FAQ standards

.

LAST REVISED 2.7.20

TUBULAR EXCHANGER MANUFACTURERS ASSOCIATION



TEMA Frequently Asked Questions

Last revised February 7, 2020

I downloaded the eBook but it is a .acsm file. Where is the PDF?

• **1. Account:** <u>IMPORTANT</u> to open your new book you need an Adobe ID. You can create your free Adobe ID <u>HERE</u>. (If you already have an Adobe ID, be sure to use your existing Adobe ID, instead of registering for a new one.)

• **2. Reader:** EditionGuard protected eBooks are compatible with any reader that is Adobe Content Server compliant. Latest Version of Adobe Digital Editions can be downloaded here: <u>http://www.adobe.com/solutions/ebook/digital-editions/download.html.</u> **Note:** If you are running Windows Vista or OSX 10.6 you should download Version 3.01 of ADE.

If you need detailed instructions on installing Adobe Digital Editions:

o Windows: https://helpx.adobe.com/digital-editions/kb/install-digital-editions-windows-7.html

o OSX: <u>https://helpx.adobe.com/digital-editions/kb/install-digital-editions-mac-os.html</u> (Accept the license agreement, then check the components you want to install. Be sure to select the option "Associate .acsm and .epub file types".)

• **3. Download:** Click [the link you already used - it is different for each order] to start downloading your .acsm file. This is a special file that will allow you to securely access your eBook.

• **4. Open:** Open the .acsm file you just downloaded with Adobe Digital Editions. When prompted to authorize your computer, enter your Adobe ID and password.

• **5. Enjoy:** Your eBook will instantly be delivered to your computer, so you can start reading immediately. You can then transfer the book to a compatible eReader device using a USB cable.

Is there a discount for bookstores/resellers?

Discounts are based on quantity only. There are no other discount methods.

What is the effective date of the TEMA standards?

The Tenth Edition standards are effective immediately, and were published April 8, 2019.

The Ninth Edition was published in 2007. The Eighth Edition was published in 1999. The Seventh Edition was published in 1988. The Sixth Edition was published in 1978. The Fifth Edition was published in 1968. The Fourth Edition was published in 1959.



The Third Edition was published in 1952. The Second Edition was published in 1949. The First Edition was published in 1941.

Can I purchase an older version of the TEMA standards?

TEMA does not offer old versions of the Standards.

What is new in the Tenth Edition?

See the <u>Standards and Software</u> page.

Is the Tenth Edition available as a PDF or eBook?

Yes. click <u>here</u> to order.

I purchased the Ninth Edition - is there a discount to purchase the Tenth Edition?

Yes - please contact <u>temaorders@tema.org</u> if you purchased your Ninth Edition Standards DIRECTLY FROM TEMA after October 1, 2018. Otherwise contact the vendor from which you purchased your book.

Can I get a copy of the nomenclature chart?

Yes - it is available here. Nomenclature Chart

What are the classes of Heat Exchangers?

- R severe petroleum and related processing applications
- C commercial and general process applications
- B chemical process service

I have the Tenth Edition Standard and have a technical question.

TEMA cannot respond to general or specific design application questions, only to requests for interpretation of the Standards. Please refer to the notes to users on page viii of the Standards. Alternatively, your question could be posed as a consulting request to one of our member companies.

To submit a technical inquiry, log in to your store account, select 'My Account' and follow the "Technical Inquiries" link there.



Does TEMA offer training?

No, but here is a site with lots of training information - <u>www.epic-edu.com</u>. Note: TEMA does not review or endorse the curricula.

If you know of other sources of training, please let us know!

Can you provide, or help me find, specific materials?

No, TEMA is a trade association, not involved with procurement.

Can you provide a quote to build a heat exchanger?

No, TEMA is a trade association. We do not manufacture heat exchangers.

Can I get a Sample Problem Book for the Tenth Edition?

No, there is no Sample Problem Book for the Tenth Edition.

Is there an addendum or errata for the Tenth Edition?

No.

Why do I see distortions in the equations in the eBook?

We have received reports of distorted equations and/or graphics; one of the following should fix the problem:

1. Close and re-open the file.

2. install an earlier version of Adobe Digital Editions. Version 4.0 can be downloaded manually from this link.

Can I get copies of the specification sheets on pages 3-2 and 3-3?

Yes - they are available here. English Metric



May I have permission to reproduce parts of the Standards in another publication?

Permission may be requested by email or fax. Please include the specific sections and page numbers containing the material you wish to reproduce. If you have a document you need signed please email or fax a copy of it. Requests are reviewed by the membership and may take up to 21 days to get a reply. NOTE: the following items may be reproduced without permission, as long as TEMA is cited as the source.

-Figure N-1.2 (Table of TEMA types)

-<u>Table N-2 and Figure N-2</u> (Nomenclature)

-Figure G-5-2 (Heat Exchanger Spec Sheet - English Units) PDF XLS

-Figure G-5-2M (Heat Exchanger Spec Sheet - Metric Units) PDF XLS





Reproduced with permission of the Tubular Exchanger Manufacturers Association, Inc.



| 1 | | Job No. | | | | | | | | | |
|----------|------------------------|---|--------------------|------------------------------|------------------------|---------------|---------------|--------------|--------------|-------------------------|-----|
| 2 | Customer Reference No. | | | | | | | | | | |
| 3 | Address | Address Proposal No. | | | | | | | | | |
| 4 | Plant Locatio | Tant location Date Rev | | | | | | | | | |
| 5 | Service of Lin | Service of Unit | | | | | | | | | |
| 6 | Size | | | | | | | r | Dorollo | Sorioo | |
| 0 | Size | Ize Iype (Hor/Vert) | | | | | Connected I | | Falalle | Series | |
| 1 | Surf/Unit (Gro | Surf/Unit (Gross/Eff.) sq ft; Shells/Uni | | | | | Surf/Shell (C | sross/Επ.) | | sq ft | |
| 8 | | | | PERF | -ORMANC | E OF OI | | | | | |
| 9 | Fluid Allocation | or | | | | Shell Sid | le | | Tube Si | de | |
| 10 | Fluid Name | | | | | | | | | | |
| 11 | Fluid Quantit | v Tota | | lb/hr | | | | | | | |
| 12 | Vapor | (InlOut) | | | | 1 | | | - | | |
| 13 | Liquid | (injout) | | | | I | | | | | |
| 14 | Stoom | | | | | | | | | | |
| 14 | Steam | | | | | I | | | | | |
| 15 | vvater | <u></u> | | | | | | | | | |
| 16 | Noncol | ndensable | | | | | | | | | |
| 17 | Temperature | | | 악 | | | | | | | |
| 18 | Specific Grav | /ity | | | | | | | | | |
| 19 | Viscosity, Liq | luid | | сP | | | | | | | |
| 20 | Molecular We | eight, Vapo | | | | | | | | | |
| 21 | Molecular We | eight, Noncon | densable | | | | | | İ | | |
| 22 | Specific Heat | 1 | | BTU / lb ^o F | | | | | | | _ |
| 23 | Thermal Con | ductivity | BTU | ft / hr sa ft ⁰ F | L | | | | I | | |
| 24 | Latent Heat | adouvity | F | 11/16@ ⁰ F | | 1 | | | | | |
| 24 | Latern Tiea | <u></u> | L | | | | | | | | |
| 20 | Mel Pressure | E . | | psia tt/sss | | | | | | | |
| 20 | velocity | | | π / sec | | | | | | | |
| 27 | Pressure Dro | ressure Drop, Allow. /Calc psi | | | | 1 | | | / | | |
| 28 | Fouling Resis | Fouling Resistance (Min.) hr sq ft ^o F / BTU | | | | | | | | | |
| 29 | Heat Exchan | gec | | | BTU | / hr MTD (0 | Corrected) | | | | ٥F |
| 30 | Transfer Rate | e, Service | | | | Clean | | | | BTU / hr sq ft | ۲°F |
| 31 | | | CONSTRU | CTION OF O | NE SHELL | | | Sketch (E | Bundle/Noz | zle Orientation |) |
| 32 | | Shel | | Side Tube Side | | | | | | | |
| 33 | Design / Test | Design / Test Pressure p | | / | | / | | | | | |
| 34 | Design Temp | Design Temp. Max/Mir | | °F / | | / | | | | | |
| 35 | No. Passes p | o. Passes per Shel | | | | | | | | | |
| 36 | Corrosion All | orrosion Allowance in | | | | | | | | | |
| 37 | Connections | In | | | | | | | | | |
| 38 | Size & | Out | | | | | | | | | |
| 20 | Size a | Untermodiate | | | | | | _ | | | |
| 39 | | | | | · | | (LD) (L) | | 1 | | |
| 40 | | OD | IN; I NK (IVIIN/A) | /g) | in;Length | | ft;Pitch | IN | -++-30 -}+-(| 50 ∐ 90 ↔ 45 | |
| 41 | Tube Type | | | | | Materia | | | | /- | |
| 42 | Shell | | ID | OD | in | Shell Cov | ei | | (Integ.) | (Remov.) | |
| 43 | Channel or B | onne | | | | Channel C | Covei | | | | |
| 44 | Tubesheet-S | ubesheet-Stationary | | | Tubesheet-Floating | | | | | | |
| 45 | Floating Head | loating Head Cove | | | Impingement Protectior | | | | | | |
| 46 | Baffles-Cross | 3 | Ty | pe | | %Cut (Dia | m/Area) | Spacing: c/c | Inlet | | in |
| 47 | Baffles-Long | | , | | | Seal Type | | . v | | | _ |
| 48 | Supports-Tuk | be | | U-Bend | | | | Type | | | |
| 49 | Bypass Seal | Arrangemen | | 2 20.10 | | Tube-to-T | ubesheet loin | · /r * | | | _ |
| 50 | Expansion Ic | vindingement | | | | Tube to T | | | | | |
| 50 | Expansion 30 | | | Dundla | | туре | | Dundla Evit | | | |
| 51 | pv -inlet Noz | v -inieci Nozzie Bundle E | | | | Bundle Exit | | | | | |
| 52 52 | Gaskets-She | II SIDE | | | | I UDE SIDE | | | | | |
| 53 | ⊢loating Hea | С | | | | | | | | | |
| 54 | Code Requirements | | | | | TEM | A Class | | | | |
| 55 | Weight / She | Veight / Shell Filled | | | d with Wate | vith Wate Bur | | | | | lb |
| 56 | Remarks | | | | | | | | | | |
| 57 | | | | | | | | | | | |
| 58 | | | | | | | | | | | |
| 59 | | | | | | | | | | | _ |
| 60 | | | | | | | | | | | |
| 00 | | | | | | | | | | | |
| 61 | | | | | | | | | | | |



| 1 | Job No. | | | | | | | | | |
|----------|-----------------------------------|--|-----------------|----------------------|-------------|--------------|----------------|--------------|---------------|---------------------------|
| 2 | Customer Reference No. | | | | | | | | | |
| 3 | Address | Address Proposal No. | | | | | | | | |
| 4 | Plant Locatio | Plant Locatior | | | | | Date Rev. | | | |
| 5 | Service of Unit | | | | | Item No. | | | | |
| 6 | Size | | Tvpe | (Hor/Vert) | | | Connected i | r | Paralle | Series |
| 7 | Surf/Unit (Gro | urf/Unit (Gross/Eff.) Sam. Shells/Unit | | | | | Surf/Shell (C | Gross/Eff.) | | sa m |
| 0 | | , | | DER | | | | | | • 1 · · · |
| 0 | | ~~ | | | | | | | Tuba C | da |
| 10 | Fluid Allocatio | JI | | | | Shell Sid | e | | Tube S | lde |
| 10 | Fluid Name | · T - (- | | 1 | | | | | | |
| 11 | | y Tota | | kg/Hr | | | | - | | |
| 12 | Vapor | (In/Out) | | | | | | | | |
| 13 | Liquid | | | | | | | | | |
| 14 | Steam | | | | | | | | | |
| 15 | Water | | | | | | | | | |
| 16 | Nonco | ndensable | | | | | | | | |
| 17 | Temperature | (In/Out) | | °C | | | | | | |
| 18 | Specific Grav | rity | | | | | | | | |
| 19 | Viscosity, Liq | uid | | Ср | | | | | | |
| 20 | Molecular We | eight, Vapo | | | | | | | | |
| 21 | Molecular We | eight, Noncon | densable | | | İ | | | İ | |
| 22 | Specific Heat | - | | J/kg ⁰C | | İ | | | İ | |
| 23 | Thermal Con | ductivity | | W/m ⁰C | | | | | | |
| 24 | Latent Heat | · · · · · · · · · · · · · · · · · · · | | J/ka @ ⁰C | | 1 | | | | |
| 25 | Inlet Pressure | 2 | | kPa(abs.) | | | | | | |
| 26 | Velocity | - | | m/sec | | | | | | |
| 27 | Pressure Dro | n Allow /Cal | c | kPa | | / | | | / | |
| 28 | Fouling Resig | stance (Min | • | Sam ^o C/W | | , | | | , | |
| 20 | Heat Exchan | | | | ١٨/ | | ected) | | | 0°C |
| 30 | Transfer Rate | Service | | | •• | Clean | | | | 0 W/Sam ⁰ C |
| 31 | | 5, Service | CONSTRU | | | Clean | | Sketch (F | Rundle/Noz | |
| 32 | | | | Shel | | т | iha Sida | OKCION (L | | |
| 32 32 | Design / Test | Onign / Tost Prossuro kPag | | Oner | / | | | - | | |
| 34 | Design 7 Test Tressure | | | | / | | 1 | - | | |
| 35 | No Passos n | or Shol | Ű | | / | | 1 | - | | |
| 36 | Corrosion All | Correction Allowance mm | | | | | | - | | |
| 37 | Connections | In | | | | | | - | | |
| 20 | Sizo 8 | Out | | | | | | - | | |
| 20 | Size a | Untermodiate | | | | | | - | | |
| 39 | | | mm.Thk (Min/ | (1)(0) | mmul an ath | | mm.Ditab | | 4 30 4 | 60 - 90 - 45 |
| 40 | | UD | mm; ink (iviin/ | Avg) | mm;Length | Mataria | mm;Pitch | mm | 4 30 E | |
| 41 | Tube Type | | | 00 | | Nateria | | | (Inter) | |
| 42 | Shell | | U | OD | mm | Shell Cove |) | | (Integ.) | (Remov.) |
| 43 | Channel or B | onne | | | | Channel C | ovel | | | |
| 44 | I ubesheet-S | tationary | | | | Iubesheet | -⊢loating | | | |
| 45 | Floating Head | d Cove | | | | Impingeme | ent Protectior | | | |
| 46 | Baffles-Cross | 3 | Ту | ре | | %Cut (Dia | m/Area) | Spacing: c/c | Inlet | mm |
| 47 | Baffles-Long | | | | | Seal Type | | | | |
| 48 | Supports-Tub | De | | U-Bend | | | | Туре | | |
| 49 | Bypass Seal | Arrangemen | | | | Tube-to-Tu | ubesheet Join | | | |
| 50 | Expansion Jo | pint | | | | Туре | | | | |
| 51 | <i>pv</i> [∠] -Inlet Noz | zle | | Bundle | Entrance | | | Bundle Exit | | |
| 52 | Gaskets-She | ll Side | | | | Tube Side | | | | |
| 53 | Floating Hea | c | | | | | | | | |
| 54 | Code Requirements | | | | TEMA Class | | | | | |
| 55 | Weight / She | Veight / Shell Filled | | | d with Wate | vith Wate Bu | | | | ka |
| 56 | Remarks | | | | | | | | | 0 |
| 57 | | | | | | | | | | |
| 58 | | | | | | | | | | |
| 59 | | | | | | | | | | |
| 60 | | | | | | | | | | |
| 00 | | | | | | | | | | |
| 61 | I | | | | | | | | | |



N-2 NOMENCLATURE OF HEAT EXCHANGER COMPONENTS

For the purpose of establishing standard terminology, Figure N-2 illustrates various types of heat exchangers. Typical parts and connections, for illustrative purposes only, are numbered for identification in Table N-2.

TABLE N-2

- 1. Stationary Head-Channel
- 2. Stationary Head-Bonnet
- 3. Stationary Head Flange-Channel or Bonnet
- 4. Channel Cover
- 5. Stationary Head Nozzle
- 6. Stationary Tubesheet
- 7. Tubes
- 8. Shell
- 9. Shell Cover
- 10. Shell Flange-Stationary Head End
- 11. Shell Flange-Rear Head End
- 12. Shell Nozzle
- 13. Shell Cover Flange
- 14. Expansion Joint
- 15. Floating Tubesheet
- 16. Floating Head Cover
- 17. Floating Head Cover Flange
- 18. Floating Head Backing Device
- 19. Split Shear Ring
- 20. Slip-on Backing Flange

- 21. Floating Head Cover-External
- 22. Floating Tubesheet Skirt
- 23. Packing Box
- 24. Packing
- 25. Packing Gland
- 26. Lantern Ring
- 27. Tierods and Spacers
- 28. Transverse Baffles or Support Plates
- 29. Impingement Plate
- 30. Longitudinal Baffle
- 31. Pass Partition
- 32. Vent Connection
- 33. Drain Connection
- 34. Instrument Connection
- 35. Support Saddle
- 36. Lifting Lug
- 37. Support Bracket
- 38. Weir
- 39. Liquid Level Connection
- 40. Floating Head Support



Reproduced with permission of the Tubular Exchanger Manufacturers Association, Inc.









AEP



Reproduced with permission of the Tubular Exchanger Manufacturers Association, Inc.



FIGURE N-2 (continued)



AKT



Reproduced with permission of the Tubular Exchanger Manufacturers Association, Inc.

