

金属熱処理業職種（表面熱処理（浸炭・浸炭窒化・窒化）作業） Job Category : Metal Heat Treatment (Operation : Surface heat treatment (carburizing, carbonitriding, nitriding) work)			
作業の定義 Criteria of Operation	<p>金属表面に炭素や窒素を固溶・侵入させることで、硬度や機械的性質を変化させ、製品・部品に使用される素材の特性を高める作業をいう。</p> <p>This operation refers to the work of enhancing the properties of materials for products and parts, by having the carbon or nitrogen to dissolve into a solid solution and penetrate the metal surface, and changing the hardness or/and mechanical nature of them.:</p> <p>表面熱処理(浸炭)作業：高温の鋼に炭素が固溶する現象を利用した熱処理で、雰囲気中の炭素を鋼表面に侵入、内部拡散させ炭素の多い表面層を作り硬化する。</p> <p>Surface heat treatment (carburizing) work : This heat treatment utilizes the phenomenon that carbon solidly dissolves in steel at high temperatures, which makes the carbon in the atmosphere penetrate the steel and diffuse internally, and hardens the steel by creating a carbon-rich surface layer.</p> <p>表面熱処理(浸炭窒化)作業：炭素と同時に窒素を侵入させ表面層を作り硬化する。浸炭に比べ、浸炭層は浅いが焼入性が高いため、安価な低炭素鋼に適用。</p> <p>Surface heat treatment (carbonitriding) work : This heat treatment creates a surface layer and hardens the metal by infiltrating nitrogen and carbon at the same time. Compared to carburizing, the carburized layer is shallower, but the quenchability is higher, so it is applied to inexpensive low-carbon steel.</p> <p>表面熱処理(窒化)作業：鋼を窒素雰囲気中で加熱し、鋼の表面に窒化物を形成させ硬化する。浸炭に比べ変形が少ないため軽荷重の高寸法精度品に適用。</p> <p>Surface heat treatment (nitrogen) work : Heating steel in a nitrogen-containing atmosphere, and hardening by forming nitrides on the steel surface. Because it causes less deformation than carburizing, it is suitable for light-load, high-dimensional precision products.</p> <p>本職種・作業で技能実習生を受入れる事業所は、以下の①または②の要件を満たす必要がある。</p> <p>The offices that accept technical intern trainees are required to meet the following condition (1) or (2) with this job category / operation.</p> <p>①専業で金属熱処理を行っている事業所（日本標準産業分類の細分類2465に該当する事業所）</p> <p>① Offices that specialize in metal heat treatment (Offices that falls under Subclassification 2456 of the Japan Standard Industrial Classification)</p> <p>②事業の一部に金属熱処理の部署等があり、以下の両方の要件を満たす事業所</p> <p>② Offices which have metal heat treatment section in the office, and satisfy both of the following conditions.</p> <ul style="list-style-type: none"> - 金属熱処理に専属で従事している常勤職員が10名以上在籍していること - Having enrollment of 10 or more full time workers who engage exclusively in to metal heat treatment. - 金属熱処理技能士（特級又は1級）が1名以上勤務していること - Having at least 1 worker as a Metal heat treatment technician (special grade or first grade). 		
	必須業務(移行対象職種・作業で必ず行う業務) Compulsory works (Works to be essential on the operations in the job categories to be shifted)	第1号技能実習 Technical Intern Training (i)	第2号技能実習 Technical Intern Training (ii)
	(1) 表面熱処理(浸炭・浸炭窒化・窒化)作業 Surface heat treatment (carburizing, carbonitriding, nitriding) work ①加工方法の設定・準備作業 Setting and preparation work of processing Method 1.仕様書確認作業 2.数量確認作業 3.加工ロット確認作業 1.Specification check work, 2.Quantity check work 3. Processing Lot check work ②前処理作業 Pre processing work 1.洗浄作業 1.Washing work ③加熱・冷却作業 Heating/cooling work 1.計器確認・記録作業 1.Instrument check/record work ④焼戻し加熱・冷却作業 Tempering/cool work 1.計器確認・記録作業 1.Instrument check/record work ⑤後処理作業 Post processing work 1.研掃作業 1.Grinding work	(1) 表面熱処理(浸炭・浸炭窒化・窒化)作業 Surface heat treatment (carburizing, carbonitriding, nitriding) work ①加工方法の設定・準備作業 Setting and preparation work of processing Method 1.仕様書確認作業 2.数量確認作業 3.加工ロット確認作業 4.段取り作業 5.図面確認作業 1.Specification check work, 2.Quantity check work 3. Processing Lot check work 4.Setup work 5.Drawings check work ②前処理作業 Pre processing work 1.洗浄作業 2.浸炭防止作業 1. Washing work 2. Carburizing prevention work ③加熱・冷却作業 Heating/cooling work 1.計器確認・記録作業 2.操炉作業 1.Instrument check/record work 2.Furnace operation ④中間検査作業 Intermediate inspection work 1.外観・割れ確認作業 2.硬さ試験 1.Appearance / cracking check work 2.Hardness test ⑤焼戻し加熱・冷却作業 Tempering/cool work 1.計器確認・記録作業 2.操炉作業 1.Instrument check/record work 2.Furnace operation ⑥後処理作業 Post processing work 1.研掃作業 2.脱脂作業 3.防錆作業 1.Grinding work 2.Degreasing work 3.Anti-corrosion work	(1) 表面熱処理(浸炭・浸炭窒化・窒化)作業 Surface heat treatment (carburizing, carbonitriding, nitriding) work ①加工方法の設定・準備作業 Setting and preparation work of processing Method 1.仕様書確認作業 2.数量確認作業 3.加工ロット確認作業 4.段取り作業 5.図面確認作業 6.治具装着作業 1.Specification check work, 2.Quantity check work 3. Processing Lot check work 4.Setup work 5.Drawings check work 6.Jig mounting work ②前処理作業 Pre processing work 1.洗浄作業 2.浸炭防止作業 1. Washing work 2. Carburizing prevention work ③加熱・冷却作業 Heating/cooling work 1.計器確認・記録作業 2.操炉作業 1.Instrument check/record work 2.Furnace operation ④中間検査作業 Intermediate inspection work 1.外観・割れ確認作業 2.硬さ試験 3.変形測定作業 1.Appearance / cracking check work 2.Hardness test 3.Deformation measurement work ⑤焼戻し加熱・冷却作業 Tempering/cool work 1.計器確認・記録作業 2.操炉作業 1.Instrument check/record work 2.Furnace operation ⑥後処理作業 Post processing work 1.研掃作業 2.脱脂作業 3.防錆作業 4.歪み矯正作業 1.Grinding work 2.Degreasing work 3.Anti-corrosion work 4.Distortion correction work

	<p>⑦加工品検査作業 Processed product inspection work</p> <p>1.外観・割れ確認作業 2.硬さ試験 3.浸透探傷・磁粉試験 4.浸炭硬化層深さ測定作業</p> <p>1.Appearance / cracking check work 2.Hardness test 3.Penetrant testing/magnetic particle test 4.Carburized layer depth measurement work</p>		<p>⑦加工品検査作業 Processed product inspection work</p> <p>1.外観・割れ確認作業 2.硬さ試験 3.浸透探傷・磁粉探傷試験 4.浸炭硬化層深さ測定作業 5.変形測定試験 6.金属組織試験 7.材料試験(引張、衝撃)</p> <p>1.Appearance / cracking check work 2.Hardness test 3.Penetrant testing/magnetic particle test 4. Carburized layer depth measurement work 5.Deformation measurement test 6.Metallographic test 7.Material test (pulling, impact)</p>
	<p>(2)安全衛生業務</p> <p>①雇入れ時等の安全衛生教育 ②作業開始前の安全装置等の点検作業 ③金属熱処理職種に必要な整理整頓作業 ④金属熱処理職種の作業用機械及び周囲の安全確認作業 ⑤保護具の着用と服装の安全点検作業 ⑥安全装置の使用等による安全作業 ⑦労働衛生上の有害性を防止するための作業 ⑧異常時の応急処置を習得するための作業</p>	<p>*</p>	<p>(2) Safety and health work</p> <p>① Safety and health education at the time of employment, etc. ② Inspection work of safety equipment etc. before work ③ Organization, cleanliness, cleaning work required for Metal heat processing ④ Safety confirmation work of machines and surroundings for Metal processing ⑤ Safety inspection work of wearing protective equipment etc. and clothes ⑥ Safety work by using safety devices, etc ⑦ Work to prevent hazards in occupational health ⑧ Work to acquire emergency measures in case of abnormalities</p>
<p>関連業務・周辺業務(上記必須業務に関連する技能等の習得に係る業務等で該当するものを選択すること。)</p> <p>Related works, Peripheral works (Select what is applicable in works related to acquisition of skills etc. concerning above essential tasks.)</p>	<p>(1)関連業務</p> <p>①熱処理用設備及び治具管理作業 ②作業指示書、作業工程表作成作業 ③加工品検査に伴う検査成績票発行作業 ④機械、設備点検作業 ⑤床上操作式クレーン運転作業 (技能講習が必要) ⑥運搬作業 (フォークリフト運転を含む場合は、特別教育又は技能講習が必要) ⑦玉掛作業 (特別教育又は技能講習が必要) ⑧溶接作業 (ガス、アーク) (特別教育又は技能講習が必要) ⑨危険物 (乙種第4類) 取扱作業 (資格が必要) ⑩研削といし取替・試運転作業 (特別教育が必要)</p> <p>(2)周辺業務</p> <p>①注文書、現品荷札確認作業 ②受注品受入れ・搬入・一時保管・履歴確認作業 ③梱包・出荷・荷積み作業 ④作業環境整備作業</p> <p>(3)安全衛生業務(関連業務、周辺業務を行う場合は必ず実施する業務) 上記※に同じ</p>		<p>(1) Related works</p> <p>① Maintenance work for heat treatment equipments and jigs ② Creation work of work instructions and work process chart ③ Issuance work of inspection reports of processed products ④ Inspecting work of machines and equipments ⑤ Operation work of floor-operated crane (Skills training course required) ⑥ Carriage work (when including operating forklift work, special education or skills training course required) ⑦ Slings work (special education or skills training course required) ⑧ Welding work (gas, ark)(special education or skills training course required) ⑨ Hazardous materials (Class B, Category 4) handling work (License required) ⑩ Grinding wheel replacement / trial operation work (special education required)</p> <p>(2) Peripheral works</p> <p>① Checking work of purchase order and actual shipping tag ② Checking work of acceptance of ordered products, delivery, temporary storage and history ③ Work of packing, shipping and loading ④ Work environment preparation work</p> <p>(3) Safety and health work(operation to be carried out whenever related works and peripheral works are carried out) Same as above (*)</p>
<p>使用する素材、材料等(該当するものを選択すること。)</p> <p>Materials to be used (Select the appropriate one)</p>	<p>1. 機械構造用炭素鋼鋼材 2. 構造用鋼材 (H鋼) 3. 機械構造用合金鋼材 4. ステンレス鋼材 5. 炭素工具鋼鋼材 6. 高速度工具鋼鋼材 7. 合金工具鋼鋼材 8. ばね鋼鋼材 9. 高炭素クロム軸受鋼鋼材 10. 炭素鋼鍛鋼品 11. 炭素鋼鋳鋼品 12. 構造用高張力炭素鋼 13. 低合金鋼鋳鋼品 14. ねずみ鋳鋼品 15. 球状黒鉛鋳鉄品 16. オーステンパ球状黒鉛鋳鉄品</p>		<p>1. Carbon steel material for machine structural use 2. Steel material for structural use (H steel) 3. Alloy steel material for machine structural use 4. Stainless steel material 5. Carbon tool steel material 6. High-speed tool steel material 7. Alloy tool steel material 8. Spring steel material 9. High carbon chromium bearing steel material 10. Carbon steel forgings 11. Carbon steel castings 12. High tensile strength steel for structural use 13. Low alloy steel castings 14. Gray cast iron 15. Spheroidal graphite cast iron 16. Austempered spheroidal graphite cast iron</p>

<p>使用する機械、器具等(該当するものを選択すること。)</p> <p>Machines, equipment, tools etc. to be used (Select the appropriate one)</p>	<p>1. ①～③のいずれか一つ、及び2. ～5. 並びに8. ③～⑧は必ず使用すること</p> <p>1. 表面熱処理設備 ①浸炭処理設備②浸炭窒化処理設備③窒化処理設備</p> <p>2. 熱処理前及び後処理作業設備 (洗浄機、ロール矯正機、油圧プレス等)</p> <p>3. 各種熱処理用手工具 (モンキ、スパナ、ドライバ、ペンチ等)</p> <p>4. 各種測定用器工具 (定規、ノギス、検査ゲージ等)</p> <p>5. 各種保護具 (防護メガネ、ヘルメット、安全靴、作業用手袋等)</p> <p>6. 各種電動工具 (旋盤、フライス盤、研削盤、ボール盤等)</p> <p>7. 各種運搬装置 (クレーン、フォークリフト等)</p> <p>8. 各種検査機器 (①ブリネル硬さ試験機②ビッカース硬さ試験機③ロックウェル硬さ試験機④万能(疲労)試験機⑤金属顕微鏡⑥磁気探傷装置⑦引張試験機⑧衝撃試験機)</p>	<p>Be sure to use 1.(one of ①~③), 2~5 and 8.(③~⑧)</p> <p>1. Surface heat treatment equipments ①Carburizing treatment equipments ② Carbonitriding treatment equipments ③ Nitriding treatment equipments</p> <p>2. Equipment for work before or after heat treatment (Washing machine, Roll straightening machine, hydraulic press, etc.)</p> <p>3. Various hand tools for heat treatment (Adjustable Wrench, Open End Wrench, Screw Driver, Lineman's pliers, etc.)</p> <p>4. Various instruments and tools for measurement (Ruler, Calipers, Inspection Gauge, etc.)</p> <p>5. Various protectors (Safety goggles, Helmet, Safety shoes, working gloves etc.)</p> <p>6. Various power tools (Lathe, Milling machine, Grinder, Drilling machine, etc.)</p> <p>7. Various carrying equipments (Crane, Forklift, etc.)</p> <p>8. Various inspection equipment (①Brinell hardness tester, ②Vickers hardness tester, ③Rockwell hardness tester, ④Universal (fatigue) testing machine, ⑤ Metallurgical microscope, ⑥Magnetic particle tester, ⑦Tensile tester, ⑧Impact tester)</p>
<p>製品等の例(該当するものを選択すること。)</p> <p>Examples of products etc. (Select the appropriate one.)</p>	<p>※輸送機械：輸 一般機械：一 金属製品：金 精密機械：精 その他：他</p> <p>1. 輸：ベアリング、自動車用ギア、船舶用油圧プランジャー等</p> <p>2. 一：建機用ワッシャー、建機用シリンダー、フォークリフトアーム等</p> <p>3. 金：ボルト、金型等</p> <p>4. 精：計測機械部品、事務機器ギア等</p> <p>5. 他：風力発電用ベアリング、工業用刃物等</p>	<p>1. Transport machinery : Bearings, Automotive gear, Marine Hydraulic Plungers, etc.</p> <p>2. General machinaery : Washer for construction machinery, Construction machine cylinder, Forklift arm, etc.</p> <p>3. Metal products : Bolt, Mold, etc.</p> <p>4. Precision machinery : Measuring machine parts, Office equipment gear, etc.</p> <p>5. Others : , Bearings for wind power generation, Industrial cutlery, etc.</p>
<p>対象職種・作業とはならない業務例</p> <p>Example of works which is not eligible for the job categories / operations to be shifted</p>	<p>1. 以下の金属素形材製品製造作業 ①鋳造作業 ②鍛造作業 ③金属プレス作業④ダイカスト作業⑤粉末冶金作業⑥金型製造作業</p> <p>2. 金属メッキ作業</p> <p>3. 金属加工作業</p> <p>4. 上記の関連業務及び周辺作業のみの場合</p>	<p>1. The following work of manufacturing metal material products ① Casting work ② Forging work ③ Metal pressing work ④ Die casting work ⑤ Powder metallurgy work ⑥ Mold manufacturing work</p> <p>2. Metal plating work</p> <p>3. Metal processing work</p> <p>4. In case of above related or peripheral work only</p>