



PLATEX INDIA

Complete Solution in **HEAT EXCHANGER SPARES & EVAPORATIVE CONDENSERS**

GENUINE SPARES

HEAT EXCHANGERS

EVAPORATIVE CONDENSER

PLATEX SERVICE MANUAL

EFFICIENT WAYS OF SERVICING A PHE

Abstract

PHE is important static equipment in any process however, Heat Transfer Plates and Gaskets are heart of PHE. Gasketed plate heat exchangers (PHE) are the “Holy Grail” of the heat exchanger world, able to provide approach temperatures as close as 1° Centigrade in a wide variety of fluid applications. They must be serviced and maintained properly to perform to their potential.

PLATEX INDIA

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SERVICE MANUAL

POINTS COVERED

- ❖ FULL SERVICE MAINTENANCE OPTIONS
- ❖ HEAT EXCHANGER REFURBISHMENT
- ❖ HEAT EXCHANGER REGASKETING
- ❖ HEAT EXCHANGER LEAK TESTING
- ❖ DYE PENETRANT TESTING OF PLATE AND FRAME HEAT EXCHANGERS
- ❖ ACID ETCHING AND CAUSTIC CHEMICAL IMMERSION CLEANING
- ❖ GASKET GLUING
- ❖ OLD GASKET REMOVAL AND CLEANING
- ❖ CHEMICAL CLEANING OF PLATES
- ❖ PLATE AND FRAME HEAT EXCHANGER CLEANING

PLATEX

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FULL SERVICE MAINTENANCE OPTIONS

DELIVERING CONFIDENCE

At PLATEX INDIA, we provide expert "trusted" attention for your heat exchanger (HX) maintenance needs: delivering confidence, taking the maintenance burden off for in-house crews who may be untrained in servicing heat exchanger units. We provide Full service at either of two specific levels:

GENERAL SERVICE CLEANING PROCESSING

General service plate cleaning can be appropriate for many light duty industrial applications where plate fouling "build up" accumulations are more superficial in nature and can be cleaned with high pressure power washing. Depending on gasket service life, elasticity, overall condition, and other variables, in some circumstances, existing gaskets can be re-used.

- 1) Open HX unit and remove, stack or crate the plate pack compliment and clean area.
- 2) Inspection and Digital "Open report" with plate count & general condition (as appropriate report emailed).
- 3) General plate cleaning with high pressure power washing removing surface debris & foulants.
- 4) Re-gasket plates with factory spec replacement gaskets (as appropriate, re-using existing gaskets require some special handling)
- 5) Re-install plate pack with disciplined and "precision" installation to insure:
 - a. plate correct specific orientation in the frame (to prevent major thermal efficiency loss or worse, cross contamination).
 - b. each & every plate & gasket checked as installed insuring no rolled, dislodged, marked gaskets, or defacements.
 - c. every plate carefully, accurately pressed into position face-to-face to adjoining plate insuring each gasket does not slide, roll, move, nor hump.
 - d. strict closing procedure to exact specified dimensions (crucial to avoid leaks & insure full spec. thermal efficiency).
- 6) Start-up, testing, check-out; then consultation of all issues concerns & nuances (unit put back into operation while our crew tests & confirms all values).
- 7) Maintenance tracking and reporting data base implemented (as appropriate).

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COMPLETE REFURBISHMENT SERVICE & REPORT

- 1) Open HX unit and remove, stack or crate the plate pack compliment and clean area.
- 2) Digital "Open report" with plate count & type, condition, application detail and images (report included)
- 3) Examine assess HX Frame and support for corrosion, buildups, and integrity (report included)
- 4) Four(4) step plate re-furbishment process at Plant
 - a. pressure power washing removing surface debris & foulants
 - b. heated caustic immersion cleaning
 - c. nitric acid ambient temp. etching bath
 - d. protective finish added with caustic "power washing" treatment
- 5) Re-gasket plates with factory spec replacement gaskets (as required, re-using existing gaskets require some special handling).
- 6) Dye Penetrant and integrity testing of plate pak.
- 7) Re-install plate pack with disciplined focused installation guaranteeing:
 - a. plate correct specific orientation in the frame (to prevent major thermal efficiency loss or worse, cross contamination).
 - b. individual plate & gasket checked as installed insuring no rolled, dislodged, marked gaskets, or defaced cond.
 - c. every plate carefully accurately pressed into position face-to-face to adjoining plate insuring each gasket does not slide, roll, move, nor hump.
 - d. strict Closing procedure to exact specified dimensions (crucial to avoid leaks & insure full spec. thermal efficiency).
- 8) Start-up, testing, and check-out (unit put back into operation while crew tests & confirms all values)
- 9) "Closing report" complete with digital images, all specifics, issues, recommendations, and consultation.

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DYE PENETRANT TESTING AND INTEGRITY TESTING

Through the proper application of the Dye Penetrant and Integrity tests, the Plate Heat Exchanger Reconditioning / cleaning process is substantively enhanced. At PLATEX INDIA these two important testing procedures are included at additional cost.

Dye penetrant testing is a crucial initial step in the "Refurbishment" cleaning process. Fifteen percent (15%) of all plates in the unit pack should be tested using this method. The 15% sample should include only plates that have the "worst" apparent visible condition. Dye penetrant "dual compound" is applied to both sides of the tested plate surfaces. A technician then examines the surfaces to find any appearing targets that either locate or confirm that there are no:

- 1) Inclusions
- 2) cracks,
- 3) pin holes
- 4) fractures
- 5) erosion
- 6) fissures

that can compromise the performance integrity of the individual plate. Through this testing method, costly breakdowns can be avoided when the unit is brought back into operation. Integrity testing is the other recommended testing procedure to insure the plate pack will properly seal and avoid leaks when the unit is closed and brought back into operation.

SUPER EFFICIENT DE-SCALING SOLUTIONS AND IMMERSION CLEANING

Getting the most from your gasketed plate heat exchangers

Gasketed plate heat exchangers (PHE) are the "Holy Grail" of the heat exchanger world, able to provide approach temperatures as close as 1° Centigrade in a wide variety of fluid applications. They must be serviced and maintained properly to perform to their potential.

PHE plates should be cleaned with a four (4) step acid etching-caustic chemical immersion process to restore their "Optimal" heat transfer efficiency. At PLATEX, this consummate process carried-out at our plant will typically cost NO More than on-site pressure "power washing" offered by competitors or performed by in-house crews.

Service shortcuts such as "power washing" oftentimes achieves only 50% to 70% restoration of the full "heat transfer" efficiency depending on the specific foulant build-up. Over time this "lost" efficiency accumulates and can result in higher energy usage, shorter service

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cycles, and operating disruptions. Customers can demand and receive 100% without additional cost.

- 1) concentrated inspection review and assessment to check for any cracks, pin holes, fissures, or erosion.
- 2) heated caustic immersion cleaning to remove any adhesives, gum, grease, sediments, or contaminants.
- 3) nitric acid bath etching to remove any mineralizations, reaction buildups, corrosion, or crystallizations.
- 4) hot caustic high pressure "power washing" to remove any cleaning compounds & add a protective layer.

Gradual surface buildup as described on line #3 will create an insulating layer bonded to the metallic plate surface reducing the heat transfer rate. The fouling causes can be quite complex, containing one or more of these types of build-ups and layers which cannot be removed with high pressure "power washing". PHE manufacturers recommend acid etching-caustic immersion cleaning to restore plates to their full OEM specification and "Optimal" 100% heat transfer efficiency. Plates cleaned with our acid etching-caustic process will evidence this 100% re-furbishment and appear "like new" as depicted below.



Inspection of PHE

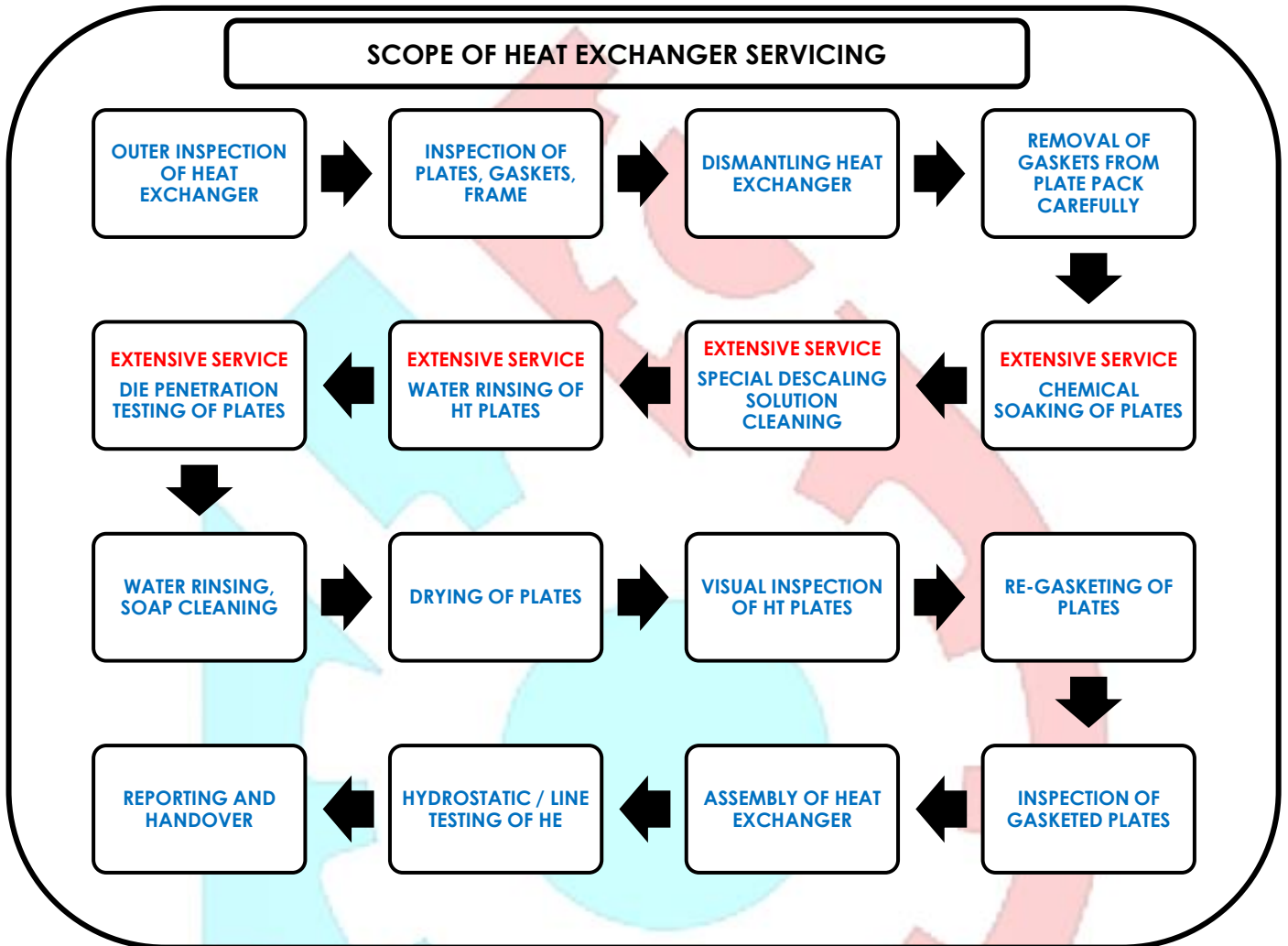


DP Testing of Heat Transfer Plate



Cleaning of HT Plates

SERVICE CYCLE



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