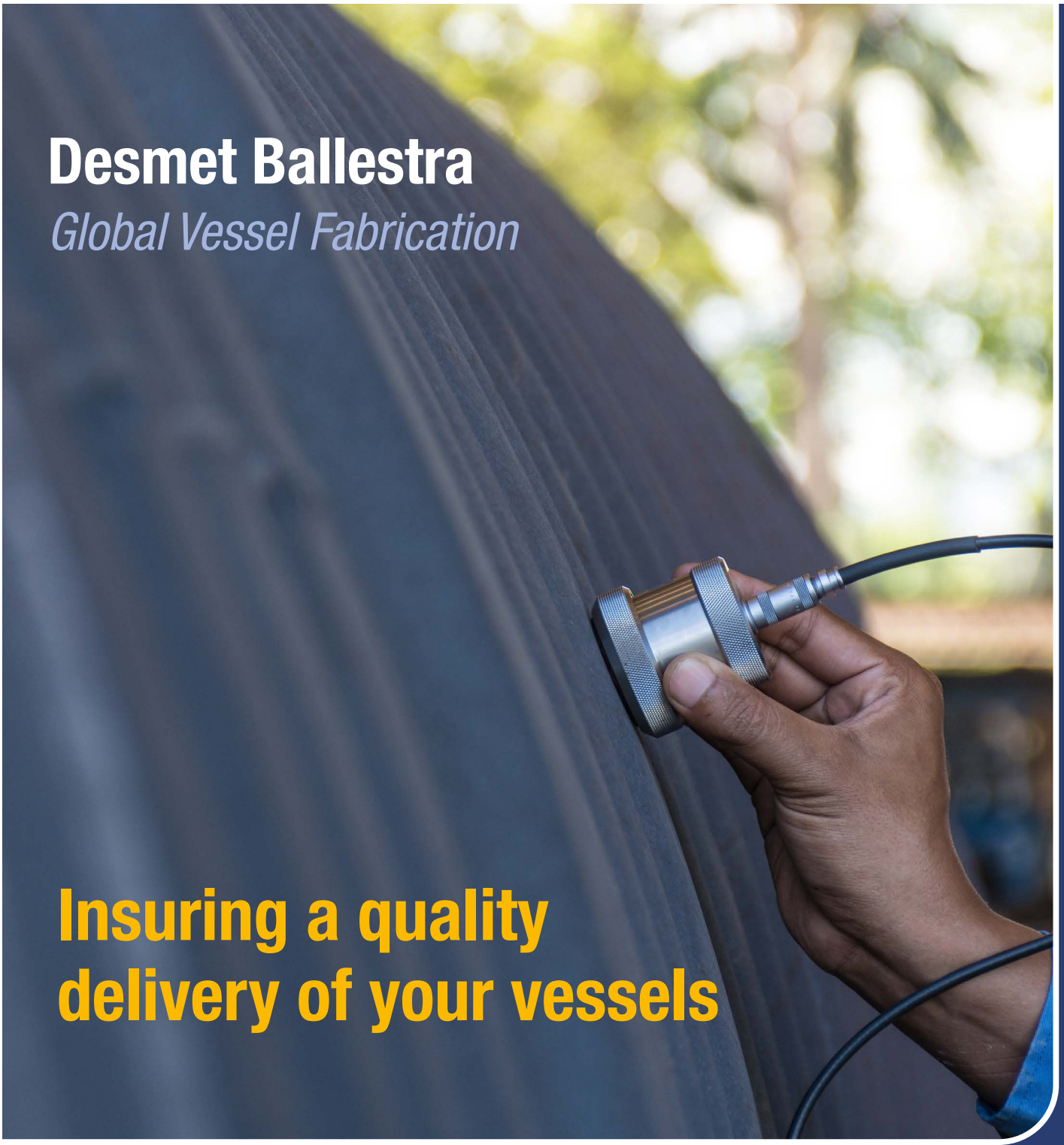
Desmet Ballestra

Global Vessel Fabrication



Insuring a quality delivery of your vessels

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Proprietary vessels

Desmet Ballestra takes great pride in developing and designing proprietary vessels for its key process applications

We fabricate these proprietary vessels in pre-approved, third-party workshops around the world



Global workshops selection

Desmet Ballestra's philosophy is to select third-party workshops where we will become a primary customer, providing:

- Repetition for higher quality
- Repetition for lower cost
- Leverage for delivery priority
- Leverage for protection of intellectual property

Workshops undergo a thorough evaluation before becoming "*approved*" Desmet Ballestra workshops

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Global workshops approval

The Desmet Ballestra global sourcing team evaluates third-party workshops for approval based upon:

- Potential to be a primary customer
- Physical workshop capabilities
- Labour force
- Staff experience with similar vessels
- Quality system
- Norm certifications
- On-time delivery record
- Safety protocol
- Price

- The Desmet Ballestra global sourcing team requires each approved workshop to sign a Non-Disclosure Agreement (NDA) to protect intellectual property

- The Desmet Ballestra global sourcing team requires each approved workshop to fill and maintain a standard information form (ID card) to keep track of their capabilities

- Primary workshops in each region are selected to insure they are qualified to meet international norm certifications:
  - CE equipment certification
  - PED pressure vessel certification
  - ASME pressure vessel "U" stamp & registration

Approved Chinese Workshops

HUALI

270 workers 22,500 m²

Zhicheng

85 workers 17,500 m²

Lima 2

72 workers
15,000 m²

Chengguang

35 workers
9,000 m²

SHLH

50 workers
6,800 m²

Approved Indian Workshops

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Vitech

120 workers
3,300 m²


Sudhir

80 workers
2,150 m²


Hi-Tech

80 workers
1,860 m²


Medore

55 workers
2,450 m²


Omniscient

40 workers
1,800 m²


SSIS

60 workers
1,625 m²


Approved Malaysian Workshops

Vestech - Malaysia

68 workers
3,500 m²

Seremban - Malaysia

243 workers
17,100 m²

Approved European Workshops

Kurtul - Turkey

55 workers
4,500 m²

Hormecal - Spain

44 workers
4,500 m²

Henkens - Belgium

20 workers
4,500 m²

Approved American Workshops

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Equipromex - Mexico

54 workers

4,300 m²

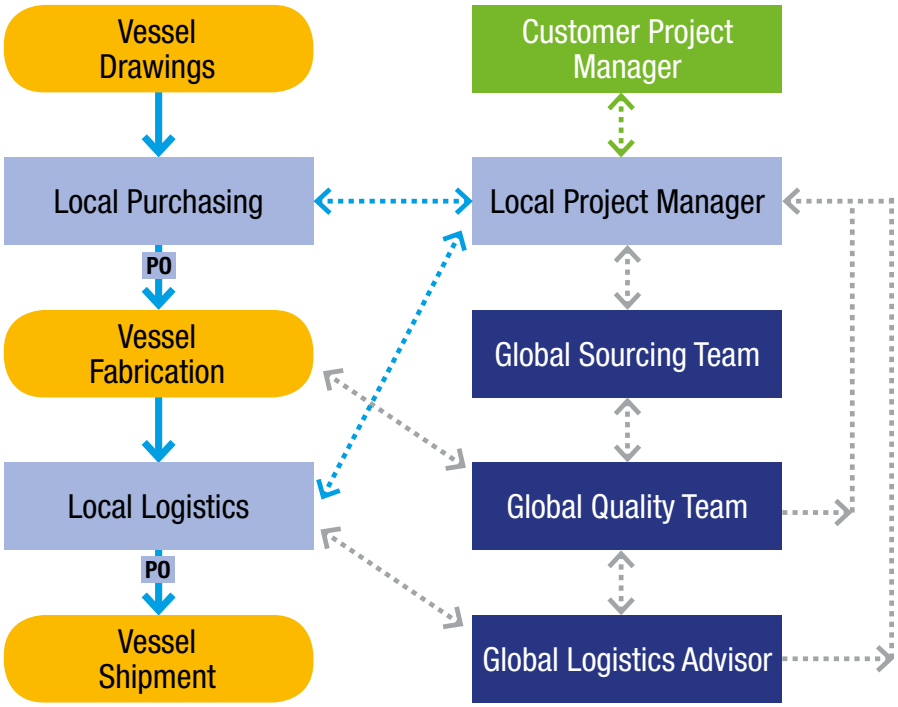
Evacon - Brazil

170 workers

11,000 m²

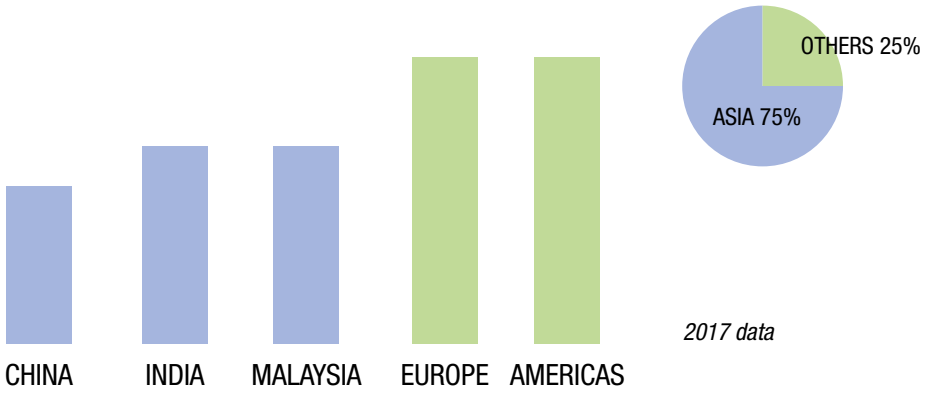
Vessel **Fabrication** Work Flow

- The **Customer's Project Manager** communicates with Desmet Ballestra's Local Project Manager throughout the project
- Using the vessel drawings, our Local Project Manager works with our **Global Sourcing Team** to determine which of our approved global workshops will manufacture each vessel
- Our **Local Procurement** then issues the PO to the third-party workshop that was chosen
- Our **Global Quality Team** assures the quality of our vessels during fabrication, keeping the Local Project Manager informed on 2-week intervals
- Our **Global Logistics Advisor** assists our Local Logistics to issue the PO to the freight forwarder to get the vessel shipped from the workshop to the final customer destination



Vessel **Price** Considerations

- Relative pricing levels across our global workshop locations are as follows:



- Asian vessel prices are ~75% of European & American vessel prices, which is a strong incentive for our customers to decide for Asian fabrication to reduce CAPEX on their projects

Vessel **Delivery** Considerations

- Vessel fabrication time is similar across all of our global third-party workshops, depending primarily upon backlog of vessels passing through

- For Asian customers, sourcing the vessel manufacture in Asia is optimum for delivery

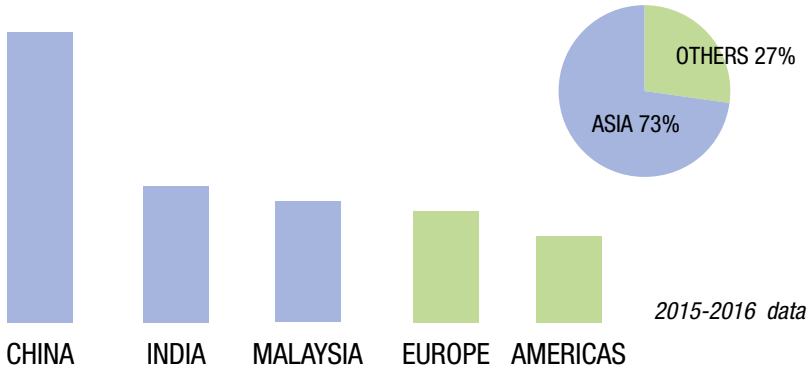
- For European and American customers, sourcing the vessel manufacture in Asia requires up to 2 months extra delivery time approved, third-party workshops

Vessel **Quality** Considerations

- It is our mission to have equivalent good quality across all of our global, approved, third-party workshops
- We have a **Global Quality Manager** (stationed in Asia) with the responsibility to carry out this mission of achieving globally equivalent quality
- We choose workshops which have their own internal quality procedures and quality control teams
- We augment the workshop quality control with an additional layer of Desmet Ballestra quality control, including **16 full time Desmet Ballestra inspectors** covering our global, approved, third-party workshops

Vessel **Quality** Considerations

- Desmet Ballestra vessel fabrication is presently distributed across our global workshop locations as follows:



- Asian region accounts for 73% of our global vessel fabrication

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Asian Vessel Fabrication











Vessel Quality Control Team

We have **1 Global Quality Manager**, with **16 inspectors**:

- 5 full time DB inspectors imbedded in our 5 China third-party workshops
- 6 full time DB inspectors imbedded in our 6 India third-party workshops
- 3 full time DB inspectors imbedded in our 2 Malaysia third-party workshops
- 1 full time DB inspector covering our 3 European third-party workshops
- 1 full time DB inspector covering our 2 American third-party workshops

Vessel Quality Standards

- We have dimensional and testing requirements specified on our Assembly, Body and Detail Vessel Drawings
- We have a Technical Note specified in all workshop POs covering the Inspection & Test Plan (ITP) to be followed for that specific type of vessel
- We have Technical Note TN-0001 specified in all workshop POs covering our vessel surface protection requirements
- We have Technical Note TN-0002 specified in all workshop POs covering our packing & handling for transport requirements

Vessel ITPs

GENERAL

- Technical Note TN-0021 ITP covers atmospheric vessels with or without agitators or coils
- Technical Note TN-0022 ITP covers vacuum vessels with or without agitators or coils
- Technical Note TN-0023 ITP covers shell & tube heat exchangers

SEED PREPARATION

- Technical Note TN-0087 ITP covers plug flow tube conditioners
- Technical Note TN-0059 ITP covers rotary steam tube cookers

SOLVENT EXTRACTION

- Technical Note TN-0074 ITP covers Reflex extractors
- Technical Note TN-0024 ITP covers LM extractors
- Technical Note TN-0075 ITP covers LLL extractors
- Technical Note TN-0025 ITP covers DTs, DCs & Stacked Cookers

REFINING

- Technical Note TN-0026 ITP covers continuous bleachers
- Technical Note TN-0027 ITP covers continuous deodorisers
- Technical Note TN-0028 ITP covers semi-continuous deodorisers
- Technical Note TN-0041 ITP covers Gen 1 Sublimax ice condensers
- Technical Note TN-0084 ITP covers Gen 2 Sublimax ice condensers

FAT MODIFICATION

- Technical Note TN-0029 ITP covers hydrogenation vessels
- Technical Note TN-0030 ITP covers mobuliser crystallisers
- Technical Note TN-0060 ITP covers membrane filter presses

Vessel **Material Quality**

- Desmet Ballestra requires approval for subsitution of material versus the ASME or EN/DIN specs we place on our drawings, and only accepts substitutions with higher physical and chemical properties
- Desmet Ballestra limits our approved workshops to purchase carbon and stainless steel from steel suppliers we approve
- Desmet Ballestra inspectors do random, periodic checks on material received to insure it complies with specifications

Vessel **Inspection Reports**

- Fortnightly Reports with photos by the inspectors keep Project Managers aware of progress every two weeks
- Partial Inspection Reports are issued on complex vessels requiring a specific interim inspection as per the ITP
- Final Inspection Reports are issued at completion of all vessels

Customer **Quality Participation**

- Desmet Ballestra welcomes our customers to participate in our assurance of good quality
- Many **customers visit** the workshops during fabrication to inspect the equipment themselves prior to shipment
- Some customers **review the ITPs** and determine which hold points that they wish to be present for during fabrication
- A few customers hire a **third party inspection firm**, such as SGS, to audit the ITP progression and quality on their behalf
- We and our third-party workshops openly welcome any customer participation in achieving our mutual goal of delivering good quality

Further **Quality Improvements**

- American Welding Society (AWS) inspector training sessions and certification are scheduled to advance our inspector's ability to adequately insure weld quality
- Inspection check-lists by vessel type are under planning to provide a more definitive list than the ITP provides for specific points to inspect on each type of vessel
- Extension of quality procedures to the third party equipment



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#014 - 16/03/2017