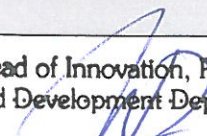


The stations for the refining and filtration of aluminium alloys		
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<i>General description of the refining and filtration station:</i>		
<p>Refining and filtration of liquid metal is a stage of the aluminium and aluminium alloys wire rod production technology after the stage of aluminium alloying process. The station consists degassing refining system, liquid metal filtration system and aluminium grain refiner dosage system. As a result of the refining and filtration process, the liquid aluminium or aluminium alloys of specified hydrogen, inclusion content and structure modification is obtained. The next stage of technology is continuous casting and rolling process. Critical parameters of the refining and filtration station are: production rate adapted to the CCR line productivity - 5000 kg / hour at aluminium EN AW 1370 at temperature 850 °C, the hydrogen content in liquid metal after refining - max 0,15 ml/100 g and the inclusion Removal Efficiency – min 95 %.</p>		
The scope	The parameter	The requirement
Liquid metal parameters	Produced aluminium alloys	<b>Aluminium alloy with added elements such as:</b> <b>Cu, Mn, Si, Mg, Zn, Zr.</b> (series: 1xxx, 2xxx, 3xxx, 4xxx, 5xxx, 6xxx, 7xxx, 8xxx, AlZr) <b>Especially aluminum alloys listed in standards: EN 1715-3: 2008 and 1715-4: 2008</b>
	Liquid metal temperature during casting and rolling	700 – 850°C
The station construction	The investment location	Documents: Plan 1 and Plan 2 - investment locations - B and C. Between the holding furnaces and the casting machine
	Available media at the investment location	Document: Media, Plan 1
	The station composition	Degassing refining system, liquid metal filtration system and aluminium grain refiner dosage system. The above systems are supposed to provide the gravitational transfer of liquid metal.
	The refining method	Degassing and purification treatment by two separately working rotors
	Used gases	Ar, Ar+Cl (max 5%)`
	Heating of the refining station chamber	Required, electrical / induction - holding of liquid metal temperature
	The construction of the filtration station	Two-chamber system working alternately
	The filtration method	Ceramic Foam Filter (CFF)
	Pore density	30 – 50 ppi
	Heating of the filter	Required, included as a part of a holding station
Aluminium grain refiner method	Continuous addition of AlTiB bar	

	Range of dosage	Form 0 to 300 cm/min
	Refractory materials	According to supplier solutions
	Temperature of the furnace/filter shell	Max. 50 °C above ambient temperature
	<b>Exhaust system for station (Degasser unit)</b>	<b>Required. Delivery includes an extraction hood with support structure. The delivery of the chimney and connecting ducts is on the side of the Purchaser</b>
	Connection of station elements	By a transport launder
	Transfer of the liquid metal in station	Gravitational, by a transport launder
	Transport launder	Required, included as a part of a refining and filtration station
	Max reduces of liquid aluminium temperature over the length of the transport launder	Max 0,5°C / per 1 m of launder length
<b>The operating parameters</b>	Production rate (Ability to deliver of the liquid aluminium)	Adapted to the CCR line productivity - 5000 kg / hour at liquid metal temperature 700 – 850°C
	Hydrogen content in liquid metal after refining	Max 0,15 ml/100 g
	Inclusion Removal Efficiency	Min 95 %
	Liquid metal temperature during casting and rolling	700 – 850°C
<b>The operation method</b>	Removal of the slag / melting losses	Manually, using tools
	Replacing the filter	Manually
	Transfer of the liquid aluminium to a casting machine	Gravitational, by a transport launder
	Transport launder	Required, included as a part of a refining and filtration station
	Max reduces of liquid aluminium temperature over the length of the transport launder	Max 0,5°C / per 1 m of launder length
<b>Measurement and control</b>	Place of liquid metal temperature measurement	In the refining station
	Controlling of the temperature in the refining station	Required, holding of constant metal temperature

	Control method of the temperature in the refining station	Manual and automatic according to alloying/holding programs
	Recording of measurement process parameters	<p>Continuous recording of process parameters:</p> <ul style="list-style-type: none"> <li>• Liquid metal temperature in the refining station chamber,</li> <li>• Liquid metal temperature in the filtration station chamber,</li> <li>• Signalling the opening of the refining station doors,</li> <li>• Signalling of rotors operations and speed,</li> <li>• Signalling and flow rate of refining/degassing gases</li> <li>• Electric energy consumption,</li> <li>• Signalling of the metal level in the filtration station chamber,</li> <li>• Signalling of heating systems operations.</li> </ul>
	Availability of measurement process parameters	Output of measurement process parameters to the NPA Skawina IT system
	Data integration	Integration of measurement process parameters with the operating panel of casting machine
	Type of PLCs	Compatible or equivalent to the standard driver used in the NPA Skawina. Type of standard: PLC - SIEMENS S7
Tools and parts and another parts	<b>Tools for commissioning of the section</b>	<b>The supply includes all the tools needed to commissioning and technical acceptance tests of the section.</b>
	<b>Spare parts</b>	<b>The supply includes tools / spare parts needed to maintain continuous production in 12 months</b>
	<b>List of spare parts</b>	<b>The supplier will provide a list of consumable / spare parts (necessary for User) with pricing and delivery times.</b>
	<b>Cabling system</b>	<b>The supply includes full cabling required to make connections between devices and control panels and power cabinets</b>
	<b>Technical documentation</b>	<b>Required in Polish</b>
	<b>Control software</b>	<b>The supplier will provide the user, after the warranty period, full access to the device control software</b>
<b>Acceptance</b>		
1. Project coordinator:.....		<p>Head of Innovation, Research and Development Department</p>  <p>PhD Eng. Piotr Ullasz</p>