

HOW DACE SUCCEEDED IN PUBLISHING LABOUR NORMS

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Introduction

In February of 2009 DACE published a CD-Rom with Labour Norms. The reason for this publication is earlier publications [1990's] by DACE/REWIND of Unit rates which led to confusions since these publications were on one hand unit rates and on the other hand methods of measurements and did not really contain labour norms. The intention was to create information that is complementary to the DACE Price booklet.

During early 2008 a project team was formed out of the DACE SIG Cost Engineering Process Industry, which took the DACE/REWIND publications as a basis to make a standard DACE Labour Norms CD-Rom.

At the start of the project the team meetings were about defining a norm and the reference of a norm to an Unit Rate, this to avoid any confusion.

The CD-Rom has a standard index, methods of measurements including labour norms valid for Western Europe and for the ASA and DIN standards.

The project team consisted of clients, engineering firms and contractors. Initially the project team collected all available information, both digital and as a hard copy, from the DACE/REWIND booklets and various other sources. The original workgroups who published the DACE/REWIND booklets also were consulted. All material was analysed to deliver a representative norm set per discipline for the industry.

After this initial phase of the project, the team agreed on a standard index of chapters and every team member was assigned to a section and a schedule of meetings was prepared to meet our envisaged publication date. Furthermore it was agreed not to publish a book but to publish on a CD-Rom and that the publication of 2009 would be the first phase of our further publication. The product was also to be complementary to the existing publication of the DACE Price booklet, the 27th edition was published in November 2009, which only gives costs of supplies and in some case installation costs.

The first phase of the publication [February 2009] comprises of following sections:

General Description

The purpose was to provide guidance in the development and application of labour norms for estimating and scheduling. In parallel to the development of these labour norms, consideration has been given to the application of location (productivity)

factors, indirect costs, overheads, profit & risk, condition factors and/ or efficiency factors.

Therefore the user should have a common understanding of the terminology used in this process to ensure clarity (understanding) with regard to what is included in labour norms, labour rates and those items that should be captured as derived costs (applying factors and uplifts).

This section addresses labour norms and labour rates separately; it does NOT address contract forms or those elements that are specifically excluded from the labour norms and/ or labour rates.

The preambles (scope description) and qualifications (condition factors when special working conditions apply) to the labour norms are intended to provide the basis for completeness and consistency in estimates. The preambles and qualifications are applicable for all types of installation work.

When making estimates it should be ascertained whether the work construction site conditions meet the principles on which the labour norms are based. If that is not the case corrections have to be made to the relevant labour norms i.e. exceptional circumstances might apply.

The exceptional situations that might exist and for which correction factors are given are:

- Walking distance to workplace;
- High working spaces;
- Below ground level/ low rooms (cellars);
- Enclosed spaces;
- Dust, temperature and noise development;
- Increased concentration of released gases;
- Use of protective clothing in case of work in e.g. chemical environments;
- Congestion;
- Abnormal weather conditions.

Piping

This section includes labour norms and allowances (correction factors) for the assembly of piping systems according to ASA and DIN from 1/8" up to and including 48" and material factors for welding based on the petro-chemical industry. A calculation example is included.

A measuring system is describe and is intended for the settlement and the assessment of the progress of the piping installation.

To allow assessment of the installation steps, then these have been divided into measured items.

The tables show the measured items of the main dimensions used in the measuring system and specify a labour norm for the different nominal bores and wall thicknesses at each measured item.

By using labour norms, the values of these measured items will become dimensionless and bear a fixed relation to each other.

In fixing the number of linear metres, allowance is made for the measurements from pipe centre to pipe centre or to flange front.

Remarks regarding the use of the measuring system:

- a) The price of separate measured items (corresponding with a unit rate) is calculated by multiplying the relevant labour norms from the table by the labour rate.
- b) The price of installation of a complete pipeline or a complete piping system is calculated by multiplying the relevant sum of labour norms by the labour rate.
- c) The measurement table only specifies the major dimensions; during settlement all intermediate values can be calculated or, if necessary, determined for valuation through interpolation.
- d) The influence of various materials on the installation to be carried out is reflected in what is known as the material multiplication factors; they are only used for correcting welding labour norms versus carbon steel welding.
- e) The table shows the labour norms, which depend on the nominal bore on the wall thickness, only once per action.
- f) In case the labour norm is influenced by parameters other than 'wall thickness', 'pressure rating' and 'nominal bore', the labour norm relate to typical values. Intermediate values are calculated for the settlement or, if necessary, for the valuation through interpolation.
- g) The measurement system is valid for the classification of items shown in the table. A further subdivision where, for example, a distinction is made between prefabrication and installation at site, is not made. It is possible that certain activities have to be carried out under special conditions. In this case correction factors can be applied, as specified in the general description.
- h) The in this paragraph specified labour norms are based on activities in the plant and or field. For the labour norms for prefabrication the listed labour norms must be multiplied with an efficiency factor. This efficiency factor is dependant upon the circumstances as in the prefabrication shop.
- i) In determining the labour norms, the nominal bore is decisive.

Painting

This section describes performance-based coating applicable for painting and coating and is intended for all painting and coating contracts, for both new construction and maintenance of onshore facilities. It includes Labour Norms for protection against external corrosion of both ferrous and non-ferrous metals.

This section includes descriptions for coating application and surface preparation and gives labour norms for prefabrication and field in the same manner as piping.

However it does not apply for internal coatings, coating of buildings and other civil installations, equipment and components with a service temperature below minus 20°C or over 450°C or equipment where thermal shock may appear when in operation.

Insulation [hot & personnel protection]

This section includes descriptions for thermal insulation and specifies requirements and recommendations for external thermal insulation of above ground surfaces of equipment and piping. Again the same table layout of piping is used for the labour norms.

This section is based on the Committee Insulation Netherlands Industry [CINI] Manual "Insulation for Industries".

The CINI Foundation, an institution in which, uniquely, both principals and contractors cooperate. The CINI Manual is meant to serve as a tool for designers, purchasers, installers and inspectors, in realizing the optimal insulation for all common situations. For this purpose, the know-how and experience of specialists from dozens of companies were gathered and laid down in interlinked specifications.

Insulation is defined as those materials or combinations of materials which retard the flow of heat energy by performing one or more of the following functions:

1. Conserve energy by reducing heat loss or gain;
2. Control surface temperatures for personnel protection and comfort;
3. Facilitate temperature control of process;
4. Prevent vapour flow and water condensation on cold surfaces;
5. Increase operating efficiency of heating/ventilating/cooling, plumbing, steam, process and power systems found in commercial and industrial installations;
6. Prevent or reduce damage to equipment from exposure to fire or corrosive atmospheres;
7. Assist mechanical systems in meeting criteria in food and cosmetic plants;
8. Reduce emissions of pollutants to the atmosphere.

Scaffolding

This section describes the points of attention and describes the activities for scaffolding. Furthermore it gives examples how to measure the most common types of

scaffolding using sketches and calculation methods. A metric of scaffolding labour norms is included.

Together with a general checklist with points of attention, scaffolding has been classified in types. For each type of scaffolding a checklist for composing the scaffolding types is included. This covers approximately 90% of all scaffolding. As an aid the most common selection has been indicated.

Information concerning scaffolding construction can be obtained at the association of scaffolding companies in the Netherlands called Vereniging van Steiger-, Hoogwerken Betonbekistingbedrijven [VSB], section Steigerbedrijven.

Points of attention

The method of measurement is also intended for assessing of progress of the installation of scaffolding work.

To be able to evaluate the steps of the installation, the type of measurements are segregated. Tables shows the main dimensions used in the measuring system for each item.

The table specifies labour norms for different types of scaffolding for each measured item.

The measured items are valued by means of the relevant standard labour norms on the basis of theoretical considerations and practical experience.

In fixing the number of linear metres, allowance is made for the measurements from centre to centre of scaffolding pipe.

Remarks regarding the use of the measurement system:

- I. The price of separate measured items (which corresponds with a unit rate) is calculated by multiplying the relevant standard labour norms from the table by the relevant labour rate.
- II. The price of installation of scaffolding or a complete scaffolding system is calculated by multiplying the relevant sum of standard labour norms by the relevant labour rate.

Electrical & instrumentation

Here we have based our labour norms on standard electrical and instrumentation work which are common in the Petro-chemical industry. Beside labour norms we included sketches with their calculations of typical hook-ups.

Future development

At this point in time we have started-up phase two of our project with the aim of improve and extend our DACE Labour Norms with the following sections:

- New section Structural Steel Construction;
- New section Equipment
 - Static
 - Rotating
- Improve and extend insulation section with cold and noise insulation;
- Improve general section with better definitions of productivity and efficiency;
- Improve painting section add fittings to be consistent with other sections;
- Improve and extend electrical and instrumentation;
- Extend Piping section with Post Weld Heat Treatment and Stress Relieving;
- Improve Scaffolding;
- Extend calculation example with insulation and painting;
- Study possibilities with estimating tools;

Our aim is to publish an improved and extended CD-Rom in the spring of 2011. In order to achieve this we will require besides input from our original project team further input from trade and industries is required. Due to the DACE network set-up we have these connections and are confident that this will succeed.

This CD-Rom is available in Dutch and English for € 495 postage included, for DACE members there is a reduced cost, and can be acquired at www.dace.nl

Unfortunately our DACE website is in Dutch with a Google translation into English. For those who want to order the CD-Rom please do the following: You go to the DACE website [Dutch version] you click on “Publicaties” and after it is open you click “Deze kunnen [online](#) besteld worden”. On the bottom of the page you will find: For ordering publications in English please click [here](#)

References

DACE/Rewin *Piping Unit Rates*, 2nd edition maart 2004, Stichting NAP/DACE, www.dace.nl

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Vereniging van Steiger-, Hoogwerk- en Betonbekistingbedrijven [VSB], www.vsb-info.nl