

# SIDACT GmbH

Simulation Data Analysis and Compression Technologies

## SDMZIP: COMPRESSING SETS OF SIMULATION RESULTS



**SDMZIP**

# COMPRESSION WITH SDMZIP

SDMZIP is an advanced compression tool designed for the compression of sets of simulation results with multiple versions applicable to different data formats.

## CHALLENGE

The use of data compression to reduce the physical size of stored information is nowadays an industry standard. The growth in data is the result of both larger, more detailed models and the increase in simulations carried out to improve engineering design. Simulation data has to be analyzed, exchanged among engineers and archived for future reference and re-analysis.

The biggest technical challenges in the use of data compression comprise increasing efficiency of simulations, better mastering the explosion of data generated and providing flexibility in analysis and development of the aggregated data. Adequate and potent tools are needed to further exploit the potential of simulation tools.

## SOLUTION

SIDACT has with FEMZIP already introduced a compression tool achieving high compression factors. SDMZIP was developed to further minimize storage space while optimizing the performance. This is achieved by aggregating related simulation files into a set instead of compressing each simulation result individually.

## FUNCTIONALITY

As a lossy compression tool the SDMZIP software, developed by SIDACT, enables the aggregation of related simulation files into a set, thus adding additional features to sophisticated compression procedures and achieving a substantial increase in data size reduction.

SDMZIP compiles aggregated information of different simulations in a central database. This database is complemented by simulation-specific detail files for each simulation result. To an existing set any number of simulations can be added resulting in an update database.

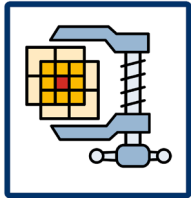
Each simulation can be decompressed separately, requiring only the simulation-specific file and all databases that were generated resp. existed at the time of compression. As dependencies are stored recursively, the predecessors can be identified.

A patent application for the core of this technology has already been submitted to the German Patent Office (DPMA Number 10 2014 103 768.5). The associated research was co-funded by the Federal Ministry for Economic Affairs and Energy (BMWi, Support code 03SU03D011)

# BENEFITS

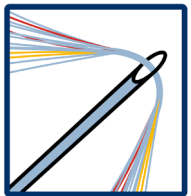
The improved compression and modular file structure of the SDMZIP software provides significant benefits for users in terms of considerably less memory and rapid data transmission.

## REDUCED ARCHIVE SIZE



Simulations generate huge volumes of data and the size of this data will only increase in the future. If all simulation data is compressed only a fraction of the storage is required. Storage and backup capacities can hold more simulation results. SDMZIP brings a cost-effective and highly integrated solution for sets of simulation results reducing the need to extend archive infrastructure and storage space.

## SHORTER DATA TRANSFER TIMES



Lossy data compression technologies are known to grow computationally more complex as they grow more efficient. This places high demands on data transmission when it comes to transmission of result data across computer networks. Apart from the mere issues of transfer speed, especially network bandwidths have turned out to be the bottleneck for transmissions speed. As compressed simulation results require significantly less storage they can be transferred in a fraction of the time needed to transfer uncompressed results. With the file structure of SDMZIP being a modular one, the extension of an existing set requires only the transmission of the update database and the new simulation-specific files.

## SUPPORTED DATAFORMATS

With high compression factors achieved by FEMZIP-CRASH products and the good integration into leading post-processors FEMZIP is in high demand throughout the industry. The newly developed SDMZIP software is an advanced data compression tool designed to compress sets of simulation results.

SDMZIP addresses – same as FEMZIP – compression solutions for the most commonly used software packages. SDMZIP is already available for PAM-CRASH.

SDMZIP releases for

- LS-DYNA
- RADIOSS
- A4DB

will soon be available.

Please do not hesitate to contact us for release dates, additional product features.

# DEPLOYMENT

SDMZIP can be deployed in a broad range of application areas and easily be integrated in existing software environments.

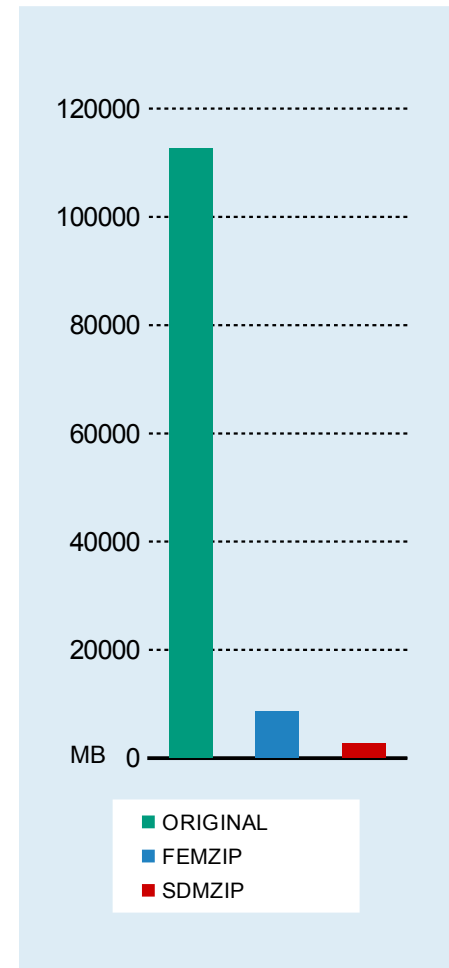
## INTEGRATION

Deploying SDMZIP as a compression tool offers – apart from reduction of storage space – the user significant flexibility. SDMZIP allows it to compress a set of simulation results and to extend this set afterwards. Simulations can be compressed all at once or one after another, even across various intermediate steps or combinations of both.

To analyze an already existing set one has to compress all simulations together and copy the compressed files into the working directory. With all simulation-specific file data being stored, various analyses can be conducted. Furthermore, the required storage space and transfer time are kept at a minimum.

When developing a new model SDMZIP can be integrated into a simulation data management system to append each new version one after another to the set. The SDM-System can then identify the appropriate set and the generated updates can be made available to all developers involved.

## COMPRESSION RESULTS



SDMZIP further improves the compression of FEMZIP by eliminating data redundancy and storing common-alities in a central database. SDMZIP can be used for the compression of simulation results one after another or all at once and has already achieved very good compression performance. In the test case to the left SDMZIP was used for an all at once compression.

The test case shows an example of an ENCAP frontal crash robust analysis with 24 simulations. The simulations were compressed all at once with an absolute precision of 0.1 mm. The graph shows the significant reduction in storage space. In this example the compression ratio with respect to FEMZIP has increased threefold.

## **FREE EVALUATION**

Find out how you can benefit from SDMZIP and ask for a free evaluation license.

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