Approval of Material Manufacturers
Zulassung von Werkstoffherstellern

This is to certify that the works of
Hiermit wird bescheinigt, dass die Firma

SAPA PROFILES UK LTD.
TIBSHELF WORKS
UNITED KINGDOM

has been subjected to an approval test in accordance with the Society's Rules with satisfactory results and is approved for the manufacture of the following products:
einer Zulassungsprüfung nach den Vorschriften des Germanischen Lloyd unterzogen wurde und für die Herstellung folgender Erzeugnisse zugelassen ist:

Wrought Aluminium Alloys
in accordance with the GL-Rules for Metallic Materials,
Chapter 3, Section 1.A

This approval is granted provided that all products intended to be used for the construction of ships or installations classed with Germanischer Lloyd comply in every respect with the Society's Rules and Requirements.
Die Zulassung erfolgt unter der Voraussetzung, dass alle Erzeugnisse, die zum Bau von Schiffen und Anlagen mit Klasse des Germanischen Lloyd bestimmt sind, die Vorschriften des Germanischen Lloyd in jeder Hinsicht erfüllen.

Certificate of approval No. WZ 423 HH 5
Zulassungsbescheinigung Nr.

This Certificate is valid until: 2014-06-30
Diese Bescheinigung ist gültig bis:

Part of the approval is our letter of approval ref. no. 063476-I-11 of 2011-05-26.
Bestandteil der Zulassung ist das Zulassungsanschreiben, Tgb.-Nr. 063476-I-11 vom 2011-05-26.

Hamburg, 2011-05-26

Germanischer Lloyd

i.A. Michael Kühnel

i.A. Oliver Krömer

Germanischer Lloyd SE • P.O. Box 11 16 06 • 20416 Hamburg/Germany

Sapa Profiles UK Ltd.
Tibshelf Works
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Your reference	Your Letter of	Our reference	Extension	Date
		063476-I-11/OKoe	+49 40 3 61 49-4561	2011-05-26

Approval of your works for the manufacture of sections (prolongation)

Dear Mr. Spendley,

Thank you for your company's commitment to manufacture products with GL certification.

We refer to our Surveyor's report on the inspection of your works performed on 2011-05-18 and to his confirmation that the results of continuous delivery tests witnessed by him are in full compliance with our Rules for Materials.

Therefore the preconditions for prolongation of approval of your works granted by our letter ref. no. 096273-08 dated 2008-07-03 are complied with.

The material grades, supply conditions and dimensions / weights covered by the approval are indicated in the approval annex.

The manufacturing details covered by the approval are as follows:

1. **Products**
   Hot extruded aluminium sections such as bars, angles, channels, tubes, i-beams and t-sections made of wrought aluminium alloys intended for the fabrication of ships' hulls, superstructures and other ship structures as well as for pipelines

2. **Dimensions**

Round Bar
Diameter: max. Ø68 mm
Weight: max. 9.842 kg/m

Flat Bar
Dimension: max. 200 x 15 mm²
Weight: max. 8.130 kg/m

Square Bar
Diameter: max. 70 x 70 mm²
Weight: max. 13.279 kg/m

Hexagonal Bar
Diameter: max. Ø46 mm
Weight: max. 4.966 kg/m

Equal Angle
Dimension: max. 152.4 x 152.4 x 12.7 mm
Weight: max. 10.106 kg/m

Unequal Angle
Dimension: max. 180 x 80 x 6 mm
Weight: max. 4.130 kg/m

Channel
Dimension: max. 203.2 x 76.2 x 9.53 x 12.7 mm
Weight: max. 9.953 kg/m

Round Tube
Dimension: max. Ø150 x 8 mm
Weight: max. 3.500 kg/m

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Rectangluar Tube
Dimension: max. 200 x 45 x 3 mm
Weight: max. 3.889 kg/m

Square Tube
Dimension: max. 152.4 x 152.4 x 6.35 mm
Weight: max. 10.061 kg/m

I-Beam
Dimension: max. 101.6 x 76.2 x 7.93 x 6.35 mm
Weight: max. 4.773 kg/m

T-Section
Dimension: max. 120 x 120 x 8 x 8 mm
Weight: max. 5.030 kg/m

3. Manufacturing process

Melting Process
Melting by melting furnace, holding furnace incl. mechanical stirring, casting by semi-continuous casting system with billet diameter of Ø178 mm and Ø228 mm, chemical and visual inspection, cutting

Hot Extrusion Process
Inspection and preparation of billets, reheating of billets by electric induction billet heater, hot extrusion by two horizontal hydraulic presses, cutting, heat treatment by aging furnace, machining, final inspection, packing, despatch

Our approval is granted under provision that all sections intended to be used for the outfit of ships classed with our Society will comply with our Rules in all respects and will be tested in the presence of our Surveyor.

The quality of your company's manufactured products, within the valid approved scope, contributes to the safety and reputation of GL classed ships.

Your company has been added to the list of approved manufacturers, which is regularly published on the Internet. In order to view the appropriate data start the GL website http://www.gl-group.com , from the menu "GL Tools" select "Approval Finder", and then "Manufacturers of Materials".

Enclosed please find our certificate of approval no. **WZ 423 HH 5**, valid until 2014-06-30, as well as the corresponding annex.

We thank you for your cooperation and wish your company every success.

Yours faithfully,

Germanischer Lloyd

i.A. Michael Kühnel

i.A. Oliver Krömer

Ref. no.: 063476-I-11

Manufacturer: Sapa Profiles UK Ltd.
Tibshelf Works

List 6: Aluminium and Copper Alloys

Grade	Key	Supply Condition (1)	max. Thick-ness, mm	max. Weight	Casting Method (2)	Remarks
GL AW-6005A	PR-AL	T6	70	13.279 kg/m	semi-	
GL AW-6061	PR-AL	T6	70	13.279 kg/m	semi-	
GL AW-6082	PR-AL	T6	70	13.279 kg/m	semi-	

Key: -AL Aluminium BD Strip BL Plates -CU Copper, Copper Alloys FF Hammer Forgings G Castings
GE Die Forgings HZ Prematerial PR Sections RO Pipes

(1):
AC, AF, AR = as cast, as forged, as rolled
CR = controlled rolled
F = ferritized
HF = hot formed
N = normalized
N+T = normalized + tempered
Q+T = quenched + tempered
SH = surface hardened
S+Q = solution annealed + quenched
TM = thermochemically rolled

(2):
CC = continuous casting
IC = ingot casting