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(54) **METHOD FOR MANUFACTURING ALMGSI ALUMINIUM STRIP**

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(57) **ABSTRACT**

The invention relates to a method for producing a strip made of an AlMgSi alloy, in which a rolling ingot made of an AlMgSi alloy is cast, the rolling ingot is subjected to homogenization, the rolling ingot having been brought to rolling temperature is hot-rolled and is optionally cold-rolled to the final thickness thereafter. The problem of providing an improved method for producing aluminum strip made of an AlMgSi alloy, with which AlMgSi strips having very good shaping behaviour can be produced reliably, is solved in that immediately after exit from the final rolling pass, the hot strip has a temperature of between more than 130° C., preferably 135° C., and at most 250° C., preferably at most 230° C., and the hot strip is wound up at this temperature.

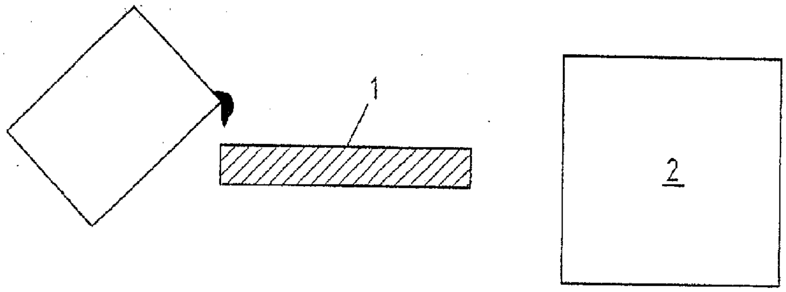

Fig. 1a

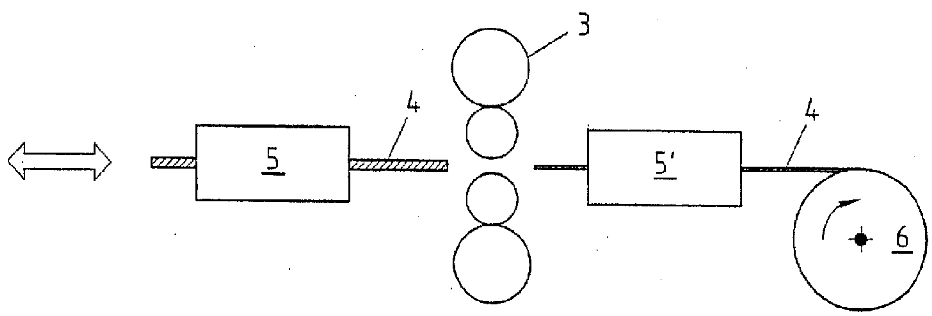

Fig. 1b

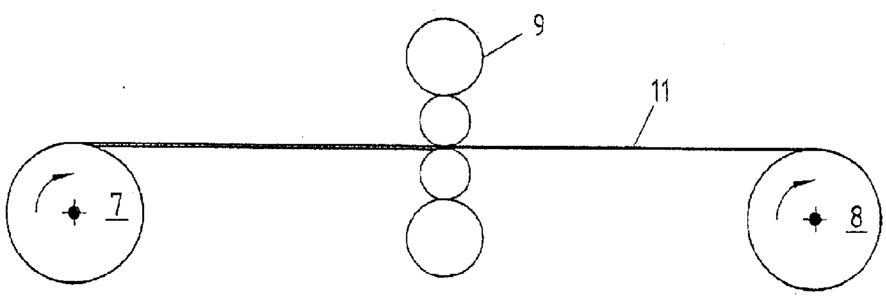

Fig. 1c

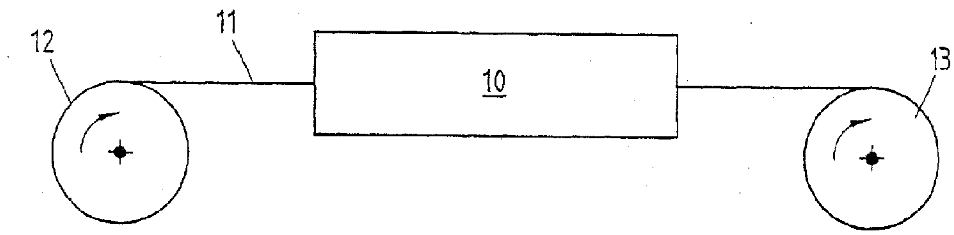

Fig. 1d

METHOD FOR MANUFACTURING ALMGSI ALUMINIUM STRIP

CROSS-REFERENCE TO RELATED PATENT APPLICATIONS

[0001] This patent application is a continuation of PCT/EP2012/068005, filed Sep. 13, 2012, which claims priority to European Application No. 11181519.7, filed Sep. 15, 2011, the entire teachings and disclosure of which are incorporated herein by reference thereto.

FIELD OF THE INVENTION

[0002] The invention relates to a method for manufacturing a strip from an AlMgSi alloy, in which a rolling ingot is cast from an AlMgSi alloy, the rolling ingot undergoes homogenization, the rolling ingot which has been brought to rolling temperature is hot rolled then optionally cold rolled to final thickness and the finished strip is solution annealed and quenched. Furthermore, the invention relates to advantageous uses of an AlMgSi aluminium strip which has been manufactured accordingly.

BACKGROUND OF THE INVENTION

[0003] In particular in automotive vehicle construction, but also in other application fields, for example, aircraft construction or rail vehicle construction, metal sheets of aluminium alloys are required which are not only distinguished by particularly high strength values, but at the same time have a very good formability and enable high degrees of deforming. In automotive vehicle construction, typical application fields are the bodywork and chassis components. In the case of visible painted components, for example, metal bodywork sheets which can be seen from the outside, additionally the forming of the materials has to be carried out in such a manner that the surface is not impaired by defects such as flow figures or roping after the painting. This is particularly important, for example, for the use of aluminium alloy metal sheets for producing bonnets and other bodywork components of an automotive vehicle. However, it choice of material is restricted with respect to the aluminium alloy. In particular AlMgSi alloys, the main alloy constituents of which are magnesium and silicon, have relatively high strengths in the state T6 with, at the same time, good forming behaviour in the state T4 and excellent corrosion resistance. AlMgSi alloys are the alloy types AA6XXX, for example, the alloy type AA6016, AA6014, AA6181, AA6060 and AA6111. Conventionally, aluminium strips are produced from an AlMgSi alloy by means of casting a rolling ingot, homogenising the rolling ingot, hot rolling the rolling ingot and cold rolling the hot strip. The homogenisation of the rolling ingot is carried out at a temperature from 380 to 580° C. for more than one hour. Owing to a final solution-annealing operation at typical temperatures from 500° C. to 570° C. with subsequent quenching and natural ageing approximately at ambient temperature for at least three days, the strips can be delivered in the state T4. The state T6 is set after the quenching by means of artificial ageing at temperatures between 100° C. and 220° C.

[0004] It is problematic that, in hot-rolled aluminium strips of AlMgSi alloys, coarse Mg_2Si precipitations are present which are broken and comminuted in the subsequent cold rolling by high degrees of forming. Hot strips of an AlMgSi alloy are usually produced in thicknesses from 3 mm to 12 mm and supplied to a cold-rolling operation with high degrees of forming. Since the temperature range in which the AlMgSi phases are formed is passed through very slowly during conventional hot rolling, these phases are formed in a very coarse manner. The temperature range for forming the above-mentioned phases is alloy dependent. However, it is between 230° C. and 550° C., that is to say, in the range of the hot-rolling temperatures. It could be proven experimentally that these coarse phases in the hot strip have a negative influence on the elongation of the end product. This means that the formability of aluminium strips from AlMgSi alloys could previously not be fully exploited.

[0005] From the published European Patent Application EP 2 270 249 A1, belonging to the same Applicant, it was proposed that the AlMgSi alloy strip, directly after leaving the last hot rolling pass, has a temperature of a maximum of 130° C. and is coiled at this or a lower temperature. Owing to the quenching of the hot strip with this method, aluminium strips in the state T4 were able to be produced, which in the state T4 has an elongation at break of A80 of more than 30% or a uniform elongation A_g of more than 25%. Furthermore, very high values for the elongation at break in the state T6 were also produced. However, it has been found that this temperature range at the outlet of the last hot rolling pass leads to problems with respect to the surface evenness of the hot strip so that the subsequent production steps were impaired. Furthermore, the predetermined cooling rate could be achieved only at reduced production speeds. Based on this prior art, an object of the present invention is to provide an improved method for manufacturing an aluminium strip from an AlMgSi alloy, by means of which method AlMgSi aluminium strips with very good formability in the state T4 may be produced in an operationally reliable manner.

SUMMARY OF THE INVENTION

[0006] According to a first teaching of the present invention, the object set out for a method is achieved in that, immediately after being discharged from the last hot rolling pass, the hot strip is at a temperature of more than 130° C. to 250° C., preferably to 230° C. and the hot strip is coiled at this temperature.

[0007] In contrast to the known method with particularly low coiling temperatures, it has surprisingly been found that the mechanical properties with respect to the uniform elongation A_g which determines the formability did not change or changed only insignificantly in spite of the changed coiling temperatures. The AlMgSi alloy strips produced according to the invention in the state T4 further showed a uniform elongation of more than 25% in the tensile test according to DIN EN. Furthermore, they had the very good hardenability in the state T6 as known from the prior application of the Applicant. However, the production method could be substantially stabilised and a higher production speed could be achieved.

[0008] According to an advantageous embodiment of the method according to the invention, this cooling process is carried out within the last two hot-rolling passes, that is to say, the cooling to more than 130° C., preferably from 135° C. to 250° C., preferably from 135° C. to 230° C., is carried out within seconds, at the most within 5 minutes. It has been found that, in this method, the increased uniform elongation values with usual strength and yield point values in the state T4 and the improved hardenability in the state T6 are achieved in a particularly operationally reliable manner.

[0009] According to another embodiment of the method according to the invention, operationally reliable cooling of the hot strip is achieved in that the hot strip is quenched to the outlet temperature using at least one plate cooler and the hot rolling pass itself, loaded with emulsion. A plate cooler comprises an arrangement of cooling or lubrication nozzles which spray a rolling emulsion onto the aluminium strip. The plate cooler may be present in a hot rolling installation in order to cool rolled hot strips to rolling temperature before hot rolling and in order to be able to achieve higher production speeds.

[0010] If the temperature of the hot strip before the start of the cooling process, which preferably takes place within the last two rolling passes, is at least 400° C., preferably from 470° C. to 490° C., according to a next embodiment of the method, it is possible for particularly small Mg_2Si precipitations to be present in the quenched hot strip, since the largest proportion of the alloy constituents magnesium and silicon are present in the dissolved state in the aluminium matrix at these temperatures. This advantageous state of the hot strip is practically "frozen" by the quenching operation.

[0011] According to another embodiment of the method, the temperature of the hot strip after the penultimate rolling pass is from 290° C. to 310° C. It has been found both that these temperatures enable sufficient freezing of the precipitations and, on the other hand, at the same time, the last rolling pass can be carried out without any problems.

[0012] If the rolled hot strip has, immediately after being discharged from the final hot rolling pass, a temperature of from 200° C. to 230° C., an optimum process speed can be achieved during hot rolling, without the properties of the aluminium strip produced being impaired.

[0013] The thickness of the prepared hot strip is from 3 mm to 12 mm, preferably from 5 mm to 8 mm, so that conventional cold rolling mills can be used for the cold rolling operation.

[0014] The aluminium alloy used is preferably of the alloy type AA6xxx, preferably AA6014, AA6016, AA6060, AA6111 or AA6181. All the alloy types AA6xxx have the common feature that they have particularly good formability, characterised by high elongation values in the state T4 and high strengths or yield points in the state for use T6, for example, after artificial ageing at 205° C./30 minutes.

[0015] According to another embodiment of the method according to the invention, the finished, rolled aluminium strip undergoes a heat treatment, in which the aluminium strip is heated to more than 100° C. after solution annealing and quenching and then coiled and aged at a temperature of more than 55° C., preferably more than 85° C. This embodiment of the method enables, after the natural ageing, by means of a shorter heating phase at lower temperatures the state T6 to be set in the strip or the metal sheet, in which the metal sheets or strips formed to components are used in the application. To this end, these rapidly hardening aluminium strips are heated only to temperatures of approximately 185° C. for only 20 minutes in order to achieve the higher yield point values in the state T6.

[0016] The elongation at break values A_{80} of the aluminium strips produced by means of this embodiment of the method according to the invention in the state T4 are slightly below 29%. However, the aluminium strip produced according to the invention is further distinguished after the ageing in the state T4 by a very good uniform elongation A_g of more than 25%. The term uniform elongation A_g is intended to be understood to refer to the maximum elongation of the sample, at which no necking of the sample can be identified during the tensile test. The sample is thus expanded in a uniform manner in the region of the uniform elongation. The value for the uniform elongation for similar materials was previously at a maximum of 22% to 23%. The uniform elongation has a significant influence on the formability since it determines the maximum degree of forming of the material used in practice. In this regard, using the method according to the invention, an aluminium strip having very good forming properties can be provided, and can also be converted into the state T6 by means of an accelerated artificial ageing operation (185° C./20 min).

[0017] An aluminium alloy of the type AA6016 has the following alloy constituents in percent by weight:

[0018] 0.25%≤Mg≤0.6%

[0019] 1.0%≤Si≤1.5%

[0020] Fe≤0.5%

[0021] Cu≤0.2%

[0022] Mn≤0.2%

[0023] Cr≤0.1%

[0024] Zn≤0.1%

[0025] Ti≤0.1%

and the remainder being Al and inevitable impurities, up to a maximum in total of 0.15%, individually a maximum of 0.05%.

[0026] With magnesium contents of less than 0.25% by weight, the strength of the aluminium strip which is provided for structural applications is too low but, on the other hand, the formability with magnesium contents of above 0.6% by weight becomes worse. Silicon, together with magnesium, is substantially responsible for the hardenability of the aluminium alloy and consequently also for the high strengths which can be achieved in the application, for example, after paint baking. With Si contents of less than 1.0% by weight, the hardenability of the aluminium strip is reduced so that in the application only reduced strengths can be provided. Si contents of more than 1.5% by weight do not lead to an improvement of the hardening behaviour of the alloy. The Fe proportion should be limited to a maximum of 0.5% by weight in order to prevent coarse precipitations. A limitation of the copper content to a maximum of 0.2% by weight in particular leads to improved corrosion resistance of the aluminium alloy in the specific application. The manganese content of less than 0.2% by weight reduces the tendency for the formation of relatively coarse manganese precipitations. Although chromium ensures a fine microstructure, it is intended to be limited to 0.1% by weight in order to also prevent coarse precipitations. The presence of manganese in contrast improved the weldability by reducing the tendency for cracking or susceptibility to quenching of the aluminium strip according to the invention. A reduction of the zinc content to a maximum of 0.1% by weight in particular improves the corrosion resistance of the aluminium alloy or the finished metal sheet in the respective application. In contrast, titanium ensures grain refinement during the casting operation, but is intended to be limited to a maximum of 0.1% by weight in order to ensure good castability of the aluminium alloy.

[0027] An aluminium alloy of the type AA6060 has the following alloy constituents in percentage by weight:

[0028] 0.35%≤Mg≤0.6%

[0029] 0.3%≤Si≤0.6%

[0030] 0.1%≤Fe≤0.3%

[0031] Cu≤0.1%

[0032] Mn≤0.1%

[0033] Cr≤0.05%

[0034] Zn≤0.10%

[0035] Ti≤0.1% and

the remainder being Al and inevitable impurities, up to a maximum in total of 0.15%, individually a maximum of 0.05%.

[0036] The combination of a precisely predetermined magnesium content with an Si content which is reduced in comparison with the first embodiment and narrowly specified Fe content produces an aluminium alloy in which the formation of Mg_2Si precipitations after hot rolling with the method according to the invention can be prevented particularly well so that a metal sheet having improved elongation and high yield points in comparison with conventionally produced metal sheets can be provided. The lower upper limits of the alloy constituents Cu, Mn and Cr additionally increase the effect of the method according to the invention. With respect to the effects of the upper limit of Zn and Ti, reference may be made to the statements relating to the first embodiment of the aluminium alloy.

[0037] An aluminium alloy of the type AA6014 has the following alloy constituents in percentage by weight:

[0038] 0.4%≤Mg≤0.8%

[0039] 0.3%≤Si≤0.6%

[0040] Fe≤0.35%

[0041] Cu≤0.25%

[0042] 0.05%≤Mn≤0.20%

[0043] Cr≤0.20%

[0044] Zn≤0.10%

[0045] 0.05% V≤0.20%

[0046] Ti≤0.1% and

the remainder being Al and inevitable impurities, up to a maximum in total of 0.15%, individually a maximum of 0.05%.

[0047] An aluminium alloy of the type AA6181 has the following alloy constituents in percentage by weight:

[0048] 0.6%≤Mg≤1.0%

[0049] 0.8%≤Si≤1.2%

[0050] Fe≤0.45%

[0051] Cu≤0.10%

[0052] Mn≤0.15%

[0053] Cr≤0.10%

[0054] Zn≤0.20%

[0055] Ti≤0.1% and

the remainder being Al and inevitable impurities, up to a maximum in total of 0.15%, individually a maximum of 0.05%.

[0056] An aluminium alloy of the type AA6111 has the following alloy constituents in percentage by weight:

[0057] 0.5%≤Mg≤1.0%

[0058] 0.7%≤Si≤1.1%

[0059] Fe≤0.40%

[0060] 0.50%≤Cu≤0.90%

[0061] 0.15%≤Mn≤0.45%

[0062] Cr≤0.10%

[0063] Zn≤0.15%

[0064] Ti≤0.1% and

the remainder being Al and inevitable impurities, up to a maximum in total of 0.15%, individually a maximum of 0.05%. The alloy AA6111 has in principle owing to the higher copper content higher strength values in the application state T6, but must be classified as being more susceptible to corrosion.

[0065] All of the aluminium alloys set out are adapted specifically in terms of their alloy constituents to different applications. As already set out, strips of these aluminium alloys, which have been produced using the method according to the invention, have particularly good uniform elongation values in the state T4 paired with a particularly evident increase of the yield point, for example, after artificial ageing at 205° C./30 min.

[0066] This also applies to the aluminium strips in the state T4 which have been subjected to heat treatment after the solution annealing.

[0067] Owing to the excellent combination between good formability in the state T4, high corrosion resistance and high values for the yield point Rp0.2 in the state for use (state T6), the object set out above is achieved according to a second teaching of the present invention by the use of an AlMgSi alloy strip produced by the method according to the invention for a component, chassis or structural part or panel in automotive, aircraft or railway vehicle engineering, in particular as component, chassis part, external or internal panel in automotive engineering, preferably as a bodywork component. In particular, visible bodywork components, for example, bonnets, mudguards, etc., and outer skin components of a railway vehicle or aircraft benefit from the high yield points Rp0.2 with good surface properties even after a forming with high degrees of deformation.

[0068] A rapidly hardening AlMgSi alloy strip having excellent formability can therefore be provided by an aluminium alloy strip which has been produced according to the invention and which has been subjected to a solution annealing with subsequent heat treatment after the production thereof. In the state T4, as already set out, it has a uniform elongation A_g of more than 25%, for example, with an yield point Rp0.2 of from 80 to 140 MPa. With this variant, a rapidly hardenable and at the same time very readily formable AlMgSi alloy strip can be provided. The artificial ageing in order to achieve the state T6 can be carried out at 185° C. for 20 minutes in order to achieve the required increase of the yield point.

[0069] According to a next embodiment, an aluminium alloy strip which has been produced according to the invention has a uniform elongation A_g of more than 25% in the rolling direction, transversely relative to the rolling direction and diagonally relative to the rolling direction so that a particularly isotropic formability is enabled.

[0070] Preferably, the aluminium strips produced according to the invention have a thickness from 0.5 mm to 12 mm. Aluminium strips having thicknesses from 0.5 mm to 2 mm are preferably used for bodywork components, for example, in automotive vehicle construction, whilst aluminium strips having larger thicknesses from 2 to 4.5 mm are used, for example, in chassis components for automotive vehicle construction. Individual components can also be produced in a cold strip with a thickness of up to 6 mm. In addition, in specific applications, aluminium strips with thicknesses of up to 12 mm can also be used. These aluminium strips with a very large thickness are conventionally provided only by means of hot rolling.

[0071] The invention will now be explained in greater detail with reference to embodiments together with the drawing.

BRIEF DESCRIPTION OF THE DRAWINGS

[0072] The drawing shows in the single FIG. **1** a schematic flow chart of an embodiment of the method according to the invention for manufacturing a strip from an MgSi aluminium alloy having the steps of a) producing and homogenising the rolling ingot, b) hot rolling, c) cold rolling and d) solution annealing with quenching.

DETAILED DESCRIPTION OF THE INVENTION

[0073] A rolling ingot **1** is first cast from an aluminium alloy with the following alloy constituents in percentage by weight:

[0074] 0.25%≤Mg≤0.6%

[0075] 1.0%≤Si≤1.5%

[0076] Fe≤0.50%

[0077] Cu≤0.20%

[0078] Mn≤0.20%

[0079] Cr≤0.10%

[0080] Zn≤0.20%

[0081] Ti≤0.15% and

the remainder being Al and inevitable impurities, up to a maximum in total of 0.15%, individually a maximum of 0.05%.

[0082] The rolling ingot produced in this manner is homogenised at a homogenisation temperature of approximately 550° C. for 8 hours in a furnace 2 so that the alloy constituents which have been added by means of alloying are present in the rolling ingot in a state distributed in a particularly homogeneous manner, FIG. **1***a*).

[0083] FIG. **1***b* illustrates how the rolling ingot **1** in the present embodiment of the method according to the invention is hot rolled in a reversing manner by means of a hot rolling mill **3**, the rolling ingot **1** having a temperature of from 400 to 550° C. during the hot rolling operation. In this embodiment, after leaving the hot rolling mill **3** and before the penultimate hot rolling pass, the hot strip **4** preferably has a temperature of at least 400° C., preferably from 470° C. to 490° C. Preferably at this hot strip temperature, the quenching of the hot strip **4** is carried out using a plate cooler **5** and the operating rollers of the hot rolling mill **3**. Preferably, the hot strip is in this instance cooled to a temperature of from 290° C. to 310° C. before the last hot rolling pass. To this end, the plate cooler **5**, illustrated only schematically, sprays the hot strip **4** with cooling rolling emulsion and ensures accelerated cooling of the hot strip **4** to the last-mentioned temperatures. The operating rollers of the hot rolling mill **3** are also loaded with emulsion and further cool the hot strip **4** during the last hot rolling pass. After the last rolling pass, the hot strip **4** has at the output of the plate cooler **5'** in the present embodiment a temperature from 200° C. to 230° C. and is subsequently coiled at this temperature by means of the recoiler **6**.

[0084] Owing to the fact that the hot strip **4** directly at the outlet of the last hot-rolling pass has a temperature of more than 135° C. to 250° C., preferably from 200° C. to 230° C., or optionally in the last two hot rolling passes, using the plate cooler **5** and the operating rollers of the hot rolling mill **3**, is brought to the temperatures mentioned, in spite of the increased winding temperature, the hot strip **4** has a frozen crystalline microstructural state which leads to very good uniform elongation properties A_g of more than 25% in the state T4. Nonetheless, owing to the higher coiling temperature, it can be processed more rapidly and advantageously. The hot strip having a thickness from 3 to 12 mm, preferably from 5 to 8 mm, is coiled via the recoiler **6**. As already set out, the coiling temperature in the present embodiment is preferably from 135° C. to 250° C.

[0085] In the method according to the invention, no or only a few coarse Mg_2Si precipitations are now able to form in the coiled hot strip **4**. The hot strip **4** has a very favourable crystalline state for further processing and can be decoiled from the decoiler **7**, supplied, for example, to a cold rolling mill **9** and recoiled on a recoiler **8**, FIG. **1***c*).

[0086] The resulting cold rolled strip **11** is coiled. Subsequently, it is supplied to a solution annealing operation at temperatures from 520° C. to 570° C. and a quenching operation **10**, FIG. **1***d*). To this end, it is decoiled again from the coil **12**, solution annealed in a furnace **10** and quenched, and again coiled to a coil **13**. After natural ageing at ambient temperature in the state T4, the aluminium strip can then be supplied with maximum formability. Alternatively (not illustrated), the aluminium strip **11** can be separated into individual sheets, which are present in the state T4 after natural ageing.

[0087] With larger aluminium strip thicknesses, for example, with chassis applications or components, such as, for example, brake anchor plates, piece annealing operations can also alternatively be carried out and the metal sheets can be subsequently quenched.

[0088] The aluminium strip or the aluminium sheet is brought into the state T6 by means of artificial ageing at from 100° C. to 220° C. in order to achieve maximum values for the yield point. For example, artificial ageing can also be carried out at 205° C./30 min.

[0089] The aluminium strips produced in accordance with the embodiment illustrated have after the cold rolling, for example, a thickness of from 0.5 to 4.5 mm. Strip thicknesses from 0.5 to 2 mm are conventionally used for bodywork applications or strip thicknesses of from 2.0 mm to 4.5 mm for chassis components in automotive vehicle construction. In both application fields, the improved uniform elongation values are a decisive advantage in the production of components since in most cases significant deformations of the metal sheets are carried out and nonetheless great strengths are required in the state for use (T6) of the end product.

[0090] Table 1 sets out the alloy constituents of aluminium alloys from which aluminium strips are produced in a conventional manner or according to the invention. In addition to the shown contents of alloy constituents, the aluminium strips contain as remainder aluminium and impurities, individually at a maximum of 0.05% by weight and in total a maximum of 0.15% by weight.

TABLE 1

Strips	Si % by weight	Fe % by weight	Cu % by weight	Mn % by weight	Mg % by weight	Cr % by weight	Zn % by weight	Ti % by weight
251	1.3	0.19	—	0.06	0.3	—	0.01	0.02
252	1.3	0.19	—	0.06	0.3	—	0.01	0.02
491-1	1.39	0.18	0.002	0.062	0.30	0.0006	0.01	0.0158
491-11	1.40	0.18	0.002	0.063	0.31	0.0006	0.0104	0.0147

[0091] The strips (samples) 251 and 252 were produced using a method according to the invention in which the hot strip was cooled and coiled within the last two hot rolling passes from approximately 470° C. to 490° C. to from 135° C. to 250° C. using a plate cooler and the hot rollers themselves.

In Table 2, the measurement values of these strips are designated "Inv.". Subsequently, a cold rolling operation was carried out to a final thickness of 0.865 mm.

[0092] The strips (samples) 491-1 and 491-11 were produced using a conventional hot rolling and cold rolling operation and designated "Conv.".

[0093] The results of the mechanical properties illustrated in Table 2 clearly show the difference in the achievable uniform elongation values A_g.

TABLE 2

							T6 205° C./30 Min.			
			T4							Δ
Strips		Thickness (mm)	Rp0.2 (MPa)	R_m (MPa)	A_g (%)	A_{80} (%)	Rp0.2 (MPa)	R_m (MPa)	A_g (%)	Rp0.2 (MPa)
251 L	Inv.	0.865	93	207	26.3	30.4				
251 Q	Inv.	0.865	86	203	26.4	29.0	193	249	12.4	107
251 D	Inv.	0.865	87	203	27.0	30.0				
252 L	Inv.	0.865	93	206	26.1	31.5				
252 Q	Inv.	0.865	88	205	26.6	29.0	185	244	12.2	97
252 D	Inv.	0.865	87	202	27.3	31.1				
491-1	Conv.	1.04	92	202	23.1	27.8	180	235	10.7	88
491-11	Conv.	1.04	88	196	23.0	27.4	179	232	11.2	91

[0094] In order to achieve the T4 state, the strips were subjected to a solution-annealing operation with subsequent quenching and subsequent natural ageing for eight days at ambient temperature. The T6 state was achieved by means of artificial ageing which followed the natural ageing at 205° C. for 30 minutes.

[0095] The samples designated L were cut out in the rolling direction, the samples designated Q transversely relative to the rolling direction and the samples designated D diagonally with respect to the rolling direction. The samples 491-1 and 491-11 were each measured transversely relative to the rolling direction.

[0096] It has been found that the advantageous microstructure, which was adjusted in the strips 251 and 252 by means of the method according to the invention, with an identical yield point Rp0.2 and strength Rm, enables a substantial increase of the uniform elongation A_g. The uniform elongation A_g increased from 23.0% to a maximum of 26.6% transversely relative to the rolling direction in the strips produced according to the invention in comparison with the conventionally produced strips.

[0097] The microstructure configured with the method according to the invention leads to the particularly advantageous combination of high uniform elongation A_g of more than 25% with very high values for the yield point Rp0.2 from 80 to 140 MPa. In the state T6, the yield point Rp0.2 increases up to at least 185 MPa, the uniform elongation A_g further remaining at more than 12%. The hardenability with a ΔRp0.2 of 97 or 107 MPa is furthermore very good in the strips produced according to the invention.

[0098] In the state T6, the increase of the uniform elongation A_g in comparison with conventionally produced strips was almost able to be preserved.

[0099] The elongation at break values A_g and A_{80}, the yield point values Rp0.2 and the tensile strength values Rm in the Tables were measured in accordance with DIN EN.

1. A method for manufacturing a strip from an AlMgSi alloy, comprising casting a rolling ingot from an AlMgSi alloy, wherein the rolling ingot undergoes homogenization, the rolling ingot which has been brought to a rolling temperature is hot rolled then optionally cold rolled to final thickness, and the finished rolled strip is solution annealed and quenched, wherein immediately after being discharged from the last hot rolling pass, the hot strip is at a temperature of more than 130° C. to 250° C., preferably to 230° C., and the hot strip is coiled at this temperature.

2. The method as claimed in claim **1**, wherein the hot strip is quenched to the outlet temperature using at least one plate cooler and the hot rolling pass itself, loaded with emulsion.

3. The method as claimed in claim **1**, wherein prior to the start of the cooling process, the temperature of the hot strip is more than 400° C.

4. The method as claimed in claim **1**, wherein the temperature of the hot strip after the penultimate roiling pass is more than 250° C.

5. The method as claimed in claim **1**, wherein the temperature of the hot strip after the last rolling pass prior to coiling is 200° C. to 230° C.

6. The method as claimed in claim **1**, wherein the thickness of the prepared hot strip is 3 mm to 12 mm, preferably 5 mm to 8 mm.

7. The method as claimed in claim **1**, wherein the aluminium alloy is of alloy type A6xxx, preferably AA6014, A016, A2'6060, AA6111 or A6181.

8. The method as claimed in claim **1**, wherein the finished, rolled aluminium strip undergoes a heat treatment, in which the aluminium strip is heated. to more than 100° C. after solution annealing and quenching and then coiled and aged at a temperature of more than 55° C., preferably more than 85° C.

9. Use of an aluminium strip manufactured by a method as claimed in claim **1** for a component, chassis or structural part or panel in automotive, aircraft or railway vehicle engineering, in particular as component, chassis part, external or internal panel in automotive engineering, preferably as a bodywork component.

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