

# Heat Treatment Certificates



**As a professional body, CHTA awards heat treatment certificates to recognise personnel who have gained a broad understanding of heat treatment and related topics, based on their training and experience.**

## APPLICATION FORM

*The sponsor should be a senior member of the candidate's employing company.*

Please indicate the certificate being applied for:

**CHTA Heat Treatment Certificate Level 1**, aimed at individuals such as technicians, inspectors, experienced operators and setters.

**CHTA Heat Treatment Certificate Level 2**, aimed at individuals such as team leaders, departmental supervisors and managers.

**See Appendix 1 for the basis upon which applications are considered.**

### CANDIDATE'S DETAILS

Name:

Company:

Company address

Job Title:

### SPONSOR'S DETAILS

Name:

Job Title:

E-mail address:

Telephone number:

### CANDIDATE'S EXPERIENCE

Please summarise the scope and duration of the candidate's experience:

## CANDIDATE'S TRAINING

### Internal training

Please summarise the scope and course duration of the candidate's in-company training, linking its relevance to the topics listed in Appendix 1:

### External training

Please summarise the scope and duration of the candidate's participation in external courses, linking its relevance to the topics listed in Appendix 1:

## FEES

Applications will be considered after payment of the following fee (non-refundable):

Certificate	Cost to CHTA member company	Cost to non-member company
CHTA Heat Treatment Certificate <b>Level 1</b>	<b>£150</b>	<b>£350</b>
CHTA Heat Treatment Certificate <b>Level 2</b>	<b>£100</b>	<b>£250</b>

Please indicate to whom the CHTA invoice should be addressed:

Name:

E-mail address:

SPONSOR'S SIGNATURE:

Date:

## SUBMISSION

Please return this completed form and supporting documentation to [mail@chta.co.uk](mailto:mail@chta.co.uk) or by post to CHTA c/o SEA, Federation House, 10 Vyse Street, Birmingham, B18 6LT, for forwarding to CHTA's Training Subcommittee.



## APPENDIX 1 - APPLICATION ASSESSMENT

**Applications and supporting documentation from candidates' company management are assessed, at quarterly meetings of CHTA's Training Subcommittee, on the following basis...**

### CHTA HEAT TREATMENT CERTIFICATE – LEVEL 1

To be awarded for a minimum of one year's relevant experience in a heat treatment environment plus completion of training on all topics shown below:

#### **Practical topics - understanding of:**

- (a) Basic metallography and microscopy.
- (b) Destructive test methods.
- (c) Non-destructive test methods.
- (d) Hardness testing.

#### **Theoretical topics**

- (a) Fundamentals of metallurgy.
- (b) Properties and uses of common engineering metals and alloys.
- (c) Heat treatment basic theory and common techniques; to include:
  - Through hardening, precipitation hardening, stress relieving, annealing, normalising.
  - Case hardening, incorporating: nitriding, carburising, carbonitriding, nitrocarburising, induction and flame hardening, 'stopping-off'.
- (d) Furnace types and media – strengths and weaknesses. To include: muffle, pit, sealed-quench, continuous, vacuum furnaces and salt baths.

### CHTA HEAT TREATMENT CERTIFICATE – LEVEL 2

To be awarded for a minimum of two year's relevant experience in a heat treatment environment plus completion of training on three topics from Certificate Level 1 "Practical topics" **and** topics 1-5 **and** one of 6-9 from the list detailed below:

- (1) The nature of metals and alloys – incorporating crystal structures, phase diagrams, grain orientation and common microstructures found in heat-treated metals.
- (2) Ferrous and non-ferrous alloys – common alloying elements and their effects.
- (3) Heat treatment – principles and practice. To cover the same processes as in Level 1 theoretical (c) and (d) in more detail plus HIP and plasma treatments; to include furnace design and construction details, control of furnace atmospheres, heating rates, soaking times, diffusion, and safety concerns.
- (4) Quenching – theory and methods, incorporating TTT and CTT diagrams and other allied topics.
- (5) Metallurgical failure – methods, analysis and prevention.
- (6) Temperature measurement techniques.
- (7) Metal-forming techniques.
- (8) Corrosion – causes and prevention.
- (9) Joining of metals – methods: brazing, electron-beam, friction, rod, MIG, TIG.

### EXPERIENCE VERIFICATION

A confirmation statement of relevant experience is required from a senior member of the candidate's employing company.

### TRAINING VERIFICATION

#### **External training**

The CHTA Training Subcommittee will assess if the external courses completed by the applicant are of sufficient standard.

#### **Internal training**

The CHTA Training Subcommittee will assess if in-company training is of sufficient standard after the examination of a sample. If there are any objections from employing companies, internal course content will be examined by the CHTA Secretary or another commercially-independent individual or organisation, such as Wolfson Heat Treatment Centre.

**If any application is deemed not to meet the guidelines set out in Appendix 1, feedback will be provided to the sponsor to support re-consideration.**

## APPENDIX 2 – SOME EXTERNAL TRAINING COURSES AVAILABLE (2017)

Provider	Course title	Time		Cost £	Cost \$	Additional information
		Days	Hours			
<b>AMRC:</b> <a href="http://www.amrcrtraining.co.uk/course-calendar">www.amrcrtraining.co.uk/course-calendar</a>						
	Testing Techniques	1		£400		
	Metals Processing & Manufacturing Technologies	1		£400		
	Metallurgy for Non-Metallurgists	2		£700		
	Metallurgical Failures Analysis & Prevention	1		£400		
	Carbon & Alloy Steel Metallurgy	1		£400		
	Fundamentals of Metallurgy	1		£400		
	Principles of Heat Treatment	1		£400		
	Stainless Steel Metallurgy	1		£400		
<b>BIFCA:</b> <a href="http://www.bifca.org.uk/page.asp?node=158&amp;sec=Training">www.bifca.org.uk/page.asp?node=158&amp;sec=Training</a>						
	Introduction to Induction Hardening	1		£235		
	Furnace & Burner Controls	1		£235		
<b>WOLFSON HEAT TREATMENT CENTRE:</b> <a href="http://www.sea.org.uk/whtc/uhc-course/">www.sea.org.uk/whtc/uhc-course/</a>						
	Understanding Heat Treatment	3		£890		£735 for subscribers
<b>EQUALEARN:</b> <a href="http://p-r-i.org/professional-development/training-2/">http://p-r-i.org/professional-development/training-2/</a>						
	NDT Level 3 Responsibilities	1		£330		
	Root Cause Corrective Action	1		£310		
	Introduction to Pyrometry	2		£655		
	Nadcap Audit Preparation - Heat Treating	2		£475		Other Nadcap Audit prep courses available
	Process FMEA	2		£475		
	Heat Treating (Owner)	2		£590		
<b>Webinars:</b> <a href="http://www.equalearn.com/learncenter.asp?id=178409&amp;page=31">www.equalearn.com/learncenter.asp?id=178409&amp;page=31</a>						
	Basic Heat Treatment		3		\$200	
	Basic Metallurgy of Heat Treatment		3		\$200	
	Heat Treatment in Brazing		1.5 - 2		\$175	
	Heat Treatment of Alloy Steels		1.5 - 2		\$175	
	Heat Treatment of Titanium Alloys		1.5 - 2		\$175	
	Heat Treatment of Stainless Steel		1.5 - 2		\$175	
	Heat Treatment in Diffusion Processes, e.g. Carburising		1.5 - 2		\$175	
	Heat Treatment of Aluminium Alloys		1.5 - 2		\$175	
	Heat Treatment of Nickel Based Alloys		1.5 - 2		\$175	
	Contract Review		3		\$175	
	Nadcap Audit Preparation		3		\$175	
<b>INDUSTRIAL METALLURGISTS (USA), webinars :</b> <a href="http://www.imetllc.com/webinar-schedule/">www.imetllc.com/webinar-schedule/</a>						
	Principles of Metallurgy		4		\$225	90 days
	Failure Analysis of Metals				\$290	90 days
	Corrosion of Metals		5		\$290	90 days
	Steel Metallurgy					
	Metallurgy of Steel Through Hardening		1		\$70	90 days
	Steel Case Hardening (includes Carb. Induc. etc)		1		\$70	90 days
	Metallurgy of Steel Heat Treating		5		\$290	90 days
	Aluminium Metallurgy					
	Metallurgy of Precipitation Strengthening		2		\$125	90 days
	Tensile Testing		0.5		\$39	90 days
	Hardness Testing		0.5		\$39	90 days
<b>MATERIALS PROCESSING INSTITUTE ( Middlesbrough):</b> <a href="http://www.mpiuk.com/courses-steel-overview.php">http://www.mpiuk.com/courses-steel-overview.php</a>						
	Metallurgy Course - Primary Carbon and Alloy Steels	3 - 5			Estimate £995	
<b>TEESIDE UNIVERSITY</b>						
	HNC Metallurgy - Open Learning - 5 Years max				Estimate £3950	
<b>SHEFFIELD UNIVERSITY</b>						
	MMET - 1 year				£10,700 per year	
	Degree - 3 to 4 years				£9,000 per year	

Any sponsoring company can put forward additional courses for the CHTA Training Subcommittee's consideration.