

Method and system for using an industrial site

The invention relates to a method for using an industrial site and to an associated system for using industrial sites. It furthermore relates to the use of the system to carry
5 out the method.

High-quality industrial sites are a rarity. This applies especially to the chemical industry, which has to satisfy strict environmental legislation when establishing new sites and setting up chemical plants. However, this is not the decisive reason for the fact that
10 setting up new industrial chemistry plants on "green field sites" is a relatively unusual occurrence. It is rather that chemical plants make significantly greater demands on the infrastructure grid of the site than other plants since the chemical industry is more reliant on a reliable supply of raw materials and energy than other branches of production.

15 In addition, there is the fact that most chemical processes are made economically viable only if the individual plant is operated in combination with a large number of other plants, with materials and energy being exchanged between the plants. Thus, large chemical concerns in Germany operate "integrated sites", whose success depends on operating a large number of individual plants in a relatively dense concentration at one
20 location and exchanging energy and materials intensively between the individual plants. Other advantages of integrated sites are the exploitation of synergies in the provision of process energy, transportation logistics and personnel. The result is that new chemical plants are almost exclusively located within existing integrated sites, at least in highly industrialized countries.

25 Since the area of integrated sites is limited, despite their often considerable size, it is important to make effective use of the available plots within the integrated site. This is achieved not only by building in a space-saving way but also by converting buildings and plants that are no longer needed to new uses or demolishing and rebuilding them.

30 Converting existing industrial property is especially worth considering in the case of laboratory or pilot-plant operations or production plants for specialty chemicals. This is

because plants of this kind are used for only a relatively short time in comparison with "large" production plants for basic chemicals. As soon as the respective research and development project is finished, conversion of the building is in prospect. The same applies when batch production of specialty chemicals is complete.

5

The constant shortening of innovation cycles is increasingly presenting operators of integrated sites with the task of reducing conversion times and conversion costs for such buildings.

- 10 Since laboratory and pilot-plant units are currently constructed as static units in the form of buildings, the compartments are dependent on the structure of the building and cannot be disassembled and relocated as a whole. Consequently, laboratory and pilot-plant units that are tied to a particular building have the following disadvantages: fitting out laboratory and pilot-plant units with equipment and infrastructure means that,
- 15 whenever there is a changeover between two trials, the disassembly and assembly time required before the new experimental plant is available is added. The resulting speed of conversion is relatively low and no longer matches the present pace of innovation. Moreover, assuming that the effort involved in conversion is to be avoided and that the costs of conversion are to be reduced, further use of a building in the case of a change
- 20 of use is always restricted to the original purpose. Thus, it is not possible - at acceptable cost - to convert an office building that is no longer in use to a laboratory facility, for example.

- In order to avoid these intrinsic disadvantages of static laboratory, pilot-plant or
- 25 production units in the form of buildings, container-based laboratory and pilot-plant facilities are already being used as stand-alone units in isolated cases. One example of such a concept is described in WO 2010/028869 A1. The universal infrastructure shown there for chemical processes is container-based and can be set up at any desired location and transported backward and forward between the locations as required. One
- 30 particular advantage of this concept is that scaling up of the chemical process can be achieved simply by increasing the number of containers, and therefore problems with similarity are hardly to be expected.

The disadvantages of container-based production and/or operating facilities are well known to those who have already lived or worked in a container: even given the good insulation, air-conditioning and heating that is nowadays possible, containers cannot be compared with the sense of space of a permanent building. Prolonged occupation for an entire working day and over several weeks and months reduces the motivation of the workers employed therein. However, such container solutions also have technical disadvantages, especially as regards their connectivity to permanently installed infrastructure. Ultimately, they are always a provisional solution.

There is no difference if a modular laboratory is constructed using a multiplicity of standardized containers, as shown in DE 10361621 A1 or in WO 2011/075625 A1 or in DE 102006001977 B3.

An improvement in the quality of accommodation in a container-based operating facility of modular construction can be achieved by inserting container-based functional units into a static building. This concept is described in DD 87156 A1, relating to telecommunications, and in EP 0572814 B1 for plants in the chemical and pharmaceutical industry. However, the modularity taught in said documents is limited, and therefore the flexibility with which the developed site can be used and the speed of conversion required to use the building for a different purpose is limited.

In light of the above prior art, it is the underlying object of the invention to specify a method for using an industrial site in which the available area of the site is used in a particularly effective way by virtue of the fact that conversion times and costs are reduced and a greater freedom of choice as regards the subsequent use of existing buildings is achieved.

These objects are achieved by a method having the features of claim 1.

Consequently, the invention relates to a method for using an industrial site, comprising the following steps:

a) Erecting a permanent building on the site, wherein the building has a multiplicity of bays for receiving interchangeable functional units, a building shell to protect the functional units received from the effects of weather, technical building equipment and an infrastructure grid for energy and/or materials and/or data;

b) Providing a multiplicity of pallets, which are neutral as regards the use thereof, are standardized as regards the dimensions thereof and are designed to be received by the bays of the building;

c) Equipping pallets with production and/or operating devices at one or more locations remote from the site to give a first generation of functional units for a specific purpose;

d) Transportation of the functional units to the site;

e) Installation of the first generation of functional units in the building by inserting the functional units in the bays;

f) Connecting the functional units to at least some of the infrastructure grid;

g) Using the first generation of functional units within the building in accordance with the purpose of the respective functional unit;

h) Equipping pallets with production and/or operating devices at one or more locations remote from the site to give a second generation of functional units for a specific purpose, which differ at least partially from the functional units of the first generation as regards the respective purpose thereof;

i) Replacing the first generation of functional units with the second generation of functional units;

j) Using the second generation of functional units within the building in accordance with the purpose of the respective functional unit.

5 It is a basic concept of the present method to subdivide the individual functions of a fully equipped building integrated into the infrastructure of an industrial site as regards the duration of use of the technical devices and, with a decreasing time in use, to provide increasing modularization of these functions. The permanent functions of the fully equipped building are accordingly permanently installed, while the devices which are
10 subject to use for a shorter time on the basis of their purpose are embodied in a correspondingly modular and interchangeable manner.

More specifically, this means that the building shell of the building is erected in an unchangeable and permanent manner on the industrial site. The building is connected
15 to the surrounding infrastructure, by means of which the building is supplied with energy and/or materials and/or data, in an equally permanent and fixed manner. The production and/or operating devices for a specific purpose which are essential for the specific use of the building are combined into mobile functional units independently thereof. The functional units are intended to be inserted into the bays of the building and to be
20 connected to at least some of the infrastructure grid of the building.

According to the invention, each functional unit is, in turn, subdivided into a pallet, which is essentially neutral as regards the use thereof, and into production and/or operating devices, with which the pallets are equipped and which define the purpose of the
25 functional units. This creates the advantage that the pallets can be equipped with the production and/or operating devices at a remote location - i.e. off the site to be used - e.g. in a workshop. The functional units assembled in this way outside the building can then be transported to the site and inserted there into the building. Setup times within the building are thereby considerably reduced. Equipment mounting outside the building
30 also makes it possible to use low-priced areas.

Another advantage of the pallet system is that the pallets can be used for several generations if the service life of the operating and/or production devices mounted on the pallet is exceeded. The pallets can also be stored for later use.

- 5 The system according to the invention and the method carried out by means of the system thus have significantly higher flexibility than was previously known in the prior art and therefore offers better utilization of the resources used, namely materials, time and space.
- 10 Moreover, the output of the technical equipment of the building is more effectively scalable by virtue of its modular construction, thereby avoiding over- and underdimensioning of the plants. Ultimately, the effect is that unnecessary energy consumption is avoided.
- 15 In a preferred development of the method according to the invention, at least some of the functional units of the first generation are transported, after each replacement, to a second building remote from the site, and are inserted and used in said building. The underlying concept behind this development is that the system is used not just at one location but also across locations. Thus, it is conceivable for a pilot-plant unit used in a
20 building on a first integrated site to be removed from there at the end of the project phase and used again in a second building at a location B for the same or a different purpose.

- If a replaced functional unit cannot be reused, it is recommended that the operating
25 and/or production devices which define its function be removed from the pallet, leaving a pallet which is neutral as regards the function thereof, which can be reequipped or stored for subsequent use. According to the invention, this reequipping of the pallets can take place at one or more locations remote from the site to be used, ensuring that these setup times are not included in the conversion times. Moreover, reequipping or
30 storage can take place at low-cost locations. The reusability of a pallet which has already been used also contributes to the sustainability of the system according to the invention.

In a very particularly preferred development of the invention, the operating and/or production devices which are inserted into the building as functional units can be subdivided into two functional groups. The first functional group comprises chemical, biological, physical or nutritional production plants, laboratory or pilot plants or offices. In contrast, the devices of the second functional group comprise technical building equipment, heating systems, air-conditioning systems, fire extinguishing systems, storage rooms, compressed air supply systems, water supply systems, power supply systems, sewage systems, systems for providing starting materials, systems for providing process energy; such as especially heat or cold, exhaust treatment systems, such as especially thermal afterburners, activated carbon adsorption or exhaust gas scrubbing, sanitary systems or staff rooms.

The first functional group comprises those operating and/or production devices which are designed very specifically for the respective use of the functional unit and which, accordingly, have a very short service life. The devices in the second functional group, in contrast, are general purpose devices and, accordingly, can remain in the building for several generations of use. Thus, for example, a heating system will always be required when personnel are in the building for a relatively long time. A functional unit carrying the heating system can therefore be installed as part of the initial equipment of the building and can remain therein for as long as there are laboratory facilities and offices in the building, for example. A compressed air supply system, on the other hand, is only required while there is a pilot plant in the building. If the pilot plant is removed at some stage, the compressed air supply system can also be removed and used again at some other location. Instead of the compressed air supply system, this bay of the building can now be occupied by a staff room, for instance if the pilot plant has been replaced by an office and the increased number of workers in the building requires the setting up of a staff room.

A preferred development of the invention therefore envisages that, in situations in which functional units of both functional groups have been installed in the building, at least

some of the functional units of the second functional group remain in the building when functional units of the first generation are replaced.

The high degree of modularity of the present concept, in which even the technical building equipment is embodied in interchangeable functional units, shows its flexibility particularly when production and/or laboratory facilities are replaced by offices or vice versa. This aspect has not previously been taken into account in the reusage concepts for modular production plants previously described in the prior art.

10 The invention also relates to a system for using industrial sites

- having at least one permanent building, which has a multiplicity of bays for receiving interchangeable functional units, a building shell to protect the functional units received from the effects of weather, technical building equipment and an infrastructure grid for energy and/or materials and/or data;
- and having a multiplicity of functional units, wherein each functional unit comprises a pallet, which is essentially neutral as regards the use thereof and is equipped with production and/or operating devices in order to define the purpose of the functional unit.

In this case, the building can be embodied in a manner known per se to accommodate functional units. Suitable designs of building are known from DE 3036468 A1 and DE 202011108631 U1, for example.

A preferred development of the invention envisages that the bays of the building and the pallets of the functional unit are designed so as to correspond to one another in such a way that they form a standardized interface within the system. The standardized interface signifies first of all that fundamentally any pallet with any functional unit can be inserted into any bay. This increases flexibility.

The interface is preferably formed by a linear guide assigned to the bay and by a carriage arranged on the pallet, which can be inserted into the linear guide. This makes

it possible to insert the functional unit with the carriage into the linear guide of the bay and thus to push the functional unit into the building. The carriage does not have to receive sliding guidance in the linear guide: it is also conceivable to provide the carriage with rollers.

5

In a particularly preferred embodiment of the system, the pallets and/or the functional units constructed thereon are dimensioned in such a way that they correspond to a standardized container format such as that for sea containers according to ISO 668.

10 This makes it possible to transport the functional units using existing transportation logistics between the plots or buildings to be used. The side walls and the roof of the container are not required while in use since the functional unit is, of course, protected by the building shell from the effects of weather. It is therefore conceivable to fasten the walls and the roof on the functional unit only for transportation and to remove them again during installation in the building.

15

The system according to the invention preferably comprises a plurality of buildings which are provided with corresponding standardized bays for receiving the functional units. This makes it possible to use the same functional unit initially at one location and then in the second building at a different location.

20

In a very particularly preferred embodiment of the invention, at least one building of the system is subdivided into at least three sections, namely a first section, which comprises a multiplicity of bays for functional units, a second section, which likewise comprises bays for receiving functional units, wherein the number of bays in the second
25 section corresponds to the number of bays in the first section, and a third section without bays, wherein the third section is situated between the first and second sections and wherein in each case one bay in the first section is assigned to one bay in the second section, and the respectively assigned bays in the first and second sections are arranged in alignment with one another on each side of the third section. This building
30 concept allows particularly short paths between the two mutually assigned functional units.

In such a building concept, the bays should each be individually accessible from the outside for the insertion of functional units, and the third section should comprise a floor region, from which all the bays can be accessed from the inside. A building configured in this way has particularly advantageous usage of space and allows short paths
5 between the inserted functional units.

A preferred development of the invention envisages that there is a path which extends along the linear guide of the bay and from which an installed functional unit can be accessed from the side without barriers. This improves access to the individual
10 functional units. It is namely advantageous that the functional unit extends in the direction of the linear guide, for which reason access to the functional unit from the side is more agreeable than access by the end, e.g. through the loading aperture of a container. As already mentioned, the walls and the roof of the functional unit can be removed in the installed state, further improving access to the production and/or
15 operating devices arranged on the pallet.

The invention also relates to the use of the system to carry out the method according to the invention, such that a system is used in which the building contains three sections in the manner described, and that functional units of the first functional group are installed
20 in the first section of the building, and functional units of the second functional group are installed in the second section of the building, wherein at least some of the technical building equipment is embodied as functional units of the second functional group and said units remain in the building when functional units of the first functional group are replaced.

25 This preferred embodiment of the invention is based on the concept of arranging primarily those functional units of the second functional group which are used for a longer time in the second section of the building and, in this case, accommodating particularly the technical building equipment here. On the other hand, those functional
30 units in the first group which have to be exchanged frequently are accommodated in the first section of the building. Consequently, rapid exchange between the generations takes place in the first section, while the functional units used over the longer term

largely remain in the second section. The outlay on conversion thus generally pertains only to the first section, while the second section remains untouched over the longer term.

- 5 Further preferred embodiments of the invention will be found in the description now given of illustrative embodiments. The figures show:

Figure 1: the basic concept of use;

Figure 2: a pallet neutral as regards use;

10 Figure 3: a functional unit consisting of a pallet with equipment;

Figure 4: a first embodiment of a building with two sections;

Figure 5: an external view of a second embodiment of the building with three sections;

Figure 6: a plan view of the second embodiment of the building.

15

The basic concept of the invention is illustrated schematically in figure 1. It is the use of an industrial site A, preferably situated on an integrated site for the chemical industry, which is of interest. Two further locations B and C, which can be situated on some other integrated site or, alternatively, on the same site, are at a distance therefrom. Of
20 particular interest is the use of site A, e.g. because it has a particularly good infrastructure grid 1.

On this high-quality industrial site A, a permanent building 2 is erected, which has a conventional building shell 3 which protects the interior of the building 2 from the effects
25 of weather. The building shell 3 comprises a façade, a roof and a floor. Everything is of conventional construction with appropriate sealing, insulation and light apertures. Moreover, the building 2 comprises a building core (not shown specifically here), which provides static support and the function of which is to support the building shell 3 and the internal fittings of the building 2. The building core can be a steel skeleton, for
30 example. Those components of the building 2 which have been described hitherto are of permanent design, i.e. they have the usual life of structures or parts of structures (20-100 years).

Even the technical building equipment 4 is not fixedly installed in the building 2 but is embodied as interchangeable functional units F_2 . The technical building equipment 4 belongs to a second group of functional units F_2 , which in principle remain for longer in the building 2.

Functional units of a first functional group F_1 , which can comprise chemical production plants, laboratories or even office facilities for example, remain for a shorter time in the building 2.

These functional units F_1 of the first functional group are assembled outside the building 2 at a remote location C, preferably in a workshop. This is achieved by equipping a pallet 5 which is essentially neutral as regards the use thereof with production and/or operating devices 7 for a specific purpose on an installation wall 6 extending vertically on the pallet 5. This is illustrated in greater detail by means of figures 2 and 3. The fully assembled functional units $F_{1,0}$ are transported to the industrial site A, where they are inserted into the building 2 and connected to the infrastructure grid 1 thereof. Thus, the building receives initial equipment (first generation) comprising functional units F_1 and F_2 .

When the service life of the functional units has expired in accordance with their purpose, the functional units $F_{1,1}$ which are no longer required on the site A can be removed from the building 2 again and moved to a different location, such as a second industrial site B, for secondary use. There, the functional unit $F_{1,1}$ can continue to be used for the same purpose as at location A, e.g. by installation in another building.

Functional units $F_{1,2}$ for which there is no possibility of direct continued use are transported back to the workshop at location C for disassembly. There, the operating and production units which are no longer required are removed from the functional unit $F_{1,2}$, leaving the pallet 5, which is neutral as regards the use thereof. This pallet is then reequipped immediately or subsequently after storage, giving a new functional unit $F_{1,3}$, which is reinserted into the building 2 with the next generation of functional units. The

functional units $F_{1.1}$ which are no longer required at location B can be reprocessed in the same workshop at location C and sent out for a new use.

Figure 2 shows a pallet 5 of the kind used to construct the functional units, which is essentially neutral as regards the use thereof. The pallet 5 has essentially the configuration and dimensions of a sea container according to ISO 668, although the side walls and the roof can be removed to improve access. Along a long side there is an installation wall 6, which is intended to receive various operating devices. On the bottom of the pallet 5 there is a carriage 8. The carriage 8 is part of a standardized interface for mechanical and infrastructural connection of the pallet 5 to the building. The interface also includes standardized connections 9 for the transfer of energy, materials and data from the infrastructure grid of the building to the pallet 5.

The pallet 5, which is essentially neutral as regards the use thereof, is dedicated to a particular use by equipping it with the desired operating devices 7. For this purpose, the operating devices 7 required for the desired purpose, such as apparatus, reactors, analytical equipment or workshop equipment, are fastened on the installation wall 6 and connected to one another and to the standardized connections 9. The precise construction of the operating devices 7 depends solely on the desired purpose of the functional unit F_1 .

The pallet 5 fully equipped with the operating devices 7 forms a functional unit F_1 for a specific purpose; cf. figure 3.

Figure 4 shows schematically how the functional units F can be introduced into a building 2. For this purpose, the building 2 has a multiplicity of bays S, which are each designed to receive one functional unit F. The building 2 shown in figure 4 is assigned a fixed logistics and floor region 10, which allows access to the functional units F from this region 10.

Figure 5 shows a development of the building 2, which is divided into three sections 11, 12, 13. The first section 11 comprises a multiplicity of substantially box-shaped bays S,

which are intended to receive functional units F_1 of the first functional group. The bays S are dimensioned in such a way that a functional unit F_1 of the size of a 40'-container can be pushed in. In order to insert a functional unit F_1 of this kind into the bay S, a gate 14 which closes the bay S with respect to the outside is opened, and the functional unit F_1 is inserted by means of its carriage 8 arranged on the pallet 5 into a linear guide 15. The functional unit F_1 can be pushed along the linear guide 15 into the bay S by means of the carriage 8. The side walls of the pallet 5, which are no longer required, are then removed, and the gate 14 is closed. The functional unit F_1 is connected to the infrastructure grid 1 of the building via the standardized connections 9. It is also possible to interlink a plurality of functional units within the building.

The construction of the building 2 will be seen in greater detail in the plan view shown in figure 6. The building has two sections 11 and 13, which are each provided with a multiplicity of bays S for receiving the functional units F_1 , F_2 . Here, the first section 11 serves to receive functional units F_1 from the first functional group, while the second section is intended to receive functional units F_2 from the second functional group. As can be seen from the plan view, the bays in the second section 12 are shorter than those in the first section 11 and are suitable only for receiving pallets 5 of shorter length than those in the first section 11. Thus, it is conceivable to embody the functional units F_2 of the second functional group with the size of a 20'-container, while the functional units F_1 of the first functional group are embodied with the size of a 40'-container. Accordingly, the bays in the first section are 15 m long, for example, while the bays in the second section are 7 m long, for example. Both bays are 5 m wide, for example, and arranged on each side of a section 13 situated between the first section 11 and the second section 12. In this way, a bay in the first section 11 and a bay in the second section 12 are in each case arranged directly in alignment with one another and are directly accessible via the floor region formed by section 13.

It is primarily the functional units F_1 of the first functional group, which have to be exchanged more frequently, which are arranged in the first section 11. It is primarily functional groups F_2 which can remain for longer in the building 2, e.g. the technical building equipment or logistics regions, which are situated in the second section 12.

Thus, for example, a heating system 17 arranged in section 12 will remain for longer in the building 2 than a pilot-plant module 18, which will subsequently be replaced by an office module 19. However, a logistics unit 20 which can only be used in conjunction with the pilot-plant module 18 will likewise leave the building when the pilot plant is replaced and will be replaced by a sanitary system 20, which becomes necessary when the pilot plant 18 is replaced by another office module 19.

A path 16, which can be reached from the floor of the third section 13, extends along the linear guide 15 of the respective bays 16. The path 16 is arranged on the opposite side of the installation wall 6 of the pallet 5. The pallet 5 can furthermore be accessed without barriers from the path 16, allowing the operating devices 7 on the installation wall 6 to be reached easily on foot and with industrial trucks.

The functional units are connected to the building infrastructure via the standardized connections 9, which are designed for the transfer of operating media requiring pipes, for supplying power, for metrological connection and evaluation (e.g. process management systems), connecting air-conditioning systems, supplying starting materials and processing products. These connections are provided in each bay S, and therefore in principle any functional unit F_1 can be inserted into any bay S in the first section 11.

Overall, the combination of the standardized connections 9 for connecting the functional units to the infrastructure 1 and the combination comprising linear guide 15 and carriage 8 form a standardized interface within the system.

The building 2 must meet all the requirements as regards statics and heat. In addition, measures to prevent fire must be installed in the building 2 and must be available at every interface S. Thus, fire protection is always ensured, irrespective of the functional units inserted. Finally, a special room concept must apply to the whole building and to all the bays S, according to which the individual bays S are provided with forced ventilation and with explosion protection sensors and toxic gas sensors in accordance with the risk assessment.

It is also possible to arrange the functional modules F_2 of the second functional group in the upper region of the buildings and to insert essentially the technical building equipment there. The bays situated at a higher level are namely more difficult to reach,
5 and therefore said bays S should only be occupied by functional units F_2 which do not have to be replaced as frequently.

The advantages of the use according to the invention of industrial sites will be summarized once more:

10

The changing and making ready of test plants for carrying out technical trials can be significantly accelerated. The fitting and removal of the individual functional units can take place independently in terms of time and location. The total volume within the building with pilot plants and laboratory units is reduced. This means that the required
15 converted volume of such a building is smaller. Moreover, the volume of the building can be used as required by virtue of the modular configuration of the bays for the functional units. It is particularly important that an office module can also be used as an alternative to a technical functional unit. A particular flexibility of the concept under consideration is provided by the fact that the technical building equipment, such as
20 heating, ventilation, air conditioning, gas supply and supply of operating media is of modular construction.

List of reference numerals

	A	first industrial site
	B	second industrial site at a first remote location
5	C	second remote location
	1	infrastructure grid
	2	building
	3	building shell
	4	technical building equipment
10	F ₁	functional unit of the first functional group
	F ₂	functional unit of the second functional group
	5	pallet
	6	installation wall
	7	operating devices
15	8	carriage
	9	connections
	10	floor and logistics region
	11	first section
	12	second section
20	13	third section
	S	bay
	14	gate
	15	linear guide
	16	path
25	17	heating system
	18	pilot-plant unit
	19	office module
	20	sanitary system

Claims

1. A method for using an industrial site, characterized by the following steps:

- 5 a) Erecting a permanent building on the site, wherein the building has a multiplicity of bays for receiving interchangeable functional units, a building shell to protect the functional units received from the effects of weather, technical building equipment and an infrastructure grid for energy and/or materials and/or data;
- 10 b) Providing a multiplicity of pallets, which are neutral as regards the use thereof, are standardized as regards the dimensions thereof and are designed to be received by the bays of the building;
- 15 c) Equipping pallets with production and/or operating devices at one or more locations remote from the site to give a first generation of functional units for a specific purpose;
- d) Transportation of the functional units to the site;
- 20 e) Installation of the first generation of functional units in the building by inserting the functional units in the bays;
- f) Connecting the functional units to at least some of the infrastructure grid;
- 25 g) Using the first generation of functional units within the building in accordance with the purpose of the respective functional unit;
- h) Equipping pallets with production and/or operating devices at one or more locations remote from the site to give a second generation of functional units for a specific purpose, which differ at least partially from the
- 30

functional units of the first generation of as regards the respective purpose thereof;

5 i) Replacing the first generation of functional units with the second generation of functional units;

j) Using the second generation of functional units within the building in accordance with the purpose of the respective functional unit.

10 2. The method as claimed in claim 1, characterized

in that at least some of the functional units of the first generation are transported, after being replaced, to a second building remote from the site, and are inserted and used in said building.

15

3. The method as claimed in claim 1 or 2, characterized

20 in that the operating and/or production devices are removed from at least some of the replaced functional units at one or more locations remote from the site, and the pallets thereby obtained, which are neutral as regards the use thereof, are reequipped or stored.

4. The method as claimed in claim 1, 2 or 3, characterized

25 in that the operating and/or production devices are selected

- from a first functional group comprising: chemical, biological, physical or nutritional production, laboratory or pilot plants and offices,

30 and/or

- from a second functional group comprising: technical building equipment, heating systems, air-conditioning systems, ventilation systems, fire extinguishing systems, storage rooms, product handling facilities, electronic control systems, process management equipment, compressed air supply systems, water supply systems, power supply systems, sewage systems, systems for providing starting materials, systems for providing process energy, such as especially heat or cold, exhaust treatment systems, such as especially thermal afterburners, activated carbon adsorption, exhaust gas scrubbing, sanitary systems and staff rooms.

5. The method as claimed in claim 4,
characterized

in that functional units from both functional groups are installed in the building,
and in that at least some of the functional units of the second functional group
remain in the building when functional units of the first generation are replaced.

6. The method as claimed in claim 4 or 5,
characterized

in that chemical production and/or laboratory facilities can be replaced by offices
or vice versa.

7. A system for using industrial sites

- having at least one permanent building, which has a multiplicity of bays for receiving interchangeable functional units, a building shell to protect the functional units received from the effects of weather, technical building equipment and an infrastructure grid for energy and/or materials and/or data;

- and having a multiplicity of functional units, wherein each functional unit comprises a pallet, which is essentially neutral as regards the use thereof and is equipped with production and/or operating devices in order to define the purpose of the functional unit.

8. The system as claimed in claim 7,
characterized
in that the bays of the building and the pallets of the functional units are designed
5 so as to correspond to one another in such a way that they form a standardized
interface within the system.
9. The system as claimed in claim 8,
characterized
10 in that the interface is formed by a linear guide assigned to the bay and by a
carriage arranged on the pallet, which can be inserted into the linear guide.
10. The system as claimed in claim 7, 8 or 9,
characterized
15 in that the pallets and/or the functional units constructed thereon correspond to a
standardized container format, such as that in ISO 668.
11. The system as claimed in any of claims 7 to 10,
characterized
20 in that it comprises at least two buildings which are provided with bays and are
situated at a distance from one another.
12. The system as claimed in any of claims 7 to 11,
characterized
25 in that it comprises at least one building, which is subdivided into at least three
sections, namely a first section comprising a multiplicity of bays, a second section
comprising a number of bays corresponding to the number of bays in the first
section, and a third section without bays, wherein in each case one bay in the
first section is assigned to one bay in the second section, and the respectively
30 assigned bays in the first and second sections are arranged in alignment with
one another on each side of the third section.

13. The system as claimed in claim 12,
characterized
in that each bay is individually accessible from the outside for the insertion of
functional units, and in that the third section comprises a floor region, from which
5 all the bays can be accessed from the inside.
14. The system as claimed in any of claims 9 to 13,
characterized
in that at least one bay has a path which extends along the linear guide and from
10 which an installed functional unit can be accessed from the side without barriers.
15. The use of a system as claimed in claim 12 for carrying out a method as claimed
in claim 5,
characterized
15 in that functional units of the first functional group are installed in the first section
of the building, and functional units of the second functional group are installed in
the second section of the building, wherein at least some of the technical building
equipment is embodied as functional units of the second functional group and
said units remain in the building when functional units of the first functional group
20 are replaced.