International Journal of Research in Engineering and Science (IJRES)
ISSN (Online): 2320-9364, ISSN (Print): 2320-9356
www.ijres.org Volume 14 Issue 3 ǁ March 2026 ǁ PP. 49-54

A Review on Post-Processing Polishing of Laser Powder Bed Fusion AlSi10Mg Alloy

Guoqing Yan[1]
[1]*School of Materials and Chemistry, the University of Shanghai for Science and Technology, Shanghai, China*

Abstract
Benefiting from a favorable balance of strength and weight, laser powder bed fusion (LPBF) built AlSi10Mg has seen extensive engineering use in aerospace and automotive manufacturing. However, surface quality and performance remain key factors limiting its further application. The four main surface defects that affect surface quality are powder adhesion, staircase, balling, and ripple effects. These defects not only influence surface roughness and smoothness but also directly impact the mechanical properties of the material. In response to these challenges, this paper reviews several common post-processing polishing techniques, including mechanical polishing, laser polishing, abrasive flow polishing, electrochemical polishing, and chemical polishing, and discusses their applications, advantages, and suitability in improving surface quality.
Keywords: *Laser powder bed fusion (LPBF); AlSi10Mg alloy; Polishing*

Date of Submission: 01-03-2026 Date of Acceptance: 10-03-2026

I. Introduction

Laser powder bed fusion (LPBF) is a common route for metal additive manufacturing. The CAD model is sliced into layers, and powder is recoated on the substrate for each layer. A laser then selectively scans the layer cross-section to melt the powder, which solidifies and bonds to the previously built material. By repeating the “powder spreading–laser scanning–layer lowering” cycle, a three-dimensional part is built layer by layer [1]. To limit oxidation, LPBF is typically performed in a sealed chamber under an inert atmosphere [2]. LPBF allows the fabrication of components with complex internal flow channels that are difficult to obtain by conventional machining. The elimination of tool-access constraints inherent in the process enables the fabrication of conformal cooling channels and intricately designed flow passages, thereby enhancing fluid dynamics and heat transfer performance. The process can also consolidate assemblies into a single build, eliminating joints and sealing interfaces and thereby reducing potential leakage sites [2]. For micro-scale internal channels with small diameters and high aspect ratios, LPBF remains one of the few practical manufacturing routes [3]. The rapid solidification inherent to LPBF (cooling rates on the order of 10^5–10^6 K/s) typically results in a fine microstructure and can improve properties such as strength, which is relevant to applications in aerospace and biomedicine [1, 4]. Among aluminum alloys processed by LPBF, AlSi10Mg has been extensively studied due to its relatively stable processability and a workable processing window [1]. Its rapidly solidified microstructure is often associated with good mechanical performance, and the alloy has been used in, and continues to be investigated for, aerospace, automotive, and heat-exchanger applications.

In the LPBF process, four surface defects—namely the staircase effect, ripple effect, balling effect, and powder-adhesion effect—are the primary contributors to surface roughness. The staircase effect is inherent to the process and arises from the stacking of two-dimensional contours generated by slicing a three-dimensional model; when the surface is inclined, step-like textures readily appear on the outer surface, thereby affecting dimensional and geometric accuracy [5]. During laser scanning, non-uniform temperature distribution in the melt pool induces surface-tension gradients that drive melt flow along the surface (often referred to as Marangoni convection); after solidification, such flow may leave fine undulations, known as the ripple effect [6, 7]. When laser energy input is mismatched or the material exhibits inadequate wettability, the molten track may destabilize and undergo capillary-driven disintegration into discrete droplets—a defect known as balling. This phenomenon compromises surface quality and can impair inter-track or inter-layer bonding strength [8]. The related powder-adhesion effect refers to partially unmelted powder particles that, after thermal exposure, adhere to the part surface—particularly on down-facing surfaces of overhangs—thereby increasing surface roughness [5, 9].

A primary limitation of parts manufactured by LPBF is their inherently high surface roughness, which can severely degrade functional performance and preclude their use in demanding operational environments. From a mechanical perspective, surface asperities act as geometric discontinuities that promote local stress concentration under cyclic loading, facilitating early fatigue-crack initiation and reducing fatigue life and reliability [10]. In addition, surface defects such as partially fused powder and microcracks can reduce the effective load-bearing area, leading to decreases in ultimate tensile strength and yield strength [11]. For functional components such as fuel nozzles, heat exchangers, and precision cooling channels, rough internal walls increase flow resistance and pressure drop, weakening atomization and heat transfer performance; detached particles or powder may further clog narrow passages [2, 4]. In biomedical applications, excessive roughness or powder detachment may trigger inflammatory responses and irritate surrounding tissues; for mating components, increased roughness raises friction and accelerates wear, thereby compromising assembly accuracy and sealing performance [12].

Although optimizing process parameters (e.g., laser power and scan speed) can improve densification, it offers only limited control over surface quality. The stair-step profile is intrinsic to layerwise fabrication, and balling and powder adhesion arising from melt-pool instability cannot be completely removed by parameter optimization alone [4, 11]. Moreover, the parameter window that maximizes density does not necessarily coincide with that minimizing roughness, and parameter-based mitigation of side-surface roughness is generally less effective than for top surfaces [13]. Consequently, even with optimized parameters, the surface roughness (Ra) typically remains in the range of 5–15 μm [10, 12], whereas certain aerospace and medical-device components require substantially lower values. For these reasons, post-processing is often needed to achieve the target surface condition and ensure consistent final performance. This review systematically assesses the efficacy of various post-processing polishing techniques in enhancing the surface integrity of AlSi10Mg components fabricated by LPBF.

II. Result And Discussion

1.Mechanical Machining

Mechanical machining processes typically remove material through the application of external forces, enabling geometric modification or surface conditioning. Common methods such as milling and turning utilize hard cutting tools to physically remove excess material from workpiece surfaces. To mitigate thermal and mechanical loads in the cutting zone, these processes are often augmented by minimum-quantity lubrication (MQL) or the application of solid lubricants [14, 15]. Abrasive-based finishing techniques—including vibratory finishing and magnetic abrasive finishing—rely on relative motion between abrasive media and the target surface to achieve micro-cutting and polishing effects [16]. Surface impact treatments, such as shot peening, employ high-velocity media (e.g., glass beads) to impinge upon the surface, thereby flattening asperities and facilitating the removal of sintered particles [17].

Although mechanical finishing techniques can significantly improve the surface quality of additively manufactured components, their effectiveness remains strongly contingent upon the choice and sequencing of the processes applied. For AlSi10Mg components, vibratory finishing can reduce surface Sa from approximately 14–16 μm to 4–8 μm [14]; turning further lowers Ra to 0.8–1.0 μm from an initial 1.5–2.1 μm, and when combined with manual polishing, Ra can be reduced to as low as 0.3–0.75 μm [18]; a combination of grinding and magnetic abrasive finishing (GP+MAF) reduces Ra from 7 μm to 0.155 μm [16]. Shot peening is also efficient, reducing the roughness of aluminum alloys by 38% in a short time [17].

One significant benefit of mechanical machining is the enhancement of mechanical properties; it can increase fatigue life by up to 50 times by reducing stress concentration sites [18]. The process can also compact near-surface porosity, improving surface integrity. Methods,such as shot peening and vibratory finishing, are often low-cost and efficient [17]. However, the applicability of mechanical finishing is inherently limited by geometric accessibility, especially when internal or intricate features are involved. Conventional machining methods struggle to reach complex internal channels or lattice structures.Moreover, inappropriate parameters can result in surface degradation. Milling may leave flake-like debris, whereas excessive grinding or shot peening may cause scratches and deep pits, potentially re-exposing pore defects located beneath the surface.

2. Laser Polishing

Laser polishing is a non-contact surface post-processing method. It works by irradiating the part surface with a laser, which heats the near-surface material within a very short time and causes it to melt, thereby forming a thin molten layer on the surface [19]. During laser irradiation, the melt can redistribute under the combined influence of surface-tension gradients and gravity, tending to flow from small surface asperities into nearby valleys and depressions, which evens out the surface profile[20]. Rapid cooling and resolidification following beam departure retain the smoothed morphology, resulting in a higher-quality surface finish than that of the as-processed surface.

Recent experimental findings demonstrate that laser polishing substantially reduces the surface roughness of AlSi10Mg parts produced via LPBF. For components with an initial roughness Ra ranging from 6.2 to 21.5 μm, optimized processing parameters yield a post-polish Ra of 0.66–3.7 μm, corresponding to a reduction of approximately 70–92% [19-21]. As an example, roughness was reduced by about 87% for narrow-groove features in one study[22], while a separate study based on an oscillating beam reported a 92% reduction[21]. These reports support the use of laser polishing as an effective post-treatment for improving LPBF surface finish.Collectively, these findings underscore the efficacy of laser polishing in enhancing the surface quality of LPBF-manufactured parts.

By operating without physical contact, laser polishing circumvents tool wear and avoids the mechanical stresses inherent to conventional finishing methods, while its compatibility with automation enables precise regulation of process parameters. Moreover, beyond surface roughness reduction, this technique has been reported to decrease fine surface porosity and refine the near-surface microstructure, potentially contributing to improved surface hardness and corrosion resistance [23]. Nevertheless, the process typically demands stringent operating conditions and poses greater challenges when applied to highly reflective aluminum alloys; additionally, the rapid melting–solidification cycle may induce residual thermal stresses [24]. A further constraint arises when processing components with complex internal cavities: delivering the laser beam to the target region becomes problematic in the absence of a direct line of sight.

3. Abrasive Flow Machining

In abrasive flow machining (AFM), a medium filled with abrasive particles is forced to flow over the workpiece surface, removing material to improve the finish. This technique is commonly used for post-processing AlSi10Mg parts produced by laser powder bed fusion (LPBF). In practice, hard abrasive particles, such as SiC, alumina, or steel grit, are suspended in a viscoelastic polymer carrier. The medium is then driven, either by hydraulic pressure or rotation, to flow across external surfaces or through internal channels. As the medium passes over the surface, the particles can remove common LPBF features such as partially fused powder attachments and step-like protrusions, and local plastic deformation may also occur [25]. For relatively soft aluminum alloys like AlSi10Mg, abrasive density can play a more decisive role than hardness in determining material removal rates under specific conditions. Higher-density media, such as steel grit, tend to generate greater tangential forces during flow, facilitating the dislodgment of adhered particles [26]. Outcomes are jointly affected by abrasive type and size, medium viscosity, extrusion pressure, relative speed, number of cycles, and the angle between the surface and the flow direction; within a suitable range, adjusting this angle strengthens near-surface tangential action and helps improve both uniformity and efficiency of removal [27].

Although AFMcan effectively reduce the surface roughness of LPBF-built AlSi10Mg parts, the extent of improvement is highly dependent on processing parameters and the geometric complexity of the component. Reported results include the following: under a rotation-assisted fluidized-bed condition (high-density, irregular steel abrasives; tilt angle 25°), the Sa of flat specimens decreased from about 21.7 μm to 7.2 μm (~67%)[26]. Under an abrasive fluidized-bed condition, the Ra of flat specimens decreased from about 16.7 μm to 1.6 μm (~90%)[25]. For complex internal channels, a HydroFlex flexible-spindle approach was reported to reduce channel Sa to 1.58 μm (an 86% reduction) within about 5 min [27]. By contrast, for bar specimens processed by conventional AFM, Ra decreased from about 14.2 μm to 9.4 μm (~34%) [28]. The variability across studies stems from multiple factors: the driving mode and kinematics, the choice of abrasive–medium combination, and part geometry—particularly channel size and the distribution of flow resistance. Comparability is further complicated by differences in initial surface condition and the parameters used for roughness measurement.

The primary advantage of this method lies in its accessibility: the processing medium is capable of penetrating complex cavities and narrow channels, rendering it suitable for regions that conventional rigid tools cannot readily reach [25]. Furthermore, several studies have reported alterations in near-surface residual stress following treatment, which have been correlated with enhanced fatigue performance [28]. A further practical consideration arises when processing long or highly branched channels: pressure losses along the flow path can reduce the effectiveness of material removal at distal sections, leading to non-uniform results. Custom-designed fixtures and tooling, required on an application-specific basis, further add to both operational costs and preparation lead times.

4. Electrochemical Polishing

As a non-contact finishing technique, electrochemical polishing (ECP) relies on an applied potential within an electrolyte to drive controlled anodic dissolution of the workpiece surface. When the workpiece serves as the anode, dissolution does not proceed uniformly across the surface; microscopic protrusions typically dissolve faster, leading to preferential removal of asperities [29]. In addition, a viscous film develops on the anode surface. Because this film is thicker in valleys and thinner on protrusions, it further accentuates the preferential dissolution at protrusions and promotes surface leveling [30]. For LPBF-fabricated AlSi10Mg, the microstructure mainly comprises α-Al matrix and Si-rich phase. As Al dissolves preferentially during polishing, a Si-rich residual layer can form on the surface [31, 32], which impedes mass transport in the electrolyte and reduces polishing efficiency. To address this issue, pulsed current, intermittent polishing, heat treatment to tailor the Si-phase morphology, and approaches combining electrochemical action with mild mechanical assistance have been explored to improve process stability and polishing performance.

Electrochemical polishing (ECP) can substantially reduce the surface roughness of LPBF-fabricated AlSi10Mg when processing parameters are appropriately optimized, though the extent of improvement remains contingent upon the initial surface condition. Anand Kumar et al. employed pulsed ECP (current density ~30 A/dm²) and reduced Sa from 11.10 μm to 2.18 μm (~73.4% reduction) [29]. Using a similar pulsed mode, Defanti et al. reduced Sa from 6.15 μm to 1.57 μm in local measurements (~74.5% reduction) [30]. Liu et al. adopted an intermittent strategy in an NaOH-based electrolyte, reducing Sa from 14.90 μm to 1.84 μm (~87.7% reduction) [32]. The same group further reported that applying a 300 °C heat treatment prior to ECP reduced Sa from 13.96 μm to 2.33 μm (~82.5% reduction) [31]. Yu et al. combined ECP with mild mechanical assistance, reducing Sa from 14.91 μm to 2.19 μm (~85.3% reduction) [33]. Jeong et al. polished for 70 min in a different electrolyte system, reducing Ra from 14.0 μm to 2.0 μm (~85.7% reduction) [34].

ECP removes material electrochemically without tool contact. With little rubbing or mechanical loading on the surface, it typically causes limited mechanical damage and is unlikely to introduce significant residual stresses.It is well suited to complex parts and inaccessible regions (e.g., internal cavities/channels and curved surfaces). However, electrodes—and occasionally fixtures—usually have to be tailored to the specific geometry, increasing setup cost and reducing flexibility.

5. Chemical Polishing

Chemical polishing levels a surface mainly because micro-peaks dissolve faster than the surrounding valleys when the metal is immersed in a reactive bath. In practice, oxidation and dissolution occur at the same time, and the local renewal of the solution varies with the surface profile, which makes removal at asperity peaks faster than in depressions[35]. Peaks are more exposed to fresh solution, so the reactions proceed more readily and material removal is accelerated. Valleys, in contrast, tend to trap reaction products and see weaker solution exchange, leading to a lower local dissolution rate. As this rate difference persists, height variations gradually decrease and a net leveling effect is obtained.

From an application standpoint, chemical polishing can act fairly uniformly even in geometrically constrained regions, such as complex internal flow channels. However, the process is highly sensitive to time and temperature; poor control can easily cause over-etching and dimensional nonconformance. It also produces chemical waste streams, which bring environmental and disposal burdens. In engineering practice, surface improvement therefore needs to be weighed against dimensional control requirements and compliance-related costs.

III. Conclusion

LPBF can produce AlSi10Mg parts with complex internal channel networks, but the as-built surfaces are often too rough for demanding applications. The roughness mainly comes from the layer-by-layer stair-step effect, melt-pool–related ripples caused by flow behavior and instability of the solidification front, and balling when the energy input, track overlap, or wetting condition is not well matched. Powder-related issues also contribute, such as partially fused particles, redeposited spatter, and dross on down-skin overhangs. In many cases, tuning parameters alone cannot reliably meet roughness targets—especially for internal or shielded surfaces—so post-processing is usually required for stable service performance. Different finishing methods suit different geometries and requirements. Machining and abrasive polishing can reduce roughness effectively, but they are limited by tool access in complex features and microchannels. Laser polishing is a non-contact method and can be automated, but aluminum's high reflectivity leaves only a narrow stable window and may bring residual stress or remelting-related defects. Abrasive flow machining works well for internal passages, but material removal can become uneven in long or highly branched channels, and abrasive grains may be trapped or even embedded. Electrochemical and chemical polishing are also applicable to complex geometries; however, the multiphase microstructure of AlSi10Mg can cause selective etching, local Si enrichment, and residue buildup. These problems are typically more severe in deep channels, where shielding restricts the renewal of the electrolyte or polishing solution and makes material removal even less uniform. In practice, the post-processing route has to be selected by balancing achievable surface finish with accessibility, tolerance control, throughput and cost, and environmental requirements. For components with internal channels, tool access and removal uniformity should be prioritized to maintain flow performance and long-term reliability.

References

[1]. Aboulkhair, N. T., Simonelli, M., Parry, L., Ashcroft, I., Tuck, C., Hague, R. (2019) "3D printing of Aluminium alloys: Additive Manufacturing of Aluminium alloys using selective laser melting" Progress in Materials Science, Vol.(106), Pp.100578.

[2]. Champel, B., Baffie, T., Masmoudi, A., Frayret, J., Moro, I., Zribi, A., Peiffer, R., Carpier, S. (2025) "Dynamic chemical polishing of millimeter-size channels heat exchanger made of Ti-6Al-4V alloy by Laser Powder Bed Fusion" Next Materials, Vol.(9), Pp.101274.

[3]. Wang, B., Hao, J., Mi, T., Du, Y., Yang, M., Fei, Q., Wang, D., Yang, C., Dong, D. (2025) "Study on the Influence of Chemical Polishing on the Micro-Complex Flow Channels of SLM CoCrMo Superalloys with Different Surface Microstructure" Transactions of the Indian Institute of Metals, Vol.(78), Pp.190.

[4]. Lu, K., Zhang, Z., Zhao, F., Hu, P., Wang, Y., Li, S., Hu, R., Liu, G., Zhang, W. (2025) "Review on advanced machining methods for components with complex surfaces and structures produced by additive manufacturing" Surfaces and Interfaces, Vol.(72), Pp.107257.

[5]. Cabanettes, F., Joubert, A., Chardon, G., Dumas, V., Rech, J., Grosjean, C., Dimkovski, Z. (2018) "Topography of as built surfaces generated in metal additive manufacturing: A multi scale analysis from form to roughness" Precision Engineering, Vol.(52), Pp.249-265.

[6]. Aboulkhair, N. T., Maskery, I., Tuck, C., Ashcroft, I., Everitt, N. M. (2016) "On the formation of AlSi10Mg single tracks and layers in selective laser melting: Microstructure and nano-mechanical properties" Journal of Materials Processing Technology, Vol.(230), Pp.88-98.

[7]. Ramos, J. A., Bourell, D. L., Beaman, J. J. (2003) "Surface Over-Melt During Laser Polishing of Indirect-SLS Metal Parts" MRS Online Proceedings Library, Vol.(758), Pp.19.

[8]. Gu, D., Shen, Y. (2009) "Balling phenomena in direct laser sintering of stainless steel powder: Metallurgical mechanisms and control methods" Materials & Design, Vol.(30), Pp.2903-2910.

[9]. Rafi, H. K., Karthik, N. V., Gong, H., Starr, T. L., Stucker, B. E. (2013) "Microstructures and Mechanical Properties of Ti6Al4V Parts Fabricated by Selective Laser Melting and Electron Beam Melting" Journal of Materials Engineering and Performance, Vol.(22), Pp.3872-3883.

[10]. Khan, H. M., Karabulut, Y., Kitay, O., Kaynak, Y., Jawahir, I. S. (2021) "Influence of the post-processing operations on surface integrity of metal components produced by laser powder bed fusion additive manufacturing: a review" Machining Science and Technology, Vol.(25), Pp.118-176.

[11]. Boban, J., Ahmed, A., Jithinraj, E. K., Rahman, M. A., Rahman, M. (2022) "Polishing of additive manufactured metallic components: retrospect on existing methods and future prospects" The International Journal of Advanced Manufacturing Technology, Vol.(121), Pp.83-125.

[12]. Basha, M. M., Basha, S. M., Jain, V. K., Sankar, M. R. (2022) "State of the art on chemical and electrochemical based finishing processes for additive manufactured features" Additive Manufacturing, Vol.(58), Pp.103028.

[13]. Khosravani, M. R., Ayatollahi, M. R., Reinicke, T. (2023) "Effects of post-processing techniques on the mechanical characterization of additively manufactured parts" Journal of Manufacturing Processes, Vol.(107), Pp.98-114.

[14]. Bhaduri, D., Penchev, P., Dimov, S., Essa, K., Carter, L. N., Pruncu, C. I., Jiang, J., Pullini, D. (2020) "On the surface integrity of additive manufactured and post-processed AlSi10Mg parts" Procedia CIRP, Vol.(87), Pp.339-344.

[15]. Dou, Z., Guo, K., Sun, J., Huang, X. (2025) "Machinability Analysis of LPBF-AlSi10Mg: A Study on SL-MQL Efficiency and ML Prediction Models" Processes, Vol.(13), Pp.3687.

[16]. Teng, X., Zhang, G., Zhao, Y., Cui, Y., Li, L., Jiang, L. (2019) "Study on magnetic abrasive finishing of AlSi10Mg alloy prepared by selective laser melting" The International Journal of Advanced Manufacturing Technology, Vol.(105), Pp.2513-2521.

[17]. Calignano, F., Mercurio, V., Rizza, G., Galati, M. (2022) "Investigation of surface shot blasting of AlSi10Mg and Ti6Al4V components produced by powder bed fusion technologies" Precision Engineering, Vol.(78), Pp.79-89.

[18]. Afroz, L., Qian, M., Forsmark, J., Li, Y., Easton, M., Das, R. (2024) "Fatigue life of laser powder bed fusion (L-PBF) AlSi10Mg alloy: effects of surface roughness and porosity" Progress in Additive Manufacturing, Vol.(10), Pp.2423-2441.

[19]. Zhou, J., Han, X., Li, H., Liu, S., Yi, J. (2021) "Investigation of layer-by-layer laser remelting to improve surface quality, microstructure, and mechanical properties of laser powder bed fused AlSi10Mg alloy" Materials & Design, Vol.(210), Pp.110092.

[20]. El Hassanin, A., Obeidi, M. A., Scherillo, F., Brabazon, D. (2021) "CO2 laser polishing of laser-powder bed fusion produced AlSi10Mg parts" Surface and Coatings Technology, Vol.(419), Pp.127291.

[21]. Schanz, J., Hofele, M., Hitzler, L., Merkel, M., Riegel, H. (2016) "Laser Polishing of Additive Manufactured AlSi10Mg Parts with an Oscillating Laser Beam" Springer Singapore, Singapore 2016, p. 159-169.

[22]. Hofele, M., Roth, A., Schanz, J., Harrison, D. K., DeSilva, A. K., Riegel, H. (2021) "Laser polishing of laser powder bed fusion AlSi10Mg parts—influence of initial surface roughness on achievable surface quality" Materials Sciences and Applications, Vol.(12), Pp.15-41.

[23]. Zhou, J., Han, X., Li, H., Liu, S., Shen, S., Zhou, X., Zhang, D. (2021) "In-Situ Laser Polishing Additive Manufactured AlSi10Mg: Effect of Laser Polishing Strategy on Surface Morphology, Roughness and Microhardness" Materials (Basel), Vol.(14), Pp.393.

[24]. Karkadakattil, A. (2025) "Geometry aware laser polishing of LPBF AlSi10Mg defence components with physics inspired neural network based surface roughness prediction" Discover Mechanical Engineering, Vol.(4), Pp.52.

[25]. Atzeni, E., Barletta, M., Calignano, F., Iuliano, L., Rubino, G., Tagliaferri, V. (2016) "Abrasive Fluidized Bed (AFB) finishing of AlSi10Mg substrates manufactured by Direct Metal Laser Sintering (DMLS)" Additive Manufacturing, Vol.(10), Pp.15-23.

[26]. Troiano, M., El Hassanin, A., Solimene, R., Silvestri, A. T., Scala, F., Squillace, A., Salatino, P. (2024) "Fluidized bed finishing of additively manufactured objects: The influence of operating parameters" Powder Technology, Vol.(432), Pp.119115.

[27]. Chernjavsky, P., Dey, R., Shanks, J., Zheng, Y. (2025) "Experimental investigation of hydrodynamic flexible spindle polishing of metal additively manufactured channels" Journal of Manufacturing Processes, Vol.(138), Pp.24-37.

[28]. Rümmler, C., Neumann, G. R. H., Groh, W., Hähnel, F., Grumbt, G., Tropschuh, R., Schiemann, T., Markmiller, J. F. C. (2024) "Study of the influence of additive manufacturing applicable surface treatment methods on mechanical part properties for use in aerospace applications" CEAS Aeronautical Journal, Vol.(15), Pp.481-495.

[29]. Anand Kumar, S., Sudarshan Reddy, A., Mathias, S., Shrivastava, A., Raghupatruni, P. (2021) "Investigation on pulsed electrolytically polished AlSi10Mg alloy processed via selective laser melting technique" Proceedings of the Institution of Mechanical Engineers, Part L: Journal of Materials: Design and Applications, Vol.(239), Pp.1892-1904.

[30]. Defanti, S., Denti, L., Vincenzi, N., Gatto, A. (2020) "Preliminary Assessment of Electro-Chemical Machining for Aluminum Parts Produced by Laser-Based Powder Bed Fusion" Smart and Sustainable Manufacturing Systems, Vol.(4), Pp.121-134.

[31]. Liu, H., Ye, M., Shen, X., Ye, Z., Wang, L., Wang, G., Xu, P., Wang, C. (2024) "Improving surface electrochemical polishing quality of additive manufactured AlSi10Mg by reconstituting the Si phase" Surface and Coatings Technology, Vol.(479), Pp.130549.

[32]. Liu, H., Ye, M., Ye, Z., Wang, L., Wang, G., Shen, X., Xu, P., Wang, C. (2022) "High-quality surface smoothening of laser powder bed fusion additive manufacturing AlSi10Mg via intermittent electrochemical polishing" Surface and Coatings Technology, Vol.(443), Pp.128608.

[33]. Yu, Z., Liu, H., Ye, Z., Wang, L., Wang, G., Ye, M., Wang, C. (2023) "A comparison study of the electrochemical polishing of laser powder bed fusion HR-2 stainless steel and AlSi10Mg" Journal of Applied Electrochemistry, Vol.(53), Pp.1157-1166.

[34]. Jeong, J.-U., Lee, K.-K., Ahn, D.-G., Lee, J.-W. (2024) "Study of surface roughness change of AlSi10Mg based on selective laser melting (SLM) using electro-polishing technique" Journal of Mechanical Science and Technology, Vol.(38), Pp.4579-4585.
[35]. Calvet, M., Domenech, A., Vilaro, S., Meseguer, T., Bautista, L. (2023) "Innovative Post-Processing for Complex Geometries and Inner Parts of 3D-Printed AlSi10Mg Devices" Materials (Basel), Vol.(16), Pp.7040.