BENTELER Automotive

Ergonomics in Automotive .
The key in manufacturing excellence search

10º Congreso Nacional de Ergonomía y Psicosociología.

13 - 14 - 15 de Octubre. 2016
Avilés
España

PREVERAS ASOCIACIÓN ASTURIANA DE ERGONOMÍA

Asociación Española de Ergonomía

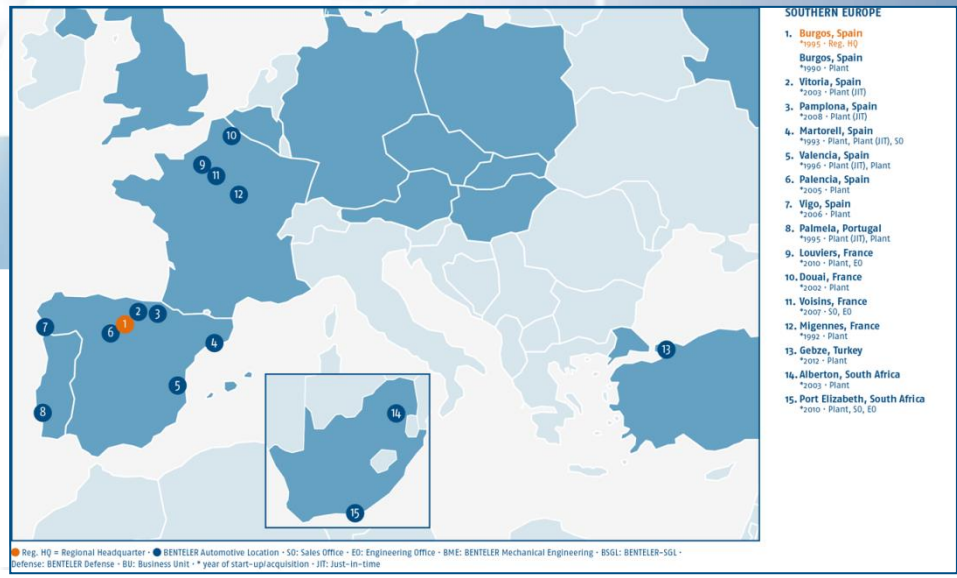
BENTELER Automotive

WHO WE ARE

Lucinio Bausela

Health and Safety Manager for Southern Europe

Asociación Española de Ergonomía



BENTELER Automotive
Region Southern Europe

OUR STRUCTURE

BENTELER-Group

BENTELER Automotive

- Chassis & Modules
- Structures
- Engine & Exhaust Systems

+Asia/Pacific
+Mercosur
+North America
+North/Eastern Europe
+Southern Europe
+Western Europe

BENTELER Steel/Tube

- Seamless
- Welded

BENTELER Distribution

- Asia/Pacific
- Eastern Europe
- Northern Europe
- Southern Europe
- Germany
- Switzerland
- United Kingdom

BENTELER Engineering

BENTELER Glass Processing Equipment

Corporate Functions

Divisions | Business Units | Operating Units | Regions

KEY FIGURES & Business Areas

Sales

~5,8

billion euros

Employees

21,500

FTE

Locations

in

28

countries

CHASSIS & MODULES

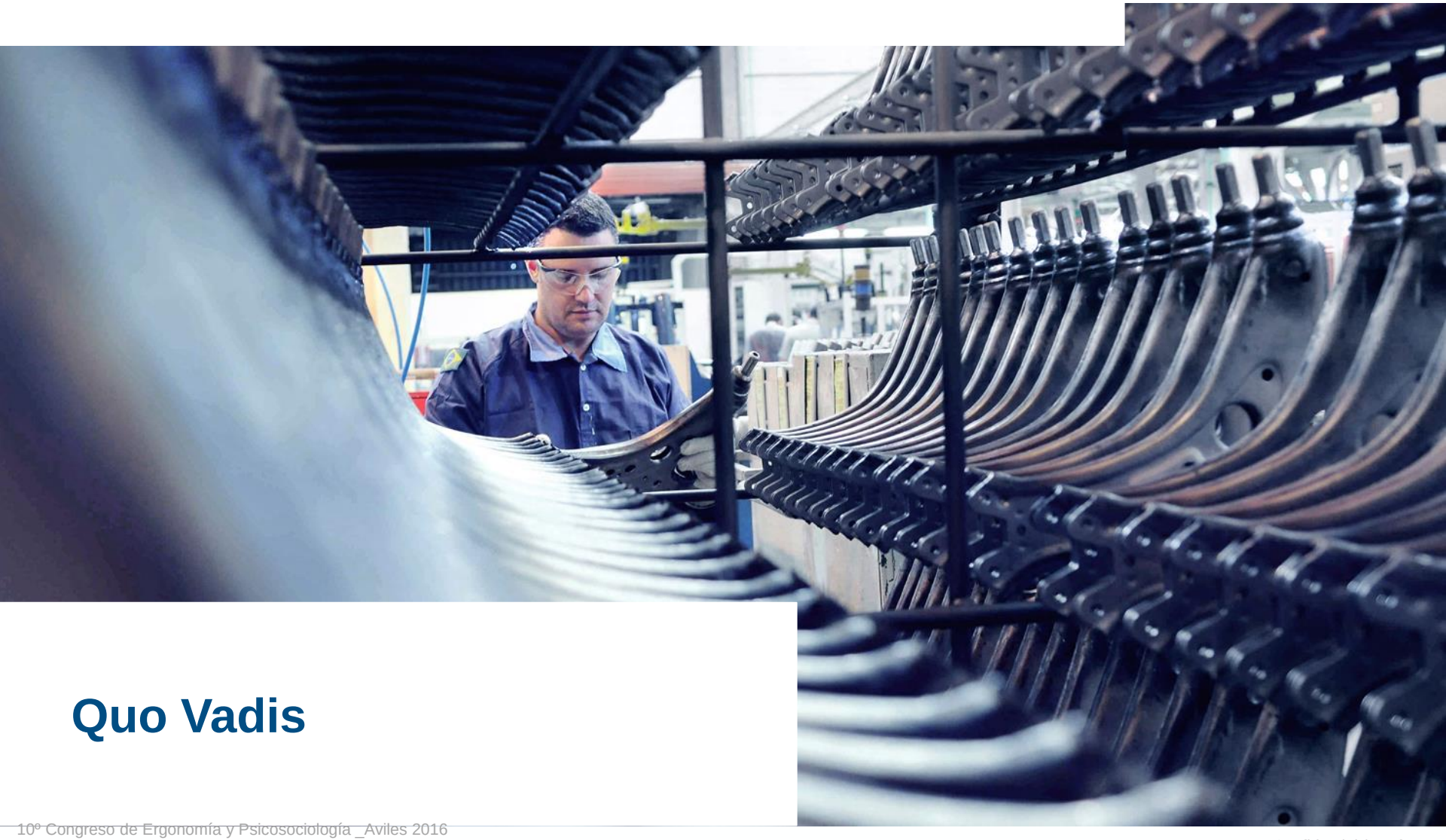
ENGINE & EXHAUST SYSTEMS

BENTELER-SGL

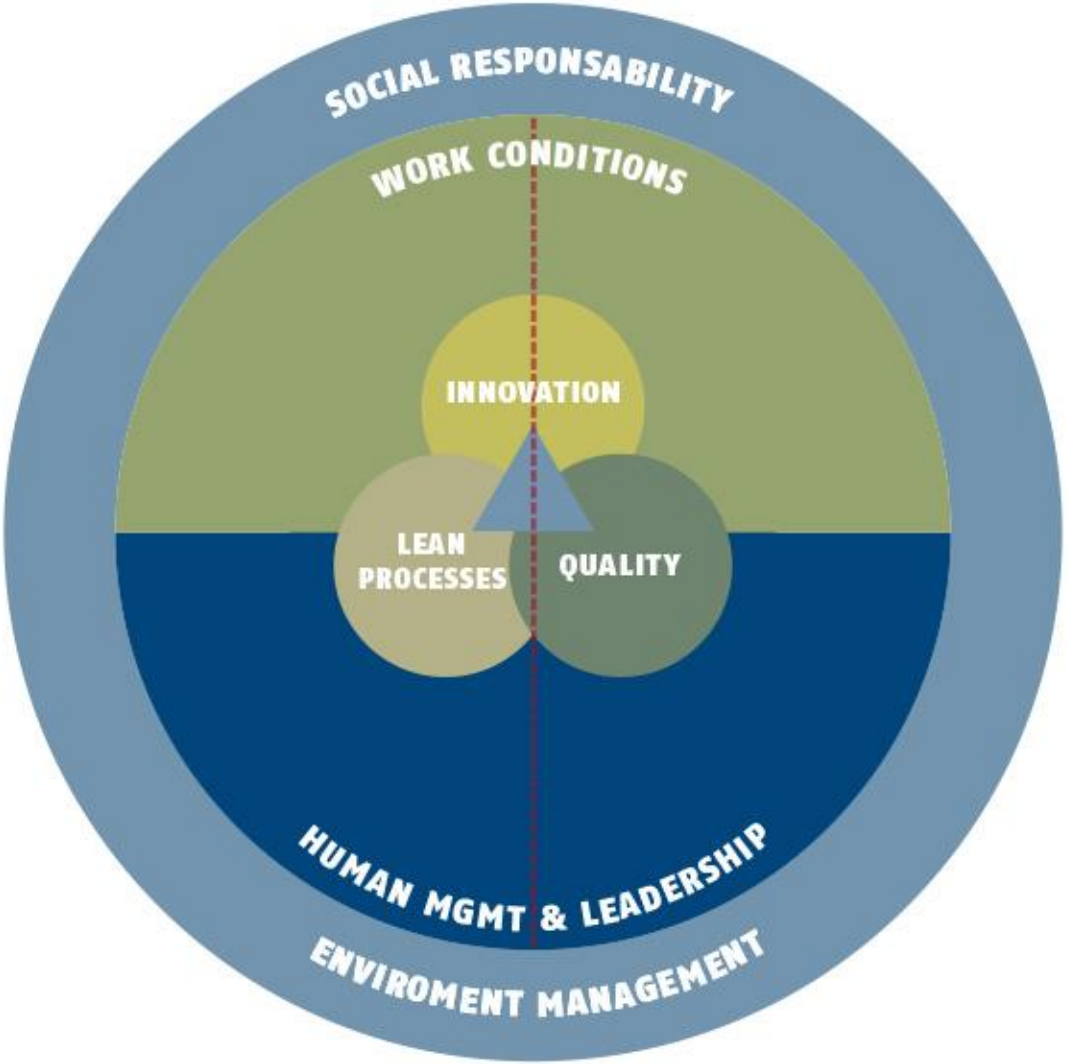
DEFENSE

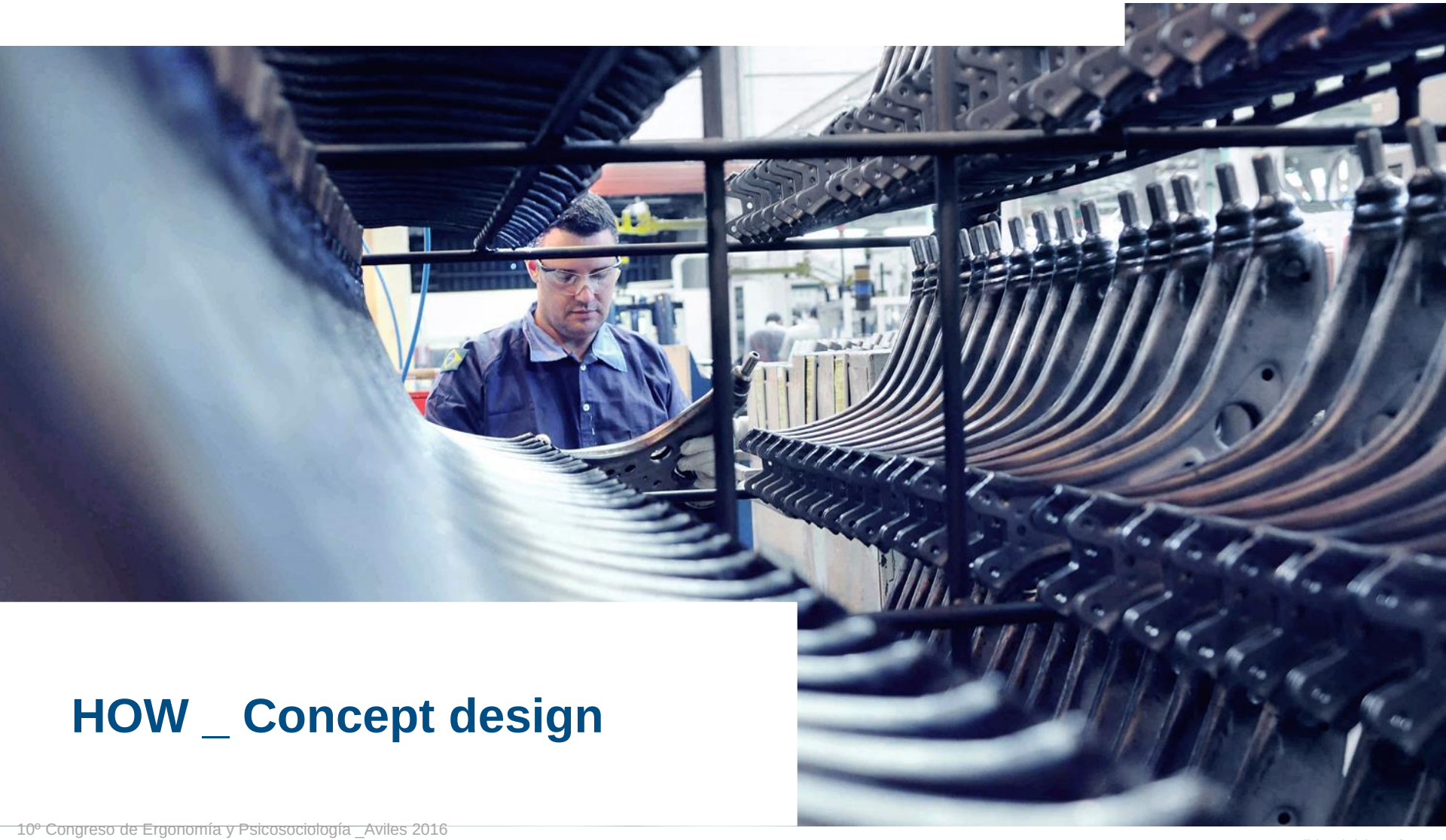
STRUCTURES

MECHANICAL ENGINEERING



Quo Vadis


SOCIAL RESPONSABILITY
WORK CONDITIONS
INNOVATION
LEAN PROCESSES
QUALITY
HUMAN MGMT & LEADERSHIP
ENVIROMENT MANAGEMENT



HOW _ Concept design

Develop and Launch

Develop Virtually

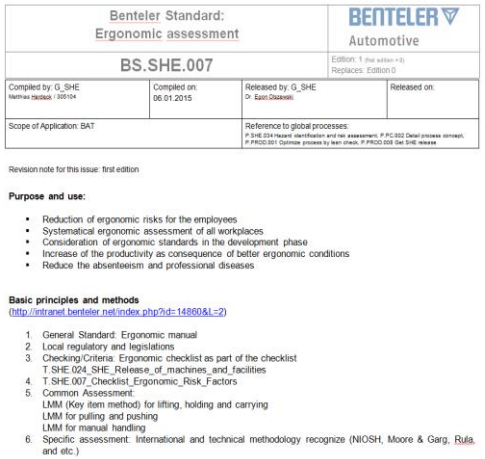
Gate 3

Process Design

14 **P.PC.002 Detail process concept**

Quality

33 **P.QM.008 Apply Material data to IMDS**



Benteler Standard:
Ergonomic assessment

BENTELER Automotive

BS.SHE.007

Edition: 1 (1st edition = 0)
Replaces: Edition 0

Compiled by: G_SHE	Compiled on:	Released by: G_SHE	Released on:
Matthias Hardock / 305104	06.01.2015	Dr. Egon Olszewski	
Scope of Application: BAT		Reference to global processes: P.SHE.034 Hazard identification and risk assessment, P.PC.002 Detail process concept, P.PROD.021 Optimize process by team check, P.PROD.008 Get SHE release	

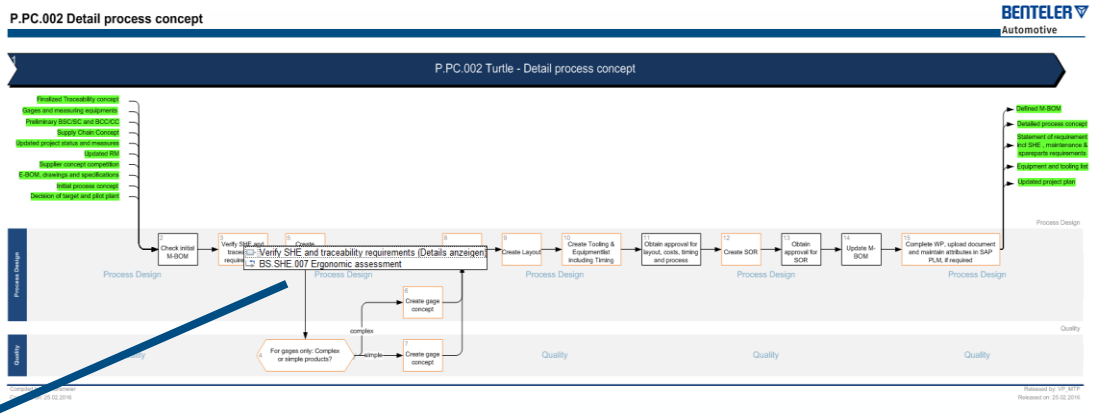
Revision note for this issue: first edition

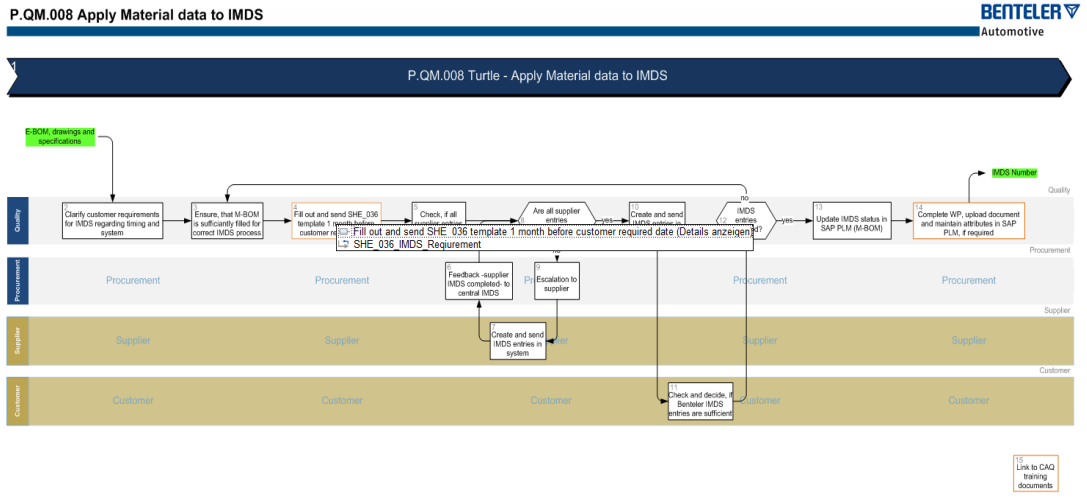
Purpose and use:

- Reduction of ergonomic risks for the employees
- Systematical ergonomic assessment of all workplaces
- Consideration of ergonomic standards in the development phase
- Increase of the productivity as consequence of better ergonomic conditions
- Reduce the absenteeism and professional diseases

Basic principles and methods
(http://intranet.benteler.net/index.php?id=14860&L=2)

1. General Standard: Ergonomic manual
2. Local regulatory and legislations
3. Checking/Criteria: Ergonomic checklist as part of the checklist
   T.SHE.024_SHE_Release_of_machines_and_facilities
4. T.SHE.007_Checklist_Ergonomic_Risk_Factors
5. Common Assessment:
   LMM (Key item method) for lifting, holding and carrying
   LMM for pulling and pushing
   LMM for manual handling
6. Specific assessment: International and technical methodology recognize (NIOSH, Moore & Garg, Rula, and etc.)





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Develop Physically

Gate 4

Production

9

P.PROD.001Optimize process by lean check

P.PROD.001 Optimize process by lean check based on plant layout

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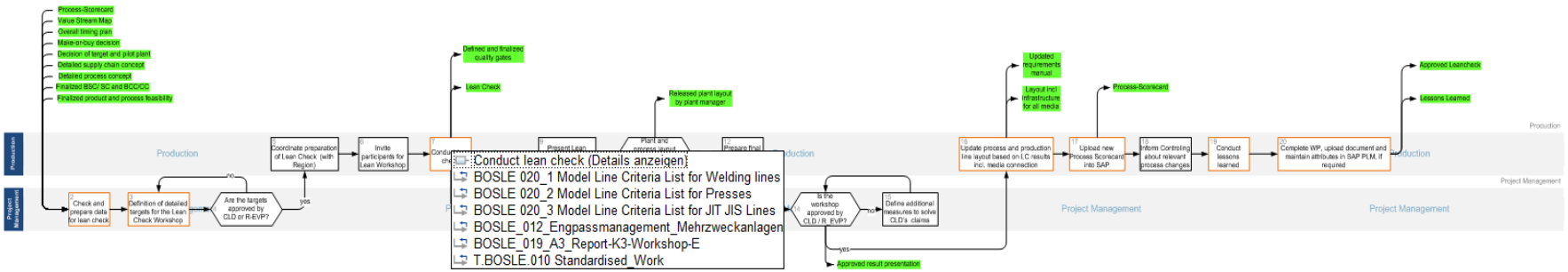
P.PROD.001 Turtle - Optimize process by lean check based on plant layout



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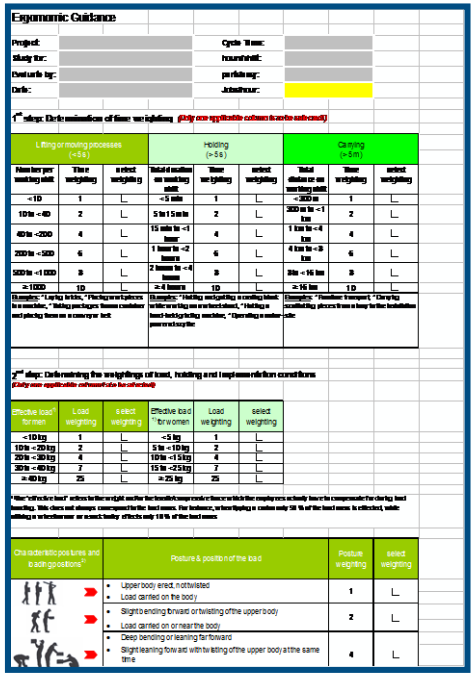
Ergonomics & Others in project Lean process.

.- K2_42. SHE technical specifications for equipment.
Consider whether are requested, considered and implemented
Data available.
Deviations.
LMM expected _ forecast. Evaluation.

.- Ergonomics Risk factor analyses. List. (Workplaces & work conditions)
Consider which are applicable.
Deviations

.- IMDS.- List of substances in the project. Hazardous substances to consi



Ergonomic Guidance

Project: Cycle Time:
Study for: Investment:
Evaluate by: participants:
Date: Jobnumber:

1st step: Determination of time weighting (Only one applicable column has to be ticked!)

Lifting or moving processes (<5s)			Holding (>5s)			Carrying (>5m)		
Number per working shift	Time weighting	select weighting	Total of motion on working shift	Time weighting	select weighting	Total distance on working shift	Time weighting	select weighting
<10	1	☐	<5 min	1	☐	<200 m	1	☐
10 to <40	2	☐	5 to 15 min	2	☐	200 m to <1 km	2	☐
40 to <200	4	☐	15 min to <1 hour	4	☐	1 km to <4 km	4	☐
200 to <500	6	☐	1 hour to <2 hours	6	☐	4 km to <8 km	6	☐
500 to <1000	8	☐	2 hours to <4 hours	8	☐	8km to <16 km	8	☐
≥ 1000	10	☐	≥ 4 hours	10	☐	≥ 16 km	10	☐

Examples: "Laying bricks, "Placing workpieces in a machine, "Taking packages from a conveyor and placing them on a conveyor belt

Examples: "Holding and guiding a cooling hose to the welding machine, "Holding a hand-held grinding machine, "Operating a control

Examples: "Position transport, "Carrying scrutching pieces from a heap to the installation

2nd step: Determining the weightings of load, holding and implementation conditions (Only one applicable column has to be selected)

Effective load* for men	Load weighting	select weighting	Effective load* for women	Load weighting	select weighting
<10 kg	1	☐	<5 kg	1	☐
10 to <20 kg	2	☐	5 to <10 kg	2	☐
20 to <30 kg	4	☐	10 to <15 kg	4	☐
30 to <40 kg	7	☐	15 to <25 kg	7	☐
≥ 40 kg	25	☐	≥ 25 kg	25	☐

* The "effective load" refers to the weight and/or the load/handling resistance that the employee actually has to compensate for during load handling. This does not always correspond to the load mass. For instance, when lifting a crate only 50 % of the load mass is effected, while rolling a wheelbarrow or a pallet truck effects only 10 % of the load mass

Characteristic postures and loading positions	Posture & position of the load	Posture weighting	select weighting
	• Upper body erect, not twisted • Load carried on the body	1	☐
	• Slightly bending forward or twisting of the upper body • Load carried on or near the body	2	☐
	• Deep bending or leaning far forward • Slight leaning forward with twisting of the upper body at the same time	4	☐

CHECK list_ Ergonomic and Psychosocial impacts analyses					
RISK FACTORS	N / A	O K	N o O K	Remarks	Specific STUDY need
F1. Working postures and position.					
F2. Work planes.					
F3. Access to work stations and workplaces.					
F4. Isolated work stations.					
F5. Information devices; control and command devices.					
F6. Right-handed and left-handed operators.					
F7. Access openings and gaps.					
F8. VDU.					
F9. Noise.					
F10. Lighting.					
F11. Workplace temperature.					
F12. Industrial hygiene.					
F13. Personal protective equipment.					
F14. Manual handling of loads.					
F15. Awkward postures.					
F16. Postures strain and stress.					
F17. Repetitive movements.					
F18. Perception of information.					
F19. Mental workload.					
F20. Mobbing and Burnout.					

T.SHE.024_00 Table of contents

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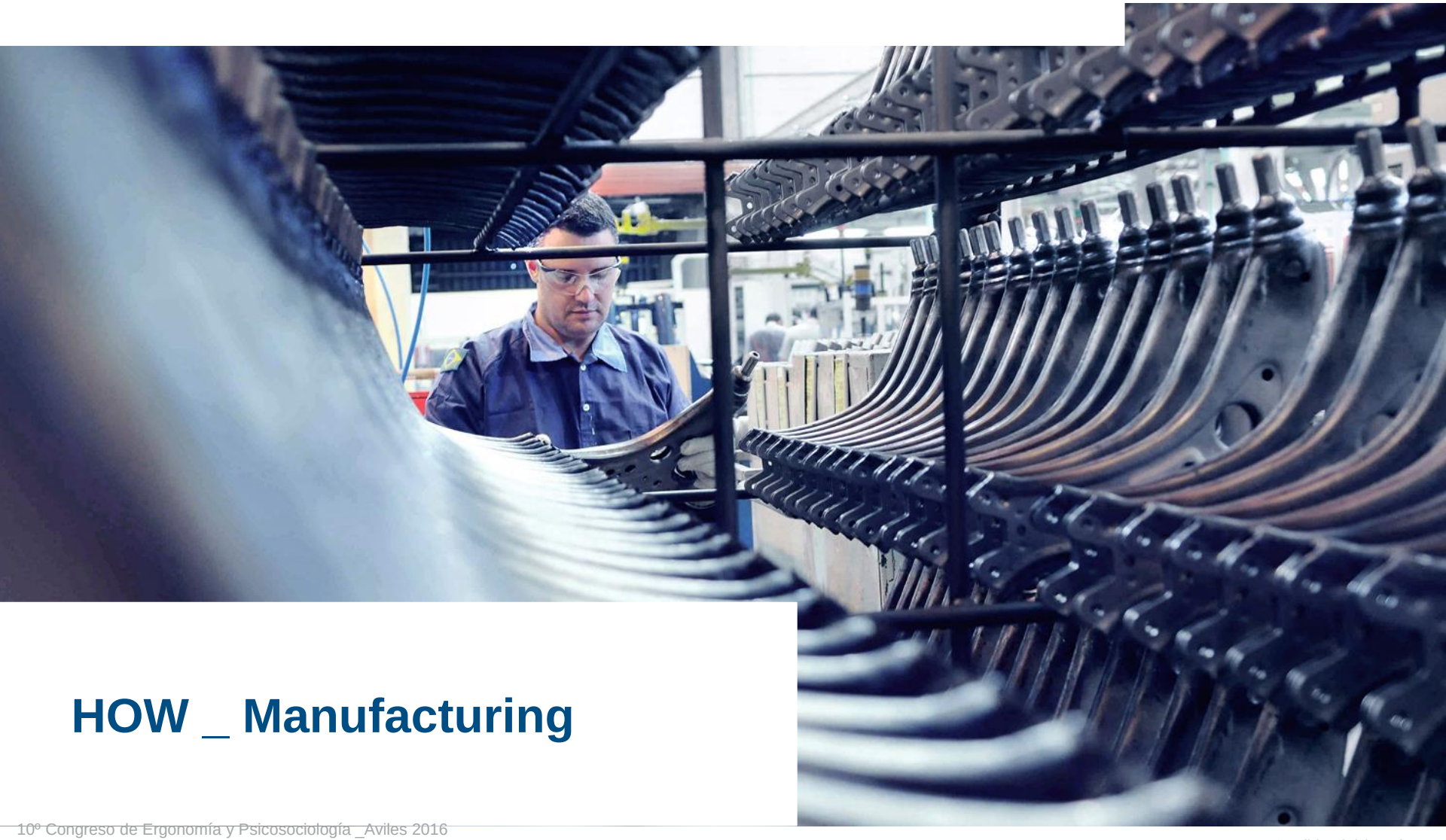
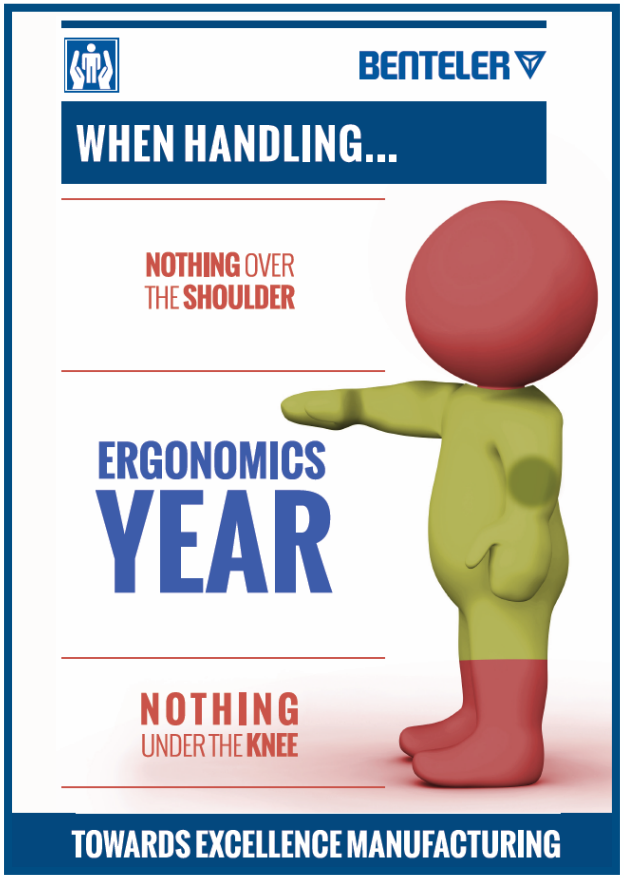
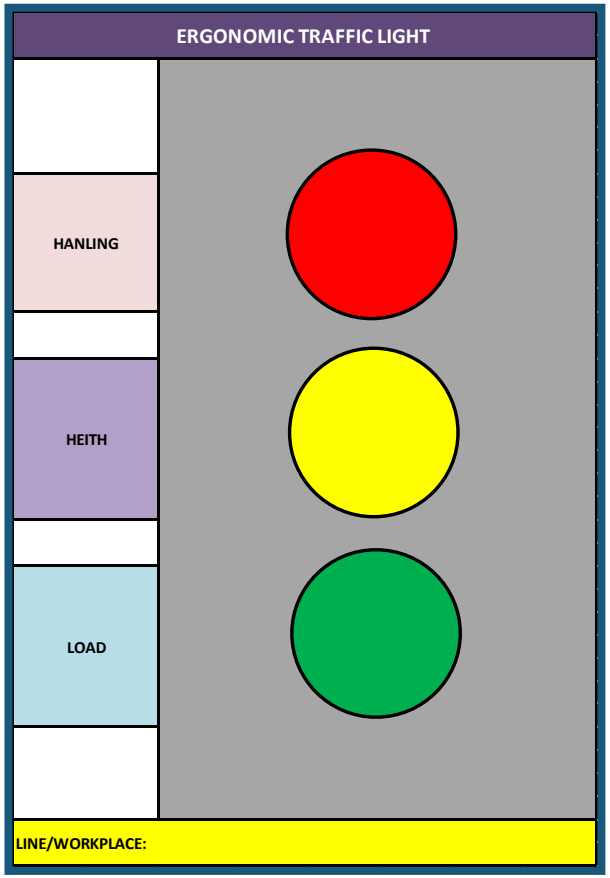


HOW _ Manufacturing

South Europe

HEALTH & ERGONOMICS_ETL





Health & Ergonomics

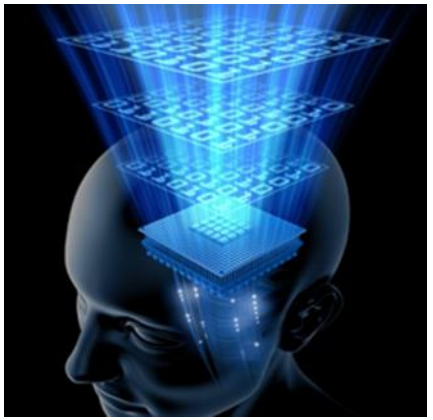
Aging

Beyond to previous proposals and improvements must be consider also specific actions in order to go farther in the dealing with aging .

- **Qualification of people …. Adaptation to change.**
- **HR programs.**
  - **Shifting organization.**
  - **Working at Night**
  - **Knowledge. Transfers programs**
- **Collaborative robots**
  - **Company´s adaptation y promotion in Europe.**
  - **Study the Safe move**
  - **Slight robots next to people for heavy and hard works.**
- **Chairless. Magic chair.**

Audi_**Neckarsulm**

Welcome to this exciting challenge.



Thank you

L. Bausela.