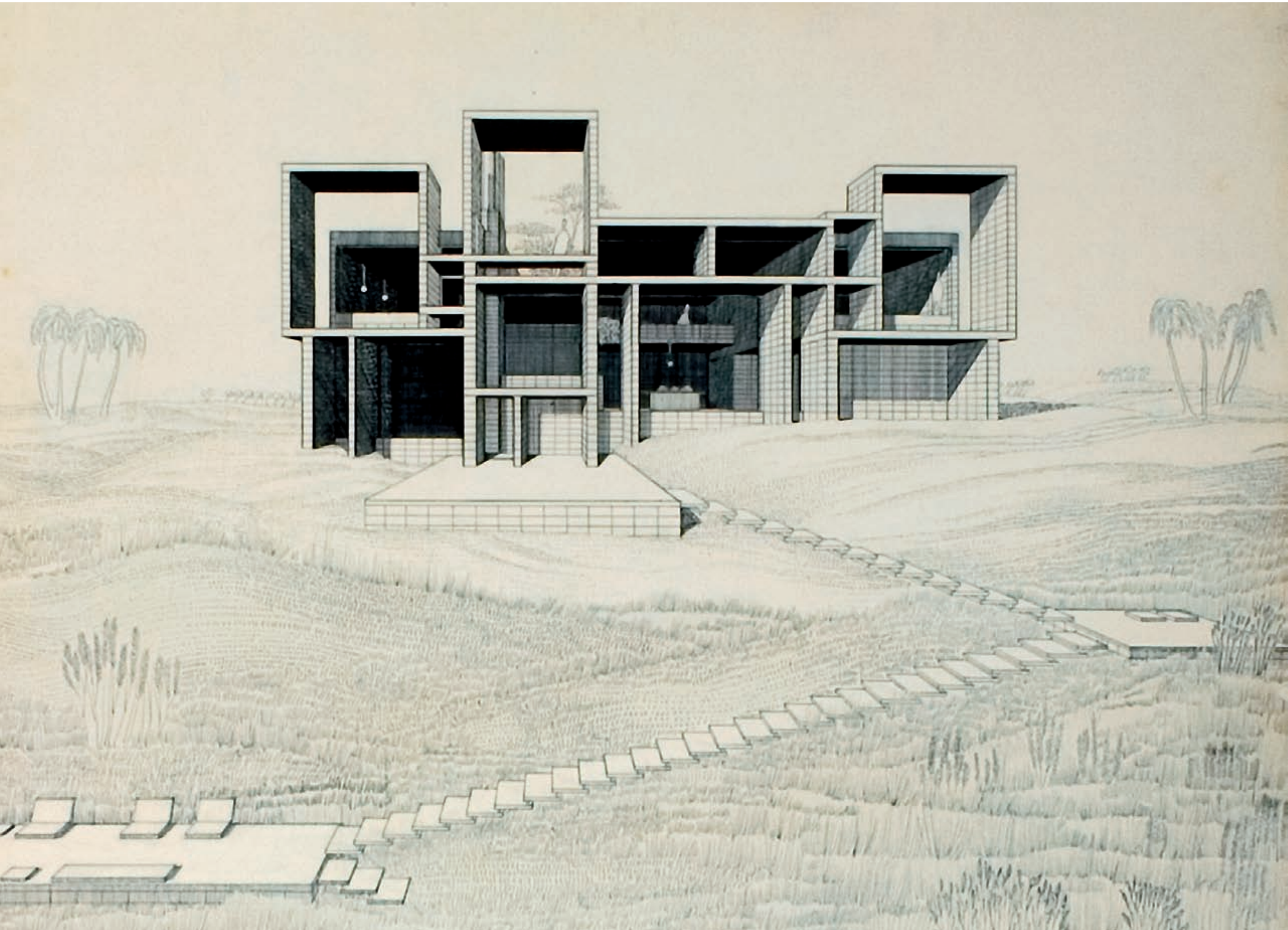
Design: Peter Bastian

www.fsb.de/1001
www.fsb.de/7607

Its square cross-section lends the FSB 1001 model its characteristic gripping volume, one that notably sets off large-format doors to advantage. Designed by the architect Peter Bastian, the handle likewise looks great as a “return-to-the-door” model for emergency-exit doors.



House of Arthur W. Milam,
Ponte Vedra Beach in Florida
Perspectival view of the facade,
Indian ink on card,
Paul Rudolph, 1962
Collection of the Museum of
Modern Art, New York



1003

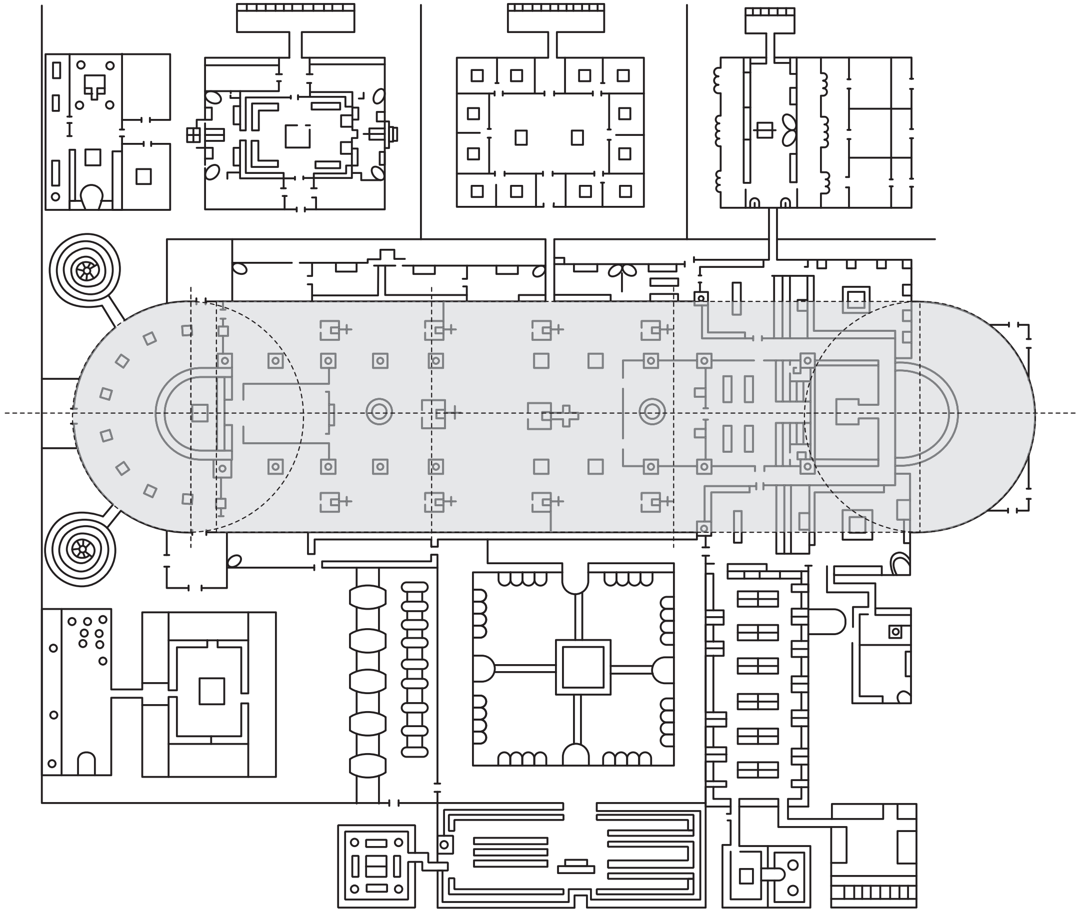
Aluminium
AluGrey
Stainless Steel

Design: Johannes Potente

www.fsb.de/1003

Door handle FSB 1003, which has echoes of a miniature door on its side, is decidedly something of a collector's item. Johannes Potente adopted the underlying visual concept and put it to effect in aluminium and stainless steel. We have since added a version in AluGrey® that sports a striking silvery-grey finish.

Plan of Carolingian monastery
at St. Gall, c. 820 AD,
St. Gall Monastic Library



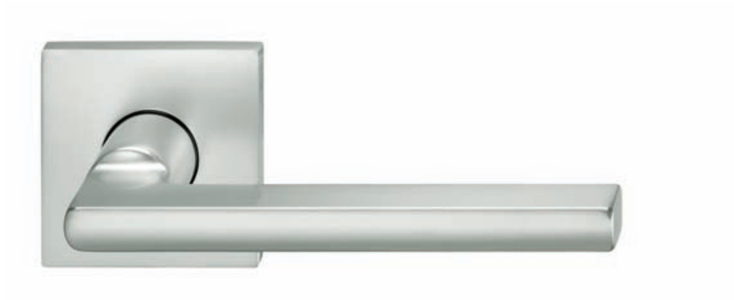
1035 | 7631

- Aluminium
- AluGrey
- Stainless Steel

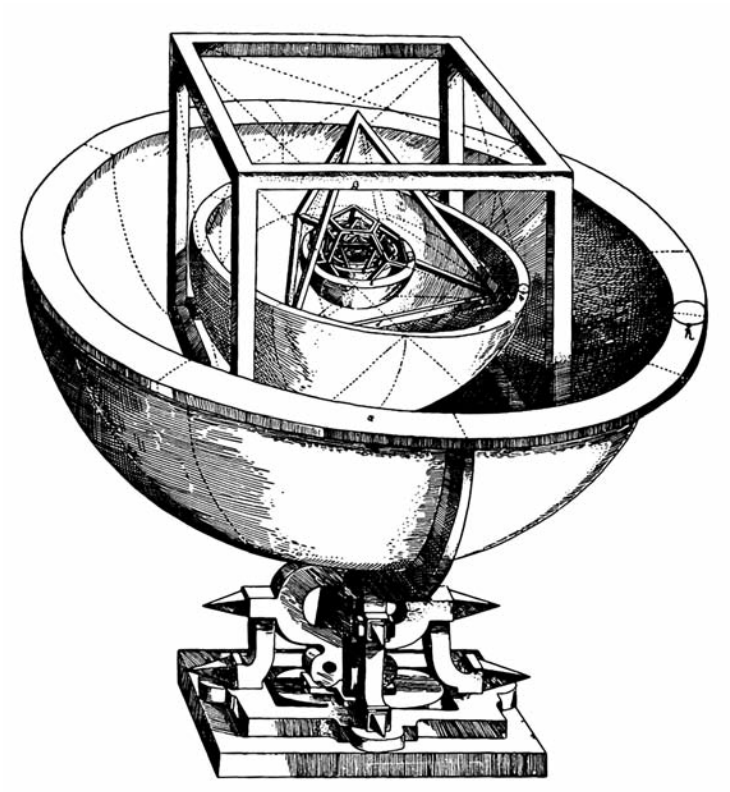
Design: Heike Falkenberg

www.fsb.de/1035
www.fsb.de/7631

In the autumn of 1996, Düsseldorf-based interior designer Heike Falkenberg asked FSB to recreate an old handle design for a renovation job. Using the sketch she submitted, FSB's Development unit cut a demonstration model out of the FSB 1076 handle. The prototype looked so good that, together with the designer, we spontaneously decided to market our gripping idea. The design was rapturously received. The oval cross-section of the grip on FSB 1035 is effectively a squashed circle. This is what produces the furniture's characteristic contours, which are made up of two squares and two semicircular planes.



Model of the solar system
after Johannes Kepler, 1596



1102

- Aluminium
- AluGrey
- Stainless Steel
- Brass*
- Bronze

Design: Alessandro Mendini

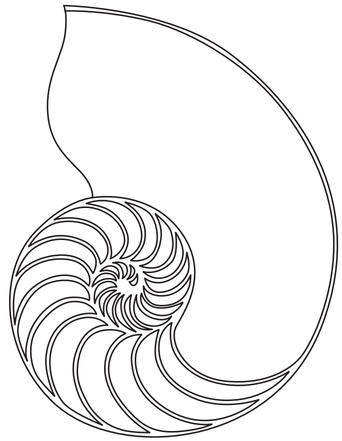
www.fsb.de/1102

The FSB 1102 model is rooted in a redesign venture by Italian designer Alessandro Mendini, who refashioned the celebrated Gropius lever handle by using a different material and adding a groove as one of his submissions to FSB's Design Workshop held in 1986. We now supply FSB 1102 in the five materials listed above and the corresponding finishes. We would recommend using the rugged stainless steel variant on heavily used doors.

* only rose versions and backplates 1418 .. and 1451 .. (standard bearing)

The golden section – a law inherent to both Nature and art

The section through a nautilus shell renders the growth spiral visible.



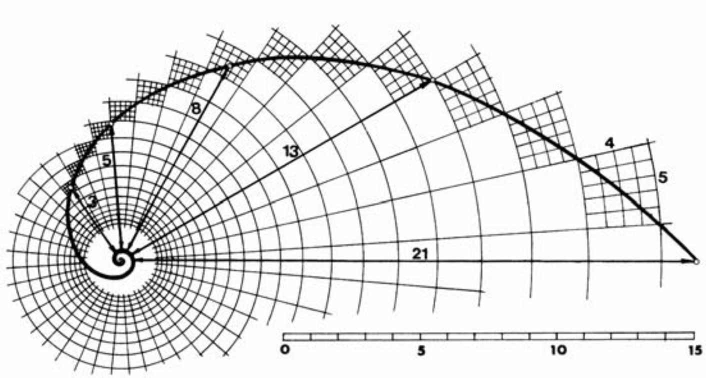
The golden section defines a dimensional ratio in the first instance. The sectioning involved is merely figurative, the purpose being to harmoniously relate two differing parts of a line to one another. A line is divided into two unequal segments in such a manner that the smaller is in the same ratio to the larger as the larger is to the line as a whole. The golden section can be expressed in terms of the mathematical equation a:b= b:(a+b). Applied to a numerical series, this gives rise to a constant sequence in which the last two numbers are added together: 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 144 ... Disregarding the first four cases, dividing any number in the series by the one that follows always roughly yields the value 0.618; similarly, division by the preceding number yields 1.618 or thereabouts.

These two numbers determine the ratio between the segments of the golden section. The “major” segment of any line is 1.6 times larger than the “minor”, which is accordingly arrived at by dividing the known length of the former by 1.6. The golden section proves to be of reliable assistance in arriving at beautiful proportions when applied to the size ratios within any two-dimensional structure.

Though initially amenable to representation in geometrical forms, it is also to be found in natural phenomena. A ratio of 5:8 has been established in the leaves of many plants, for instance. From a sample of 500 oak leaves, 235 exactly correspond to the proportions of the golden section, 93 differ by 1 mm and 92 display deviations of 2 mm. In addition to such readily perceivable instances of concurrence, Nature also contains complex structures such as the growth spiral. Mathematicians call this phenomenon of regular formal curvature ‘dilatation’.

The term is used to describe a form that twists to mathematically definable structures and shrinks at the same time. Dilatations are to be found in snail shells just as they are in pine cones. They taper to a point whilst simultaneously spiralling around.

Regularity of the growth spiral established by mathematical means

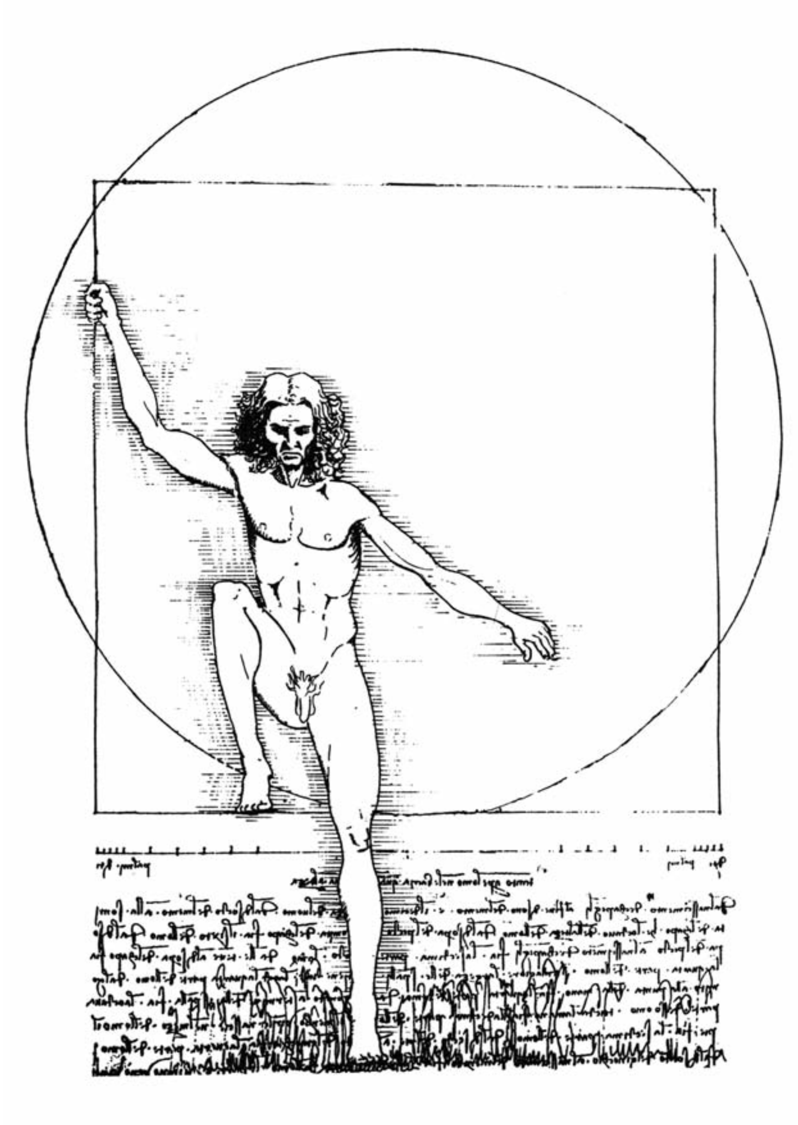


Phenomena of this kind are referred to in mathematics as "logarithmic spirals". Close inspection of a buttercup reveals that the yellow petals form a structure made up of juxtaposed logarithmic spirals. The factor by which the spirals increase in size is exactly 0.6181. It's as though Nature were bent on approximating as precisely as possible to the ideal mathematical base form, since the proportionality of this natural spiral clearly squares with the golden section. The same applies to the sunflower, whose seeds are arranged in right and left-handed spirals. The plotted diagram illustrates the link with the above numerical series of 1, 1, 2, 3, 5, 8, 13, 21 etc.

Beautiful dimensional ratio as formal precept for utilitarian objects

All such studies and age-old insights are factored into the design of utilitarian objects. Thus it was that the dynamic form of the growth spiral served as the formal role model for a series of door handles: echoing the dilational curve, handles in the FSB 1160 series curve stylishly round from neck to tip, becoming ever thinner in the process – just as much a treat for the eye as for the hand.

Logo of the “Theory of Architecture” Department at BTU Cottbus



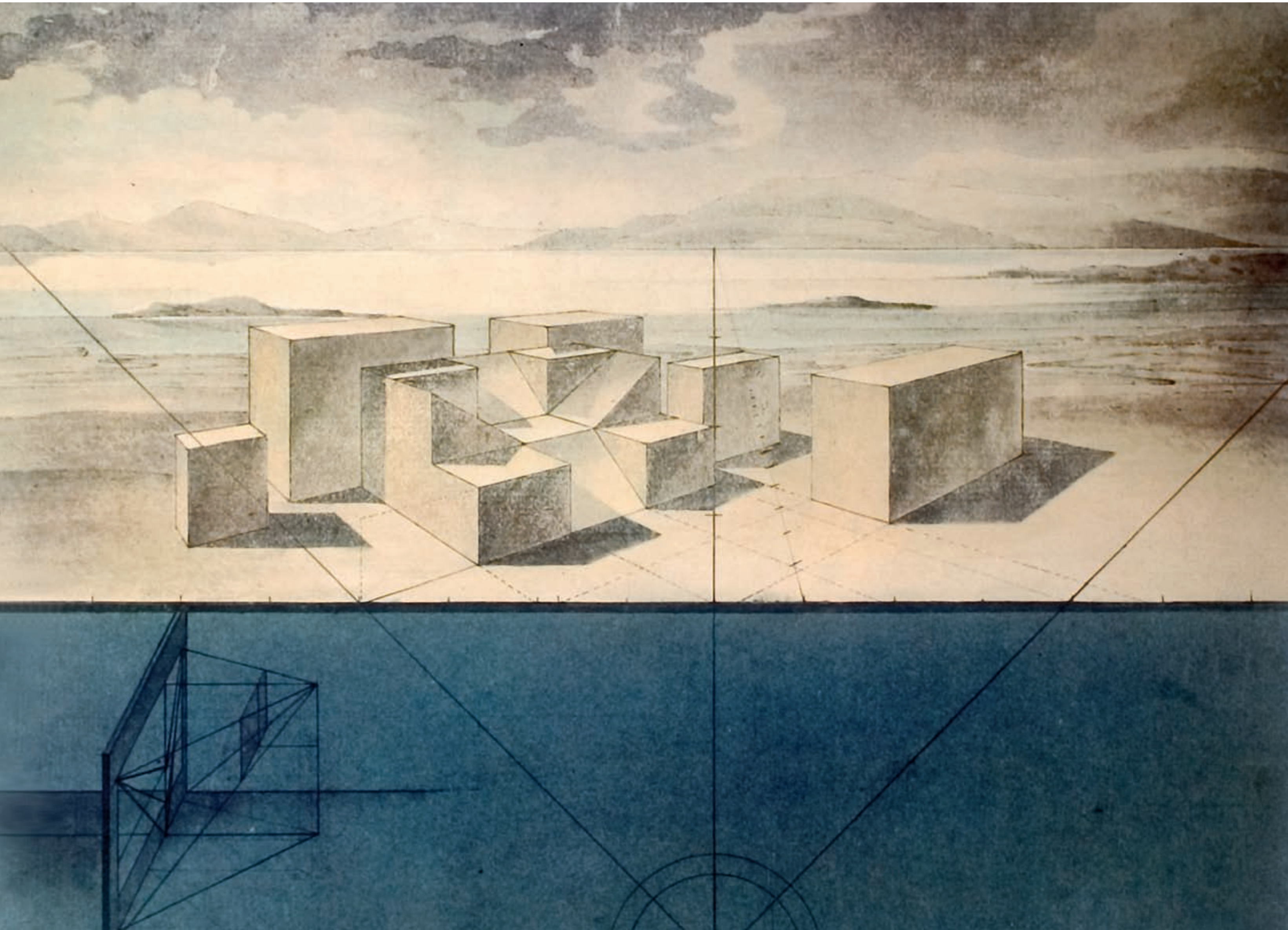
1160

- Aluminium
- AluGrey
- Stainless Steel

www.fsb.de/1160

Works design FSB 1160 recreates the “dynamic golden growth spiral” (cf. p. 15) in the form of a round cross-section, with the lever handle likewise tapering from the neck to the end of the handle in conformance with the rules of the golden section. This narrowing heightens the momentum of the natural curve. The design is restrained, good to hold and features direction-of-motion styling.

Perspectival study sheet
with countryside scenery,
Friedrich Gilly, 1799



Aluminium
Stainless Steel

Design: Hadi Teherani

www.fsb.de/1183
www.fsb.de/7674

Hadi Teherani breaks with traditional thinking in FSB 1183. We are all familiar with the “Wittgenstein solution” for narrow-frame doors in which a standard lever handle is paired with a contrasting – cranked – design on the slamming face. Hadi Teherani has radically reduced the diversity of such handle models: he delivers the function of the cranked lever handle model – averting the danger of fingers getting caught in the slamming area of frame doors – by shifting the handle’s point of rotation leftwards. Hadi Teherani’s emergency exit model boasts a similarly radical return to the door: he simply takes a third of the grip section and attaches it to same at right angles.

PROUN
Interpenetrating Planes,
after El Lissitzky, 1920

HandleDuo
1203 | 1204

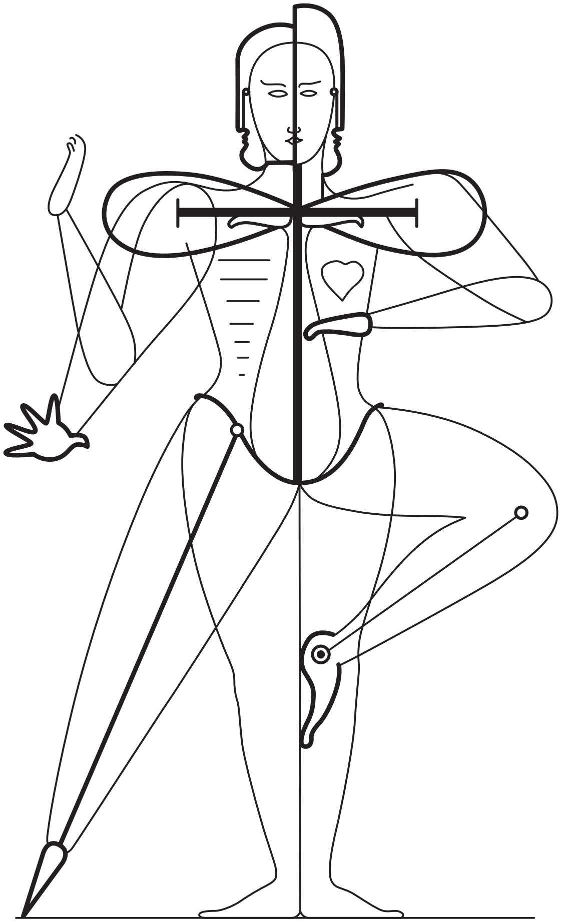
Stainless Steel

A modern, clean-lined formal vocabulary is the trademark of Berlin architects Ivan Reimann and Gesine Weinmiller. They champion elemental forms and love reduction. The handle duo they have come up with encapsulates this approach: two angular bodies in stainless steel having elemental geometrical forms give rise to a three-dimensional pattern whose severe elegance derives from the visual interplay of trapeze and rectangle and of line and plane. The short neck of one handle protrudes from the door as an upright rectangle, that of the other as a flat rectangle. There is the same perceptual interplay when the grip sections are viewed front-on. While one model presents itself to the observer flat-on to highlight the trapezoidal styling of its neck, its counterpart is a horizontal block that has seemingly undergone planar elongation. Backplates cut from solid material reinforce the emblematic effect of these elemental bodies.

Design: Ivan Reimann,
Gesine Weinmiller

www.fsb.de/duos

Geometrical Man,
after Oskar Schlemmer, 1924



HandleDuo
1208 | 1209

Stainless Steel
Macassar Grip

Stuttgart architect duo Stefanie and Martin Naumann set about their remit in a soberly pragmatic vein: “Resisting the urge to be showy, we have opted for a very straightforward path after a long, hard tussle. We have admittedly risked treading where others have trodden before, but there’s not necessarily anything wrong in that.” There’s certainly nothing wrong with their handle duo, whose archaic simplicity and purist linearity could be said to constitute the base model for all handle duos. Forming the point of departure are the varying sequences of movements involved in operating doors: “Doors have two sides and each is different. One side comes at you whilst you have to shove the other one away, on one side you have to use your own hand as a brake to avoid being squashed against the door reveal whilst on the other you have to firmly take hold.” The designer duo have drawn the following formal consequences from these push/pull constraints: both handles have the same basic form but can be told apart by design details indicative of the different ways in which handles are taken hold of. The handle with which a door is pushed open features a clearly visible “thumb rest”, whilst the handle used to pull a door open has been given a “forefinger furrow” – all very much in line with our Four-Point Guide to Good Grip (-pability).

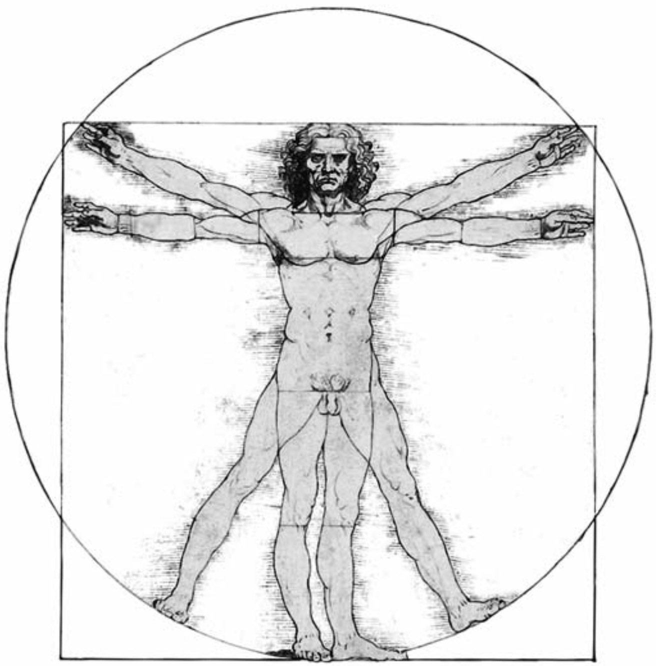
Design: Stefanie and
Martin Naumann

www.fsb.de/duos

Study of the proportions of the human body after Vitruvius, drawing by Leonardo da Vinci, c. 1490

Flush pulls

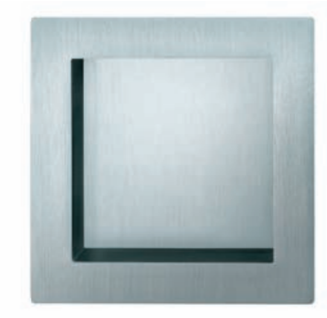
- Aluminium
- Stainless Steel



FSB delivers a formally and functionally innovative hardware solution for sliding doors in the form of either enclosed or open flush pulls. These echo in exemplary fashion the architectural trend towards the flush-mounting of functional appliances. Enclosed flush pulls ensure a uniform appearance for the door leaf. The operating aperture is always blanked out by a flap that springs neatly into the closed position when the hardware is not being used.

4252
4252 0001

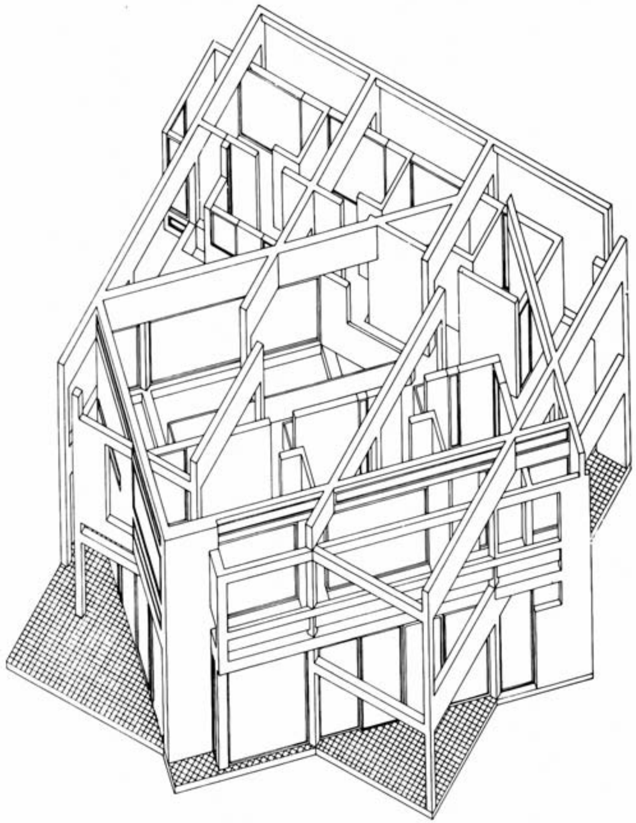
4253
4253 0001



House III,
axonometric representation,
Peter Eisenman, 1970

Security hardware

Stainless Steel



Adopting a radically purist approach to design, FSB's in-house designer Hartmut Weise introduces a security hardware design with FSB 7360 and FSB 7361 that departs radically from received formal concepts: using stainless steel 5 mm thick he has created a matter-of-fact sculpture of folded surfaces that makes no concessions whatsoever to its intended door. The design is only available with an S4 security rating and, besides a classic version, optionally comes with an integrated electronics package in the form of a capacitive door-bell sensor plus nameplate and radio-operated door-bell module and a harmonised radio gong on the inside.

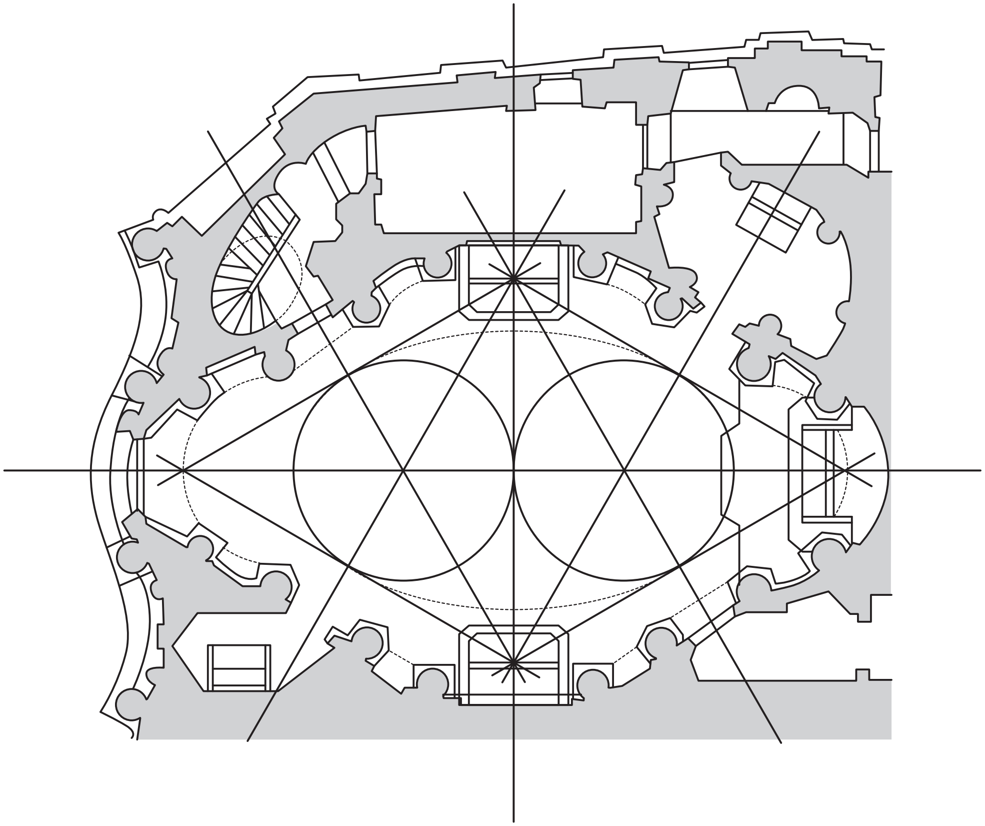
FSB supplies both models as entrance door furniture with a security-coordinated straight-cornered backplate and an FSB 1108 lever handle on the inside, Security Class S4 - ZA (cylinder projection 8 – 16 mm), with 92 mm lock centres and a 10 mm spindle hole.

7360

7361

www.fsb.de/7360
www.fsb.de/7361

Church of San Carlo
alle Quattro Fontane, Rome,
representation of the geo-
metrical ground plan, after
Francesco Borromini, 1634



“Geometry is important not solely on account of its practical merits but because it investigates objects that are eternal and unchangeable and strives to raise the soul to truth.”

Plato, 360 BC

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