Assessment of pulling and pushing based on key indicators Version Sept. 2002

The overall activity must be broken down into individual activities. Each individual activity involving major physical strain must be assessed separately.

Workplace/Activity:

1st step: Determination of time rating points (Select only one column)

Pulling and pushing over short distances or fre- quent stopping (single distance up to 5 metres)		Pulling and pushing over longer distances (sin- gle distance more than 5 metres)	
Number on working day	Time rating points	Total distance on working day	Time rating points
< 10	1	< 300 m	1
10 to < 40	2	300 m to < 1km	2
40 to < 200	4	1 km to < 4 km	4
200 to < 500	6	4 to < 8 km	6
500 to < 1000	8	8 to < 16 km	8
≥ 1000	10	≥ 16 km	10
Examples: operation of manipulators, setting up machines, distri- bution of meals in a hospital		Examples: garbage collection, furniture transport in buildings on rollers, unloading and transloading of containers	

2nd step: Determination of rating points of mass, positioning accuracy, speed, posture and working conditions

	Industrial truck, aid				
Mass to be	Without,	Barrow	Carriage, roller,	Rail cars, hand carts,	Manipulators, rope
moved	load is		trolleys without fixed	roller tables, carriages	balancers
	rolled		rollers (only steer-	with fixed rollers	
(lead weight)		\mathbf{O}	able rollers)	þ	
(load weight)		Ry Ry		0	
			00.00		
rolling		60 66			1
roning			100 0 0 0		
4 50 hrs	0.5	0.5	0.5		0.5
< 50 kg	0.5	0.5	0.5	0.5	0.5
50 to < 100 kg	1	1	1	1	1
100 to < 200 kg	1.5	2	2	1.5	2
200 to < 300 kg	2	4	3	2	4
300 to < 400 kg	3		4	3	
400 to < 600 kg	4		5	4	
600 to <1000 kg	5			5	
≥ 1000 kg					
sliding			Grey areas:		

sliding	
< 10 kg	1
10 to < 25 kg	2
25 to < 50 kg	4
> 50 kg	

Critical because a check of the movement of industrial truck/load depends very much on skill and physical strength.

White areas without number:

Basically to be avoided because the necessary action forces can easily exceed the maximum physical forces.

	Speed of motion	
Positioning accuracy	slow (< 0.8 m/s)	fast (0.8 bis 1.3 m/s)
Low - no specification of travelling distance - load can roll to a stop or runs against a stop	1	2
High - load must be accurately positioned and stopped - travelling distance must be adhered to exactly - frequent changes in direction	2	4

Note: the average walking speed is approx. 1 m/s

Posture ¹⁾		
	Trunk upright, not twisted	1
<u>x</u>	Trunk slightly bending forward or slightly twisted (one- sided pulling)	2
33-m?	Body inclined low in direction of motion Squatting, kneeling, bending	4
	Combination of bending and twisting	8

1) The typical posture must be used. The greater trunk inclination possible when starting up, braking or shunting can be ignored if it only occurs occasionally.

Working conditions

Good: \rightarrow floor or other surfaces level, firm, smooth, dry \rightarrow no incline \rightarrow no obstacles in work-	
space \rightarrow rollers or wheels run easily, no evident wear in the wheel bearings	0
Restricted : \rightarrow floor soiled, a little uneven, soft \rightarrow slight incline up to 2° \rightarrow obstacles in work- space which have to be bypassed \rightarrow rollers or wheels soiled, no longer run easily, bearings worn	2
Difficult: \rightarrow unpaved or roughly paved roadway, potholes, severe soiling \rightarrow inclines of 2 to 5° \rightarrow industrial trucks have to be torn loose when starting up \rightarrow rollers or wheels soiled, bearings run sluggishly	4
Complicated: \rightarrow steps, stairs \rightarrow inclines >5° \rightarrow combinations of indicators from "restricted" to "difficult"	8

Indicators not mentioned in the table must be added as appropriate.

3rd step: Evaluation

The rating points relevant to this activity are to be entered and calculated in the diagram.



2) The boundaries between the risk ranges are fluid because of the individual working techniques a	nd performance cond	ditions.
The classification may therefore only be regarded as an orientation aid. Basically it must be assum	ned that as the numb	er of risk
scores rises, so the risk of overloading the muscular-skeletal system increases.		

Workplace redesign is necessary.

3) Less resilient persons in this context are persons older than 40 or younger than 21 years, newcomers in the job or people suffering from illness.

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