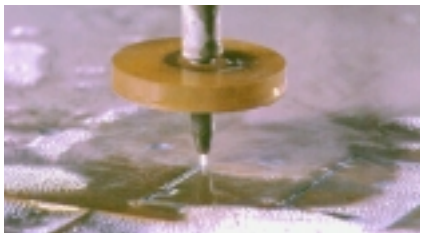
ARMOX™ Cutting recommendations

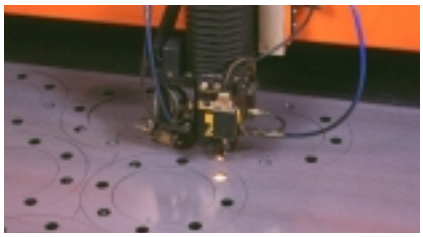
SSAB Oxelösund AB, Sweden, produces up to 150 mm thick ARMOX armour plate in steel grades ranging from ARMOX 370T up to ARMOX 600T. All *high-hardness* ARMOX plate (see the table below) should be cut under controlled conditions as described below :

ARMOX 500T	ARMOX 560T	ARMOX 600T	Recommended cutting method
Up to 25 mm	Up to 15 mm	Up to 10 mm	● Abrasive waterjet ● Plasma ● Laser ● Abrasive disc
25 – 35 mm	15 – 25 mm	10 – 20 mm	● Abrasive waterjet ● Laser ● Gas cutting at reduced speed ● Gas cutting plus preheating to 170 ± 30°C ● Abrasive disc
40 – 60 mm	25 – 35 mm	20 – 30 mm	● Abrasive waterjet ● Gas cutting plus preheating to 170 ± 30°C plus keep warm for 4 hours at 160 ± 40°C ● Abrasive disc
Over 60 mm	Over 35 mm	Over 30 mm	● Abrasive waterjet ● Abrasive disc



Abrasive waterjet

This process can be applied to the complete range of high-hardness ARMOX plate, and is recommended as the best method, because the absence of HAZ eliminates the risk of cracking.



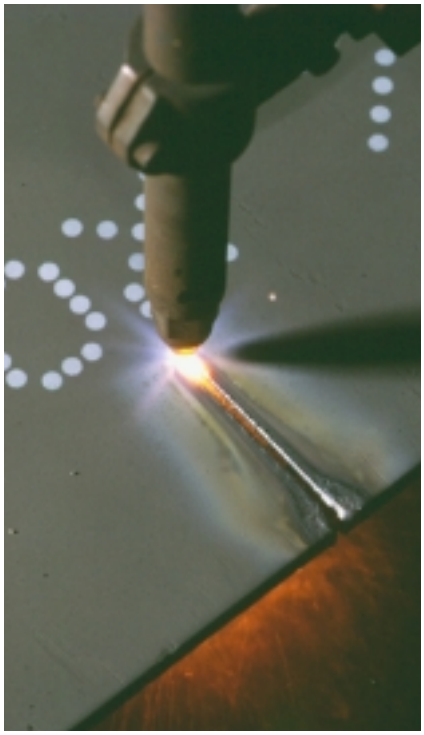
Laser cutting

High-hardness ARMOX plate up to around 20 mm thick can be cut using this process. It generates a narrow kerf, usually less than 1 mm, and a narrow HAZ, usually less than 3 mm.

Plasma cutting

High-hardness ARMOX plate up to around 25 mm thick can be cut using this process. It generates a kerf, usually 3–4 mm, and a HAZ up to 5 mm. Plasma cutting can be performed under water, which minimizes the amount of distortion.

cont. overleaf ►►►



Gas cutting

This process can be applied to high-hardness ARMOX plate up to 80 mm thick. It generates a kerf of 2–5 mm and a HAZ which is usually 4–10 mm wide.

Uncontrolled gas cutting of high-hardness armour plate may result in *hydrogen cracking* (also called *cold cracking*) which may occur in thicknesses above 20–30 mm. The thicker the plate, the higher the sensitivity to cracking.

The most effective technique for avoiding cracking during and after the cutting process is to preheat the plate and then keep the cut profiles warm (see the table overleaf).

Preheating consists of bringing the whole plate, or at least a 100 mm wide area on either side of the future kerf, up to a specified minimum temperature before the process begins. This can be done by using thermostatically controlled furnaces, heating mats or, in some cases, using gas burners to maintain the temperature throughout the process.

The same equipment can be used to keep the profiles warm for a specific time immediately following the cutting process.

In some instances, thick plate profiles that are not prone to overheating can be cut at low speed, which obviates the need for preheating.

Abrasive disc

This process is usually applied to the cutting of tube and rod but can also be adopted for straight line cutting of the complete range of high-hardness ARMOX plate. The kerf is the thickness of the disc, with little or no HAZ.

Profiling before quenching

In some special cases, small profiles cut from high-hardness ARMOX plate over 100 mm thick require extensive and expensive machining. In such cases, we can supply ARMOX plate in *as-rolled* condition, subject to prior agreement.

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